How Macroeconomic Factors Affect Capital Structure Choices during an Economic Crisis

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Abstract

This paper studies the macro-economic determinants of the capital structure during an economic crisis: the Euro Crisis. In this study, the pooled and fixed effects multivariate regression models are employed to quantify the influence of five macroeconomic independent variables, during the time period of 1999-2015, on three dependent variables of book leverage, net equity, and debt-to-equity ratio of a balanced panel of 621 European publicly traded firms which are divided into three industries of retail trade and services, manufacturing and construction, and transportation and tourism. The signs of the statistically significant coefficients disclose that our findings are consistent with the market timing theory of capital structure. Our empirical results shed light on the macroeconomic determinants of the capital structure during the Euro Crisis and provide evidence that the eurozone firms count on equity when they operate in economic growth, the European Central Bank adopts the expansionary monetary policy, they expect the interest rate falls, the inflation rate drops and their respective government faces a budget deficit. Conversely, eurozone businesses rely on debt in recessions, contractionary monetary policy, increasing interest rates, inflationary economy, and budget surplus. In addition, we conclude that in capital structure decisions, the more investment required, the more macroeconomic determinants exist.

Keywords: Euro Crisis; fixed effects multivariate regression model; macroeconomic determinants; theories of capital structure.

1. Introduction

Determining an optimal capital structure has been a principal research issue and an area of debate among academicians and practitioners for a long time. “How should firms adjust their capital structure during different periods of their business life cycles?” or “How should firms arrange their capital structure according to changes in economies?” has been questioned enduringly in several studies. Capital structure refers to the way a firm finances its business operations and future investments through some combinations of debt and equity. Equity finance can be raised either by issuing and selling equity securities such as common stock, preferred stock, and warrants to investors or by using retained earnings. Debt finance is raised when a firm sells debt securities such as commercial papers and corporate bonds to creditors. Theoretically speaking, the optimal capital structure is the point at which the marginal benefit of debt financing equals that of equity financing (Yang, 2013); however, practitioners may seek a target capital structure by relying heavily on practical rules (Graham and Harvey, 2001) such as the moving average of historical capital structure and the industry ratio.

Traditional capital structure theories suggest a very slow adjustment process towards target debt ratio (Shyam-Sunder and Myers, 1999; Fama and French, 2002; Baker and Wurgler, 2002; Welch, 2004), which is determined by the adjustment costs and benefits (Flannery and Hankins 2007). Hackberth *et al.* (2006) and Cook and Tang (2010) demonstrate that regardless of firms' access to capital markets, firms tend to adjust faster toward their target leverage in booms than in recessions. By using a sample of 90 Swiss firms between 1991 and 2001, Drobetz and Wanzenried (2006) conclude that faster-growing firms and those that are further away from their optimal capital structure adjust more readily.

Capital structure is normally stable over time (Lemmon *et al.*, 2008; Andres *et al.*, 2014) until some changes in either firm-specific or macroeconomic factors happen (Korajczyk and Levy, 2003; Andres *et al.*, 2014) and researchers have devoted a significant effort to review these two distinct categories of capital structure determinants. A considerable body of literature on determinants of capital structure has investigated the effects of certain firm characteristics such as profitability (Titman and Wessels, 1988; Harris and Raviv, 1991; Rajan and Zingales, 1995; Booth *et al.*, 2001; Ozkan, 2001; Hovakimian *et al.*, 2004; Drobetz and Wanzenried, 2006; Kim *et al.*, 2006; De Jong *et al.*, 2008; Bastos *et al.*, 2009; Frank and Goyal, 2009; Mukherjee and Mahakud, 2010; Rajagopal, 2010; Yang *et al.*, 2010; Moradi and Paulet, 2019), financial flexibility (Bancel and Mittoo, 2002), stock return (Bhandari, 1988; Hovakimian *et al.*, 2001; Yang *et al.*, 2010), investment opportunities (Titman and Wessels, 1988; Stulz, 1990; Harris and Raviv, 1991; Rajan and Zingales, 1995; Hovakimian *et al.*, 2001; Baker and Wurgler, 2002; Banerjee *et al.*, 2004; Hovakimian *et al.*, 2004; Drobetz and Wanzenried, 2006; Frank and Goyal, 2009; Mukherjee and Mahakud, 2010; Rajagopal, 2010), expected growth (Ozkan, 2001; Lööf, 2004; Kim *et al.*, 2006; De Jong *et al.*, 2008; Yang *et al.*, 2010; Moradi and Paulet, 2019), liquidity (Ozkan, 2001, Bastos *et al.*, 2009), asset tangibility (Titman and Wessels, 1988; Rajan and Zingales, 1995; Johnson, 1997; Booth *et al.*, 2001; Drobetz and Wanzenried, 2006; De Jong *et al.*, 2008; Frank and Goyal, 2009; Yang *et al.*, 2010; Mukherjee and Mahakud, 2010; Moradi and Paulet, 2019), diluted EPS (Bancel and Mittoo, 2002), earnings volatility (Titman and Wessels, 1988; Harris and Raviv, 1991; Rajan and Zingales, 1995; Rajagopal, 2010; Moradi and Paulet, 2019), research and development intensity (Lööf, 2004), size of firm (Titman and Wessels, 1988; Harris and Raviv, 1991; Ozkan, 2001; Banerjee *et al.*, 2004; Lööf, 2004; Drobetz and Wanzenried, 2006; Kim *et al.*, 2006; De Jong *et al.*, 2008; Bastos *et al.*, 2009; Mukherjee and Mahakud, 2010; Rajagopal, 2010; Abeywardhana, 2015; Moradi and Paulet, 2019), industry leverage (Frank and Goyal, 2009), risk (De Jong *et al.*, 2008), industry classification (Yang *et al.*, 2010; Balboa *et al.*, 2016; Serrasqueiro *et al.*, 2016), tax shield (Moradi and Paulet, 2019), non-debt tax shield (Moradi and Paulet, 2019), and effective rate of corporate taxation (Sett and Sarkhel, 2010).

As external factors over which managers do not have control, macroeconomic factors are important parameters that have the potential to induce substantial changes in the capital structure. Hanousek and Shamshur (2011) demonstrate that financially unconstrained firms respond quickly to economic changes and adjust their target capital structure substantially faster than constrained firms. Guad *et al.* (2005) conclude that the national environment affects the debt-equity choices of European firms over the period of 1988-2000, but they do not mention which macroeconomic variables are decisive factors and how the national economy affects the capital structure choices. Baum *et al.* (2010) indicate the macroeconomic uncertainty affects the ability of a firm to borrow. Hackbarth *et al.* (2006) declare that the tax

benefit of issuing debt relates to the level of cash flows which is dependent on economic booms and recessions. Mcclure *et al.* (1999) show firms in France, Italy, and Germany tend to use more debt than those operating in the US, the UK, and Japan. In addition, Lööf (2004) states the UK and the US are equity-dominated economies. Booth *et al.* (2001) analyze 727 firms in 10 developing countries and declare that the GDP growth directly and the inflation rate inversely affect the capital structure choices. By examining the US firms from 1964 to 2001, Huang and Ritter (2005) state that the GDP growth is positively correlated with the likelihood of debt issuance while it is not reliably correlated with the probability of equity issuance. Conversely, Bastos *et al.* (2009) use panel data of 388 publicly traded Latin American companies between 2001 and 2006 and document that the only macroeconomic determinant is the GDP growth which is significantly negatively related to the indebtedness level. Besides, Bokpin (2009) covers panel data for 34 emerging market countries during the time period of 1990-2006 and finds that there is a significantly negative relationship between GDP per capita and capital structure choices. He also adds the inflation rate positively influences the choice of short-term debt over equity and expectations of increasing interest rate positively influences firms to substitute long-term debt for short-term debt over equity. While Gajurel (2006) and Camara (2012) states the GDP growth rate and the inflation rate are significantly negatively related to leverage, Wanzenried (2006) announces that both of these factors significantly positively affect the adjustment of capital structure by investigating a sample of 873 firms in four European countries. By forming a sample of firms within 42 developed and developing countries, De Jong *et al.* (2008) evidence that the influence of GDP growth rate on corporate capital structure is mixed, in some countries positively significant and in the others negatively significant. Frank and Goyal (2009) and Hanousek and Shamshur (2011) asserts that expected inflation is significantly positively correlated with market leverage. Sett and Sarkhel (2010) find that financial leverage is positively related to the rate of inflation by examining the Indian non-financial private corporate sector during the period of 1981-2007. In a recently published paper, Mokhova and Zinecker (2014) investigate the effects of fiscal and monetary factors on the capital structure of firms operating in seven European countries during the time period of 2006-2010. They conclude that government debt, interest rate, and inflation rate affect the capital structure choices in some specific countries. However, their study lacks a sound macroeconomic model and is solely based on the correlation coefficients among the selected variables. As it is obvious from the prior studies, the findings are blended and each phenomenon should be separately investigated based on its own characteristics.

Despite the intuitiveness and impact of the Euro Crisis on the capital structure of European firms, there has been a lack of theoretical framework and quantitative models that formalize it and examine its implications. It is neither feasible nor desirable to include all macroeconomic factors affecting capital structure choices in a model specification because the purpose of modeling is not to mimic the reality but to capture the essential forces affecting the leverage. Based on the aforementioned researches, we form a set of five macroeconomic factors of GDP growth, money supply, interest rates, inflation rates, and budget surplus (deficit) to investigate the macroeconomic determinants of capital structure in our empirical analysis. Our primary research question is which macroeconomic variables, during the Euro Crisis, are mainly decisive when the capital structure is going to be formed. Our paper contributes to the literature on capital structure in three ways. First, it investigates a currently exiting crisis that has been barely investigated before in the capital structure studies. Second, it analyzes three

separate measures of book leverage, net equity, and debt-to-equity ratio rather than either an aggregate measure of the total debt or a sole measure of leverage. Third, it tests two rarely used macroeconomic variables, the money supply, and the budget surplus, in the capital structure studies.

The balance of this paper is organized as follows: We, firstly, review the theories of capital-structure related decisions. Then, we use a multivariate regression model for a balanced panel sample to investigate the impact of macroeconomic factors on three dependent variables of book leverage, net equity, and debt-to-equity ratio. Using panel analysis on balanced data for a recent 17-year period for 621 European registered firms from Austria, Belgium, France, Germany, Luxembourg, and the Netherlands, this paper documents that the macroeconomic determinants of capital structure for the full sample, the full sample with dummy variables specifying different countries and three subsamples introducing different industries. In particular, we find that the GDP growth and the money supply are statistically negatively related to leverage as well as debt-to-equity ratio, and are positively correlated with net equity. Also, we detect that the interest rate, the inflation rate, and the budget surplus are statistically positively correlated with leverage as well as debt-to-equity ratio, and are negatively related to net equity.

2. The theories of capital structure

Begun with the celebrated paper of Modigliani and Miller (1958), the basis for modern thinking on the capital structure was formed. The Modigliani and Miller (M&M) basic theorem states that in the absence of taxes, bankruptcy costs, agency costs, and asymmetric information, and in an efficient market, the value of a firm is unaffected by how that firm is financed (Modigliani and Miller, 1958). That is, it does not matter if the firm's capital is raised by issuing stock or selling debt, it does not matter what the firm's dividend policy is. Thus, there is no gain from opportunistically switching between equity and debt.

However, the M&M theorem follows a restrictive set of assumptions and does not apply to real-world situations since firstly the firm’s choice of financing and dividend policy can affect the taxes of the firm or of its investors. Secondly, financing and payout policy can affect information costs or contracting costs, including the cost arising from bankruptcy or financial distress. Thirdly, the firm’s capital structure, and whether it chooses to retain or payout corporate cash, can affect management’s operating and investment decisions.

The irrelevant assumption of no taxes was later modified with the introduction of the second M&M theory which suggests that firms seek target capital structures where they can enjoy the tax-deductibility of interest payments (Modigliani and Miller, 1963). If managers possess inside information, the value of the firm will rise with leverage (Ross, 1977). However, the theoretical tax benefits of borrowing shrink as more debt is issued and interest tax shields become less certain (Myers, 1977).

According to trade-off theory, firms seek their optimal capital structure where the benefit of the last dollar of debt offsets the corresponding cost (Kraus and Litzenberger, 1973). This theory assumes that a firm trades off between benefits such as the tax-deductibility of interest as well as the reductions of free cash flow problems and costs including potential bankruptcy costs and agency conflicts between shareholders and bondholders (Fama and French, 2002).

Introduced by Myers and Majluf (1984), the pecking order theory departs from the theory of an optimal capital structure and suggests the hierarchy of preferences that firms follow in order to choose their capital structures. According to this theory, firms prefer first to finance investment with internally generated funds such as retained earnings, and then they prefer to issue debt in lieu of equity when they need outside funding.

The Theories of Capital Structure	Assumptions	Method of Prioritization	Shortcomings
M&M1 Theory	No taxes; no bankruptcy costs; no agency costs; asymmetric information; efficient market	Indifferent to select either debt financing or equity financing	Assumptions are not compatible with the real world.
M&M2 Theory	Tax deductibility of the interest cost	First debt financing and then equity financing	The tax advantage of borrowing shrinks as more debt is issued.
Trade-off Theory	Weighting the benefits and costs of an additional dollar of debt	The benefits of the last dollar of debt offset the corresponding cost	The theory retains the assumptions of market efficiency and symmetric information.
Pecking Order Theory	Easiness to access	First retained earnings, second debt financing, and third equity financing	The theory departs from the theory of an optimal capital structure.
Market Timing Theory	High stock returns initiate the equity issuance.	Issuing shares at high prices; repurchasing shares at low prices	The theory departs from the rational perspective because it considers investors' inability the main driver of issuers' opportunistic behavior.

Exhibit 1 – Summary of the capital structure theories.

The most recently developed theory of capital structure is market timing, also called windows of opportunities. Several empirical studies have found evidence to support the market timing theory of capital structure (Welch, 2004; Mahajan and Tartaroglu, 2008; Brendea, 2012; Dong *et al.*, 2012; Lee *et al.*, 2012; Chen *et al.*, 2013; Yang, 2013; Arosa *et al.*, 2014; Huang, 2014; Khanna *et al.*, 2015). This theory suggests that firms issue equity when their shares are overvalued and then repurchase when the market value of shares is perceived to be low (Ritter, 1991; Loughran and Ritter, 1995). Also, Baker and Wurgler (2000 and 2002) affirm that firms issue equity either when market-to-book values are higher or when stock prices have risen. Alti and Suleiman (2012) document that firms exhibit equity issues when high returns coincide with strong demand from institutional investors. Huang and Ritter (2009) show that publicly traded U.S. firms gratify their financing needs with external equity when the cost of equity capital is low. In conclusion, capital structure is the cumulative consequence of past endeavors to time the equity market and there is no optimal capital structure (Baker and Wurgler, 2002).

Exhibit 1 succinctly summarizes the above-mentioned theories of capital structure. Given the tradeoffs between benefits and costs of debt financing, capital structure theories suggest that the optimal debt ratio can be found, but there is no precise explanation of how to measure an optimal capital structure. Moreover, the adjustment of capital structure can be elaborated based on the nature of companies: growth and value. Not only does a growth company focus on obtaining financial flexibility which means minimal debt and low payout, but also when it faces a drop in its operating cash flows, it is less likely that it forgoes positive NPV projects

than firms financed mainly with debt. On the other hand, value companies tend to use more debt and higher gearing than growth companies.

In sum, considering the existing theories and different levels of investment opportunities for firms, the examination of the adjustment of the capital structure of firms in a pandemic financial distress such as the Euro Crisis is an interesting research topic that can contribute to academia and provide useful guidelines to businesses.

3. Research design

We estimate a panel data model to incorporate the selected economy-wide factors and the equation is the following:

$$\mathrm{DepVar}_{i,t} = c_{i,t} + \beta_1 G_{i,t} + \beta_2 S_{i,t} + \beta_3 R_{i,t} + \beta_4 I_{i,t} + \beta_5 B_{i,t} + \mathrm{AR}(1) + \varepsilon_{i,t} \qquad (1)$$

where the subscript *i* defines the observations that belong to the i^{th} firm and the subscript *t* denotes the time period. In this model, the dependent variable of firm *i* over the time period *t* ($\mathrm{DepVar}_{i,t}$) is regressed on a set of potential macroeconomic determinants such as the GDP growth rate ($G_{i,t}$), the money supply ($S_{i,t}$), the interest rate ($R_{i,t}$), the inflation rate ($I_{i,t}$), budget surplus ($B_{i,t}$) and the lagged value of the dependent variable (AR(1)). Moreover, $c_{i,t}$, $\varepsilon_{i,t}$ and β_i represent the intercept term of the multivariate regression, the error term for the i^{th} observation in the period *t*, and the slope coefficient for the i^{th} independent variables, respectively.

The dependent variables consist of book leverage, net equity, and debt-to-equity ratio which are three proxies for how the firm's capital structure is formed. Book leverage equals the book value of total debt divided by total assets. Net equity is total shareholders' equity, net of retained earnings, divided by total assets and debt-to-equity ratio is equal to total debt divided by total shareholders' equity. We define total debt as long-term debt plus interest-bearing short-term debt and we do not consider non-interest-bearing liabilities, such as accounts payable, accrued liabilities and deferred taxes, debt.

As shown in Exhibit 2, the independent variables of the six European countries between 1999 and 2015 are collected from the databases of the World Bank and the Eurostat. Based on the three dominated theories of capital structure, we state the properties for each of the estimated coefficients of the independent variables and present them in Exhibit 3.

GDP growth rate: The widely investigated macroeconomic determinant is the GDP growth rate. The existing literature has provided mixed results on the coefficient sign. The significantly negative sign is consistent with the pecking order theory because the boost in the economy leads to an increase in the profit of firms who prefer retained earnings to debt and vice versa. The market timing theory declares that the economic boom is positively correlated with net equity and negatively correlated with book leverage. Consistent with the trade-off theory of capital structure, during an economic contraction, firms have lower taxable income to shield; as a consequence, debt will be less attractive and the book leverage is positively correlated with the GDP growth rate. Some studies such as Booth *et al.* (2001), Huang and Ritter (2005), and Hanousek and Shamshur (2011) support the direct relationship between the

GDP growth rate and leverage, while the others (Gajurel, 2006; Bastos *et al.*, 2009, Bokpin, 2009; Camara, 2012) state the indirect correlation.

Money supply: M2 is a proxy for the money supply which has not been recognized as a macroeconomic determinant of capital structure in prior studies. As an expansion of the money supply pursues to lower the interest rate, we expect to have different coefficient signs for the independent variables of money supply and interest rate.

Interest rate: The Maastricht convergence criterion bond yields act as a proxy for the long-term interest rate. This rate is a good measure of the interest rate for the purpose of this research because capital structure mainly relates to long-term debt, consequently long-term interest rates, this rate reflects the expectations about future fluctuations in the interest rate along with the convergence yields exclude the market expectation about the extra return required because of the additional risk the investors take when they invest in corporate bonds. According to the market timing theory and the trade-off theory, firms prefer leverage when the interest rates are low compared to the cost of equity and future expected interest rates. Bokpin (2009) asserts the expectations of increasing interest rates positively influence firms to substitute debt over equity. As a result, a positive (negative) correlation exists between the leverage (net equity) and the convergence yields which illustrate the expectations on future interest rates.

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Austria																	
GDP Growth Rate (%) †	3.590	3.368	1.351	1.656	0.756	2.706	2.141	3.351	3.622	1.547	-3.799	1.929	2.808	0.757	0.321	0.353	0.862
Money supply (% of GDP) †	137.200	142.300	65.805	65.030	68.313	69.150	74.145	77.770	86.516	92.523	91.175	88.639	86.611	86.263	87.624	89.631	85.659
Interest Rate (%) ‡	4.680	5.560	5.080	4.960	4.140	4.130	3.390	3.800	4.300	4.360	3.940	3.230	3.320	2.370	2.010	1.490	0.750
Inflation Rate (%) †	0.562	2.395	2.663	1.802	1.356	2.061	2.305	1.450	2.169	3.216	0.506	1.814	3.267	2.486	2.000	1.606	0.897
Budget surplus (% of GDP) ‡	-2.600	-2.000	-0.600	-1.300	-1.800	-4.800	-2.500	-2.500	-1.300	-1.400	-5.300	-4.400	-2.600	-2.200	-1.300	-2.700	-1.200
Belgium																	
GDP Growth Rate (%) †	3.563	3.634	0.811	1.780	0.775	3.635	2.094	2.499	3.397	0.747	-2.285	2.695	1.797	0.159	0.003	1.295	1.374
Money supply (% of GDP) †	126.600	121.500	88.836	91.269	95.786	98.728	101.971	102.927	101.941	103.366	108.470	107.869	105.916	109.269	113.064	117.781	117.975
Interest Rate (%) ‡	4.750	5.590	5.130	4.990	4.180	4.150	3.430	3.810	4.330	4.420	3.900	3.460	4.230	3.000	2.410	1.710	0.840
Inflation Rate (%) †	1.118	2.545	2.474	1.642	1.593	2.092	2.784	1.791	1.822	4.489	-0.053	2.189	3.532	2.840	1.114	0.340	0.561
Budget surplus (% of GDP) ‡	-0.600	-0.100	0.200	0.000	-1.800	-0.200	-2.600	0.200	0.100	-1.100	-5.400	-4.000	-4.100	-4.200	-3.000	-3.100	-2.600
France																	
GDP Growth Rate (%) †	3.407	3.875	1.954	1.118	0.820	2.786	1.608	2.375	2.361	0.195	-2.941	1.966	2.079	0.183	0.576	0.259	1.156
Money supply (% of GDP) †	102.800	101.000	64.215	66.888	70.729	72.698	76.139	79.087	84.845	89.766	88.528	89.871	89.731	90.477	87.654	89.784	82.069
Interest Rate (%) ‡	4.610	5.390	4.940	4.860	4.130	4.100	3.410	3.800	4.300	4.230	3.650	3.120	3.320	2.540	2.200	1.670	0.840
Inflation Rate (%) †	0.533	1.699	1.630	1.917	2.109	2.135	1.736	1.684	1.488	2.814	0.088	1.530	2.117	1.956	0.864	0.508	0.038
Budget surplus (% of GDP) ‡	-1.600	-1.300	-1.400	-3.100	-3.900	-3.500	-3.200	-2.300	-2.500	-3.200	-7.200	-6.800	-5.100	-4.800	-4.000	-4.000	-3.500

Exhibit 2 (1) – A complete history of the underlying macroeconomic data in six European countries.
The annual percentage growth rate of GDP is at market prices based on the constant local currency. The money supply is proxied by M2 as a percentage of GDP, which is measured as the sum of money in circulation, overnight deposits, deposits with an agreed maturity of up to two years, and deposits redeemable at notice of up to three months divided by the GDP value. The Maastricht convergence criterion bond yields act as a proxy for long-term interest rate and are defined as the central government bond yields on the secondary market, gross of tax, with an approximately 10-year maturity. The inflation rate is measured by the consumer price index (CPI) and is calculated by the Laspeyres formula. The budget surplus (deficit) is reported as a percentage of GDP.

†Data are collected from the database of the World Bank.
‡Data are gathered from the database of the Eurostat.

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Germany																	
GDP Growth Rate (%) †	1.987	2.962	1.695	0.000	-0.710	1.170	0.707	3.700	3.261	1.082	-5.619	4.080	3.660	0.405	0.298	1.600	1.688
Money supply (% of GDP) †	167.600	169.600	65.431	68.366	70.065	70.399	73.841	75.560	79.177	83.951	84.958	84.042	84.652	88.048	89.180	89.995	85.805
Interest Rate (%) ‡	4.490	5.260	4.800	4.780	4.070	4.040	3.350	3.760	4.220	3.980	3.220	2.740	2.610	1.500	1.570	1.160	0.500
Inflation Rate (%) †	0.570	1.471	1.984	1.421	1.034	1.666	1.547	1.577	2.298	2.628	0.313	1.104	2.075	2.008	1.505	0.907	0.234
Budget surplus (% of GDP) ‡	-1.700	0.900	-3.100	-3.900	-4.200	-3.700	-3.400	-1.700	0.200	-0.200	-3.200	-4.200	-1.000	-0.100	-0.100	0.300	0.700
Luxembourg																	
GDP Growth Rate (%) †	8.420	8.442	2.153	3.621	1.398	4.411	3.216	5.111	8.396	-0.843	-5.377	5.677	2.566	-0.847	4.347	4.069	4.849
Money supply (% of GDP) †	633.484	618.900	420.027	398.940	380.314	383.286	429.429	455.720	494.966	511.501	398.336	375.560	367.756	347.250	377.960	400.737	482.825
Interest Rate (%) ‡	4.660	5.520	4.860	4.700	3.320	2.840	2.410	3.300	4.460	4.610	4.230	3.170	2.920	1.820	1.850	1.340	0.370
Inflation Rate (%) †	1.005	3.147	2.667	2.074	2.050	2.226	2.490	2.676	2.303	3.400	0.370	2.273	3.410	2.664	1.734	0.630	0.475
Budget surplus (% of GDP) ‡	3.700	5.900	6.000	2.500	0.200	-1.300	0.100	2.000	4.200	3.400	-0.700	-0.700	0.500	0.300	0.800	1.700	1.200
The Netherlands																	
GDP Growth Rate (%) †	5.052	4.239	2.124	0.104	0.284	2.031	2.160	3.519	3.698	1.699	-3.768	1.403	1.664	-1.057	-0.495	1.011	1.991
Money supply (% of GDP) †	82.842	84.389	80.587	83.518	90.169	91.746	100.574	103.676	99.204	102.067	108.335	108.431	110.155	109.976	107.308	117.433	122.861
Interest Rate (%) ‡	4.630	5.400	4.960	4.890	4.120	4.100	3.370	3.780	4.290	4.230	3.690	2.990	2.990	1.930	1.960	1.450	0.690
Inflation Rate (%) †	2.193	2.317	4.162	3.287	2.113	1.238	1.674	1.168	1.614	2.487	1.190	1.276	2.341	2.456	2.507	0.976	0.600
Budget surplus (% of GDP) ‡	0.300	1.900	-0.300	-2.100	-3.000	-1.700	-0.300	0.200	0.200	0.200	-5.400	-5.000	-4.300	-3.900	-2.400	-2.400	-1.800

Exhibit 2 (2) – A complete history of the underlying macroeconomic data in six European countries.
The annual percentage growth rate of GDP is at market prices based on the constant local currency. The money supply is proxied by M2 as a percentage of GDP, which is measured as the sum of money in circulation, overnight deposits, deposits with an agreed maturity of up to two years, and deposits redeemable at notice of up to three months divided by the GDP value. The Maastricht convergence criterion bond yields act as a proxy for long-term interest rate and are defined as the central government bond yields on the secondary market, gross of tax, with an approximately 10-year maturity. The inflation rate is measured by the consumer price index (CPI) and is calculated by the Laspeyres formula. The budget surplus (deficit) is reported as a percentage of GDP.

†Data are collected from the database of the World Bank.
‡Data are gathered from the database of the Eurostat.

Inflation rate: According to market timing theory, when the inflation rate is expected to grow, firms use debt financing, so a positive relationship exists. The reason is attributed to the fact that an increasing inflation rate escalates the nominal interest rate on future loans, but diminishes the real interest rate on previous debt securities. Bokpin (2009), Frank and Goyal (2009), and Sett and Sarkhel (2010) indicate supporting evidence.

Budget surplus (deficit): None of the prior studies has investigated the relationship between the budget surplus and leverage. Our expectation regarding the coefficient sign of the inflation rate is inconclusive.

The Theories of capital structure	GDP growth rate	Money supply	Interest rate	Inflation Rate	Budget surplus (deficit)
Trade-off Theory					
Book leverage	Positive	Negative	Positive	–	–
Net Equity	Negative	Positive	Negative	–	–
Debt-to-equity ratio	–	–	–	–	–
Pecking Order Theory					
Book leverage	Negative	–	–	–	–
Net Equity	Positive	–	–	–	–
Debt-to-equity ratio	–	–	–	–	–
Market Timing Theory					
Book leverage	Negative	Negative	Positive	Positive	–
Net Equity	Positive	Positive	Negative	Negative	–
Debt-to-equity ratio	–	–	–	–	–

Exhibit 3 – Review of the capital structure theories on selected macroeconomic determinants.

The autoregressive variable acts as a proxy for the firm-specific factors which are not within the boundaries of this research. This variable also represents an aggregate of past decisions and shows the cumulative result of hierarchical financing over time. The correlation coefficients among the independent variables for the full sample are depicted in Exhibit 4 which shows the low correlation coefficients, less than 0.43, do not create multicollinearity problems.

Since we tend to mathematically describe the relationship between a set of explanatory variables and the dependent variables, we posit the existence of a linear relationship, and we consider the multivariate regression model the appropriate statistical technique. We follow a three-step procedure for each of our demonstrated results in order to not only correct the violations of the underlying assumptions of the linear regression model, but also choose the most appropriate statistical method. Firstly, the model is tested for heteroskedasticity, autocorrelation, and multicollinearity by performing model diagnostics of the Breusch-Pagan chi-square test, the Durbin-Watson test, and the variance inflation factor (VIF), respectively. The model is corrected for heteroskedasticity and autocorrelation by applying the estimated

generalized least square (EGLS) method. Furthermore, the VIF statistic, in addition to correlation coefficients reported in Exhibit 4, indicates that multicollinearity is not a problem.

	GDP growth rate	Money supply	Interest rate	Inflation rate	Budget surplus
GDP growth rate	1.0000	0.1769	0.2045	0.2817	0.4254
Money supply	0.1769	1.0000	0.0316	-0.0347	0.3094
Interest rate	0.2045	0.0316	1.0000	0.3897	0.0200
Inflation rate	0.2817	-0.0347	0.3897	1.0000	0.1916
Budget surplus	0.4254	0.3094	0.0200	0.1916	1.0000

Exhibit 4 – The correlation coefficient amongst independent variables for the full sample.

Second, since an autoregressive variable is used in the model and the panel data has the characteristics of the time series, we test the model for covariance stationarity. Because the absolute value of the inverted autoregressive root is less than 1and the absolute value of the lag coefficient is less than 1, the model has a finite mean-reverting level and is covariance stationary. Additionally, we perform the augmented Dickey-Fuller (ADF) test, and the null hypothesis is rejected, which shows that the panel data does not have a unit root and is covariance stationary.

Third, amongst the panel models of pooled, fixed effects, or random effects, the suitable one should be selected for our analysis. Hence, we perform three tests of *F*-test, Breusch-Pagan Lagrange Multiplier (LM), and Hausman specification. For the full sample and the three subsamples, the results prove the most appropriate statistical method is the fixed effects model; however, the pooled panel model is selected for the full sample with dummy variables assigned to countries because the fixed effects model with dummy variables may suffer from a large loss of degrees of freedom and the many dummies may produce or aggravate the problem of multicollinearity among the regressors.

4. Sample

As corporate rating is a function of country rating and firms typically cannot borrow from the financial markets at interest rates below the rates on their respective government bonds, any sovereign debt spreads will translate into financing problems of firms. During the period under investigation, we observe the credit rating of eurozone countries measured by the Standard and Poor's and we find six countries whose rating has never stood lower than AA. This rating reveals that firms operating in these six European countries have not dramatically suffered from a sudden decrease in their national credit rating and have relied on their own credit rating to issue either equity or debt in the financial markets. As a consequence, the data used in the study are limited to the registered corporations in six eurozone member countries of Austria, Belgium, France, Germany, Luxembourg, and the Netherlands. We pass the following steps to form the sample.

Country	N (firms)	Book leverage		Net equity		Debt-to-equity	
		mean value	Standard deviation	mean value	Standard deviation	mean value	Standard deviation
Austria	33	0.2459	0.1495	0.4386	0.1592	0.9883	2.9105
Belgium	46	0.2313	0.1464	0.4176	0.1631	0.7553	0.8544
France	228	0.2166	0.1430	0.4068	0.1683	0.8026	1.5345
Germany	250	0.1845	0.1586	0.4493	0.1951	0.6712	1.3298
Luxembourg	6	0.2156	0.1386	0.4464	0.1690	0.9964	2.4041
The Netherlands	58	0.2205	0.1548	0.4306	0.1732	0.8084	1.2188
Full sample	621	0.2067	0.1523	0.4290	0.1802	0.7584	1.5102
Industry							
Retail trade and services	222	0.1916	0.1590	0.4260	0.1868	0.7222	1.2239
Manufacturing and construction	358	0.2068	0.1418	0.4388	0.1755	0.7227	1.5537
Transportation and tourism	41	0.2870	0.1775	0.3599	0.1680	1.2668	2.2563
Full sample	621	0.2067	0.1523	0.4290	0.1802	0.7584	1.5102

Exhibit 5 – Sample summary of key variables.
Book leverage equals the book value of total debt divided by total assets. Net equity is total shareholders' equity, net of retained earnings, divided by total assets. The debt-to-equity ratio is equal to total debt divided by total shareholders' equity. The data are book values and are extracted from the database of the Compustat Global Fundamentals Annual.

First, a primary sample of all publicly traded firms in Austria, Belgium, France, Germany, Luxembourg, and the Netherlands during the time period of 1999-2015 is extracted from the Compustat Global Fundamentals Annual database. We focus on book values, gathered from the audited financial reports, rather than market values because calculating the market value is highly dependent on the analyst, increases the complexity of the datasheet, reduces the reliability of the data, and is difficult to defend. Second, the firms are shortlisted by excluding inactive companies. Third, because financial institutions are obliged to follow a set of special regulations that may drive their leverage decisions and because the nature of the industry is highly levered, their capital structures are highly likely to be significantly different from the capital structures of other firms in our sample. So these institutions are forgone in this study. From this narrowed dataset, we limit the sample by eliminating the firms with missing values in order to have balanced panel data. We further exclude observations with negative values for current assets, total assets, current liabilities, long-term debt, and total liabilities. After calculating the equity, we restrict the sample to include firms with shareholders equity greater than 0. Using these criteria, we identify a panel data sample comprised of 621 firms over 17 successive years; that is, we have the total balanced panel observations of 10,591.

The distribution of the sample is described in Exhibit 5 which indicates German firms have the lowest level of book leverage and debt-to-equity ratio and the highest level of net equity amongst the other firms. There are four plausible explanations. Firstly, Germany has the lowest average interest rates, 3.29%, during the time period of 1999-2015 in the midst of all

European countries and in 2015, borrowers relish the cheap money at interest rates of 0.5%. However, before the Euro Crisis, the German banks have invested a lot in Greek and Spanish bonds; thereupon, after the inception of the Crisis, they have confronted with a lack of credit and eagerness to lend (Moradi and Paulet, 2015). Secondly, as the interest rate has been decreasing since the beginning of the Crisis (see Exhibit 2), German firms expect the downturn continues in the future, so they postpone the issuance of their debt securities. Thirdly, when the interest rate falls, the price of corporate bonds will increase, so corporate managers prefer to buy back their bonds before the employment of the low-interest-rate policy and as a result, the level of debt curtails. Fourthly, since the 1980s, Germany has been the most creditworthy country in the eurozone with an AAA credit rating by the Standard and Poor's unveiling that the risk free rate of return, consequently the cost of equity, is the lowest amongst other nations in Europe. To exemplify, the Germany 3-month bond, as a benchmark of the risk-free rate of return, has been negative since December 2011 and reached -0.604% on December 27, 2015. That is, the cost of equity is long-lasting low and firms have been enticed to issue equity.

Additionally, the recognition of macroeconomic determinants of capital structure for a sample of firms operating in inherently different industries may not be useful and the values generated may not convey meaningful results. Hence, by using the Standard Industrial Classification (SIC) codes, 621 firms are categorized into three industry-specific subsamples of retail trade and services (RTS), manufacturing and construction (MC), and transportation and tourism (TT). This categorization makes us enable to not only recognize national drivers of the capital structure, but also compare the effects of macroeconomic factors on different industrial segments. A brief overview of the subsamples is described as follows.

Retail trade and services: This industry is engaged with final consumers who are mainly obliged to shop from this industry in order to handle their daily lives, so the money supply is a key factor. As shown in Exhibit 5, the level of book leverage is the lowest amongst the subsamples and the industry is mainly financed by equity.

Manufacturing and construction: This industry is heavily capital-driven with lengthy projects to implement and the firms operating in the segment can sell their products when the economy is boosting and the demand is growing. The MC industry has an average amount of short-term debt equals to the sum of average short-term debt in the other two industries, which means a considerable part of the debt is allocated to finance business operations and the interest rate is a decisive factor. Also, equity is the preferred choice of financing here.

Transportation and tourism: This industry is connected with recreational activities which consumers use when they can afford, so it is expected that the industry is heavily influenced by the GDP growth rate. As exhibit 5 illustrates, firms in the TT industry have the highest level of book leverage, meaning that the interest rate a major contributor to the formation of capital structure.

5. Empirical results

In what follows, we discuss the results of running Equation 1 by Eviews and examine the full sample as well as the subsamples corresponding to each specified industry and country. We first estimate the multivariate regression equation for the full panel sample, that is, all data

without any distinction in either industries or countries. The estimated intercept and coefficients for the model, their corresponding *p*-values, R^2, Adjusted R^2, *F*-statistic values along with inverted AR roots are presented in Exhibit 6.

Dependent Variable	Intercept	GDP growth rate	Money supply	Interest rate	Inflation rate	Budget surplus	AR(1)	*R*-squared	Adjusted *R*-squared	*F*-statistic	Inverted AR roots
Book leverage	0.2072 (0.0000) ***	-0.0006 (0.0000) ***	-0.0001 (0.0006) ***	0.0010 (0.0245) **	0.0010 (0.0107) **	0.0002 (0.3810)	0.7042 (0.0000) ***	0.9590	0.9562	347.27 (0.0000) ***	0.70
Net equity	0.4436 (0.0000) ***	0.0011 (0.0000) ***	0.0001 (0.0000) ***	-0.0062 (0.0000) ***	-0.0019 (0.0012) ***	-0.0010 (0.0034)	0.7188 (0.0000) ***	0.9478	0.9442	269.78 (0.0000) ***	0.72
Debt-to-equity ratio	0.7595 (0.0000) ***	-0.0043 (0.0000) ***	-0.0006 (0.0000) ***	0.0105 (0.0001) ***	0.0033 (0.1115)	0.0040 (0.0011) ***	0.5313 (0.0000) ***	0.8636	0.8544	94.1402 (0.0000) ***	0.53

Exhibit 6 – The regression estimates for the full balanced panel sample.
This exhibit reports the results of $DepVar_{i,t} = c_{i,t} + \beta_1 G_{i,t} + \beta_2 S_{i,t} + \beta_3 R_{i,t} + \beta_4 I_{i,t} + \beta_5 B_{i,t} + AR(1) + \varepsilon_{i,t}$, where three dependent variables of firm *i* over the time period *t* ($DepVar_{i,t}$) are separately regressed on a set of potential macroeconomic determinants such as the GDP growth rate ($G_{i,t}$), the money supply ($S_{i,t}$), the interest rate ($R_{i,t}$), the inflation rate ($I_{i,t}$), budget surplus ($B_{i,t}$) and the lagged value of dependent variable (AR(1)). Moreover, $c_{i,t}$, $\varepsilon_{i,t}$ and β_i represent the intercept term of the multivariate regression, the error term for the i^{th} observation in the period *t* and the slope coefficient for the i^{th} independent variables, respectively. The dependent variables are book leverage, net equity, and debt-to-equity ratio. Book leverage equals the book value of total debt divided by total assets. Net equity is total shareholders' equity, net of retained earnings, divided by total assets. The debt-to-equity ratio is equal to total debt divided by total shareholders' equity. The model is corrected for heteroskedasticity and autocorrelation and is covariance stationary. We apply the fixed effects regression model estimated by the panel EGLS method in this equation.

The figures display the coefficient of independent variables, *p*-values are shown in parentheses, and ***, **, and * indicate significance at 0.01, 0.05, and 0.10 levels, respectively.

Given the high value of the *F*-statistic and the *p*-value of zero, the regression is significant at the level of 1%. The coefficients for four regressors and the intercept are statistically significant at the 1% level for all three dependent variables. However, the coefficients for inflation rate and budget surplus are statistically insignificant for two and one dependent variables, respectively. As the sample is large, reporting the residuals is not possible in this paper, but it is worthwhile to mention that the mean of residuals is zero by considering seven decimal places. Moreover, the reported high adjusted R^2s, 95.62%, 94.42%, and 85.44%, reveal that the model includes all the relevant predictors and can be used to forecast.

The intercept term and the autoregressive variable are significantly positively correlated with all three regressands at the 1% level. The GDP growth and the money supply are significantly negatively (positively) related to leverage plus debt-to-equity ratio (net equity) at the significance level of 1%. The interest rate is significantly positively (negatively) correlated with leverage and debt-to-equity ratio (net equity) at the 1% or 5% levels. The inflation rate is significantly positively (negatively) correlated with leverage (net equity) at the 1% or 5% levels, but it does not show any significant relationship with the debt-to-equity ratio. And the budget surplus is significantly positively related to the debt-to-equity ratio at the level of 1%. All coefficients enter the regressions with the signs consistent with the market timing theory of capital structure and are aligned with previously noted studies such as Gajurel (2006), De Jong *et al.* (2008), Bastos *et al.* (2009), Bokpin (2009), Frank and Goyal (2009) and Sett and Sarkhel (2010). We conclude that during the time period of 1999-2015, the European firms count on equity when they operate in economic growth, the European Central Bank adopts the expansionary monetary policy, they expect the interest rate falls, the inflation rate drops and their respective government faces a budget deficit. Conversely, eurozone businesses rely on debt in recessions, contractionary monetary policy, increasing interest rates, inflationary economy, and a budget surplus.

Country	D1	D2	D3	D4	D5
Austria	1	0	0	0	0
Belgium	0	1	0	0	0
France	0	0	1	0	0
Germany	0	0	0	1	0
Luxembourg	0	0	0	0	1
The Netherlands	0	0	0	0	0

Exhibit 7 – The definition of dummy variables.

Second, we estimate the country effects by introducing the country-specific dummy variables in Equation 1. As the appropriate statistical method is the fixed effects model, the dummy variables should be added as intercept terms; that is, slopes are the same for six eurozone countries, but the intercepts are different. The new panel data regression is constructed as follows:

$$\mathrm{DepVar}_{i,t} = c_{i,t} + D1 + D2 + D3 + D4 + D5 + \beta_1 G_{i,t} + \beta_2 S_{i,t} + \beta_3 R_{i,t} + \beta_4 I_{i,t} + \beta_5 B_{i,t} + AR(1) + \varepsilon_{i,t} \quad (2)$$

where D1, D2, D3, D4 and D5 have the value of 1 for Austria, Belgium, France, Germany and Luxembourg, respectively; otherwise, their value is zero. When all dummy variables are

zero, the Netherlands is presented. Exhibit 7 shows the value of assigned dummy variables for each country.

We correct the model for heteroskedasticity and autocorrelation and the model is covariance stationary. As the fixed effects model with dummy variables may suffer from a large loss of degrees of freedom and the many dummies may produce or aggravate the problem of multicollinearity among the regressors, we apply the pooled regression model estimated by the EGLS method. The results of the regression are reported in Exhibit 8 which discloses the findings are similar to the findings for the full sample with some minor deviations in the significance levels. As Exhibit 8 shows, the intercept terms of debt-to-equity ratio for France and the intercept term of book leverage for Austria are statistically significant at the 5% level. By ignoring these two significant outcomes, we note that European firms regardless of the country of origin follow the same pattern, which is compatible with the market timing theory, to form their capital structure. Particularly, they rely on debt in recessions, contractionary monetary policy, increasing interest rates, inflationary economy, and budget surplus and they issue equity in converse situation. Besides, in regressions performed for the full sample and for the full sample with dummy variables, the autoregressive variable is always significant at the 1% level and its absolute value is much higher than the absolute value of the other significant predictor variables. This finding expresses that although macroeconomic elements are significantly influential on the formation of capital structure decisions, the firm-specific factors and cumulative aggregate of past decisions, represented by the autoregressive variable, dominantly determine three explained variables of book leverage, net equity, and debt-to-equity ratio. In conclusion, we assert the capital structure of the European firms is bound by the status quo from which a considerable deviation is not supported by the empirical results of this research.

Dependent variables	Intercept	D1	D2	D3	D4	D5	GDP growth rate	Money supply	Interest rate	Inflation rate	Budget surplus	AR(1)	*R*-squared	Adjusted *R*-squared	*F*-statistic
Book leverage	0.1255 (0.0000) ***	0.1098 (0.0103) **	0.0314 (0.4367)	0.0545 (0.0607) *	-0.0282 (0.3307)	-0.0211 (0.8240)	-0.0013 (0.0000) ***	-0.0001 (0.0264) **	0.0015 (0.0964) *	0.0021 (0.0002) ***	0.0002 (0.5603)	0.9446 (0.0000) ***	0.9182	0.9181	10128.59 (0.0000) ***
Net equity	0.4886 (0.0000) ***	-0.0442 (0.3284)	-0.0366 (0.4141)	-0.0578 (0.0884) *	-0.0295 (0.4016)	0.0011 (0.9933)	0.0010 (0.0000) ***	0.0001 (0.0246) **	-0.0031 (0.0013) ***	-0.0022 (0.0002) ***	-0.0007 (0.0537) *	0.9447 (0.0000) ***	0.9112	0.9111	9254.86 (0.0000) ***
Debt-to-equity ratio	0.5009 (0.0000) ***	0.1183 (0.1073)	0.0964 (0.1112)	0.1175 (0.0119) **	-0.0478 (0.3129)	0.1613 (0.4175)	-0.0088 (0.0000) ***	-0.0004 (0.0116) **	0.0089 (0.0500) **	0.0131 (0.0001) ***	0.0051 (0.0125) **	0.7982 (0.0000) ***	0.6994	0.6991	2099.12 (0.0000) ***

Exhibit 8 – The regression estimates for the full balanced panel sample with assigned dummy variables for each country.
This exhibit reports the results of $\mathrm{DepVar}_{i,t} = c_{i,t} + D1 + D2 + D3 + D4 + D5 + \beta_1 G_{i,t} + \beta_2 S_{i,t} + \beta_3 R_{i,t} + \beta_4 I_{i,t} + \beta_5 B_{i,t} + AR(1) + \varepsilon_{i,t}$, where three dependent variables of firm *i* over the time period *t* ($\mathrm{DepVar}_{i,t}$) are separately regressed on a set of potential macroeconomic determinants such as the GDP growth rate ($G_{i,t}$), the money supply ($S_{i,t}$), the interest rate ($R_{i,t}$), the inflation rate ($I_{i,t}$), budget surplus ($B_{i,t}$) and the lagged value of dependent variable (AR(1)). D1, D2, D3, D4, and D5 have the value of 1 for Austria, Belgium, France, Germany, and Luxembourg, respectively; otherwise, their value is zero. Moreover, $c_{i,t}$, $\varepsilon_{i,t}$ and β_i represent the intercept term of the multivariate regression, the error term for the i^{th} observation in the period *t* and the slope coefficient for the i^{th} independent variables, respectively. The dependent variables are book leverage, net equity, and debt-to-equity ratio. Book leverage equals the book value of total debt divided by total assets. Net equity is total shareholders' equity, net of retained earnings, divided by total assets. The debt-to-equity ratio is equal to total debt divided by total shareholders' equity. The model is corrected for heteroskedasticity and autocorrelation and is covariance stationary. We apply the pooled regression model estimated by the panel EGLS method in this equation.

The figures display the coefficient of independent variables, *p*-values are shown in parentheses, and ***, **, and * indicate significance at 0.01, 0.05, and 0.10 levels, respectively.

Third, we analyze to see whether we could obtain a better fit by considering the three categories of industries. Accordingly, the full sample is divided in three subsamples based on the SIC classification in order to investigate the macroeconomic determinants in different industries of retail trade and services, manufacturing and construction, plus transportation and tourism. We apply the regression model to annual data from 1999 to 2015 and implement the three-step procedure, explained in the research design section, which verifies the fixed effects model is the most appropriate statistical method. The results of the multivariate regression are presented in Exhibit 9 and signify the existence of market timing theory in the capital structure decisions as all significant coefficient signs are compatible with this theory. We also pinpoint the implications of our model for the three industries. In the RTS industry, the money supply is the main driver of issuing debt and equity and is followed by the budget surplus as the second one. The credible interpretation is that this industry deals with final consumers consisting of people, firms, and governments who shop to satisfy their daily needs, so the critical factor is the money in hand which is represented with the money supply and the budget surplus variables in the model. In the MC industry, most of the allocated macroeconomic variables play a significant role, but the importance of the GDP growth rate and the interest rate is considerably higher as these two regressors are statistically significant at the 1% level for book leverage, net equity, and debt-to-equity ratio. There are two plausible explanations for this finding. First, this industry is heavily capital-driven with lengthy projects to implement, so the investors and debtholders should place confidence in the economic conditions before engaging in the MC industry. Second, by scrutinizing the financial statements of the sample firms, we discern that firms operating in this industry have an average amount of short-term debt equals to the sum of average short-term debt in the other two industries, which means a considerable part of the debt is allocated to finance business operations and the interest rate is a decisive factor. In the TT industry, the GDP growth significantly influences the three dependent variables, while the interest rate and the budget surplus have a significant correlation with net equity and book leverage, respectively. The reason is attributed to the fact that the economy affects the affordability of recreational activities, so managers issue equity when the economy is flourishing and involve creditors when the economy is weakened. In addition, Exhibit 9 illustrates the capital structure decisions in the manufacturing and construction industry, compared to the other two industries, are highly influenced by the macroeconomic determinants as the investors and creditors precisely survey the economic conditions before locking lengthy capital-intensive projects. Accordingly, we conclude that in capital structure decisions, the more investment required, the more macroeconomic determinants exist.

Dependent Variable	Intercept	GDP growth rate	Money supply	Interest rate	Inflation rate	Budget surplus	AR(1)	*R*-squared	Adjusted *R*-squared	*F*-statistic	Inverted AR roots
Retail trade and services											
Book leverage	0.2201 (0.0000)***	-0.0009 (0.1132)	-0.0003 (0.0006)***	0.0007 (0.7053)	-0.0004 (0.8147)	0.0019 (0.0493)***	0.6529 (0.0000)***	0.8330	0.8216	73.0411 (0.0000)***	0.65
Net equity	0.3898 (0.0000)***	-0.0002 (0.7528)	0.0005 (0.0000)***	-0.0003 (0.9071)	-0.0004 (0.8682)	0.0001 (0.9192)	0.6407 (0.0000)***	0.8123	0.7995	63.3887 (0.0000)***	0.64
Debt-to-equity ratio	0.9244 (0.0000)***	-0.0117 (0.2349)	-0.0036 (0.0008)***	0.0488 (0.0039)***	0.0075 (0.7825)	0.0204 (0.0817)*	0.1901 (0.0000)	0.3588	0.3150	8.1938 (0.0000)***	0.19
Manufacturing and construction											
Book leverage	0.1911 (0.0000)***	-0.0026 (0.0000)***	-0.0001 (0.4522)	0.0054 (0.0000)***	0.0037 (0.0006)***	0.0010 (0.0980)*	0.6899 (0.0000)***	0.8504	0.8403	83.9889 (0.0000)***	0.69
Net equity	0.4661 (0.0000)***	0.0017 (0.0001)***	0.0001 (0.6432)	-0.0070 (0.0000)***	-0.0022 (0.0799)*	-0.0008 (0.2725)	0.6836 (0.0000)***	0.8684	0.8595	97.5370 (0.0000)***	0.68
Debt-to-equity ratio	0.7048 (0.0000)***	-0.0057 (0.0000)***	-0.0003 (0.0325)**	0.0122 (0.0000)***	0.0041 (0.1772)	0.0046 (0.0045)***	0.5106 (0.0000)***	0.8529	0.8429	85.6594 (0.0000)***	0.51

Exhibit 9 (1) – The regression estimates for the three balanced panel sub-samples.
This exhibit reports the results of $DepVar_{i,t} = c_{i,t} + \beta_1 G_{i,t} + \beta_2 S_{i,t} + \beta_3 R_{i,t} + \beta_4 I_{i,t} + \beta_5 B_{i,t} + AR(1) + \varepsilon_{i,t}$, where three dependent variables of firm *i* over the time period *t* ($DepVar_{i,t}$) are separately regressed on a set of potential macroeconomic determinants such as the GDP growth rate ($G_{i,t}$), the money supply ($S_{i,t}$), the interest rate ($R_{i,t}$), the inflation rate ($I_{i,t}$), budget surplus ($B_{i,t}$), and the lagged value of dependent variable (AR(1)). Moreover, $c_{i,t}$, $\varepsilon_{i,t}$ and β_i represent the intercept term of the multivariate regression, the error term for the i^{th} observation in the period *t* and the slope coefficient for the i^{th} independent variables, respectively. The dependent variables are book leverage, net equity, and debt-to-equity ratio. Book leverage equals the book value of total debt divided by total assets. Net equity is total shareholders' equity, net of retained earnings, divided by total assets. The debt-to-equity ratio is equal to total debt divided by total shareholders' equity. The model is corrected for heteroskedasticity and autocorrelation and is covariance stationary. We apply the fixed effects regression model estimated by the panel EGLS method in this equation.

The figures display the coefficient of independent variables, *p*-values are shown in parentheses, and ***, **, and * indicate significance at 0.01, 0.05, and 0.10 levels, respectively.

Dependent Variable	Intercept	GDP growth rate	Money supply	Interest rate	Inflation rate	Budget surplus	AR(1)	*R*-squared	Adjusted *R*-squared	*F*-statistic	Inverted AR roots
Transportation and tourism											
Book leverage	0.2715 (0.0000)***	-0.0023 (0.0025)***	0.0001 (0.5957)	0.0038 (0.2117)	0.0030 (0.2180)	-0.0034 (0.0120)**	0.7886 (0.0000)***	0.9494	0.9455	248.1699 (0.0000)***	0.79
Net equity	0.4067 (0.0000)***	0.0017 (0.0298)**	0.0001 (0.9923)	-0.0091 (0.0020)***	-0.0018 (0.4552)	0.0026 (0.0576)*	0.7888 (0.0000)***	0.9240	0.9182	160.86 (0.0000)***	0.79
Debt-to-equity ratio	0.9651 (0.0000)***	-0.0122 (0.0067)***	0.0005 (0.4540)	0.0312 (0.0441)**	-0.0019 (0.8780)	-0.0048 (0.5018)	0.7396 (0.0000)***	0.8909	0.8827	108.1337 (0.0000)***	0.74

Exhibit 9 (2) – The regression estimates for the three balanced panel sub-samples.
This exhibit reports the results of $DepVar_{i,t} = c_{i,t} + \beta_1 G_{i,t} + \beta_2 S_{i,t} + \beta_3 R_{i,t} + \beta_4 I_{i,t} + \beta_5 B_{i,t} + AR(1) + \varepsilon_{i,t}$, where three dependent variables of firm *i* over the time period *t* ($DepVar_{i,t}$) are separately regressed on a set of potential macroeconomic determinants such as the GDP growth rate ($G_{i,t}$), the money supply ($S_{i,t}$), the interest rate ($R_{i,t}$), the inflation rate ($I_{i,t}$), budget surplus ($B_{i,t}$), and the lagged value of dependent variable (AR(1)). Moreover, $c_{i,t}$, $\varepsilon_{i,t}$ and β_i represent the intercept term of the multivariate regression, the error term for the i^{th} observation in the period *t* and the slope coefficient for the i^{th} independent variables, respectively. The dependent variables are book leverage, net equity, and debt-to-equity ratio. Book leverage equals the book value of total debt divided by total assets. Net equity is total shareholders' equity, net of retained earnings, divided by total assets. The debt-to-equity ratio is equal to total debt divided by total shareholders' equity. The model is corrected for heteroskedasticity and autocorrelation and is covariance stationary. We apply the fixed effects regression model estimated by the panel EGLS method in this equation.

The figures display the coefficient of independent variables, *p*-values are shown in parentheses, and ***, **, and * indicate significance at 0.01, 0.05, and 0.10 levels, respectively.

6. Conclusion and Discussion

The choice of financing by either debt or equity has been a crucial decision for corporations especially in the situations of financial crises, such as the Euro Crisis, in which investors are not interested in investing, creditors are either unwilling or incapable to lend money, and the value of tangible assets used as collateral decreases severely. Thus, this paper derives a multivariate linear regression model in order to explain the macroeconomic determinants of the capital structure during the Euro Crisis. Our model is corrected for heteroskedasticity and autocorrelation and is covariance stationary. We apply the pooled and fixed effects regression models estimated by the panel EGLS method in this research. Our study is an appropriate extension of the previously cited studies and combines several measures into a meaningful predictive model which provides a framework in which we can study the statistical significance of macroeconomic factors such as the GDP growth rate, money supply, interest rate, inflation rate, and budget surplus (deficit) on the three dependent variables of book leverage, net equity, and debt-to-equity ratio. Two major contributions of this paper are to investigate a currently exiting crisis and to test two rarely used macroeconomic variables, the money supply, and the budget surplus, in the capital structure studies.

Our balanced panel sample is compromised of 621 publicly traded firms that are registered in six European countries of Austria, Belgium, France, Germany, Luxembourg, and the Netherlands. This paper observes the model on the full sample, the full sample with dummy variables representing different countries, and three subsamples indicating different industries. The results show that the GDP growth and the money supply are statistically negatively (positively) related to leverage and debt-to-equity ratio (net equity), and the interest rate, the inflation rate and the budget surplus are statistically positively (negatively) correlated with leverage and debt-to-equity ratio (net equity). Our empirical results impart that the eurozone firms count on equity when they operate in economic growth, the European Central Bank adopts the expansionary monetary policy, they expect the interest rate falls, the inflation rate drops and their respective government faces a budget deficit. Conversely, they rely on debt in recessions, contractionary monetary policy, increasing interest rates, inflationary economy, and a budget surplus. In addition, we conclude that in capital structure decisions, the more investment required, the more macroeconomic determinants exist. The identification of significant predictors can help managers, investors and creditors determine how macroeconomic explanatory variables affect the capital structure related decisions.

It is probable that this research has some limitations. In particular, if a firm uses off-balance-sheet financing instruments, the capital structure may be affected, but the effects are not evident on the balance sheet and are difficult to recognize. Besides, this research is bounded by the shortcomings inherent in any regression analysis such as parameter instability which states that linear relationships can change over time. Another limitation of our study is the sensitivity of dependent variables to end-of-period financing and operating decisions that can potentially impact total debt and equity. Furthermore, because only firms that have survived during the period of measurement are included in our sample, the historical estimate may be upward biased and the survivorship bias may exist.

The model and the empirical results are suggestive of promising avenues for future theoretical and empirical work. In particular, it would be of interest to explain the firm-

specific determinants of the capital structure during the Euro Crisis. In addition, another interesting area is to examine how quickly firms converge to their optimal capital structure and what are the determinants of the speed at which they adjust to their optimal capital structures in the Euro Crisis.

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