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The Determinants of Variation in Firm Leverage across European Countries

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## **Abstract**

In this paper I empirically test what variables directly affect firm leverage across European countries, considering institutional, economic and macroeconomic variables. I find evidence in favour of the trade-off theory, given by the positive relation between profitability and leverage, and also evidence in favour of the pecking-order theory, given by the negative relation between tax rate and leverage. Thus, at the country-level, capital structure choices are partially explained by the trade-off theory and the pecking-order theory. In addition, I find that institutional and macroeconomic factors, such as entry into the EMU and economic crisis, greatly impact firm leverage across European Countries.

## **1- Introduction:**

The availability of finance can be influenced by various factors, such as the size of the firm, the sector it operates in, and the institutional settings of its operating country. Furthermore, the macroeconomic conditions in the country can also play a role in affecting firms' financial decisions. This paper aims at identifying the determinants of variation in firm leverage across European countries. I empirically examine a set of data directly taken from the European Central Bank site, with country-level closing-balance sheet annual data from 1999 to 2010.

My main findings are:

Firm leverage is highly correlated with the occurrence of the crisis in 2008. This positive relation may be reasonably linked with the decrease in assets, thus in equity, with the occurrence of the crisis. In addition, the European Monetary Union entry is have a positive impact on firm leverage; however, the EU entry does not appear to be associated with firms' capital structures. These findings indicate that, while the membership of the EU does not necessarily help improving funding conditions of firms, joining the EMU does indeed facilitate firms' access to debt funding.

There is high level of positive correlation between the efficiency of the judicial system and firms' leverage ratio. The finding is aligned with what La Porta (1999) found, proving that countries with higher legal protection reflect a higher leverage ratio.

What turned out to be weakly affecting the leverage ratio is the corporate tax rate. In fact, it shows a negative relation with the dependent variable, with a very low level of statistical significance, against the trade-off theory. I find a high positive significance of the non-financial corporations' investment rates and profitability ratios. These results strongly support the trade-off theory, demonstrating that more profitable firms are more

likely to borrow money, resulting in greater chances to invest in growing opportunities. Furthermore, macroeconomic evidence results from the negative relation between the GDP per capita and the leverage ratio, expressing the necessity, on average, of borrowing less money as countries' welfares increase.

Lastly, I find that the leverage ratio of non-financial corporations appears to be highly affected by monetary and financial institutions' (MFI) loans granted by non-MFI euro area residents, including the general government and the private sector, and by non-MFI holdings of securities, such as shares, other equity and debt securities, issued by MFI in the euro area.

Section 2 includes a review of the literature on the two traditional views of capital structure: the trade-off theory and the pecking-order theory. Section 3 will present and explain the dataset used. Section 4 and 5 will analyse the results obtained by running a regression on the data chosen. Finally, the last section concludes the work.

## **2- Literature Review:**

This study is related to the firms' leverage ratio analysis between European countries. Two strands of literature are relevant for this study. The first refers to corporate finance, including the two classic theories, which are the trade-off model and the pecking-order model. The second strand is related to empirical corporate finance studies made at the country-level.

Trade-off theory is proposed by Modigliani and Miller (1958). They first presented their work stating that under very binding assumptions, like the absence of taxes, it is irrelevant how firms build their capital structures. A few years later, Modigliani and Miller (1963) presented the trade-off model, which focuses on firms looking for a target

leverage that optimally combines the various costs of debt, like financial distress costs, and the benefits of debt, like tax savings. Thus, this theory leads to the pursuit of an optimum level of leverage by balancing and quantifying the corporate tax savings of debt with those costs linked to bankruptcy. The first critiques to the model arose by Jensen and Meckling (1976), Jensen (1986), and Hart and Moore (1994), noting that agency conflicts that may occur between shareholders and managers might be favouring perks and power at the expense of shareholders. Myers (1977) also discussed agency conflicts, considering them disputes between debt-holders and shareholders, and linking them to firms with high growth opportunities, thus less debt. However, the trade-off theory was integrated some years later by the study made by Miller (1977), who showed that bankruptcy costs seemed to have a minor impact on the leverage ratio, rather than the tax savings. In the following years, further studies conducted by De Angelo and Masulis (1980) and by Bradley, Jarrell and Kim (1984), found an alignment with the trade-off theory, quantifying the effects and showing how large they could be under reasonable conditions. Myers (1984) made some critiques to the model, proving that the tax effect occurs in a lesser way than the bankruptcy costs, thus going against the abovementioned Miller (1977) study. Agency costs, and their negative correlation with leverage, are also discussed by Diamond (1989), and by Harris and Raviv (1990), confirming that firms with a long trend of credits are linked to low default probability. Thus, profitability of firms is one of the most relevant factors affecting leverage. In fact, as profitability increases, bankruptcy costs decrease, allowing firms to borrow more, as stated by Graham (2000). More profitable firms face higher expected tax rates, leading firms to engage in higher leverage to benefit more from the tax shield, as stated by De Angelo and Masulis (1980). Furthermore, profitability tends to be linked directly to

higher cash flows, in order to have more excess earnings over profitable investments, reported again by Graham (2000). Studies conducted by Barclay and Smith (1999), as well as Green and Hollifield (2003), also found coherence and an alignment with the trade-off theory, proving and quantifying the effects displayed by the model under reasonable conditions. The trade-off theory was also criticised by Ju, Parrino, Poteshman and Weisbach (2003), who simulated a tax bankruptcy trade-off model to quantify and prove the too small bankruptcy costs' effect asserted by Miller (1977), without finding any results in favour. In the end, according to the theory, firms with more tangible assets tend to have lower bankruptcy costs, since tangible assets may be considered as collaterals, as stated by Graham (2011).

The second of the two main theories concerning corporate capital structure's decisions is the pecking-order theory. Myers and Majluf (1984), discuss how firms' decisions follow a financing hierarchy aimed at minimizing adverse selection costs of security issuance. The pecking-order view highlights that the adverse selection costs of issuing equity are so high to let other costs and benefits of debt and equity second-order. Stiglitz (1973), Heaton (2002), and Myers (2003) discuss in favour of the pecking-order theory, stating that frictions such as transaction costs, taxes, agency costs and managerial optimism lead to a financing hierarchy. Thus, mature firms with limited growth prospects first use retained earnings, then debt, and finally issue equity only as a last opportunity. Myers and Majluf (1984) justified this hierarchy by two empirical regularities. There is a substantial negative market reaction to the announcement of equity issues, and, firms contribute to the majority of investments with retained earnings, while aggregate net equity issues are often small. Myers and Majluf (1984) demonstrate that more profitable firms are linked to a lower leverage. On the other

hand, larger firms may have more assets available, so adverse selection would damage them. At the same time, as Fama and French (2002) state, larger firms suffer less asymmetric information, so the adverse selection damage would be minor. Several studies went against the pecking-order theory's assumptions, like Helwege and Liang (1996) and Shyam-Sunder and Myers (1999) who showed a strong correlation between a firm's "financing deficit" (a proxy for the need for external funding) and the issuance of debt. Then, when Frank and Goyal (2003) and Fama and French (2005) tested the results of Shyam-Sunder and Myers (1999) on a broader sample, they found that smaller and younger firms occupy their financing deficits mostly with equity. After these critiques, Lemmon and Zender (2010) stated that these findings should not be considered necessarily inconsistent with the pecking-order assumptions, mainly because those firms with high growth opportunities might be bound by limited debt capacity, even if this would lead to trade-off forces. Furthermore, when Myers and Majluf (1984) stated the theorem, they demonstrated that their theory is more likely to become true for those firms, whose value of growth opportunities is relatively low in relation to assets in place. Leary and Roberts (2010) proved that the pecking order is not so reliable in predicting issuance decisions, even among subsamples where the theory is most expected to hold. From an empirical study made by Titman and Wessels (1988) and from a survey ran by Harris and Raviv (1991), the main factors which affect capital structure decisions are summarized: the leverage "increases with fixed assets, non-debt tax shields, growth opportunities, and firm size, and decreases with volatility, advertising expenditures, R&D expenditures, bankruptcy probability, profitability and uniqueness of the product."

While the pecking order may be a useful “conditional theory” (Myers (2001)), like the trade-off view, it leaves many financing decisions unexplained.

Broadening the argument to the second relevant strand of literature, previous studies have focused on specific factors. Institutional factors, such as a high ownership concentration are often considered relevant for determining leverage. As argued by Jensen and Meckling (1976) and Shleifer and Vishny (1986), the concentration of ownership of a firm’s share leads to providing managers incentives to work, and large investors to monitor the managers. Implicitly, this situation reflects a country with poor investor protection. Furthermore, investors might be better protected if dividend rights are directly linked to voting rights, in place of being subjected to the one-share-one vote method, as stated by Grossman and Hart (1988) and also by Harris and Raviv (1988). Creditors need to be protected as well as shareholders, and as underlined by Hart (1995), the most basic right of a creditor is to repossess and then liquidate or keep collateral when a loan is in default. Furthermore, there are some unclear situations analysed by Rajan and Zingales (1995) and by Wald (1999), in which many determinants of leverage have a similar impact in different countries, despite their large differences in business environments. First, differences in legal protections of investors could help to explain why firms are financed and owned in so different ways from country to country, as stated in La Porta (1999). In his study, he showed that countries with weak investor protections have much smaller debt and equity markets.

Justifying and explaining different internal institutional factors and effects as Pagano, Panetta and Zingales (1998) did, wondering why Italian companies would rarely go public; or as Edwards and Fischer (1994) did, finding why Germany has a small stock market but maintaining large and powerful banks at the same time. All these studies

witness that since different countries are regulated by different rules, this might explain large differences in financing patterns. Other institutional factors, as studied by Knack and Keefer (1995), such as proxies for the quality of enforcement, corruption, rule of law and efficiency of judicial system, affect the national growth rate and the leverage of the companies inside each country. King and Levine (1993), as well as Levine and Zervos (1998) found that developed debt and equity markets contribute to economic growth; at the same time Rajan and Zingales (1998) found that countries with highly developed financial systems show higher growth in capital intensive sectors that rely particularly on external finance. At the end of 1999, Shyam-Sunder and Myers (1999) and Chirinko and Singha (2000) examined if the pecking-order theory could be applied at the country-level as well, focusing on a US firm's sample. The first found correspondence between the theory and the sample, but the second researchers made a parallel study and gave a critical review to Shyam-Sunder and Myers (1999). A few years later, Gaud et al. (2007) examined capital structure choices in a large number of European countries and found that neither the trade-off theory nor the pecking order one may adequately fit. Thus, even if there are no direct theories, several studies have been made about capital structure, highlighting other relevant components affecting leverage. In fact, prior research, such as Demirgüç-Kunt and Maksimovic (2001), Bancel and Mittoo (2004) confirmed what was found by all the previous studies: that costs and benefits of leverage depend on the institutional, legal and financial environment.

### **3- Data:**

I use a dataset collected by the European Central Bank employing the closing balance sheet's data for each country. This dataset provides relevant detailed accounting

information about all the countries in Europe<sup>1</sup>. In this work only annual data will be used since quarterly data are not available for all the countries. This dataset differentiates and separates those countries in the Euro Area from those outside of the European Monetary Union (EMU), and the sample period is from 1999 until 2010. The Euro area accounts provide a comprehensive picture of how economic value is generated and distributed in the EMU, on the basis of an analytical grouping of economic agents into institutional sectors, namely, households (including non-profit institutions serving households), non-financial corporations, financial corporations and general government.

I use country-level data collected for the non-financial corporations, the monetary financial institutions, and the households. No inconsistencies arising from the aggregation of national data, such “asymmetries”(discrepancies in the recording transactions/positions between euro area countries<sup>2</sup>), occur. The following ratios are directly taken from the European Central Bank website

The following data on non-financial corporations are employed<sup>3</sup>:

The leverage ratio is the ratio (as a percentage) of non-financial corporations’ debt outstanding to their total liabilities. This is going to be my dependent variable in the research.

The profit share is the ratio (as a percentage) of non-financial corporations’ gross operating surplus and mixed income to their gross value added. This indicator would measure non-financial corporations’ profitability. Profits, considered as gross operating

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<sup>1</sup> Data for Malta, Bulgaria and Romania are not available, so they are considered in this study.

<sup>2</sup> E.g. while Germany’s exports of goods to France should be equal to France’s imports of goods from Germany, this is not always the case and the difference between the two measures is referred to as asymmetries.

<sup>3</sup> Non-financial corporations and households ratios’ definitions are directly taken from European Central Bank website: <http://www.ecb.int/home/html/index.en.html>.

surplus, derive from wages costs that remunerate labour, plus net taxes on production that partially finance government services. Relying on Antoniou et al. (2007), he shows that agency costs increase with free cash flow. Debt may decrease agency costs of free cash flow by ensuring an efficient and responsible managers' behaviour, since this would increase bankruptcy costs. Therefore, I expect this ratio to be negatively related to my dependent variable.

The investment rate is the ratio (as a percentage) of non-financial corporations' gross fixed capital formation to their gross value added; it shows the growth of gross value added with investment in fixed assets (gross fixed capital formation). As stated by Antoniou et al. (2007), larger levels of indebtedness lead firms to engage larger investment opportunities. Thus, I expect this ratio to be positively related to the leverage.

The ratio of debt outstanding to GDP is the ratio (as a percentage) of non-financial corporations' debt outstanding to Gross Domestic Product; (where non-financial corporations' debt outstanding intended as the sum of loans taken out, securities issued and net equity of households in pension fund reserve liabilities). This ratio should be positively related to the leverage, as stated in European Central Bank report (2007).

When ratios are not presented as a percentage, they are always expressed in Euros, even for those countries which are not part of the European Monetary Union. A real conversion with the exchange rate considered year per year is computed to express the currency, in Euros, of those countries out of the EMU. Thus, having all GDP in Euros, it is also possible to have a coherent GDP per capita ratio and a coherent GDP growth rate, to understand how much they affect the leverage ratio. Considering that all these

factors are referred to a country's welfare, I expect to find a negative correlation between them and the leverage ratio.

Other relevant numbers considered in this study are taken out by the institutional sectors, more specifically the Monetary Financial Institutions (MFIs). Monetary Financial Institutions, which are a part of the Financial Corporations inside each country, are those financial institutions that form the money-issuing sector. Thus, these encompass the Eurosystem, the resident credit institutions and all other resident financial institutions whose business is to receive deposits and/or close substitutes for deposits from entities other than MFIs and, their own account to grant credit and/or to invest in securities. An MFI credit to euro area residents is comprised of both MFI loans granted to non-MFI euro area residents (including the general government and the private sector) as well as MFI holdings of securities (shares other equity and debt securities) issued by non-MFI euro area residents. The research is going to go through the amount of loans taken in and given out to other countries in order to consider the Debit and the Credit of each country as a percentage of each Gross Domestic Product. As highlighted in the European Central Bank report (2007), the importance of bank loans for corporate financing is aligned with their respective level of indebtedness, meaning there should be a positive relation. The cost of bank financing is not directly linked to the maturity of the loans, implying that the rates are not always higher for longer maturities. Furthermore, as Rajan and Zingales (1998) stated, countries with financial systems are directly linked to higher country growths, thus to higher leverage.

The following household data are used:

The saving rate, which is the ratio (as a percentage) of households' gross saving to their gross disposable income adjusted (adjustment for the change in net equity of households

in pension fund reserves). Net saving rates are measured after deducting consumption of fixed capital (depreciation). Households' saving is defined as the difference between its disposable income (wages received, revenue of the self-employed and net property income) and its consumption (expenditures on goods and services). If there is a negative value for the rate, it means that a household spends more than it receives as income, thus finances some of the expenditure through credit, through gains deriving from assets sale or by running down cash and deposits. As stated in European Central Bank report (2007), a larger proportion of household savings should be positively related to non-financial corporations' leverage.

The investment rate is considered as the ratio (as a percentage) of households' gross fixed capital formation to their gross disposable income adjusted (adjustment for the change in net equity of households in pension fund reserves); the household investment rate mainly consists of the purchase and renovation of dwellings. The increasing importance of the investment of households in pension funds and in insurance contracts leads, as European Central Bank report (2007) finds, to the decline of investment in currency and deposits, and is broadly in line with the increase in corporate market financing. Thus, the increase in their relevance tends to lead enterprises to find newer modes of financing, thus preferring to purchase instruments issued on the market to traditional bank intermediation. Two Dummy variables are also considered to see how much they affect the Leverage of each country. They are respectively the entry into the European Union and the entry into the European Monetary Union. These two variables could produce some relevant results regarding leverage, showing the effect of the euro on the European economies. It is very likely that the participation in the EU and the EMU has affected leverage in a positive way, since the aggregation of countries under

the same currency and the same area eliminated trade barriers and facilitated the conditions for debt funding.

In addition, two factors representing the legal system and the investors' rights in each country will be taken into account. A strong system of legal enforcement could be substituted for weak rules since active and well-functioning courts can step in and rescue investors abused by management (La Porta, 1999). To address these issues, proxies for the quality of enforcement of these rights of "law and order" in different countries, compiled by private credit risk agencies for the use of foreign investors interested in doing business in the respective countries, are going to be considered. Efficiency of the judicial system and rule of law are going to be used in this paper, because they pertain to law enforcement proper and they can be considered constant over a period of time of 11 years. There are other factors in this category which might be affecting the leverage ratio inside a country, such as: Corruption, Risk of expropriation and Risk of contract reputation; but these are much more flexible over time, so it would be inappropriate to use a constant value for them over a period of time of 11 years. Thus, the two institutional factors considered are ranked on a scale from 1 to 10, where one represents a very unstable internal situation regarding rule of law and efficiency of the judicial system, while 10 represents, bureaucratically, the ideal situation. As stated by La Porta (1999), these two factors are positively related to leverage. That study showed that countries with weak investor protections have much smaller debt and equity markets, meaning that the lower the probability of being protected, the lower the level of indebtedness for the firms.

The corporate tax rate used in this research is taken from a survey run by KPMG in 2009. This survey includes the entire corporate tax rate per country from 1999 to 2009.

Since the analysis in this study includes data up to 2010, the corporate tax rate for the last year will be assumed to be equal to the previous one for each country. Following Modigliani and Miller (1963), the corporate tax rate should be positively linked to the leverage ratio since the tax deductibility of interest gives an incentive to firms to increase it. Furthermore, macroeconomic variables like GDP per capita, its growth year per year, and its Variance computed on a five-year basis, is analyzed. In the end, most of these macroeconomic variables are very likely to be positively correlated to the leverage ratio, since they are linked to each country's welfare. As Frank and Goyal (2009) stated, there is a high dependence between each firm's optimal leverage in a particular country and the macroeconomic characteristics. Frank and Goyal (2009) regarding GDP Growth, found that the rebalancing costs should be lower in good countries than in bad countries.

Table 1 presents the main descriptive statistics of the variable chosen, and starting from the institutional aspects of these variables it is possible to notice that the average of the rule of law and the efficiency of judicial system is relatively high. Since countries are evaluated on a scale out of 10, an average of 8.5 for the Judicial System and an average of 8.7 for the Rule of Law are very elevated values, representing more secure systems from a legal point of view. In fact, these indicators arrange countries by legal origin and show test of equality of means among families. Scandinavian countries and the United Kingdom are at the top of these rankings, immediately followed by Austria. Furthermore, the average corporate tax rate adopted all across Europe is 26.68%, which is relatively low. The highest tax rate was used by Italy and France in the period right before the entry into the Euro, while the lowest values are given by Cyprus, right after European Union entry. The leverage variable has an average of 34.64%, and it reflects

the situation in almost every country in Europe. Latvia had the highest leverage ratio, which was of 100%, exactly the year it entered the European Union (2004)., It then began to decrease. The opposite situation occurred in Greece, where in 1999 the leverage ratio was of 15.07%, the lowest in Europe. It then started to increase. As previously mentioned, the GDP is expressed in Euros for countries both in and out of the EMU. Another important indicator is the one represented by the GDP per capita; the average across European countries is 21.97, but the maximum value is given by the GDP per capita found in Luxembourg, where there is a very high level of production compared to the population. The lowest values of these indicators are found in Latvia from the end of 1999 on.

Before starting to write the equation to take into account, and to run the regression to spot which variables influence the leverage ratio across European countries, I also consider the correlation, through the Pearson indicator, of all the variables with each other<sup>4</sup>. I find that the EU entry and the EMU entry have a high significance and that they are positively related to the leverage ratio. The rule of law, differently from what La Porta (1999) found, has a negative correlation with the dependant variable. The efficiency of the judicial system turns out to be positively correlated with the leverage ratio, following La Porta's (1999) finding. The corporate tax rate winds up being negatively correlated with the leverage ratio, as stated by Myers and Majluf (1984), but it does not show any significance in relation to the leverage ratio. One more variable, which turns out to be highly positively correlated with the dependent variable is the Debit/GDP, representing the money loaned by other countries. And lastly, the GDP

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<sup>4</sup> The correlation table is not included in the study due to limitation of space.

growth rate and the GDP standard deviation are both significantly and negatively correlated with the leverage indicator.

#### **4- Regression Model:**

I define the regression model by the following equation:

$$\frac{D_{it}}{A_{it}} = \alpha + \beta_x X_{it} + \beta_y Y_{it} + \beta_z Z_{it}$$

The dependant variable is the non-financial corporations' leverage ratio  $\frac{D_{it}}{A_{it}}$ , where  $D_{it}$  is the non financial corporations' total debt, encompassing loans, debt securities and pension fund reserves and  $A_{it}$  is representative for non-financial corporations' total assets. On the right-hand-side of the equation, I include three vectors of independent variables. The first vector  $X_{it}$  includes institutional factors encompassing two dummy variables of being inside the European Union and European Monetary Union, the efficiency of the judicial system, the rule of law and the corporate tax rate. Moreover, a dummy variable relative to the crisis is also considered, to analyse how much the current recession has been affecting the non-financial corporations' leverage. The second vector,  $Y_{it}$ , encompasses macroeconomic variables, meaning all those ratios related to each country's GDP, including GDP per capita, GDP Growth, GDP standard deviation and GDP standard deviation's growth. Furthermore, industrial characteristics and ratios compared to each country's GDP are also included in this second vector, thus all those indicators related to Households, to Non-Financial Corporations and to Monetary Financial Institutions. In the end, the vector  $Z_{it}$  includes a dummy variable for each European country in order to control for country-specific effects.

## 5- Regression Results Analysis:

Table 2 shows the regression results. Model 1 represents the regression with only institutional factors as the independent variables. The  $R^2$  of the regression model is 19,9%. As it was expected, the EMU Entry is highly positively significant, with a p-value of 0,8%, and a  $\beta$  of 0,38; However, there is no correlation found with the EU entry. This finding shows that starting in 1999, the European currency helped countries to increase their debt level. But entering the EU itself does not necessarily ensure the facility of access of debt funding. The efficiency of the judicial system variable, examined by La Porta (1999), is in line with the forecast and shows a positive correlation with the dependent variable at a 1% level of significance. Thus, the increase in the level of indebtedness is more favoured for those countries with efficiency and integrity of the legal environment. Different results, not aligned with expectations, are given by the second variable previously analysed by La Porta (1999): the rule of law. It presents a negative  $\beta$ , with a low level of significance, differently from La Porta's findings. The corporate tax rate shows a negative correlation with the leverage ratio, going against Modigliani and Miller (1963), and a low significance with the dependent variable. This could be explained, as Modigliani and Miller (1963) stated, by the fact that countries have already reached the level of debt that maximizes the value of the firms.

Regression model 2 introduces the macroeconomic variables. As The  $R^2$  of the model now increases to 53,4%. As Table 2 shows, all the data related to the welfare of a nation are negatively linked to firm leverage. The most highly significant are the GDP per capita, with a  $\beta$  of -0,005, and the GDP Standard Deviation with a  $\beta$  of -650, respectively at 1% and 5% level of significance, meaning that the trend of borrowing

money in Europe is negatively correlated with the increasing production internal to each country. This can be reasonably explained, because a higher social welfare implies less necessity to borrow money. The other two variables linked to Countries' GDP are not significant at all. Households' investment rate and households' saving rate are both negatively correlated with the dependent variable, and both show low levels of significance. Shifting the attention to non-financial corporations, their investment rate is positively related to the dependent variable with a  $\beta$  of 0,32, and it is significant at a 10% level. The variable used to express profitability, the non-financial corporations' profit share, is also positively correlated with the leverage. In fact, it has a  $\beta$  of 0,34, but it has a higher level of significance, expressed by a p-value of 0,1%. The profitability variable results to be a positively highly affecting factor for the leverage ratio, agreeing with Graham (2000) study, witnessing that more profitable countries borrow higher amounts of money, because they have the availability to do so, as to increase their investment opportunities. High investment rates are in fact positively related to leverage, as just mentioned, because they could potentially imply high potentials for the firms. Thus, firms engaging with larger investment projects have larger leverage ratio, as Antoniou et al. (2007) stated. Furthermore, as stated in the European Central Bank report (2007), the total debt over GDP ratio winds up being positively related to the leverage ratio, but from this study it is not significant. This could be due to the negative relation between the dependent variable and the macroeconomic ones, as previously examined. Going through the last sector, I decided to analyse the banking sector represented by Monetary and Financial Institutions. It is possible to notice that the debit over GDP is positively related to the dependent variable, differently from the credit over the GDP. The debit is much more highly significant than the credit; in fact, it has a p-

value of 0.2%, thus significant at a 1% level. The credit over GDP ratio is only significant at a 5% level. This means that the leverage ratio of non-financial corporations is highly affected by MFI loans granted by non-MFI euro area residents, including the general government and the private sector, and by non-MFI holdings of securities, such as shares, other equity and debt securities, issued by MFI in the euro area.

Regression model 3 controls for country-fixed effects. It involves the introduction of a dummy variable for each country presented in the study, in order to control the individual countries' impact on the choice of leverage. A country with a strong internal economy, namely Germany, is chosen to be the omitted country, thus to compare it to the results of other countries. There are some countries dropped out the regression due to missing values or collinearity with certain variables, thus they do not show up in Model 3<sup>5</sup>. The final R<sup>2</sup> of the regression results is 71,2%. Interestingly, I find that the level of indebtedness from country to country does not differ from the German one. The only exception is represented by the French firms' leverage, which winds up being, on average, 11% lower than that of the German firms. As Table 2 Model 3 shows, this relation results to be highly significant at a 1% level of confidence. A less relevant correlation is given by the U.K Non-Financial corporations' leverage, which is on average 6.7% higher than German Non-Financial corporations' one, but at a relatively low level of confidence, namely at 10%.

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<sup>5</sup> Estonia, Cyprus, Ireland, Luxembourg, Slovenia, Slovakia, Czech Republic, Latvia, Lithuania, Hungary and Poland present constant values or have missing correlations.

## **6- Conclusions:**

In this paper, I propose to empirically verify what are the most relevant variables affecting leverage in firms across European countries. In order to do so, I explore the data contained in the European Central Bank's database. My analysis is based on the OLS methodology, using the non-financial corporations' leverage ratio as the dependent variable. Analysing the institutional factors affecting the dependant variable, I find the most relevant were the occurrence of the crisis, from 2008, and the entry into the European Monetary Union, which both led to an increase of the debt ratio; however, the EU entry does not appear to be associated with firms' capital structures. These findings indicate that, while the membership of the EU does not necessarily help improving funding conditions of firms, joining the EMU does indeed facilitate firms' access to debt funding.

I document a high significance of the legal protection connected to a higher level of indebtedness, consistent with La Porta's (1999) finding. The results found also show that the corporate tax rate is not a highly affecting variable for the leverage ratio, as Myers (1984) predicted, and it presents a negative correlation with the dependant variable as Stiglitz (1973), Heaton (2002) and Myers (2003), discussing in favour of the pecking-order theory, stating that frictions such as transaction costs, taxes, agency costs and managerial optimism lead to a financing hierarchy.

In addition, I find an alignment of the results with the trade-off theory regarding the positive relation between the Investment rate and the profitability rate of Non-Financial corporations with the dependant variable. This is also inconsistent with Myers and Majluf (1984), who found the negative correlation between profitable firms and leverage. A relevant significance, matching what was found in the European Central

Bank (2007), is the negative correlation between the GDP per capita with the leverage, and the positive correlation of the bank loans to other countries with the dependent variable. In the final part of this study, no relevant correlation between countries was found, except between Germany and France. The French Non-Financial corporations turned out to be on average 11% less levered than German ones. Since the connection between the two sectors is highlighted by a relevantly high significance, it might be explained by a difference in the drivers leading to the capital structure formation.

As Gaud et al. (2007) examined, capital structure choices, in a large number of European countries, do not adequately fit neither with the trade-off theory nor with the pecking order one. Macroeconomic conditions are relevant determinants of capital structure and leverage levels, but economic conditions affect both the availability of financing and the ability to raise capital. Therefore, economic events, such as the formation of a unique monetary union and a decrease in barriers to trade, or the occurrence of a recession, can lead to a more significant level of indebtedness, thus witnessing that economic conditions produce the most relevant impact.

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Table 1:

	<b>Descriptive Statistics</b>				
	N	Minimum	Maximum	Mean	Std. Deviation
Efficiency of Judicial System	168	5,5	10	8,5893	1,54166
Rule of Law	168	4,17	10	8,71	1,65967
Corporate Tax Rate	282	0	0,523	0,2668099	0,09007215
Leverage Ratio	241	0,1507	1	0,346449	0,09531298
Investment Rate Households	274	0,0195	0,2853	0,0958901	0,03613636
Saving Rate Households	274	-0,0626	0,87	0,1002069	0,07079195
Investment Rate NFC	274	0,0855	0,4163	0,2424131	0,06604285
Profit Share NFC	274	0,2841	0,5884	0,4222682	0,07577168
Debit/GDP	214	0,03307	5,23041	1,2300077	0,86421931
Credit/GDP	214	0	0,43225	0,048736	0,08243284
Debt/GDP	240	0,0005	3,5735	0,9254372	0,49002639
GDP Growth Rate	288	-0,19085	0,31565	0,0572536	0,06790692
GDP Standard Deviation	288	0,01844	0,22113	0,0921672	0,04284606
GDP Per Capita	288	2,8545	80,79594	22,0922618	13,93953225
GDP Growth Standard Deviation	288	0,00223	0,22299	0,040877	0,03761932
Population	288	430,5	82520	19220,356	23564,59331
Valid N (listwise)	126				

Table 2:

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>
N. Observation	163	148	148
R <sup>2</sup>	19,90%	53,40%	71,20%
	<b>Coefficient</b>	<b>Coefficient</b>	<b>Coefficient</b>
Constant	0,331	0,241 **	0,454 **
EMU Entry	0,038 ***	0,013	0,147 ***
Efficiency of Judicial System	0,014 ***	0,028 ***	
Rule of Law	-0,01 *	-0,013	-0,005
Corporate Tax Rate	-0,125	-0,188	-0,287 *
Crisis	0,044 ***	0,54 ***	0,046 ***
Investment Rate Households		-0,219	-0,044
Saving Rate Households		-0,145	-0,258
Investment Rate NFC		0,322 *	0,219
Profit Share NFC		0,34 ***	-0,179
Debit/GDP		0,047 ***	0,016
Credit/GDP		-0,186 *	-0,338 ***
Debt/GDP		0,016	-0,039
GDP Growth Rate		-0,091	-0,274 **
Real GDP ST.D		-0,65 **	-0,429
GDP Per Capita		-0,005 ***	0,001
GDP Growth ST.D.		-0,454	-0,337
Belgium			0,026
Greece			0,073 *
Spain			-0,048
France			-0,111 ***
Italy			-0,019
Netherlands			0,024
Austria			-0,006
Portugal			0,023
Finland			-0,06
Denmark			0,057
Sweden			0,116
U.K.			0,114 *

Note:

\*\*\* Significant at 1% level

\*\* Significant at 5% level

\* Significant at 10% level