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Capital Structure :

A comparison between Market-based and Bank-based Financial Systems

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Preface

This thesis is written at the end of the graduate program in Financial Analysis. I would like to express my gratitude towards my supervisor Professor Emmanuel Tsiritakis, who also was kind enough to give me a glimpse of the world of international research and science. I would also like to thank PhD Student Konstantinos Labrinoudakis for his valuable guidance and help throughout the entire process.

Abstract

We explore the equity Market timing effect on capital structure decisions in the U.K. which is considered a Market-based financial system and Germany which is regarded as a Bank-based financial system. In contrast with previous studies, we find no evidence supporting Market timing Theory in both countries. No significant and conclusive results are found to indicate that in the U.K. firms tend to issue equity when their market values are high whereas in Germany firms tend to have higher debt ratios.

Keywords: Capital structure, Leverage, Market timing, mispricing, Bank-based, Market-based, U.K. firms, German firms

1. Introduction

Capital structure is a firm's mix of methods for financing investments and its overall operations and growth.It is the way a firm finances its assets through some combination of equity, debt, or hybrid securities. There are three forms of financing: equity, debt and a combination of both.

The conventional way for a publicly traded firm to finance its operations by equity is to issue common shares at a price the market is willing to pay. Holders of common stock may be paid dividends until full payment of all the dividends of preferred shares (including payments in arrears). In the event of bankruptcy, common stock investors receive residual income after bondholders, creditors (including employees) and holders of preferred shares are paid. Holders of common stock are able to influence the firm through votes on establishing corporate objectives and policy, stock splits, and electing the Board of Directors. However, a company may have both "voting" and "non-voting" class of common shares. Some common shareholders also receive pre-emptive rights, allowing them to maintain their proportionate ownership in a company should it issue another stock offering. There is no fixed dividend paid to holders of common shares and thus their profits are uncertain, dependent on profits, company reinvestment and market efficiency in valuing and selling shares. The benefit of this is that the company does not incur more debt; however, owners lose power as they own less of the company this way

A clear alternative to the use of equity, which is a residual claim, is to borrow money. Debt financing is when a company borrows (money, assets, etc) from an investor and must one day repay it.This method of financing creates a fixed obligation to make cash flow payments and provide the lender with prior claims if the firm is in financial trouble. Obvious examples are taking out a loan from the bank, borrowing from an individual, etc. The debt obligation is considered secured, if creditors have recourse to the assets of the business in proprietary basis or otherwise ahead of general claims against the company. Unsecured debt comprises financial obligations, where creditors do not have recourse to the assets of the debtor to satisfy their claims. The benefit of this form of financing is that interest expense is tax deductible.

They are also securities that they share some characteristics with equity and with debt. These securities are called Hybrid securities. For example a convertible bond is a bond that

can be converted into a predetermined number of shares, at the discretion of the bondholder. Preferred stock is another security that shares some characteristics with debt and equity. Preferred are senior (i.e. higher ranking) to common stock, but subordinate to bonds in terms of claim (or rights to their share of the assets of the company).Preferred stock usually carries no voting rights, but may carry a dividend and may have priority over common stock in the payment of dividends and upon liquidation.

How firm make their Capital Structure decisions has been one of the most extensively researched area in corporate finance. The below mentioned questions are important and they have guided researchers for a long time trying to answer the basic question, which is whether the value of a company is affected by capital structure:

- How do firms fund their activities?
- What factors influence these choices?
- How do these choices affect the rest of the economy?

Hundreds of research papers investigate corporate capital structure in an attempt to answer all these questions. The choice of capital structure has been the subject of a considerable debate. Theoretical papers agree that there are many benefits to using debt, including the tax benefits of interest deductibility, oversight and monitoring by intermediaries and financial markets and the reduction in agency costs that may result from high profitability. But one should recognize that there are also costs of using debt. These include financial distress and bankruptcy costs, the possibility that a firm will pass up positive net present value projects if it has employed too much debt, and the agency costs that can result if debt creates conflicts between managerial objectives versus those of bondholders and stockholders. Most recent theories state that the general market conditions when a firm searches for financing can affect the capital structure outcome. Equity market timing appears to be an important aspect of corporate financial decision. Firms take advantage of "market timing "opportunities and issue equity in order to finance their activities, exploiting a run-up in their stock prices.

2. Scope

In this thesis, we try to make a comparison between Bank-based and Market-based financial systems in respect to Capital structure firms' decisions. We examine the effect of Market timing Theory in Germany and the U.K. We also try to test whether Market Timing theory has a short term or long term effect on leverage.

2.1 Thesis Outline

The disposition of the thesis is as follows; in the third chapter the theoretical and empirical framework is presented with focus on the prevailing theories and academic studies of capital structure. The fourth chapter will describe the methodology, the data sample, the statistical model, the variables used and the results. Chapter five will conclude the thesis.

2.2 Literature Review

A table with a summary of the basic articles and papers studied for the purposes of this thesis is presented below:

Title	Year	Authors	Scope / Results
Capital Structure Puzzle	1984	Stewart C.Myers	Contrasts the static trade-off theory and the pecking order theory
Stock Issues and Investment Policy : When firms have information that investors do not have	1986	Stewart C.Myers Nicholas S. Majluf	A model is presented for a firm to decide whether to issue equity or not to finance its operations. It is stated that a policy of external financing with debt is more preferable and that it is better to issue safer securities than risky ones
What Do We Know about Capital Structure :Some Evidence from International Data	1995	Raghuram G. Rajan Luigi Zingales	The determinants of capital structure across the G-7 countries are being investigated and as an result is admitted that firm leverage is dependent on each of the already identified factors by previous studies such as tangibility of assets , market-to-book ratio , return on assets .It is also pointed out that institutional differences accross G-7 countries must not be underestimated.
Bank-Based and Market-Based Financial Systems: Cross Country Comparisons	1999	Asli Demirguc-Kunt Ross Levine	Cross-sectional data is collected from 150 countries in an attempt to explore the differences between financial systems. Furthermore it is stated that the banks of Germany play a leading role whereas in the US and the U.K. securities market are more developed and have a central stage position.
The Theory and Practice of Corporate Finance:The Data	2001	John R. Graham Cambell R. Harvey	A survey is conducted among CFO's of 4.440 US Firms and the outcome is that the most important factors affecting the decision of issuing equity is Earnings per share dilution and high stock prices
How do CFO's make capital budgeting and Capital structure decisions	2002	John R. Graham Cambell R. Harvey	
The Determinants of Capital Structure choice: A survey of European Firms	2002 & 2004	Frank Bancel Usha R. Mittoo	A survey is conducted in seventeen (17) European countries concerning the managers. The result is that the most important factors affecting the decision of issuing equity is Earnings per share dilution and high stock prices
Market Timing and Capital Structure	2002	Malcom Baker Jeffrey Wrungler	Market Timing Hypothesis is being tested. It comes as a result that market-to-book ratio (measurment of market valuations) is strongly correlted in U.S firms with the change in leverage and has a long run impact on capital structure decisions. Also is stated that firms issue equity when firm's share price is overvalued.

Title	Year	Authors	Scope / Results
Capital Structure Decisions	2003	Murray Z. Frank Vidhan K.Goyal	In 2003 a set of thirty-nine (39) factors that affect leverage of US firms is found .Then in 2007 the number of these variables is reduced to nine(9) . These factors that are reliably important are : Median Industry Leverage (positive effect on leverage) , Market-to-Book Ratio(negatively correlated) ,Tangibility(positive relation) , Profitability (negatively correlated) , Log of Assets (positevely correlated) , Expected Inflation(positevely correlated) .Their empirical evidence seem consistent with the trade-off theory
Capital Structure Decesions :Which Factors are Reliably importan	2007	Murray Z. Frank Vidhan K.Goyal	
The Determinats of Capital Structure : Capital Market Oriented Versus Bank Oriented Istitutions	2007	Antonios Antoniou Yilmaz Guney Krishna Pandyal	It is being investigated how firms operate and how they determine their capital structure in capital market oriented economies (the United Kingdom and the United States) and bank oriented economies (France, Germany and Japan). The firm specific factors and the market related factors that can be responsible for determining the leverage ratio of a firm, are identified.
Trade-off and Pecking order theories of Debt	2007	Murray Z. Frank Vidhan K.Goyal	Review of Trade-off theory and Pecking order Theory. Evidence is examined in an attempt to conclude to some stylized facts such as : "Over long periods of time, aggregate leverage is stationary." , "Over the past half century, the aggregate market-based leverage ratio has been about 0.32. There have been surprisingly small fluctuations in this ratio from decade to Decade."
A theoretical review on the use of the Static Trade-off Theory , the Pecking Order Theory and the Agency Cost Theory of Capital Structure	2011	Devinaga Rasiah Peong Kwee Kim	The trade-off and the pecking order theory are being studied and important factors like profitability, effective tax rate and firm's size that determine optimal leverage ratio are determined.
Capital Structure and Stock Returns	2004	Ivo Welch	Stock prices are a crucial determinant of capital structure decisions
Are Observed Capital Structures Determined by Equity Market Timing?		Armen Hovakimian	Market timing is unlikely to have a long-lasting effect on capital structure.
How Persistent is the Impact of Market Timing on Capital Structure	2003	Aydogan Alti	Market timing is an important financing activity in the short-run. The long-run effect is limited. After the second year of the firm going public the impact of market timing effect vanishes.
Testing the Market Timing Theory of Capital Structure	2004	Rongbing Huang Jay R.Ritter	In a sample of US. Publicly traded firms it is found that market timing affect debt ratios in short run. Also it is argued that when the cost of equity is low , firms prefer external financing
Behavioral Corporate Finance:A Survey	2005	Malcom Baker Richard Ruback Jeffrey Wrungler	The research in Behavioral finance assumes two approaches.The first is based on the fact that investors are less than fully rational and their investment decisions are a response to market mispricings whereas the second approach is based on the idea that managers are less than fully rational.
Equity Market Timing and Capital Structure: International Evidence	2008	Arvind Mahajan Semih Tartaroglu	The effect of Market timing theory across the G-7 countries is being examined and its is found that the current market-to-book ratio as well as the historical market-to-book ratio is negatively correlated with leverage .Although , no evidence is found between equity issues and market-to-book ratios.
Market-timing of Capital Structure and Factors Influencing the Leverage Decision of Firms	2011	Johannes Weigl	Review of Capital structure theories and capital strucutre determinants

3. Theory

3.1 Capital Structure Theories

Modigliani and Miller's Irrelevance Propositions

The modern theory of Capital structure starts with the *Modigliani and Miller's (1958)* irrelevance propositions. The Modigliani-Miller theorem, proposed by Franco Modigliani and Merton Miller (1958), states that, in competitive and complete capital markets a firm's value is independent of the levels of debt and equity. Their theorem is based on the below key assumptions:

- There are no transaction costs
- There are no bankruptcy costs
- Firms issue only two types of claims: risk-free debt and equity
- Firms and individuals have the same information
- Neither personal nor corporate income tax exist

Their first proposition is based on the fact that a firm's total market value is independent of its capital structure. In a "perfect capital market," the total value of a firm is equal to the market value of the total cash flows generated by its assets and is not affected by its choice of capital structure.

Their second proposition is based on the fact that a firm's cost of equity increases linearly with the ratio of debt to equity. Under these strict assumptions, an investor can replicate any level of leverage that firms may undertake. Also, a firm cannot command a premium over other firms to take on more leverage compared to them. It is unlikely that the capital structure is irrelevant in the real world, taking into account the preferences of the tax debt and the likelihood of default. Definitely it does not create realistic predictions of how firms finance their activities, but provides a means for finding reasons why financing may matter. If we can identify the conditions under which capital structure is irrelevant, you might be able to infer what makes it relevant. Therefore, Modigliani and Miler irrelevance proposal is a benchmark theory. The main theories dominate capital structure literature until today were developed by loosening one or more assumptions of MM propositions. (Figure1).

Trade-off Theory

The theory of trade-off is developed by relaxing the assumptions of taxes and the cost of bankruptcy. Based on that theory, capital structure is determined by a trade-off between the benefits and costs of debt. This theory states that a firm chooses how much debt and how much equity would use to finance its operations by weighting the advantages and disadvantages of increased debt. An important purpose of the theory is to explain the fact that firms usually are financed partly with debt and partly with equity. Debt financing provides two differential benefits over equity. The first is tax advantages as the interest payments on the debt are tax deductible, whereas cash flows on equity are not. The second is the monitoring and the added discipline imposed on the management by intermediaries having to make payments on the debt. Both the benefits should be quantified if firms want to make rational decisions about debt capacity. However, debt financing has a cost. The cost is financial distress, and it includes the bankruptcy costs and non-bankruptcy costs of debts, such as staff leaving, demand of suppliers for stricter payment terms, conflicts of interest between managers and bondholders or shareholder. A vast theoretical and empirical literature evolved which led to the formulation of this theory.

Myers (1984) states that a firm will adopt a target debt level and it will try to achieve it. The firm will borrow up to the point where the marginal value of tax shields on additional debt is just offset by the increase in the present value of possible costs of bankruptcy and the agency costs that arise when the firm's creditworthiness is in doubt.

Frank and Goyal (2007) provide a review of literature of capital structure. They examine the trade-off and the pecking order theory and review the empirical evidence trying to conclude to a series of stylized facts. They use aggregate data from Compustat and U.S. Flow of Funds to examine the balance sheets and cash flow statements of the U.S. Nonfarm Nonfinancial Corporate Business. They calculate the value of each element of the balance sheet or cash flow statement as a percentage of the replacement value of total assets and averaged over available years in each decade. Some of their stylized facts are: "debt does not disappear from corporate accounts, nor do increases so much to overwhelm equity", "over long periods of time, aggregate leverage is stationary ".This facts are consistent with the trade off theory.

One can discriminate Trade-off theory in the static trade –off theory and dynamic trade-off theory in which target leverage varies over time due to time-varying determinants. The static trade-off theory says that that a firm's leverage is determined by a single period

trade-off between the tax benefits of debt and the deadweight costs of bankruptcy. At the optimal debt level, a marginal increase in the value of the tax shield is equal to the marginal increase in the value of costs of bankruptcy. This model gives a solution for leverage, but it leaves no room for the firm to be anywhere, but at the solution. On the other hand, the dynamic version of the trade off theory predicts that, because of transaction costs firms allow their leverage to drift until rebalancing benefits outweigh the costs. Therefore, firms allow leverage to move within a range around the optimal leverage ratio and rebalance when the benefits of adjusting the target are likely to exceed the costs. According to the Dynamic trade off theory proper funding decision usually depends on the financing margin that the firm anticipates in the next period. Some firms expect to pay out funds in the next period, while others expect to raise funds. If funds are to be raised, they may take the form of debt or equity. More generally, a firm undertakes a combination of these actions.

Pecking Order Theory

Pecking order theory was developed by relaxing the assumption about firms and individuals having the same information. The key idea is that Owners/managers of firms know more about their firms' prospects, risk and values than outside investors do. This asymmetric information generates adverse selection problems when firms turn to external financing. A firm is said to follow the pecking order theory if it prefers internal (retained earnings) to external financing and debt to equity if external financing is used. Equity is used only as a last resort. Suppose that there are three sources of funding available to firms - retained earnings, debt, and equity. Equity is subject to serious adverse selection, debt has only minor adverse selection problems, and retained earnings avoid the problem. From the point of view of an outside investor, equity is strictly riskier than debt. Both have an adverse selection risk premium, but that premium is larger on equity. Therefore, an outside investor will demand a higher rate of return on equity than on debt. From the perspective of those inside the firm, retained earnings are a better source of funds than debt is, and thus, debt is a better deal than equity financing. Accordingly, retained earnings are used when possible. If there is an inadequate amount of retained earnings, then debt financing will be used. Only in extreme circumstances is equity used. According to this theory, firms do not have a target debt-equity ratio, since there are two kinds of equity, internal and external, one at the top of the pecking order and one at the bottom. Each firm's observed ratio reflects its cumulative requirement for external financing.

The pecking order theory is popularized by the *Myers and Majluf (1984)*.They state that equity is a less preferred mean of raising capital, because when managers (who supposedly know better the real situation of the firm than investors) issue new equity, investors believe that managers think that the firm is overvalued and managers exploit this overvaluation. Therefore, investors will place a lower value to the new equity issuance.

Rasiah and Kim (2011) study the pecking order theory and trade off theory to decide which one has better financing behavior. They define some determinants of the optimal leverage ratio which distinct trade-off theory form pecking order theory. One of these determinants is firm's profitability level. Trade-off theory suggests that profitable firms tend to issue more debt to reduce the taxable income from the debt tax shield. Whereas according to the pecking order theory, profitability and leverage have a negative relationship. Another determining factor is the effective tax rate. According to the theory of trade off, firms that have higher taxable income should employ more debt to take advantage of the tax shield of interest. While from the perspective of pecking order theory, higher effective tax reduces the internal funds of profitable business and then increases its cost of capital. The firm's size is another factor that plays an important role in determining the capital structure of a firm. Under the trade-off theory, firm's size is positively correlated with leverage. Instead, pecking order theory indicates that there is a negative relationship between the size of firms and the level of leverage. *Rasiah and Kim (2011)* state that no matter what the capital structure of the firm is, whether it is depend on static trade-off theory or the pecking order theory, each theory must answer to the imperfections of markets and aim to approach the optimal capital structure which maximizes the firm's value.

Capital Structure Theories

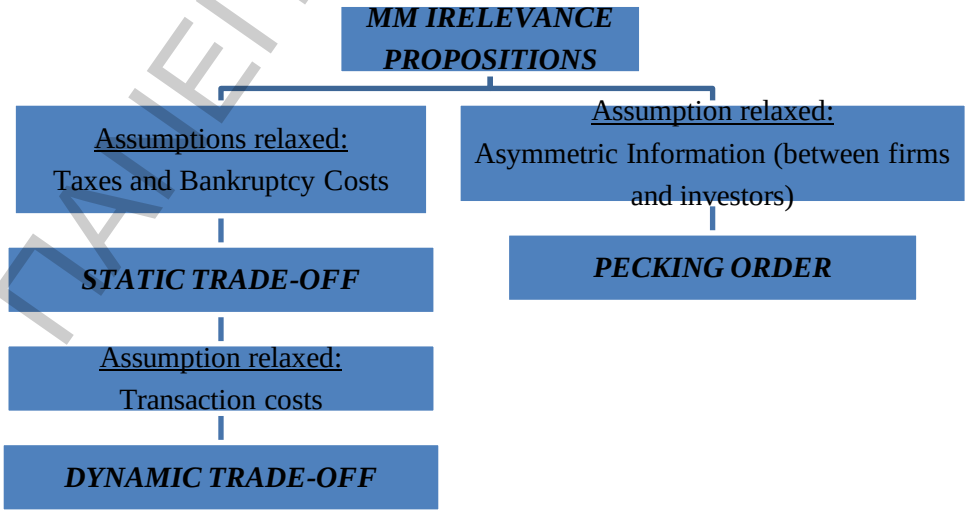


Figure 1

Market-Timing Theory

Traditional Finance seeks to understand the financial markets and seeks to explain the financing and investment patterns by understanding the beliefs and preferences of investors and managers who use models in which agents (investors and managers) are fully "rational." Whereas Behavioral finance, a new approach in corporate finance, in general, argues that some financial phenomena can be better understood using models in which agents are not fully "rational" instead of using the traditional models. Behavioral finance, study the effects of social, cognitive, and emotional factors on the economic decisions of individuals and institutions and the consequences for market prices, returns, and the resource allocation.

Baker, Rubak and Wrungler's *(2005)* research replaced the traditional rationality assumptions with potentially more realistic assumptions behavior. They organized their survey based on two approaches. The first is the "irrational investor approach" in which investors are not fully rational, and the second is the "irrational manager's approach" in which managers are not fully rational. In the approach of "irrational investors», rational managers coexist with irrational investors. This approach assumes that securities market arbitrage is imperfect, and therefore, the prices may be too high or too low. Rational managers considered to identify mispricing occurring in the market and make decisions that can encourage or respond to mispricing. Their decisions can maximize the value of the firm in short-term, but on the other hand, they can also lead to lower prices in the long-run as prices correct. In the "irrational investors" approach, managers try to balance three competing objectives: the company's fundamental value, catering, and market timing. The first objective is to maximize firm's fundamental value. The second objective is to maximize the current share price of the firm's securities. Catering refers to any action that is intended to boost share prices above fundamental value. The third objective is to exploit the current mispricing for the benefit of current long term investors. This is achieved with a "market timing" financing policy whereby managers issue securities that are temporarily overvalued and repurchase those that are undervalued.

Baker and Wrungler's survey (2011) updates and extends their previous survey with *Rubak (2005),* stating that the evidence indicates that market timing plays an important role in equity issuance decisions.

The market timing hypothesis is a theory of how firms decide whether to finance their investment with equity or with debt instruments and is classified as part of behavioral finance

literature. The idea is that firms pay attention to market conditions in an attempt to time the market. The market timing hypothesis says that the crucial determinant of the capital structure of a firm, which in accounting terms, is the cumulative result of a long series of incremental financing decisions, each driven by the need to finance a project, consummate a merger or achieve some other purpose. In particular, if funding decisions are motivated by Market timing theory do not adjust quickly the impact of the market-to-book on leverage , low leveraged firms will tend to be those raised external funds when their stock prices were high, and therefore those who tended to choose equity to finance investments and acquisitions last, and vice-versa for high leverage firms.

The Market timing theory of capital structure is developed and tested by *Baker and Wurgler (2002).* They were the first they were able to combine timing ability of a firm into a capital model able to explain capital structure decisions of firms. *Baker and Wurgler (200*2), claim that market timing is the first order determinant of a firm's capital structure . In other words, firms do not generally care whether they finance with debt or equity; they just choose the form of financing which, at that point in time, seems to be more valued by financial markets . *Baker and Wrungler (2002)* argue that firms are more likely to issue equity when their market values are high, relative to book and past market values and to repurchase equity when their market values are low. Based on this theory, managers look at current conditions in both debt and equity markets and if financing is needy they use whichever market is more favorable. The key idea is that managers try to exploit the temporary fluctuations in the cost of equity relative to the cost of other forms of capital. In the efficient and integrated capital markets studied by *Modigliani and Miller*, there is no gain from preferring equity than debt or vice versa since the costs of different forms of capital do not vary independently. In capital markets that are inefficient or segmented, by contrast, market timing benefits ongoing shareholders at the expense of entering and exiting ones. Managers thus have incentives to time the equity market if they think it is possible and if they care more about ongoing shareholders. If the equity market has been relatively favorable, then firms will tend to issue more equity even in cases that raising funds is not necessary. *Baker and Wrungler (2002)* examine how equity market timing affects capital structure and they try to prove that market timing has large, persistent effects on capital structure. Their data consists of Compustat firms for which they could determine the IPO date between 1968 and 1999. Their main finding is that firms with low leverage are those that raised funds when their market valuations were high, whereas high leveraged firms are those that raised fund when their market valuations were low. They measure the market valuation by the market-to-book ratio. First, they explore

the impact of current market-to-book ration on annual changes in book leverage. Then the decompose the leverage into equity issues , net debt issues and newly retained earnings and explore the impact of current market-to-book ratio on each of the components of leverage. In this way, they try to find whether market-to-book ratio affects leverage through net equity issues as Market timing Hypothesis states. Finally, they construct the historical market-to-book ratio as the "external finance weighted average" of a firm's past market-to-book ratios in order to test whether equity market timing has a long-run impact. This variable takes a high value for firms raised their external finance, equity or debt, when its market-to-book was high. To test that, they run a regression where leverage is the dependent variable and the independent variable is the "external finance weighted average" of a firm's past market-to-book ratios (historical market-to-book). *Baker and Wrungler (2002)* find that the effect of market-to-book on changes in leverage comes through net equity issues and that the market valuations have large effects on capital structure in the long-run.

Several lines of evidence suggest that overvaluation is a motive for equity issuance. *Graham and Harvey (2002)* conduct a survey among the CFOs of 4.440 US firms to investigate the way the corporations make decisions about capital budgeting and capital structure. They find that firms pay more attention to practical, informal rules than to academic advice. In issuing equity, they find that some of the most important factors are:

- Earnings per share dilution
- Overvaluation of stock prices
- Maintain target debt/equity ratio
- Considering stock as the least risky source of funds
- Targeting similar amount of equity as the other firms in the industry

They also find that some of the important factors affecting the decision to issue debt are:

- Maintain financial flexibility
- Credit rating
- Earnings and cash flow volatility
- Insufficient internal funds
- Level of interest rates
- Interest tax savings

Bancel and Mittoo (2002) also survey managers of firms in seventeen European countries in an attempt to provide evidence on how firms make their capital structure decisions and its determinants. Their sample contains seventeen countries: Austria, Belgium, Greece, Denmark, Finland, Ireland, Italy, France, Germany, Luxembourg, Netherlands, Norway, Portugal, Spain, Switzerland, Sweden, and U.K. They asked managers about their opinion on various factors that are likely to influence capital structure policies of firms. In the question : " Which factors affect the appropriate amount of debt for your firm ?" , the respondents rate as most important factor the financial flexibility , credit ratings, tax advantage of interest deductibility , the volatility of their earnings and cash flows. In the question: "what factors affect your choice between long and short term debt?" the respondents rates as most important factor the acting of matching the maturity of debt with the maturity of their assets. In the question : "what other factors affect your debt policy?" , the managers answered that they use debt, when they try to minimize the weighted average cost of capital ,when the interest rates are low , when their equity is undervalued. *Bancel and Mittoo (2002)* also ask questions regarding firm's common stock policy such as "Has your firm issued stock? If yes what facts affect your firm's decision about issuing common stock ". The most important factors affecting equity issuance are:

- Earnings per share dilution
- High stock prices
- Maintaining a target debt-to-equity ratio
- Providing shares to employee stock option plan

Welch (2004) found that stock returns are first order determinant of debt ratios of a firm and that stock returns and equity price shocks have long term effects on capital structure. He tests whether firms re adjust their actual debt ratios to their previous debt rations or the leave their debt ratios to fluctuate with stock prices. His sample contains US firms. He states that capital structure determinants identified by previous studies such as tax advantages, profitability bankruptcy costs and earnings have not induced managers to alter their capital structure as much as the fluctuations in stock price.

While most of the studies support the evidence regarding the importance of Market timing, there are studies that try to empirically test whether market timing effect on capital structure is persistent in the long-run. For instance, contrary to *Baker and Wurgler (2002), Hovakimian (2006)* finds no evidence that the effect of the historical weighted average market-to-book on leverage is due to past equity market timing. He replicates the *Baker and*

Wrungler (2002) regressions and his sample contains firms that appear in Compustat in years 1983-2002. They conclude that market timing is unlikely to have a long-lasting effect on capital structure.

On the other hand, *Alti (2006)* looks all reported IPOs between January 1, 1971 and December 31, 1999 by the Securities Data Company (SDC). He finds that market timing effect is presented in firms that issue equity when the prices are increased (Hot issue market). He states that hot-market IPO firms issue substantially more equity than cold-market firms but after going public the increase their debt ratios by issuing more debt than stocks. Moreover, he finds that after the second year of the initial public offering the effect of market timing disappears.

Huang and Ritter (2006) investigate the external financing decisions of U.S. publicly traded firms. Their sample contains firm-level data from Compustat and CRSP from 1963 to 2001.They examine their financing activities using information on their balance sheets .They state that when the cost of equity capital is low, firms issue equity for a short period of time. The historical values of the cost of equity capital have long-lasting effects on firm's capital structures through their influence on a firm's historical financing decisions.

The concept of market timing hypothesis is believed to counter the trade off theory and pecking order theory. The static tradeoff and pecking order theories of capital structure implicitly assume that firms have access to broad, efficient capital markets and to modern financial institutions. What if capital markets are inefficient? If firms seek to minimize their cost of capital, market inefficiencies have important implications for corporate financing. In contrast to the trade-off theory, the market timing theory is not based on a target capital structure and inhibits any adjustment in the debt –equity mix. The market timing theory can have a significant effect on the leverage ratio of the firm. Also, the key difference between pecking order theory and market timing theory is whether the assumption of semi-strong form market efficiency is maintained. The pecking order theory assumes markets are semi-strong efficient, thus the announcement effect of securities issue is the primary proxy for the degree of asymmetric information. The market timing theory does not rely on the assumption of semi-strong form market efficiency.

3.2. Capital Structure and Determinants

Several studies have gone through which factors influence the firm's financing. While the trade-off is based on traditional factors, such as tax benefits and the bankruptcy costs of leverage, others apply the asymmetric information framework where leverage or equity is used as a signaling mechanism or a strategic tool.

Frank and Goyal (2003) examine the leverage decisions of non –financial U.S. firms over the years 1950-2000 by creating a set of 39 factors, including measures of firm value, size, growth, industry, the nature of the assets, taxation, financial constraints, stock market conditions, debt market conditions, and macroeconomic factors. This set of factors includes the major factors considered in the literature. They focus on determining which factors are reliably important, for predicting leverage. They find that leverage increases with the average leverage in an industry, with firm size, and with the presence of collateral. Also consistent with the literature, riskier firms and high market-to-book firms have lower leverage.

In their updated paper *Frank and Goyal (2007)* in attempt to reduce the number of factors that are considered reliably important (found in their previous study in 2003), they explore changes in US corporate balance sheets and cash flow statements over time, and they find that a set of six factors account for more than 27% of the variation in leverage. Their sample consists of publicly traded firms over the period 1950 to 2003. They also examine whether changes in the patterns of financing decisions have taken place. They compare their evidence to predictions from the following theories. They call this set of six factors "core factors" and model that include these six factors as the "core model of leverage". The regression they used to study the effects of the factors is:

$$\boxed{L_{it} = \alpha + \beta F_{it-1} + \varepsilon_{it}}$$

L_{it}: market leverage (total debt divided by the sum of total debt and market value of equity) of firm i on date t

F_{it-1} : set of factors observed at firm i on date t-1

The core factors have consistent signs and statistical significance across many alternative treatments of the data. The core factors are, as stated by Frank and Goyal, the following:

- Industry median leverage: Firms in industries in which the median firm has high leverage tend to have high leverage.
- Market-to-book assets ratio: Firms that have a high market-to-book ratio tend to have lower leverage.

- Tangibility: Firms that have more tangible assets tend to have higher leverage.
- Profits: Firms that have more profits tend to have lower leverage.
- Firm size: Firms that are large tend to have higher leverage.
- Expected inflation: When inflation is expected to be high, firms tend to have high leverage.

Here once more we need to mention the important contribution of *Graham and Harvey (2001, 2002) and Bancel and Mittoo (2004)* in this part of literature. *Graham and Harvey (2001, 2002)* investigate which factors are reliably important in the financing mix by providing a comprehensive interview survey to CFOs in U.S. firms. They create a questionnaire of 100 questions in order to find which factors determine capital structure decisions. In general, *Graham and Harvey (2001, 2002)* argue, in broad terms, that the most important factors affecting debt policy are maintaining financial flexibility and having a good credit rating. The corporate tax advantage of debt is moderately important in capital structure decisions: 44.9% of CFOs say it is important or very important. Whereas the most important factors affecting equity issues are Earnings per share dilution and overvaluation of stock prices

Also, *Bancel and Mittoo (2004)* conduct a survey similar to that of *Graham and Harvey (2001, 2002)*; however their focus lays on the important capital structure factors for European companies. Their survey was mailed to CFOs in 17 different European countries and a total of 87 responses were obtained. They asked managers about their opinion on various factors that are likely to influence capital structure policies of firms. The questionnaire includes questions such as " Which factors affect the appropriate amount of debt for your firm ?" , "what factors affect your choice between long and short term debt ?" , "what other factors affect your debt policy?" , " Has your firm issued stock ?, if yes what facts affect your firm's decision about issuing common stock ". Three sets of factors were selected based on a review of literature. The first set of factors was based on the implications of different capital structure theories such as the trade off theory, the pecking order theory, and the asymmetric information theory. The second set of factors related to the managers. Finally, the last set of factors were based on commonly held beliefs among managers about impact of capital structure changes such as the impact of debt or equity issue on earnings. They also asked questions on the determinants of debt and equity policy. Their results seem to be quite similar to those of the study by *Graham and Harvey.* Financial flexibility is again a key determinant for managers who want their firm to have access to external financing whatever the economic outlook is. This financial flexibility is obtained by selecting the timing of the issue based on interest rate

levels or market value of equity. Their survey also confirms that managers are concerned about the impact of their decisions on financial statements. Earnings per share dilution are rated as an important determinant in issuing common stock.

Empirical research has settled on a few factors that account for much of the variation in leverage across firms (almost 30%):

- Growth opportunities
- Firm size
- Tangibility of assets
- Profitability
- Median industry leverage

Empirical research has proven that in general, growth and profitability are inversely related to debt financing. In contrast, size, tangibility, industry median debtors and expected inflation have a positive impact on leverage. Also, large firms with tangible assets tend to borrow more than small with intangible assets, firms with high profitability and/or valuable investment opportunities borrow less and firms in the same industry face common forces that seem to affect their financing decisions.

Guided by the existing empirical literature, this section provides a brief overview of the key debt factors separated in internal and external and their predicted effect on leverage as reviewed by Weigl (2011) in his dissertation.

Internal Determinants

Growth

Growth opportunities are mainly measured by Tobin's Q. There is a negative relationship between leverage and growth opportunities of a firm. The more growth opportunities a firm has, the less leverage it applies. According to the trade-off theory, since large growth opportunities coming intangibles assets such as investment opportunities, human capital may be the reason costs of final distress to be raised. This can lead to lower leverage. The empirical findings seem to be in line with the prediction of trade-off theory. On the other hand, according to pecking order theory, equity is treated as a last resort; as a result growth opportunities should be financed with leverage and not equity, leading to an increase in leverage.

Size

The firm's size is mainly measured the logarithm of asset, or sales, or the age of the firm .In most studies, size and leverage are positively correlated. This means that the bigger/older firm employs more leverage. According to trade-off theory, large firms can employ more debt since they are considered to be more diversified, with less volatile earnings and therefore they have lower default risk and better credit ratings. The empirical finding is in line with the prediction of trade-off theory. According to the pecking order theory the relationship between leverage and a firm's size is ambiguous. Large firms are associated with lower information asymmetries but they have more assets in place.

Tangibility

To measure Tangibility of a firm's assets we use the ratio of fixed assets to Total Assets. Many studies have identified a positive relationship between leverage and tangibility of assets .The more tangible assets a firm has, the more incentive the firm has to increase its leverage since tangible assets are considered a collateral and are easy to collateralize and suffer only a small loss of their value comparing to Intangibles.. This is also in line with the prediction of trade-off theory .This is also in line with the pecking order theory in which the collateral is used to diminish the relevance of asymmetric information.

Firm's Value

Empirical studies have shown that firm valuation have a significant impact on leverage. The market-to-book ratio is used to capture the market valuation effect on leverage. It is expected that market-to-book ratio is negatively correlated with the level of debt. This is consistent with the Market timing theory which states that firms tend to issue equity instead of debt when market value is high, relative to book value and past market values , an tend to repurchase equity when market value is low.

Profitability

The measurement of a firm's profitability is the ratio EBITDA (Earnings before Interest, Taxes, Amortization and Depreciation) to Assets. Generally it is expected that more profitable firm, will employ less leverage. According to empirical studies there is a negative relationship between leverage and profitability. The findings are aligned with the pecking order theory which states that firms prefer internal to external funds. Hence, more profitable firms (holding investments and dividends constant) tend to be lees leveraged. However, according to trade-

off theory profitable firms should have more debt since interest tax shield are more valuable and the expected bankruptcy costs are lower.

Industrial Median Leverage

Empirical studies have shown that firms competing in industries in which the median firm has high leverage tend to have higher levels of debt. There is no direct link to a specific theory.

External Determinants

There are recent studies stating that market or institutional conditions such as deregulation of the industry, bank concentration and access to capital market can have an impact on leverage.

A recent study of *Ovtchinmikov (2010)* shows that firms attempt to reduce their debt levels because they are exposed to industry deregulation suffering a decrease in profitability, asset tangibility and an increase in growth opportunities

Gonzalez and Gonzalez (2008) have researched the effect of bank concentration and institution on the capital structure decisions. Their study showed that firms, exposed to a greater bank concentration and stronger credit rights protection, tend to have larger debt levels. On the contrary, firms dealing with strong protection of property rights tend to have lower levels of debt.

Brav (2009) examines how the access to capital market influences firms' capital structure decisions. The author empirically proves that the access to capital markets has two implications. The first one is the level of debt, which implies that private firms employ more leverage compared to public firms, and the second one is a sensitivity effect which occurs through the avoidance of capital markets, leading to greater sensitivity of their capital structure to fluctuations in performance.

In general, we have to mention that firms do not adjust their leverage ratios constantly because of transaction costs. Instead, they allow leverage ratios to move within a range around the optimal target ratios. Within this range, the market equity values of more profitable firms grow faster, leading to the negative relation between profitability and leverage ratios. When resorting to external funds, more profitable firms are more likely to issue debt relative to equity in an effort to move toward their target ratios. In a nutshell, a negative relation between

profitability and leverage ratio may exist because some (profitable) firms temporarily deviate from their target ratios. In any case, the costly adjustment argument predicts that the combination of debt and equity must be in the direction of correcting the deviations from the target ratios.

3.3 Bank-Based vs. Market-based Economies

Studies have shown that the capital structure decision of a firm is not only affected by its own characteristics, but it is also a result of environment and traditions in which it operates. Their findings support the importance of taking into account external factors while modelling the capital structure of a firm. Capital structure is affected by the implications of the financial orientation of the economy. The implications of the characteristics of capital market oriented and bank oriented economies on the capital structure decision is important because they have direct implications on the sources of funds available to the corporate sector.

In a market-based economy system, the majority of financial power is held by the stock market and the economic mood of the area is dependent on how well or badly does the stock market. Banks in a market-based financial system are less dependent upon interest from loans and acquire much of their revenue through fee-based services such as checking accounts. In a market-based financial economy, wealth is more unevenly spread. This is constantly changing and everyone in society has the opportunity to win or lose on any given day. Richer countries are often found basing their economic system on the stock market. A market-based financial system finds more banks operating to make a profit. Average consumers can look to non-banking sources for financial support. Investments by private systems and the government often compete with those of the bank, forcing banks to adjust their practices and interest rates to compete. Market-based financial systems are found most often in areas that employ a common law legal system. The common-law system prevails in England, the United States. It is distinct from the civil-law system, which predominates in Europe

In contrast, in a bank-based financial system the economy is dependent on how well or poorly the banking industry is doing. Banks in a bank-based system prevail. Banks in these systems focus their attention on loans gain large power through this area. The stock market in these areas has little or no power over economic trends. In a bank-based financial system in the economy of wealth is more evenly distributed. Often only a few are given the opportunity to realize great gain and at the same time, there are fewer people on the lower economic

end. In a bank-based economy, little or no government assistance is available and few members of the private sector are in a position to compete with banks. Banks in this system, however, are expected to help regulate the economy .Few are expected to make a profit and is seen as a stabilizing force in the economy of the area available. Few are expected to make a profit and are seen as a stabilizing force in the economic conditions of the area. In a bank-based economy, laws are basically set forth and carried out by the government. This is based mainly on civil law rather than common law. Common law is less defined and can vary from case to case.

Countries like the U.S.A and the U.K. Are considered examples of capital market oriented economies with high transparency and investor protection. These countries are known to have lower level of leverage and higher agency costs and indirect bankruptcy costs than firms operating in bank based economy. Countries like Germany, France and Japan are examples of bank oriented economies with lower transparency and investor protection.

Antoniou, Guney and Paudyal (2008) explores how firms operate and make capital structure decisions capital in the capital market oriented economies such as the United Kingdom and the United States compared to Bank-oriented economies such as France, Germany and Japan. They identify the capital structure determinants related to the firm and other related to the market orientation. They obtain their data from DataStream for the period 1987-2000.They claim that leverage is positively correlated with the tangibility of assets and firm size, but negatively affected by the increase in the profitability of firm, growth opportunities and share price performance in both bank oriented and market oriented economies. For example, they state that in Germany, internal equity is a more favourable source of financing as German tax system favours dividends against retention of earnings. The leverage ratio is also affected by the market conditions in which it operates. The extent and effectiveness of these determinants depend on the legal and economic traditions of the country. More specifically, some of their results show that:

- German firms raise more debt than equity. This is an indication of the lenders oriented structure of German corporate sector.
- The debt ratio in the U.K is lower than in other countries. This might indicate a higher importance of equity over debt financing
- Share price performance is inversely correlated with leverage.

They conclude that a firm's capital structure is greatly influenced by the economic environment and its institutions, corporate governance practices, tax systems, lender-borrower

relationship, exposure to capital markets and the level of investor protection in the country in which it operates .

Demiguc-Kunt and Levine (1999) in their study examine financial structure of 150 countries focused on data collected from 1960 to 1990 to illustrate the relationship between financial structure and economic conditions and what drives the capital structure decisions in a Bank-based country versus a Market-based one. They state that in bank-oriented financial systems such as Germany and Japan, banks play a leading role in mobilizing savings, allocating capital, overseeing the investment decisions of corporate managers, and in providing risk management vehicles whereas in market-oriented financial systems such as the United Kingdom and the United States, securities markets play as an important role as the banks .In their paper they find that financial systems, on average, are more developed in richer countries also stock markets in richer countries become more active and efficient relative to banks and countries tend to be more Market-Based when strong protection of shareholder rights, good accounting regulations, low levels of corruption, and no explicit deposit insurance exist.

3.4 Evidence form International Data

Most of the studies in the literature have been focused on U.S. Market. Although, there are several studies focusing on international data.

Rajan & Zingales (1995) try to test whether the factors that influence capital structure of U.S. firms have the same impact on the choices of capital structure in other countries. They analyze a sample of non-financial firms operating in the G7 countries (the USA, Japan, Germany, France, Italy, the UK, and Canada) and they concentrate their analysis on the 1987-1991 period. The G7 countries are fairly homogenous regarding their level of economic development but they fairly different regarding their institutions .In more detail, the G7 countries have different tax and bankruptcy codes, and the historical role of banks and securities markets was quite different. In order to make all the necessary adjustments they identified the major differences across the G7 countries. First, they examine the balance sheets of the firms of their sample and they note three major differences in accounting practices. The first difference is that not all countries require firms to report consolidated balance sheets, but the majority of countries do it. The countries with the least proportion of firms reporting unconsolidated balance sheets are in Germany and Japan (76%). Companies with unconsolidated balance sheets may (incorrectly) appear less leveraged than otherwise identical

companies that report consolidated balance sheets. These companies might leave the most indebted associated firms off their balance sheets. It is a way to window-dress their balance sheet. So, their analysis focuses on firms that report consolidated balance sheets. Second, the valuation of assets (at historical or current value) may differ across the G7 countries. So, firms in countries like Germany that is believed they give emphasis on "conservatism" and less on "true and fair" considerations may be understated relative to asset value in other countries. The third difference has to do with what is excluded or included from a balance sheet in different countries .For example, lease reporting or pension liabilities may be treated in a different way across counties. For example generally accepted German accounting practices allow firms setting aside greater provisions for future potential liability in profitable years. The levels of leverage are a consequence of conscious financing choices made by firms. Despite the above mentioned differences, they find that firms across the G7 countries are levered fairly similarly with only U.K. and Germany being relatively less leveraged. *Rajan & Zingales* also identify the institutional differences and their effect on leverage. They examine the effect of tax code, bankruptcy laws, and development of bond markets and patterns of ownership. They argue that in order to reach any conclusion on the effect of taxes on aggregate leverage, it is important that the researcher include both personal and corporate taxes. They state that countries like Germany in which bankruptcy laws are stricter and firms tend to be liquidated more easily, seem to be less leveraged. This is why the bankruptcy costs in these countries are high. *Rajan & Zingales, also,* emphasize the differences in the importance of banks relative to public financial markets which are considered explanations for differences in capital structure. Germany can be considered as a bank-oriented country whereas U.K or the U.S can be considered as market –oriented markets. Their difference is between bank oriented countries and market oriented countries is really reflected in the choice between public (stocks and bonds) and private financing (bank loans) rather than in the amount of leverage. It might appear that the closer monitoring and control of firm management provided by banks should enable firms to take on more debt in bank oriented countries. So firms in bank oriented' countries may not want to borrow beyond a point from banks, even though financing is available. An alternative explanation is that banks in these countries have sufficient stakes in firms that even equity becomes a viable instrument of control. So firms in bank oriented countries do obtain more financing but some of this takes the form of privately placed equity and does not reflect in the leverage ratio. *Rajan & Zingales* , find that factors presented by previous studies as important in determining the cross-section of capital structure of the U.S such as tangibility of assets (the ratio of fixed to total assets),

the market to book ratio, firm size, and profitability affect firm leverage in other countries as well. Their basic regression is:

Leverage [Firm i] = $a+b_1$ Tangible Assets $+b_3$ Market to book ratio $+b_4$ Log Sales $_i$ $+b_4$ Return on assets $_i$ $+e_i$.

They find that Tangible assets measured by the ratio of fixed to total assets are positively correlated with leverage. Tangible assets are easy to collateralize and thus they reduce the agency costs of debt. The market to book ratio is negatively correlated with leverage. This is can be interpreted as a tendency of firms to issue stock when their stock price is high relative to earnings or book value. Log of Sales is the measure of the size of the firm. Size is positively correlated with leverage, except in Germany where is negatively correlated. Profitability is measured by the return on assets and is negatively correlated with leverage in all countries except Germany. Overall, firm leverage is fairly similar across the G7 countries and factors identified by previous studies as important in determining the cross-section of capital structure in the U.S. affect firm leverage in other countries as well. However, the differences in legal and institutional environment as well as in accounting practices make it difficult to compare and interpret financial data across countries.

Mahajan and Tartaroglou (2007) examine the equity market timing hypothesis of capital structure in major industrialized (G7) countries. They select a sample of all firms from G7 countries included in Standard & Poor's Compustat Global files over the 1993-2005 periods. The G7 countries are Canada, France, Germany, Italy, U.K., U.S. and Japan. All these countries are quite homogenous in their level of economic development, but they differ from each other on institutional dimensions (tax and bankruptcy codes, legal, regulatory and financial system, governance mechanisms, etc). In order to overcome some of those differences and based on the study of Rajan and Zingales (1995), they include in the sample only firms that report consolidated balance sheets. They exclude financial and regulated firms (Sic codes : 6000-6999 and 4000-4999), firms with book value of assets less than $10 million and firms for which book equity , equity and debt issues variables, are missing. They also delete all firms with leverage higher than one and they winsorize their sample at 1% and 99%. Following the data definition of Baker and Wrungler (2002), they define book equity (E) as total assets minus total liabilities and preferred stock plus deferred taxes. Debt (D) is defined as difference between total assets (TA) and book equity. The net equity issues (e) and debt issues (d) are identified by tracking changes in balance sheet figures. Net equity issue is

defined as change in book equity net of retained earnings (change in equity minus change in retained earnings). Net debt issue is the residual change in assets (change in total assets minus change in equity). These issue variables are scaled by total assets. Leverage is defined in two ways based on book and market value measures. Book leverage is defined as debt divided by total assets. Market leverage is defined as debt divided by the market value of assets (total assets minus book equity plus market value of equity).In their leverage regressions they use four variables :tangibility (measured as property, plant and net equipment(PPE) divided by total assets) , profitability(measured by earnings before interest, taxes, depreciation and amortization –EBITDA- divided by totals assets) , size (measured by logarithm of sales) , market to book ratio (measures as market value of assets- book assets minus book equity plus market value of equity- divided by total assets). Market-to-book ratio usually serves as proxy for investment opportunities but may also be related to market mispricing (over or under-valuation) of equity. Following Baker and Wurgler (2002), historical market-to-book ratio (firm within variation of market-to-book ratio) is used as market timing proxy. To calculate the historical market-to-book ratio they use the external finance weighted average market-to-book ratio (EFWAMB).For a given year, EFWAMB is defined as

$$. \boldsymbol{EFWAMB}_{t-1} = \sum_{s=0}^{t-1} \left(\frac{e_s + d_s}{\sum_{r=0}^{t-1} e_r + d_r} \right) * \left(\frac{\mathbf{M}}{\mathbf{B}} \right)_s$$

They decompose change in leverage into three parts: change in equity net of retained earnings (e), change in retained earnings (ΔRE) and residual change in leverage which depends on total growth in assets.They first investigate whether current market-to-book ratios are associated with changes in leverage due to equity issuance in each G7 country by running the below regression.

$$\left(\frac{\mathbf{D}}{\mathbf{TA}}\right)_{\mathbf{t}} - \left(\frac{\mathbf{D}}{\mathbf{TA}}\right)_{\mathbf{t-1}} = -\left(\frac{\mathbf{e}}{\mathbf{TA}}\right)_{\mathbf{t}} - \left(\frac{\mathbf{\Delta RE}}{\mathbf{TA}}\right)_{\mathbf{t}} - \left[\mathbf{E_{t-1}}\left(\frac{\mathbf{1}}{\mathbf{TA_t}} - \frac{\mathbf{1}}{\mathbf{TA_{t-1}}}\right)\right]$$

Then they regressed each of these three components of change in leverage (C_{it}, i=1, 2 and 3) in the below equation on current market to book, tangibility of assets, profitability, size and lagged level of leverage:

$$\boldsymbol{C_{it} = a + b\left(\frac{M}{B}\right)_{t-1} + c\left(\frac{PPE}{TA}\right)_{t-1} + d\left(\frac{EBITDA}{TA}\right)_{t-1} + elog(S_{t-1}) + f\left(\frac{D}{A}\right)_{t-1} + u_t}$$

They find that current market-to-book ratios are positively related to equity issues in Canada, France, Germany, Italy, U.K. and the U.S. They also show that changes in retained earnings are positively correlated with profitability in Canada, France, Germany, Italy, U.K. and the U.S. Controlling for profitability, market-to-book ratio is positively correlated with changes in retained earnings for Canada and Italy. For these two countries, current market-to-book ratio may affect leverage because it forecasts retained earnings. Higher market-to-book ratio firms, on average, have higher subsequent retained earnings and historical market-to-book ratios may be contaminated with the effects of earnings. They state that the residual asset growth component of change in leverage is positively related to market-to-book ratio as well as profitability. The positive relation between current market-to-book ratios and changes in leverage due to changes in net equity in all G-6 (G-7 less Japan) countries suggests that equity market timing attempts may indeed have a role in explaining leverage. We next explore the relation between leverage and historical market-to-book ratios as a proxy for cumulative market timing attempts. Then, they investigate the relation between historical market-to-book ratio within Canada, France, Germany, Italy, U.K. and the U.S. In more detail, leverage is regressed on external finance weighted average market-to-book ratio (EFWAMB), current market-to-book ratio, tangibility of assets, profitability and size. Along with historical market-to-book ratio, the current market-to-book ratio is included in these regressions to control for growth opportunities. The regression equation is:

$$(Leverage)_t = a + bEFWAMB_{t-1} + c\left(\frac{M}{B}\right)_{t-1} + d\left(\frac{PPE}{A}\right)_{t-1} + e\left(\frac{EBITDA}{A}\right)_{t-1} + flog(S_{t-1}) + e_t$$

They run the regression with the dependent variable first defined as book leverage and then as market leverage. Although, leverage, irrespective of whether it is measured in terms of book value or market value, is inversely related to EFWAMB in virtually all G7 countries. Current market-to-book ratio is positively related to leverage for United Kingdom. For France and Germany, the coefficient of current market-to-book ratio is insignificant. The current market-to-book ratio has a significant negative coefficient for Canada and US. They find that current market-to-book ratio for all G-7 countries has a negative relation with market leverage as well, which is consistent with trade-off theory.

They argue that the negative coefficients of current market-to-book ratio cast doubt on the role assigned to historical market-to-book ratio in testing the market timing hypothesis. This hypothesis requires that firms do not rebalance their capital structure so that market timing attempts may explain leverage in the cross section. However, if the current market-to-book ratio is consistent with trade-off theory, then historical market-to-book ratio does not necessarily reflect the impact of market timing attempts on leverage since the effects of equity market timing will dissipate over time as firms rebalance their capital structure within the trade-off frame work.

In general, *Mahajan and Tartaroglou* observes an inverse relationship between leverage and EFWAMB in most industrialized countries something that is consistent with the prediction of the equity market timing hypothesis. Although, they test whether this inverse relation between leverage and EFWAMB are more consistent with the equity market timing hypothesis or some models of dynamic trade-off with adjustment costs. They state that the market timing hypothesis of capital structure requires that firms not adjust and thereby neutralize the impact of equity issuances from their leverage. They analyze leverage ratios of firms in periods following the equity issues and they focus on the significant equity issues, which are defined as changes in equity greater than five percent of pre-issue total assets. Their results show that firms from Canada and Italy purge the negative impact of equity issuance on leverage within one year.

It takes two years for US firms and four years for French firms to revert to their original leverage levels. Results for US and Canada further reveal that the difference of leverage between fourth year (t = 4) and pre-issue year is positive and significant. Hence, Canadian and U.S. firms not only purge the negative impact of equity issuances on their leverage, they adjust to even higher levels of leverage within four years after issuing equity. Only UK and German firms do not exhibit reversion to pre-issue level of leverage during their test period. Their investigation reveals that firms in G-7 countries, except Japan, fully rebalance their capital structure after equity issuance. So, the effect of equity market timing on leverage is short lived and neutralized within at most five years of equity issuance.

4. Method

4.1 Research Approach

In this thesis, we investigate the market timing effect on German and U.K. market by employing the methodology proposed by *Baker and Wrungler (2002)*. Also *Mahajan and Tartaroglou (2007)* have used the same approach. Using the same approach makes it possible to compare the results of this thesis with the results of previous studies In essence, we try to test how equity market timing affects capital structure and we examine whether market timing has a short-run or a long-run impact. We try to test whether firms in Germany which is the largest economy in the European Union and is considered a Bank-Based Economy tend to borrow money instead of issuing equity when they want to finance their operations whereas in UK which is considered a Market-based Economy, firms when they want to finance their operations prefer to issue stock rather than borrow money.

4.2 Data Description

Our sample is comprised of all firms composing the German stock market index DAX 30 and the U.K. stock market index FTSE 100.We choose this sample of firms for Germany and the U.K. as the DAX is used as a leading indicator of economic health for the European Union and FTSE 100 is considered the UK's flagship index

The DAX (Deutscher Aktien IndeX) is a blue chip stock market index consisting of the 30 major German companies trading on the Frankfurt Stock Exchange. DAX 30 is the most followed equity index of Euro zone's biggest economy and measures the performance of the 30 largest German. The Base date for the DAX is 30 December 1987 and it was started from a base value of 1,000.

The FTSE 100 is a stock index comprised of the 100 most highly capitalized companies listed on the London Stock Exchange. It is the most monitored UK equity index and is considered a measure of the nation's business activity. The FTSE 100 was established on January 3 1984 with a base of 1000. The FTSE 100 is the most followed UK equity index, is a capitalization weighted index and only includes UK based companies. FTSE 100 represents multinational companies, many of which do little or no business in the UK. For example, the oil and mining sectors represent over 30% of the FTSE 100, yet the oil and mining industries account for a considerably lower percentage of the UK economy.

A list with all the companies that compose DAX30 and FTSE 100 is presented in Table 1 (Appendix). It is important to mention that Germany and the U.K. are fairly similar regarding the level of economic development but they fairly different regarding their institutions .In more detail, they have different tax and bankruptcy codes, and the historical role of banks and securities markets is quite different as previous studies have indicated. Germany is a representative of a bank oriented financial system and the U.K. is a representative of Market oriented financial system. Based on previous studies, we expect to find that firms in Germany have higher debt ratios and on the other have firms in the U.K. are more concerned about pricing in financial market in the capital structure choices.

We use annual accounting data drawn by DataStream database over the period 1990-2011.Following the approach taken in previous literature we exclude all financial firms with an SIC code between 6000-6999 due to their capital structure being affected by regulations. We further restrict our sample to exclude firms that have non-positive total assets, as this variable is used to standardize other variables and thus cannot be zero or negative. We also exclude firms with missing observations. To estimate the trend of the outcomes (process of regression) we use the method of least squares in our panel data. This method is influenced strongly but outliers and in order to avoid them by winsorizing our sample at 1% and 99%. The structure of the data used in our regressions is unbalanced panel data.

Following the data definition of *Baker and Wrungler (2002)* and the further research of *Mahajan and Tartaroglou (2007)* , we define the dependent variables which are : Book leverage , Market leverage , Net equity issues (e) , Change in retained earnings (ΔRE), Net debt issues (d) and the independent variables which are : Market-to-book ratio and the External Finance Weighted Average market-to-book. We also add control variables that have been found to be correlated with leverage in several developed countries as identified by *Rajan and Zingales (1995).*

Dependent Variables

Book leverage: Book leverage is defined as book value of debt to total assets, where book value of debt is total assets minus book value of equity (Baker and Wrungler (2002)).

Market leverage: Market leverage is defined as book value of debt to total assets minus book value of equity plus market value of equity. Market value of equity is defined as common shares outstanding times' price (Baker and Wrungler (2002)).

Net equity issues (e): Net equity issues are the sale of common and preferred stock minus the purchase of common and preferred stocks (Baker and Wrungler (2002)).

Changes in retained earnings (ΔRE): Defined as the change in retained earnings divided by total assets (Baker and Wrungler (2002)).

Net debt issues (d): Net debt issues are long-term debt issuance minus long-term debt reduction plus changes in current debt (Baker and Wrungler (2002)).

Independent variables

Market-to-book ($\frac{M}{B}$): This ratio is often seen as a proxy of investment opportunities but may also be related to market mispricing of equity (Rajan and Zingales 1995). According to the market timing theory Market-to-book ratio should be negatively correlated with leverage and changes in equity. This variable will also be used as a control variable for growth opportunities in the regression when the historic M/B measure is used to account for the effect of equity mispricing. (Baker and Wurgler 2002)

External Finance Weighted Average Market-to-Book ratio (EFWAMB): To test the market timing hypothesis following Baker and Wurgler (2002) and Mahajan and Tartaroglu (2007) the External Finance Weighted Average Market-to-Book ratio is used. Defined by Baker & Wurgler as follows:

$$\left(\frac{M}{B}\right)_{EFWAMB,t-1} = \sum_{s=0}^{t-1}\left(\frac{e_s + d_s}{\sum_{r=0}^{t-1} e_r + d_r}\right) * \left(\frac{\mathrm{M}}{\mathrm{B}}\right)_{\mathrm{s}}$$

Where **s** and **r** equals the first year of that sample period and d is the difference in book debt. In line with *Baker and Wurgler´s* procedure negative weights are set to zero for computational reasons and the maximum EFWAMB is set to ten with the aim of limiting a potential effect of outliers. Not allowing any negative weights will ensure that really a weighted average is created. This variable should take high values for firms that have raised external finance when the M/B ratio was high and vice versa. If the hypothesis that a firm consistently chooses to issue equity when their M/B value is high is correct, EFWAMB should be negatively correlated to leverage. (Baker and Wurgler 2002)

Control Variables

We also set three control variables, which have been found to be correlated with leverage in several developed countries (Rajan and Zingales 1995). We use as denominator the total assets in order to enhance the comparability between different firms and years. The variables also used to explain leverage are as following:

Log Sales: The size of the company is potentially something that could influence their capital structure, for example are big companies more diversified and could hence be considered safer debt holders. The logarithm of sales is used as a proxy for size, in accordance with previous research. (Baker and Wurgler 2002, Mahajan and Tartaroglu 2007)

PPE/A: This is a measure of tangibility which might be correlated to leverage since the more tangible assets a company owns the larger debt it should be able to hold. This is due to the fact that assets could serve as collateral and therefore decrease the agency cost of debt (Baker and Wurgler 2002, Rajan and Zingales 2007).

EBITDA/A: Another factor that might be correlated with leverage is profitability, since it is associated with the availability of internal funds (Baker and Wurgler 2002). This would

according to the pecking order theory be associated with less leverage (Myers 1984, Myers and Majluf 1984). EBITDA is also scaled with total assets to increase the comparability.

4.3 Methodology

First, we try to examine the effect of market-to-book ratio on the annual change in leverage. Then we decompose the change in leverage to examine whether the effect comes through net equity issues as market timing hypothesis implies. Then, we investigate the relation between leverage and historical market-to-book ratio. We run all the regression separately for each country.

The first regression equation we run is the below and the scope is to examine the correlation between the annual change in leverage and market-to-book ratio:

$$\left(\frac{D}{A}\right)_t - \left(\frac{D}{A}\right)_{t-1} = a + b\left(\frac{M}{B}\right)_{t-1} + c\left(\frac{PPE}{A}\right)_{t-1} + d\left(\frac{EBITDA}{A}\right)_{t-1} + elog(S_{t-1}) + f\left(\frac{D}{A}\right)_{t-1} + u_t$$

Equation 1

According to Baker and Wrungler (2002) the last variable (D/A_{t-1}) is the lagged leverage and is included because leverage is bounded between zero and one. When leverage is near one of these boundaries, the change in leverage can only go in one direction, regardless of the values of other variables.

Based on *Baker and Wrungler(2002) and Mahajan and Tartaroglu (2007)* the annual change in leverage can be decomposed into three parts : equity issues , retained earnings and residual change in leverage, which depends on the total growth in assets from the combination of equity issues ,debt issues and newly retained earnings. The regression equation is the below:

$$\left(\frac{D}{A}\right)_t - \left(\frac{D}{A}\right)_{t-1} = -\left[\left(\frac{E}{A}\right)_t - \left(\frac{E}{A}\right)_{t-1}\right] = -\left(\frac{e}{A}\right)_t - \left(\frac{\Delta RE}{A}\right)_t - \left[E_{t-1}\left(\frac{1}{A_t} - \frac{1}{A_{t-1}}\right)\right]$$

Equation 2

Thus, in the second regression, we regress each of the three components of change in leverage on current market-to-book, tangibility of assets, profitability, and size and lagged leverage.

The third regression that we run helps us to investigate the relation between leverage and historical market-to-book ratio and to determine if a potential short term effect of market timing is rebalance away quickly by managers or if the effect is more persistent.
In particular, leverage is regressed on the external finance weighted average market-to-book ratio, current market-to-book ratio, tangibility of assets, profitability, size and lagged leverage. The regression equation is the below:

$$(Leverage)_t = a + b\left(\frac{M}{B}\right)_{EFWAMB,t-1} + c\left(\frac{M}{B}\right)_{t-1} + d\left(\frac{PPE}{A}\right)_{t-1} + e\left(\frac{EBITDA}{A}\right)_{t-1} + flog(S_{t-1}) + e_t$$

Equation 3

The variable **Levarage** $_t$ is either book leverage or market leverage.

To compute the regressions in the thesis the statistical software E-views is used. All the analytical tables produced by E-views are presented in the Appendix.

4.4 Results

Descriptive Statistics

First, for each country the graphs of the mean value of each control variable (Market-to-book, Logarithm of Sales, EBITDA, and PPE) are shown below. It is obvious from the below graphs that comparing with the results of Mahajan and Tartaroglou (2007) the Market-to-Book ratios in both countries are extremely low. In Mahajan and Tartaroglou (2007) study the Market-to-book ratio was 1, 46 for Germany and 1, 69 for the U.K...In our study the Market-to-book ratio is 0, 58 for Germany (Graph 2 and Table 3-Appendix) and 0, 52 for the U.K (Graph 1 and Table 2 -Appendix).

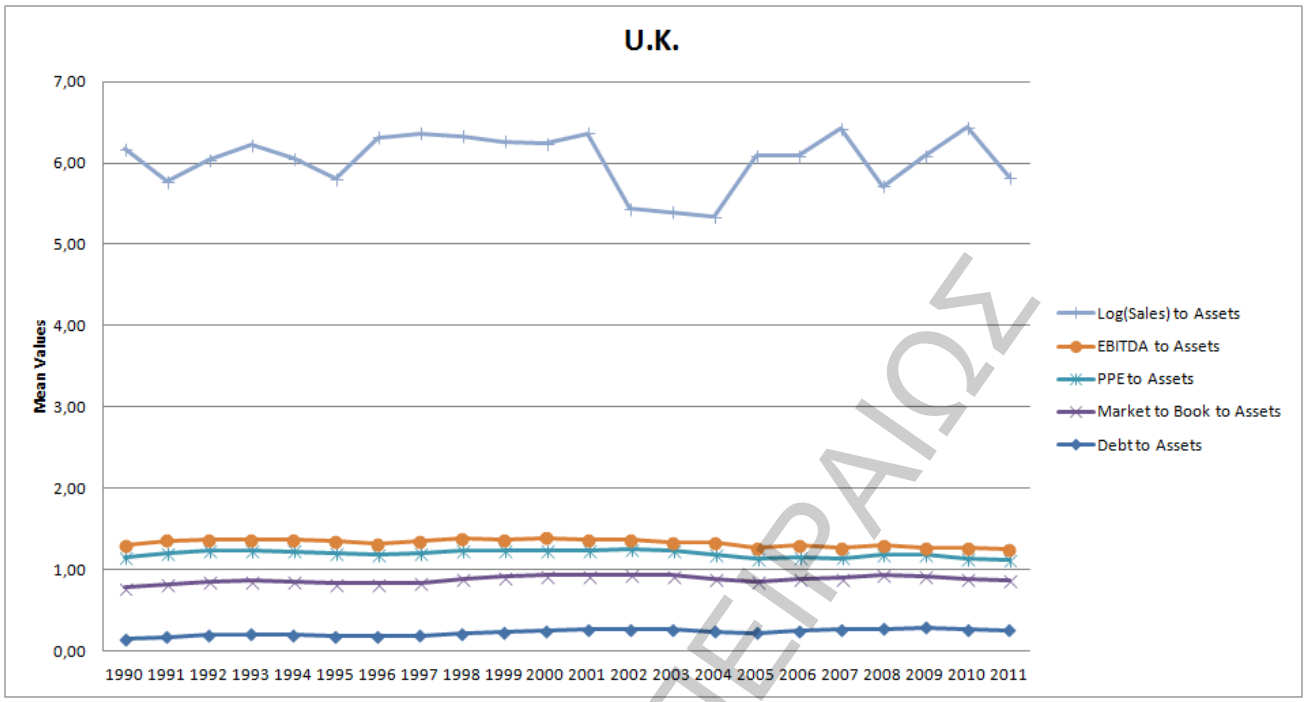
We also observe that both countries have approximately the same market-to-book ratio .The above observations might be explained by the fact that all the firms included in our

sample are large companies which have great resources in order to have a transparent communication with investors .The communication can lead to a more true valuation of the firm by the market hence decreasing the mean value of the M/B ratio.

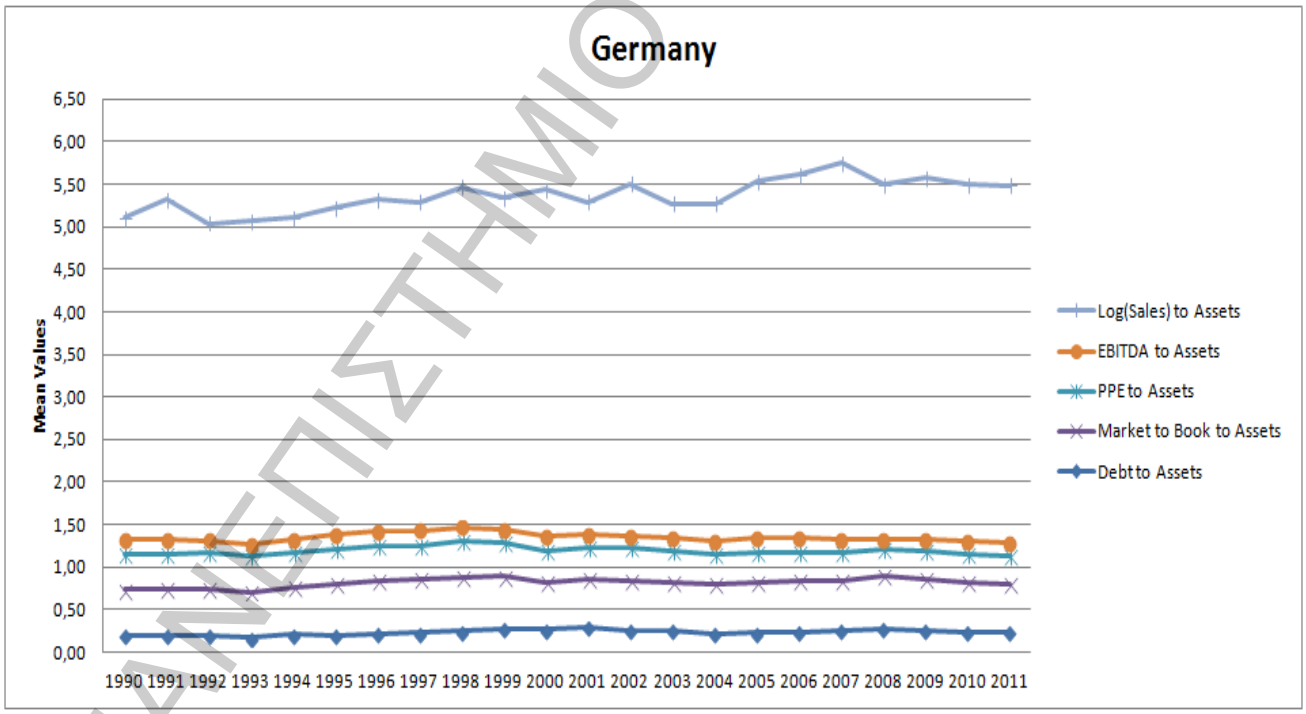
Another difference that results from the descriptive statistics presented in the below graphs is that the Logarithm of Sales, which is a proxy of a firm's size , in our sample has a mean of 4, 7 for the U.K. (Graph 1 and Table 2 -Appendix) and 4,01 for Germany (Graph 2 and Table 3-Appendix). Comparing with Mahajan and Tartaroglou (2007) values of around 12 to 13 for both countries it is obvious that there is a difference. This difference is expected and explained by the fact that in our sample only large companies are included.

Moreover, the mean value of the control variable PPE/A (Property and plant equipment divided by total assets) which is a proxy for tangibility of assets is 0, 32 for the U.K. (Graph 1 and Table 2 -Appendix) and 0, 38 for Germany (Graph 2 and Table 3-Appendix) and differs largely form the results of Mahajan and Tartaroglou (2007).In their study the mean of the tangibility of assets is 25, 2% for Germany and 35, 6 % for the U.K. This could also be one effect of the composition of our sample which only consisting of large public firms.

The profitability measure EBITDA/A (earnings before interest and taxes divided by assets) also differs from Mahajan and Tartaroglou (2007).In their sample, the mean value for the U.K. is 12,22 and for Germany is 10,83 whereas in our sample the mean value for the U.K. is 14 (Graph 1 and Table 2 -Appendix) and for Germany is 16 (Graph 2 and Table 3-Appendix) indicating higher profitability. This divergence might be caused by the period of our sample which is 1990 to 2011 whereas in of Mahajan and Tartaroglou (2007) is 1974 to 2005.



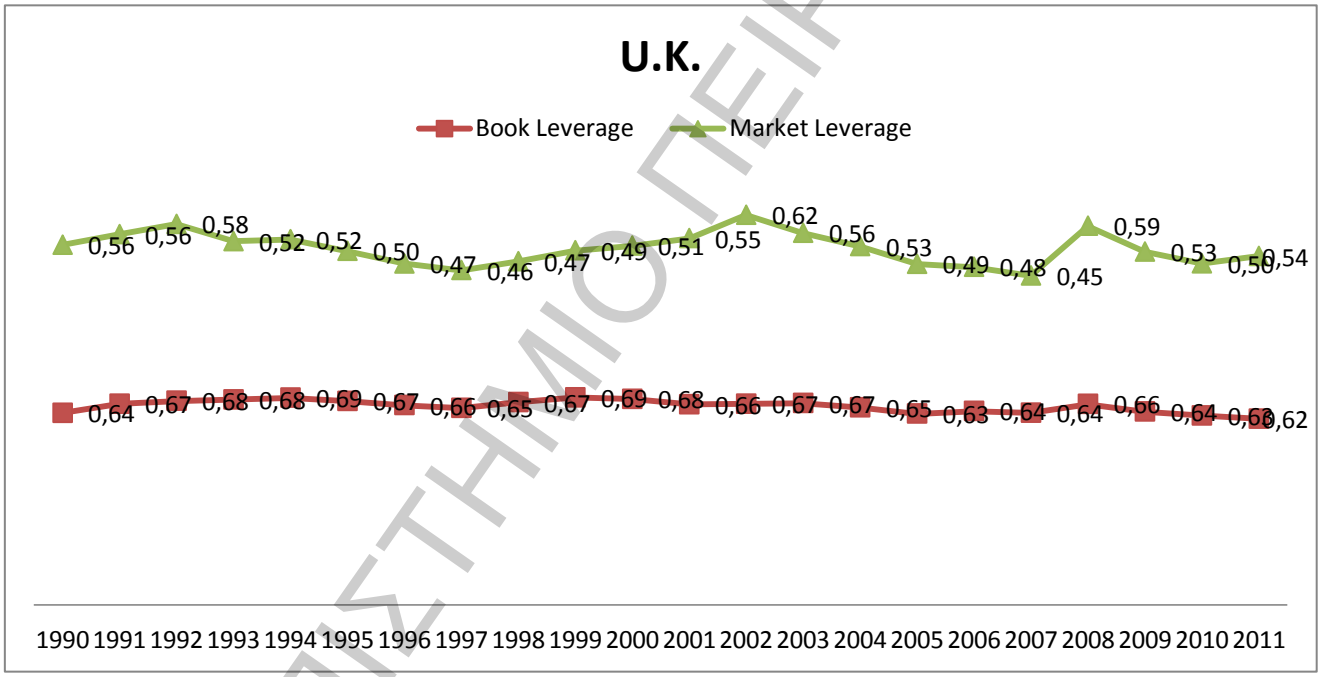
Graph 1



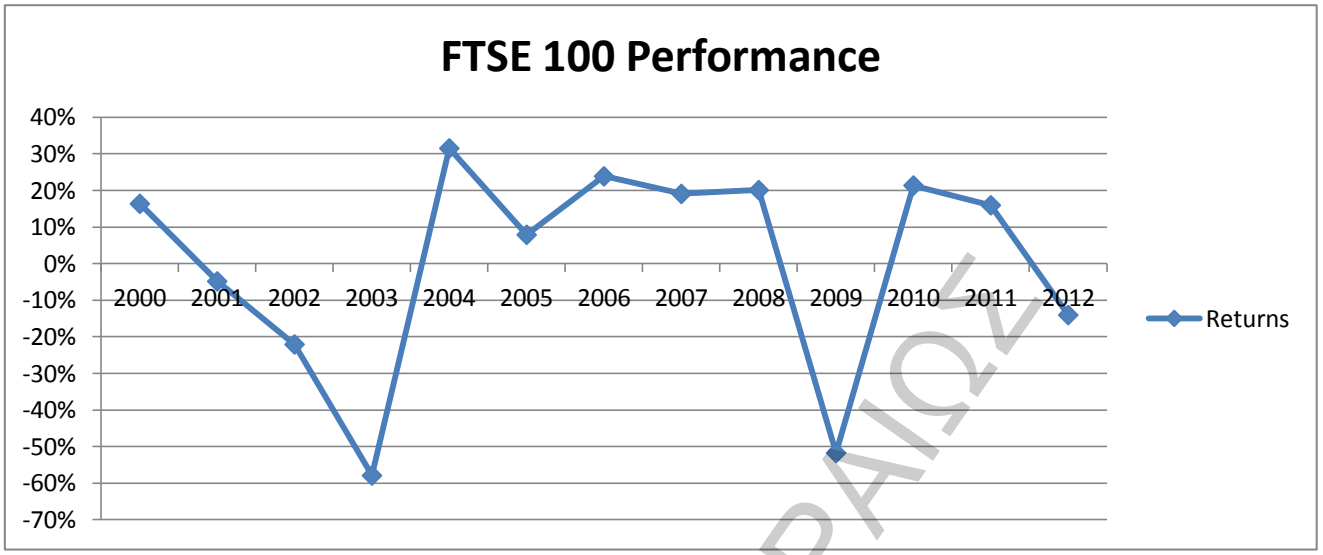
Graph 2

Then, for each country the graphs of the mean value of each of the two dependent variables: Market Leverage and Book leverage and the market performance of FTSE 100 and DAX 30 are presented. It is obvious that in both countries from 1990 to 2011 the book

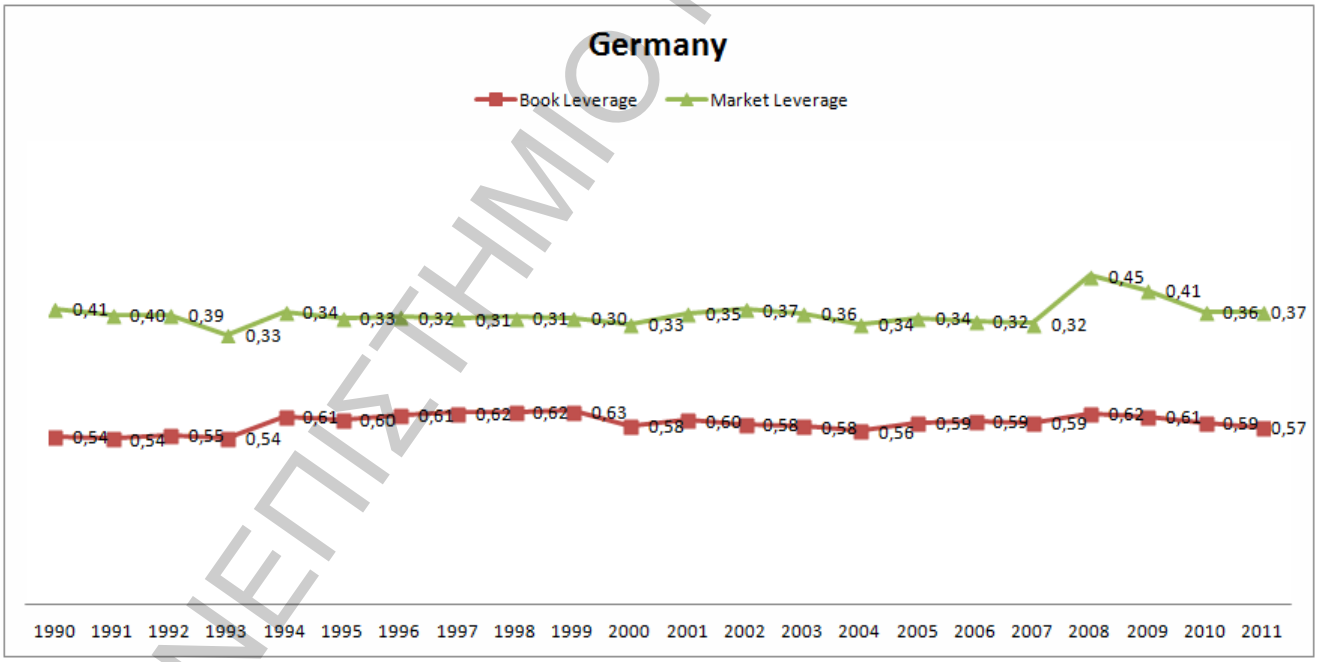
leverage remain stable, although book leverage in the UK is higher than in Germany. Comparing the leverage with the performance of FTSE 100, we observe that between 2001-2004 and 2008-2010 (bases on previous research is the period of crisis) the market leverage increases as the performance of the firms of our sample decreases dramatically. The same trend is observed in Germany too, but only for the period of crisis. From 2001 to 2004 the performance of the firms of our sample in Germany is decreasing heavily, although the market leverage and book leverage remain stable. Here, one can also observe that Market Leverage and Market-to-book ratio (Graph 1 and Graph 2) is extremely flat, something that is in contrast with the high volatility of the performance of both Indices.



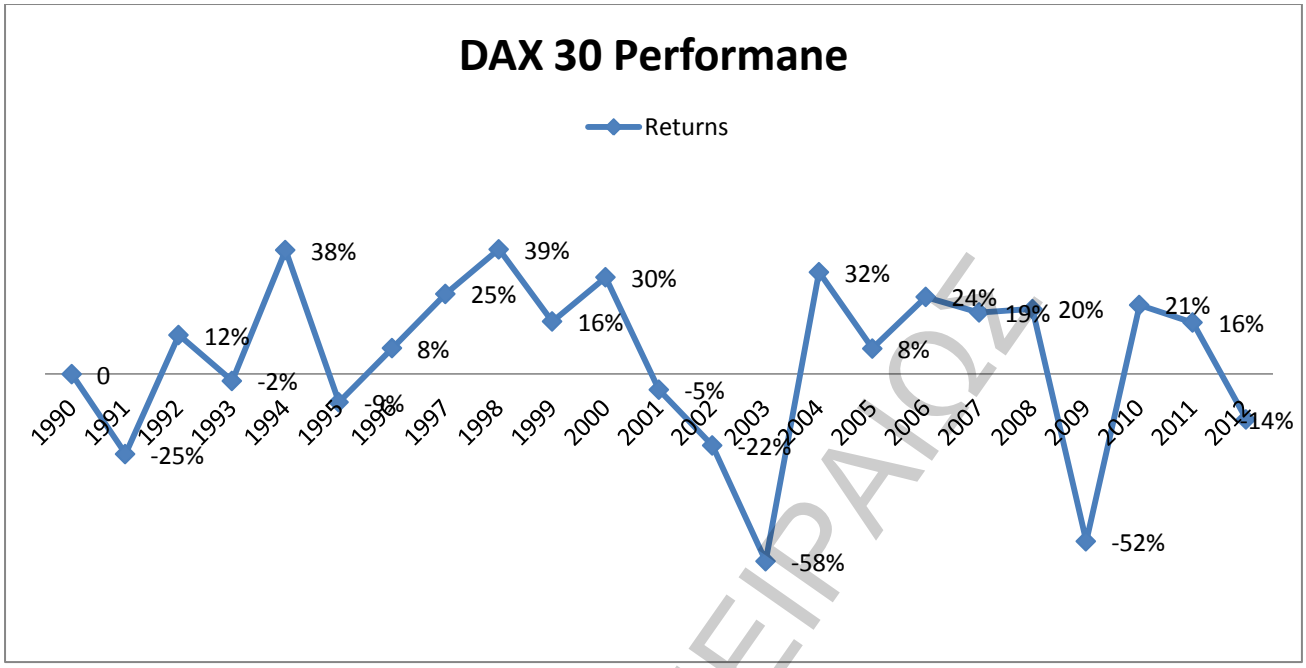
Graph 3



Graph 4

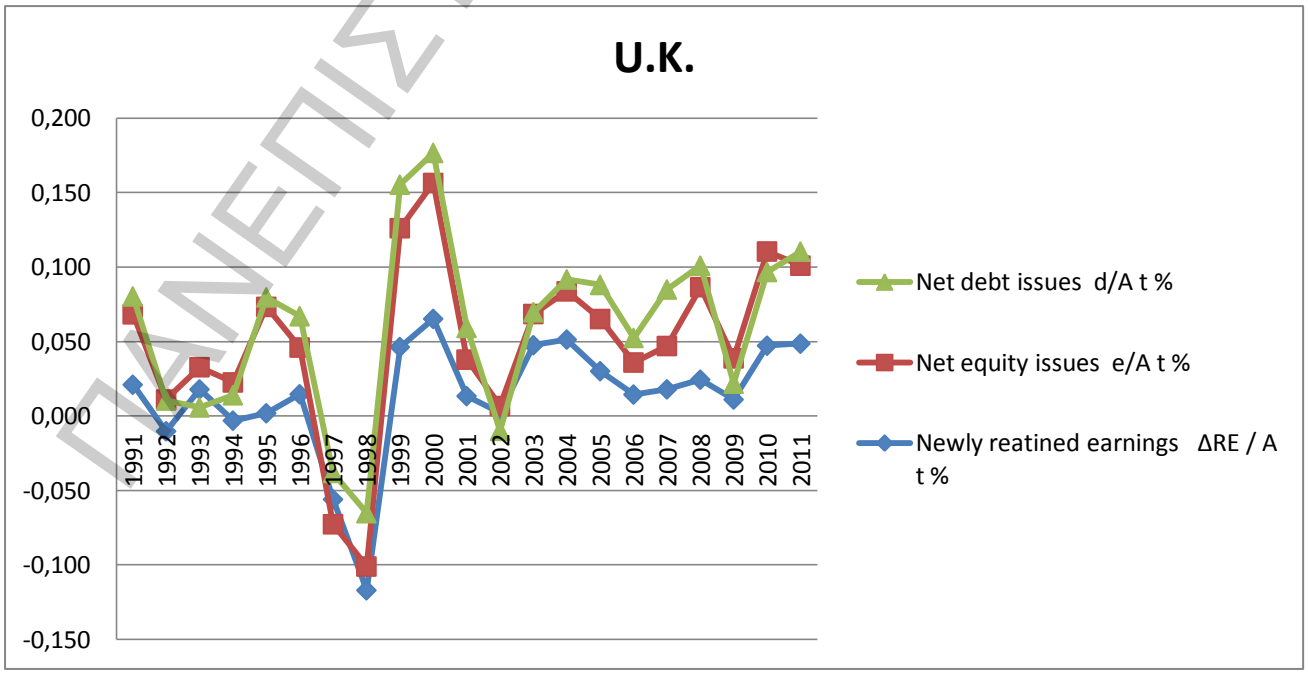


Graph 5

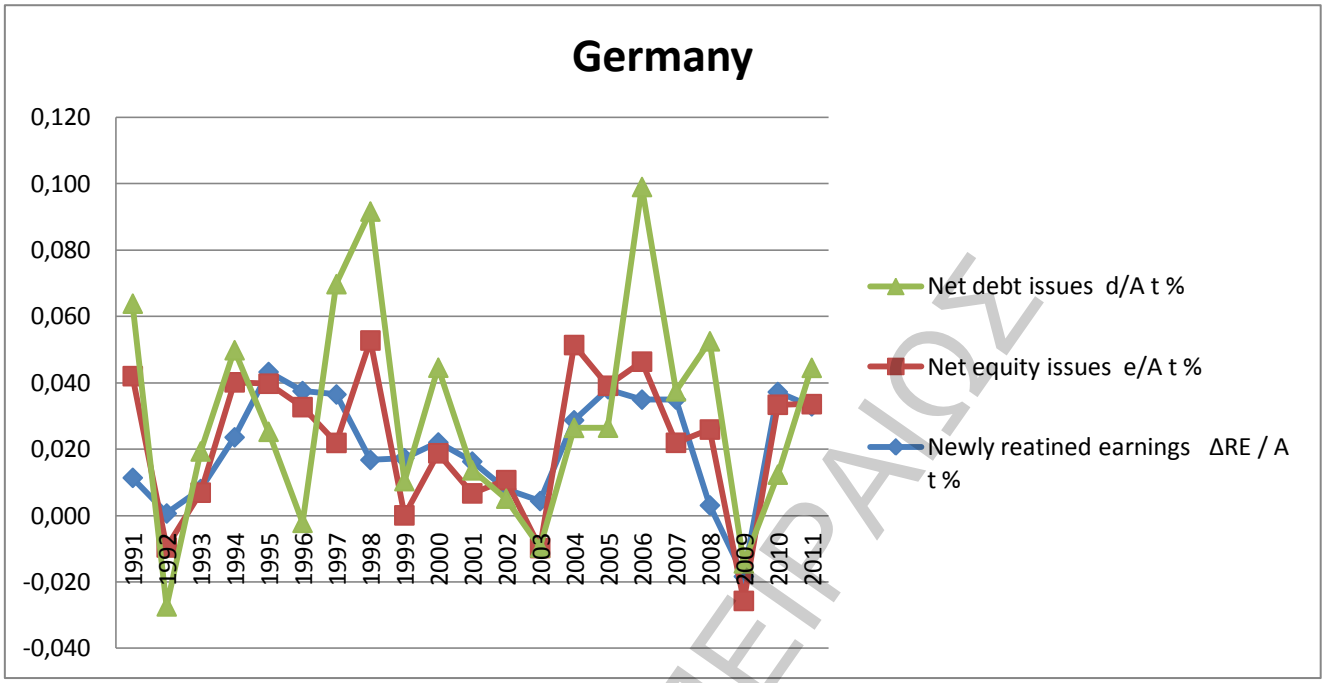


Graph 6

Also, below are presented the mean values of net equity issues, net debt issues and newly retained earnings (also see Table 4 and Table 5 in Appendix). It is obvious that U.K. has higher mean values of the three variables than Germany. In both countries the mean value of net debt issues and net equity issues follow the same trend. Furthermore, we cannot state that in U.K. net debt issues overwhelm net equity issues or vice versa. This applies to Germany too, but with two periods 1997-1999 and 2005-2007 that mean value of net debt issues is greater than the mean value of net equity issues.



Graph 7



Graph 8

Regressions Results

At this point, we examine the hypothesis that current market-to-book ratio (M/B) has an effect on firm's leverage. The ratio is used as a measure for market mispricing and also growth opportunities. This can be considered as a test of the short-term effect of market timing on the capital structure. The first regression is the below (Equation 1):

$$\left(\frac{D}{A}\right)_t - \left(\frac{D}{A}\right)_{t-1} = a + b\left(\frac{M}{B}\right)_{t-1} + c\left(\frac{PPE}{A}\right)_{t-1} + d\left(\frac{EBITDA}{A}\right)_{t-1} + elog(S_{t-1}) + f\left(\frac{D}{A}\right)_{t-1} + u_t$$

Equation 1

In general, the assumptions that we set for the estimation of the t-statistic are:

- **H_0:** b/c/d/e/f =0
- **H_1:** b/c/d/e/f ≠0

Given a p-value, you can tell at a glance if you reject or accept the hypothesis that the true coefficient is zero against a two-sided alternative that it differs from zero. If the coefficient of

the dependent variable is statistically important then the p-value must be less than 0, 1 and as result the assumption H_0 is rejected and the assumption is H_1 is accepted**.** This means that each dependent variable (Market-to-book, PPE/A, EBITDA/A, log (Sales), D/A) is correlated with the change in leverage. With this way we are going to check whether the market-to-book ratio has any relation with leverage. Here we have to mention that we perform the below controls to our sample:

- Unit root test to examine whether our variables are stationary or not.
  We test the Null hypothesis of a Unit Root test in our data and each variable was stationary, so we move on modeling. Their results of our test are presented in the Appendix.
- We correct autocorrelation and heteroscedasticity standard errors on the firm's level.

The results of the regression of Equation 1 are shown below. The method we used is Panel Least Squares:

Country : U.K.
Observations : 1084

Variable	**Coefficient**	**t-Statistic**	**Prob.**	**Significance**
C	0.024149	1.870187	0.0617	*
M/B	-0.000133	-0.009465	0.9924	-
PPE/A	0.013675	1.605041	0.1088	-
EBITDA/A	0.042595	1.763535	0.0781	*
Log(SALES)	0.000176	0.073902	0.9411	-
Lagged Leverage	-0.144871	-7.297674	0.0000	***

R-squared 0.079085
Adjusted R-squared 0.074813
Durbin-Watson stat 2.087474

Country : Germany
Observations : 237

Variable	Coefficient	t-Statistic	Prob.	Significance
C	0.029281	0.762840	0.4463	-
M/B	-0.021017	-0.595416	0.5521	-
PPE/A	0.034402	1.103565	0.2709	-
EBITDA/A	0.065751	0.791008	0.4298	-
Log(SALES)	-0.000996	-0.215191	0.8298	-
Lagged Leverage	-0.106053	-3.661118	0.0003	***
R-squared	0.085721			
Adjusted R-squared	0.065932			
Durbin-Watson stat	2.684961			

Table 6: Changes in Book Leverage (Where no significance is indicated by -, *sig. at 10% level, ** sig at 5% level and *** sig. at 1% level)

In Table 6 the fixed effects regression with book leverage is presented. Here one can see that in the U.K. the H_0 assumption is accepted, as the probability of all the coefficients is greater than 0.1.except from the proxy of profitability (EBITDA/A) which is significant at 10% level. There is a positive relation between leverage and Profitability. This means that profitable firms tend to increase their leverage. This is consistent with the trade off theory. Of course the above results for the U.K. are inconsistent with the market timing theory. Also we can see, that for Germany all the coefficients have a p-value greater than 0, 1, as a result assumption H_0 is accepted and all the variables are insignificant. Neither in Germany the market timing theory seems to be applied.

Now, the parts of leverage are regressed against the explanatory variables to determine whether any potential effect of Market-to-book on leverage indeed comes through net equity issues as the market timing theory implies. Regressing M/B on net equity issues will clarify whether the relationships between leverage and M/B are due to issuance of equity as proposed by market timing theory or if the explanation lies in changes in debt or retained earnings. The second regression is the below (Equation 2):

$$\left(\frac{D}{A}\right)_t - \left(\frac{D}{A}\right)_{t-1} = -\left[\left(\frac{E}{A}\right)_t - \left(\frac{E}{A}\right)_{t-1}\right] = -\left(\frac{e}{A}\right)_t - \left(\frac{\Delta RE}{A}\right)_t - \left[E_{t-1}\left(\frac{1}{A_t} - \frac{1}{A_{t-1}}\right)\right]$$

Equation 2

The results of the regression of Equation 2 are presented below. The method we used is Panel Least Squares:

Country : U.K.
Observations : 1076
Dependent Variable is Net equity Issues (-e/A)

Variable	**Coefficient**	**t-Statistic**	**Prob.**	**Significance**
C	-0.008074	-0.338138	0.7353	-
M/B	0.018280	0.670076	0.5030	-
PPE/A	0.012953	0.784239	0.4331	-
EBITDA/A	-0.176728	-3.946300	0.0001	***
Log(SALES)	-0.002669	-0.645905	0.5185	-
Lagged Leverage	-0.007432	-0.201014	0.8407	-
R-squared	0.019544			
Adjusted R-squared	0.014962			
Durbin-Watson stat	1.861089			

Country : U.K.
Observations : 1086
Dependent Variable is residual asset growth
[E_{t-1} $(1/A_{t-1}/A_{t-1})$]

Variable	**Coefficient**	**t-Statistic**	**Prob.**	**Significance**
C	0.089402	3.940760	0.0001	***
M/B	-0.109565	-4.187434	0.0000	***
PPE/A	0.000367	0.022680	0.9819	-
EBITDA/A	0.199278	4.519361	0.0000	***
Log(SALES)	-0.000188	-0.049247	0.9607	-
Lagged Leverage	-0.098041	-2.749465	0.0061	***
R-squared	0.109978			
Adjusted R-squared	0.105858			
Durbin-Watson stat	1.782426			

Country : U.K.
Observations : 1076
Dependent Variable is change in retained earnings (-ΔRE/A)

Variable	Coefficient	t-Statistic	Prob.	Significance
C	0.013931	0.653336	0.5137	-
M/B	0.033263	1.303068	0.1928	-
PPE/A	-0.009760	-0.682662	0.4950	-
EBITDA/A	-0.116455	-2.815853	0.0050	***
Log(SALES)	-0.005845	-1.586059	0.1130	-
Lagged Leverage	-0.033267	-0.991294	0.3218	-
R-squared	0.015908			
Adjusted R-squared	0.011309			
Durbin-Watson stat	1.892555			

Table 7: U.K. _Change in Book leverage due to Net equity issues, Assets growth and newly retained earnings (Where no significance is indicated by -, *sig. at 10% level, ** sig at 5% level and *** sig. at 1% level)

As presented in Table 7 in the U.K. no relationship is found between market-to-book ratio and net equity issues. Only, EBITDA/A which is the proxy of Profitability is positively correlated with equity issues. The p-value of EBITDA/A is 0, 0001, indicating that EBITDA/A is significant at 1 % level .This means the effect of EBITD/A on leverage depends on changes in equity. The rest of the variables are insignificant, since the H0 assumption is accepted.

As shown in Table 7 the residual asset growth component of change in leverage is positively related to market-to-book ratio and negatively correlated with EBITDA/A which is the proxy Profitability. All the other variables are insignificant, due to p-values greater than 0,1.

Also, as identified in Table 7 the change is retained earnings is positively correlated with Profitability (EBITDA/A).The coefficient is significant at 1% level. The M/B ratio has no effect on firm's leverage.

Country : Germany
Observations : 195
Dependent Variable is Net equity Issues (-e/A)

Variable	Coefficient	t-Statistic	Prob.	Significance
C	-0.091334	-3.381665	0.0009	***
M/B	0.084700	2.472260	0.0143	**
PPE/A	-0.017479	-0.629350	0.5299	-
EBITDA/A	0.125387	2.543982	0.0118	**
Log(SALES)	0.004081	1.180985	0.2391	-
Lagged Leverage	0.003223	0.130397	0.8964	-

R-squared 0.042045
Adjusted R-squared 0.016702
Durbin-Watson stat 1.983604

Country : Germany
Observations : 237
Dependent Variable is residual asset growth
[E_{t-1} ($1/A_{t-1}/A_{t-1}$)]

Variable	Coefficient	t-Statistic	Prob.	Significance
C	0.068166	2.196790	0.0290	**
M/B	-0.104526	-3.307733	0.0011	***
PPE/A	-0.016876	-0.559830	0.5761	-
EBITDA/A	0.354111	5.228729	0.0000	***
Log(SALES)	-0.003208	-0.909924	0.3638	-
Lagged Leverage	0.001360	0.048715	0.9612	-

R-squared 0.280627
Adjusted R-squared 0.265056
Durbin-Watson stat 1.866566

Country : Germany
Observations : 237
Dependent Variable is change in retained earnings (-ΔRE/A)

Variable	Coefficient	t-Statistic	Prob.	Significance
C	-0.009665	-0.287445	0.7740	-
M/B	-0.024908	-0.704163	0.4820	-
PPE/A	0.073798	2.327866	0.0208	**
EBITDA/A	-0.235452	-3.178743	0.0017	***
Log(SALES)	0.002961	0.833609	0.4054	-
Lagged Leverage	0.009716	0.343331	0.7317	-
R-squared	0.095850			
Adjusted R-squared	0.076279			
Durbin-Watson stat	1.782558			

Table 8: Change in Book leverage due to Net equity issues, Assets growth and newly retained earnings (Where no significance is indicated by -, *sig. at 10% level, ** sig at 5% level and *** sig. at 1% level)

As presented in Table 8 in Germany we find that market-to-book ratio is negatively related (it has a positive coefficient and the dependent variable is negative) to equity issues. The p-value of M/B is 0,014, indicating that M/B is significant at 5 % level .Also, EBITDA/A which is the proxy of Profitability is negatively correlated with equity issues. This means the effect of EBITD/A on leverage depends on changes in equity.

As shown in Table 8 the residual asset growth component of change in leverage is positively related to market-to-book ratio and negatively correlated with EBITDA/A which is the proxy Profitability. All the other variables are insignificant, due to p-values greater than 0,1.

Also, as identified in Table 8 the change is retained earnings is positively correlated with Profitability (EBITDA/A) and the firm's size .The coefficients are significant at 1% level and 5% level respectively .The M/B ratio has no effect on firm's leverage.

Even though the initial results imply that short term market timing does not exist, we investigate the relation between leverage and historical market-to-book ratio to see if any long-term connection can be found. In these regressions the market timing measure EFWAMB is added. The Current M/B is also included in the model to control for growth opportunities, instead of having the dual role of measuring both mispricing and growth opportunities as both Baker and Wrungler (2002) and Mahajan and Tartaroglou (2007) state. The third regression is the below (Equation 3):

$$(Leverage)_t = a + b\left(\frac{M}{B}\right)_{EFWAMB,t-1} + c\left(\frac{M}{B}\right)_{t-1} + d\left(\frac{PPE}{A}\right)_{t-1} + e\left(\frac{EBITDA}{A}\right)_{t-1} + flog(S_{t-1}) + e_t$$

Equation 3

The results of the regression of Equation 2 are displayed below. The method we used is Panel Least Squares:

Country : U.K.
Observations : 806
Dependent Variable is Book Leverage

Variable	**Coefficient**	**t-Statistic**	**Prob.**	**Significance**
C	0.103178	5.243654	0.0000	***
EFWAMB	-0.000748	-0.232212	0.8164	-
M/B	0.852621	51.05124	0.0000	***
PPE/A	0.002029	0.167970	0.8666	-
EBITDA/A	-0.029774	-0.905748	0.3653	-
Log(SALES)	-0.003322	-0.969473	0.3326	-

R-squared 0.787241
Adjusted R-squared 0.785911
Durbin-Watson stat 1.893793

Table 9 : Book leverage(Where no significance indicated by -, *sig. at 10% level,** sig at 5% level and *** sig. at 1% level)

Country : U.K.
Observations : 805
Dependent Variable is Market Leverage

Variable	Coefficient	t-Statistic	Prob.	Significance
C	0.194928	4.776890	0.0000	***
EFWAMB	0.013818	3.127233	0.0018	***
M/B	0.433242	11.77631	0.0000	***
PPE/A	0.120214	3.776963	0.0002	***
EBITDA/A	-0.873124	-12.40731	0.0000	***
Log(SALES)	-0.000900	-0.135687	0.8921	-
R-squared	0.436454			
Adjusted R-squared	0.432928			
Durbin-Watson stat	0.968886			

Table 10: Market leverage (Where no significance is indicated by -, *sig. at 10% level,** sig at 5% level and *** sig. at 1% level)

Country : Germany
Observations : 101
Dependent Variable is Book Leverage

Variable	Coefficient	t-Statistic	Prob.	Significance
C	0.114814	3.012864	0.0033	***
EFWAMB	-0.010832	-2.740693	0.0073	***
M/B	0.808499	25.24934	0.0000	***
PPE/A	0.083216	2.196053	0.0305	**
EBITDA/A	-0.142597	-1.916699	0.0583	*
Log(SALES)	0.002032	0.364816	0.7161	-
R-squared	0.874056			
Adjusted R-squared	0.867427			
Durbin-Watson stat	2.161190			

Table 11 : Book leverage(Where no significance is indicated by -, *sig. at 10% level,** sig at 5% level and *** sig. at 1% level)

Country : Germany
Observations : 101
Dependent Variable is Market Leverage

Variable	Coefficient	t-Statistic	Prob.	Significance
C	-0.066134	-0.646942	0.5192	-
EFWAMB	-0.001543	-0.212767	0.8320	-
M/B	0.835041	11.42932	0.0000	***
PPE/A	0.421003	3.993585	0.0001	***
EBITDA/A	-0.791578	-4.305197	0.0000	***
Log(SALES)	0.009393	0.774757	0.4404	-
R-squared	0.758448			
Adjusted R-squared	0.745735			
Durbin-Watson stat	1.265048			

Table 12: Market leverage (Where no significance is indicated by -, *sig. at 10% level,** sig at 5% level and *** sig. at 1% level)

As presented in Table 9 in the U.K. leverage when it is measured in terms of book value, the important measure EFWAMB is insignificant. The current M/B is insignificant too just like the regression without EFWAMB .This result is inconsistent with Market timing theory.

On the contrary when it is measured in market values as shown in Table 10 EFWAMB is significant as well as M/B and they are both positively related to leverage. But, here one can see that Durbin-Watson Statistic that measures the serial correlation in the residuals is much less than 2. As a rule of thumb, if the DW is less than 2, there is evidence of positive serial correlation. The DW statistic in our output is very close to one, indicating the presence of serial correlation in the residuals. So, our model is not well defined.

In Table 11, presents the results for Germany and leverage are measured in terms of book value. Leverage is inversely related to EFWAMB. This finding is similar to evidence obtained for US by previous studies and is consistent with the prediction of the equity market timing hypothesis. Along with historical market-to-book ratio, the current market-to-book ratio is included in these regressions to control for growth opportunities. Previous capital structure studies, which do not include historical market-to-book ratio in the regressions, find a negative relation between leverage and current market-to-book ratio. The current market-to-book ratio is positively related to leverage.

In Table 12, EFWAMB where leverage is measured in terms of market values the coefficient of EFWAMB is insignificant. But M/B is significant and positively correlated with

market leverage. Common in both regressions is that M/B is positively related to leverage and it is significant at 1&% level, PPE/A which is the proxy of tangibility is significant at 1% level and 5% respectively, EBITDA/A which is the proxy of profitability is significant at 10% and 1% level respectively.

5. Conclusions

Concerning the firms composing the FTSE 100 index of the U.K. and DAX 30 of Germany no significant and conclusive support is found for the Market Timing theory. Moreover, the hypothesis of this thesis, that in the Bank based Economy of Germany, firms will tend to depend more on the banks and turn to debt to finance their operations whereas in the Market Based Economy of the U.K., firms will tend to raise equity when their stock prices are overvalued trying to exploit the mispricing of the market to finance their investments is not confirmed.

From the descriptive statistics we observed that the firms in the U.K. are issue more debt and equity than the firms in Germany. Also, it seems that the issuance of both types of securities increases when the performance of both indices increases.

From the regressions outputs we only find that the leverage of firms in the U.K. are affected by Profitability measured by the ratio earnings before interest and taxes divided by assets. There is a positive relation between leverage and Profitability .This finding is inconsistent with the main theories of Capital structure. Moreover, we did not find any long term effect of Market to book ratio on leverage in the U.K. On the contrary we find it in Germany. Also this finding is not presented in previous studies.

Mahajan and Tartaroglou (2007) in their study find that leverage of fims is negatively related to the historical market-to-book ratio in all major industrialized countries including the U.K. and Germany. However, the negative relationship is not associated with equity market timing as Baker and Wrungler (2002) argue. Firms according to Mahajan and Tartaroglou (2007) undo the effect of equity issuance and the impact of equity market timing is short-lived and their results are more aligned with the dynamic trade off theory. Although, as we have shown in Chapter 4, our results are different from the ones presented for the U.K. and Germany of Mahajan and Tartaroglou (2007) research.

There are many explanations of the fact that market timing is out powered and the strange results between the two countries regarding the effect of Historical Market to book ratio. First of all, our sample contains only large and publicly traded firms that tend to be

transparent and accurate in their communications and investor relations. This might mean that mispricing does not occur so often in order to be exploited by managers. Here we have to mention that most of the firms that compose FTSE 100 are multinational. This gives them the opportunity to participate in international markets and obtain better financing and extend their debt maturity. That fact might distort our results. Furthermore, larger firms are considered to be bankruptcy remote to larger extent than smaller ones, and a multinational firm also has the possibility to redirect and mitigate financial exposure through a central department that can consolidate all different exposures and identify the net exposure. Moreover, it seems that the difference between the number of observations between the U.K. and Germany makes difficult to make an accurate comparison.

For further research, it would be interesting if we could expand our sample in both countries and include more firms not only the ones composing an Index in order to be able to have small and large firms , public and private , trading mostly in the local market or multinational firms . Also, we could select a period including more years.

6. Appendix

Table 1: List with the companies of FTSE 100 and DAX 30

#	FTSE 100	FTSE 100	FTSE 100	FTSE 100	DAX 30
1	HSBC HOLDINGS PLC	AVIVA PLC	BRITISH LAND COMPANY	HARGREAVES LANSD	DEUTSCHE POST AG
2	BP PLC	WPP 2012 LTD	INTERCONTINENTAL	KAZAKHMYS PLC	INFINEON TECHNOLOGIE
3	VODAFONE GROUP PLC	ANTOFAGASTA PLC	INTERTEK GROUP	POLYMETAL INTER	MERCK KGAA
4	GLAXOSMITHKLINE	ASSOCIATED BRITISH	BUNZL PLC	RESOLUTION LTD	FRESENIUS SE
5	BRITISH AMERICAN TOB	BAE SYSTEMS	IAG SA	SEVERN TRENT PLC	DAIMLER AG
6	ROYAL DUTCH SHELL	BSKYB GROUP PLC	RANDGOLD RESOURCES	JOHN WOOD GROUP PLC	HENKEL AG AND
7	RIO TINTO PLC	EXPERIAN PLC	UNITED UTILITIES PLC	IMI PLC	VOLKSWAGEN AG
8	DIAGEO PLC	ARM HOLDINGS PLC	WHITBREAD PLC	MEGGITT PLC	SAP AG
9	SABMILLER PLC	SHIRE PLC	JOHNSON MATTHEY PLC	MELROSE INDUSTRIES	ADIDAS AG
10	BHP BILLITON PLC	TULLOW OIL PLC	RSA INSURANCE GROUP	VEDANTA RESOURCES	FRESENIUS MEDICAL CA
11	STANDARD CHARTERED	FRESNILLO PLC	SERCO GROUP PLC		DEUTSCHE TELEKOM AG
12	BARCLAYS PLC	PEARSON PLC	CARNIVAL PLC		COMMERZBANK AG
13	LLOYDS BANKING GROUP	OLD MUTUAL PLC	CRODA INTERNATIONAL		RWE AG
14	ASTRAZENECA PLC	LEGAL & GEN'L GRP	G4S PLC		SIEMENS AG
15	BG GROUP PLC	J SAINSBURY PLC	HAMMERSON PLC		BASF SE
16	XSTRATA PLC	WOLSELEY PLC	ITV PLC		DEUTSCHE BANK AG
17	TESCO PLC	CRH PLC	SAGE GROUP PLC (THE)		BAYER AG
18	UNILEVER PLC	MARKS & SPENCER	SCHRODERS PLC		E.ON AG
19	ANGLO AMERICAN PLC	STANDARD LIFE PLC	SMITHS INDUSTRIES		ALLIANZ SE
20	RECKITT BENCKISER	WM. MORRISON SUPERMT	WEIR GROUP PLC (THE)		BAYER. MOTOREN WERKE
21	GLENCORE INTER	BURBERRY GROUP	AMEC PLC		LINDE AG
22	NATIONAL GRID PLC	KINGFISHER PLC	BABCOCK INT'L GROUP		HEIDELBERGCEMENT AG
23	ROYAL BANK	LAND SECURITIES	EURASIAN NATURAL		CONTINENTAL AG
24	IMPERIAL TOBACCO GRP	REED ELSEVIER PLC	GKN PLC		K+S AG
25	PRUDENTIAL PLC	SMITH & NEPHEW PLC	REXAM PLC		BEIERSDORF AG
26	BT GROUP PLC	ABERDEEN ASSET MGMT	TATE & LYLE PLC		MUNCHENER RUCKVER
27	CENTRICA PLC	NEXT PLC	TUI TRAVEL PLC		THYSSENKRUPP AG
28	ROLLS	PETROFAC LIMITED	ADMIRAL GROUP PLC		DEUTSCHE LUFTHANSA
29	COMPASS GROUP PLC	CAPITA PLC	CAPITAL SHOPPING		DEUTSCHE BOERSE AG
30	SSE PLC	AGGREKO PLC	EVRAZ PLC		LANXESS AG

Descriptive Statistics:

Table 2 : Summary Statistics (Mean Values) for leverage and control variables

U.K.	Debt to Assets	Book Leverage	Market Leverage	Market to Book to Assets	PPE to Assets	EBITDA to Assets	Log(Sales) to Assets
1990	0,14	0,64	0,56	0,64	0,36	0,15	4,88
1991	0,17	0,67	0,56	0,65	0,38	0,16	4,41
1992	0,20	0,68	0,58	0,65	0,39	0,14	4,66
1993	0,21	0,68	0,52	0,66	0,37	0,13	4,86
1994	0,20	0,69	0,52	0,66	0,38	0,14	4,68
1995	0,18	0,67	0,50	0,65	0,37	0,15	4,45
1996	0,18	0,66	0,47	0,65	0,35	0,14	4,99
1997	0,19	0,65	0,46	0,65	0,36	0,15	5,01
1998	0,22	0,67	0,47	0,67	0,35	0,14	4,95
1999	0,23	0,69	0,49	0,69	0,32	0,14	4,89
2000	0,25	0,68	0,51	0,68	0,30	0,16	4,85
2001	0,27	0,66	0,55	0,66	0,31	0,13	5,00
2002	0,27	0,67	0,62	0,67	0,31	0,12	4,07
2003	0,27	0,67	0,56	0,67	0,30	0,11	4,06
2004	0,24	0,65	0,53	0,65	0,29	0,14	4,01
2005	0,22	0,63	0,49	0,63	0,29	0,13	4,81
2006	0,25	0,64	0,48	0,64	0,26	0,14	4,79
2007	0,26	0,64	0,45	0,64	0,25	0,13	5,15
2008	0,27	0,66	0,59	0,66	0,24	0,12	4,41
2009	0,29	0,64	0,53	0,64	0,26	0,09	4,81
2010	0,26	0,63	0,50	0,63	0,25	0,12	5,17
2011	0,26	0,62	0,54	0,62	0,25	0,13	4,58
Average	**0,23**	**0,66**	**0,52**	**0,65**	**0,32**	**0,14**	**4,70**

Table 3 : Summary Statistics (Mean Values) for leverage and control variables

Germany	Debt to Assets	Book Leverage	Market Leverage	Market to Book to Assets	PPE to Assets	EBITDA to Assets	Log(Sales) to Assets
1990	0,19	0,54	0,41	0,54	0,42	0,17	3,78
1991	0,20	0,54	0,40	0,54	0,42	0,16	3,99
1992	0,20	0,55	0,39	0,55	0,41	0,15	3,72
1993	0,17	0,54	0,33	0,53	0,42	0,15	3,79
1994	0,21	0,61	0,34	0,55	0,41	0,15	3,79
1995	0,20	0,60	0,33	0,60	0,42	0,17	3,83
1996	0,22	0,61	0,32	0,62	0,40	0,18	3,89
1997	0,23	0,62	0,31	0,63	0,40	0,18	3,86
1998	0,25	0,62	0,31	0,63	0,42	0,17	4,00
1999	0,28	0,63	0,30	0,61	0,41	0,15	3,90
2000	0,27	0,58	0,33	0,56	0,37	0,16	4,08
2001	0,29	0,60	0,35	0,58	0,37	0,15	3,91
2002	0,26	0,58	0,37	0,59	0,38	0,14	4,15
2003	0,25	0,58	0,36	0,58	0,37	0,15	3,93
2004	0,23	0,56	0,34	0,57	0,36	0,16	3,96
2005	0,23	0,59	0,34	0,59	0,35	0,17	4,20
2006	0,24	0,59	0,32	0,60	0,33	0,17	4,27
2007	0,26	0,59	0,32	0,59	0,32	0,17	4,42
2008	0,28	0,62	0,45	0,62	0,31	0,13	4,16
2009	0,26	0,61	0,41	0,60	0,33	0,13	4,26
2010	0,24	0,59	0,36	0,58	0,33	0,15	4,19
2011	0,24	0,57	0,37	0,57	0,33	0,16	4,19
Average	**0,24**	**0,59**	**0,35**	**0,58**	**0,38**	**0,16**	**4,01**

Table 4: Summary Statistics (Mean Values) for net equity issues, debt issues and changes in retained earnings

U.K.	Newly retained earnings ΔRE / A $_t$ %	Net equity issues e/A $_t$ %	Net debt issues d/A t %
1991	0,021	0,047	0,012
1992	-0,010	0,021	-0,001
1993	0,018	0,015	-0,027
1994	-0,003	0,026	-0,009
1995	0,002	0,071	0,006
1996	0,015	0,031	0,021
1997	-0,056	-0,017	0,034
1998	-0,117	0,016	0,036
1999	0,046	0,080	0,029
2000	0,065	0,091	0,020
2001	0,013	0,025	0,021
2002	0,002	0,005	-0,017
2003	0,048	0,021	0,001
2004	0,051	0,032	0,008
2005	0,030	0,035	0,023
2006	0,014	0,022	0,017
2007	0,018	0,029	0,038
2008	0,024	0,062	0,014
2009	0,011	0,028	-0,017
2010	0,047	0,063	-0,014
2011	0,049	0,052	0,009
Average	**0,014**	**0,036**	**0,010**

Table 5: Summary Statistics (Mean Values) for net equity issues, debt issues and changes in retained earnings

Germany	Newly retained earnings ΔRE / A t %	Net equity issues e/A t %	Net debt issues d/A t %
1991	0,011	0,031	0,022
1992	0,001	-0,010	-0,018
1993	0,008	-0,001	0,012
1994	0,024	0,017	0,010
1995	0,043	-0,004	-0,014
1996	0,038	-0,005	-0,035
1997	0,037	-0,015	0,048
1998	0,017	0,036	0,039
1999	0,017	-0,017	0,010
2000	0,022	-0,003	0,026
2001	0,016	-0,010	0,007
2002	0,008	0,003	-0,006
2003	0,004	-0,014	0,000
2004	0,029	0,023	-0,025
2005	0,038	0,001	-0,013
2006	0,035	0,011	0,053
2007	0,035	-0,013	0,016
2008	0,003	0,023	0,027
2009	-0,018	-0,007	0,011
2010	0,037	-0,004	-0,021
2011	0,033	0,001	0,011
Average	**0,021**	**0,002**	**0,008**

Unit root tests (for each of the variables we use in the regressions models)

Panel unit root test: Summary

Series: CH_RE

Date: 02/06/13 Time: 23:25

Sample: 1990 2011

Exogenous variables: Individual effects

User specified lags at: 1

Newey-West bandwidth selection using Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.24247	0.0000	97	1563
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-17.6232	0.0000	97	1563
ADF - Fisher Chi-square	700.973	0.0000	97	1563
PP - Fisher Chi-square	1734.42	0.0000	97	1661

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: DEBT_ASSETS

Date: 02/06/13 Time: 23:27

Sample: 1990 2011

Exogenous variables: Individual effects

User specified lags at: 1

Newey-West bandwidth selection using Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-6.31179	0.0000	99	1695
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.44613	0.0000	99	1695
ADF - Fisher Chi-square	299.921	0.0000	99	1695
PP - Fisher Chi-square	320.825	0.0000	99	1796

** Probabilities for Fisher tests are computed using an asymptotic Chi
-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: EBITDA
Date: 02/06/13 Time: 23:27
Sample: 1990 2011
Exogenous variables: Individual effects
User specified lags at: 1
Newey-West bandwidth selection using Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-12.5298	0.0000	100	1712
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-8.72648	0.0000	100	1712
ADF - Fisher Chi-square	410.003	0.0000	100	1712
PP - Fisher Chi-square	511.936	0.0000	100	1814

** Probabilities for Fisher tests are computed using an asymptotic Chi
-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: MAR_BOOK
Date: 02/06/13 Time: 23:28
Sample: 1990 2011
Exogenous variables: Individual effects
User specified lags at: 1
Newey-West bandwidth selection using Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.03821	0.0000	98	1631
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.06506	0.0011	98	1631
ADF - Fisher Chi-square	247.199	0.0077	98	1631
PP - Fisher Chi-square	343.698	0.0000	98	1730

** Probabilities for Fisher tests are computed using an asymptotic Chi
-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: NET_DEBT
Date: 02/06/13 Time: 23:29
Sample: 1990 2011
Exogenous variables: Individual effects
User specified lags at: 1
Newey-West bandwidth selection using Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-9.91049	0.0000	73	849
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-7.38622	0.0000	73	849
ADF - Fisher Chi-square	320.453	0.0000	73	849
PP - Fisher Chi-square	673.246	0.0000	73	968

** Probabilities for Fisher tests are computed using an asymptotic Chi
-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: NET_E
Date: 02/06/13 Time: 23:29
Sample: 1990 2011
Exogenous variables: Individual effects
User specified lags at: 1
Newey-West bandwidth selection using Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-19.1691	0.0000	96	1503
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-17.3832	0.0000	96	1503
ADF - Fisher Chi-square	871.144	0.0000	96	1503
PP - Fisher Chi-square	2721.16	0.0000	96	1607

** Probabilities for Fisher tests are computed using an asymptotic Chi
-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: NET_RE

Date: 02/06/13 Time: 23:30

Sample: 1990 2011

Exogenous variables: Individual effects

User specified lags at: 1

Newey-West bandwidth selection using Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-204.084	0.0000	97	1627
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-39.1859	0.0000	97	1627
ADF - Fisher Chi-square	765.455	0.0000	97	1627
PP - Fisher Chi-square	1765.91	0.0000	97	1725

** Probabilities for Fisher tests are computed using an asymptotic Chi
-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: PPE

Date: 02/06/13 Time: 23:30

Sample: 1990 2011

Exogenous variables: Individual effects

User specified lags at: 1

Newey-West bandwidth selection using Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-2.84687	0.0022	100	1703
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-0.36414	0.3579	100	1703
ADF - Fisher Chi-square	219.498	0.1640	100	1703
PP - Fisher Chi-square	254.366	0.0056	100	1803

** Probabilities for Fisher tests are computed using an asymptotic Chi
-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: SALES

Date: 02/06/13 Time: 23:31

Sample: 1990 2011

Exogenous variables: Individual effects

User specified lags at: 1

Newey-West bandwidth selection using Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.27215	0.0000	76	1069
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-7.19314	0.0000	76	1069
ADF - Fisher Chi-square	316.543	0.0000	76	1069
PP - Fisher Chi-square	567.443	0.0000	76	1180

** Probabilities for Fisher tests are computed using an asymptotic Chi
-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: COEFF

Date: 02/06/13 Time: 23:51

Sample: 1990 2011

Exogenous variables: Individual effects

User specified lags at: 1

Newey-West bandwidth selection using Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-12.3037	0.0000	99	1615
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-12.0618	0.0000	99	1615
ADF - Fisher Chi-square	528.461	0.0000	99	1615
PP - Fisher Chi-square	1050.65	0.0000	99	1714

** Probabilities for Fisher tests are computed using an asymptotic Chi
-square distribution. All other tests assume asymptotic normality.

Regressions produced by EVIEWS

Determinants of Annual Changes in Book Leverage

Least Squares regressions of changes in book leverage and its components on the market-to-book ratio, fixed assets, profitability, firm size, and lagged leverage.

$$\left(\frac{D}{A}\right)_t - \left(\frac{D}{A}\right)_{t-1} = a + b\left(\frac{M}{B}\right)_{t-1} + c\left(\frac{PPE}{A}\right)_{t-1} + d\left(\frac{EBITDA}{A}\right)_{t-1} + elog(S_{t-1}) + f\left(\frac{D}{A}\right)_{t-1} + u_t$$

We do not report *a* and *f*.

Germany

Dependent Variable: DEBT_ASSETS_W-DEBT_ASSETS_W(-1)
Method: Panel Least Squares
Date: 02/10/13 Time: 21:55
Sample: 1990 2011 IF COUNTRY=2
Periods included: 21
Cross-sections included: 23
Total panel (unbalanced) observations: 237
Period SUR (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Significance
C	0.029281	0.038384	0.762840	0.4463	-
MAR_BOOK_W(-1)	-0.021017	0.035298	-0.595416	0.5521	-
PPE_W(-1)	0.034402	0.031174	1.103565	0.2709	-
EBITDA_W(-1)	0.065751	0.083123	0.791008	0.4298	-
SALES_W(-1)	-0.000996	0.004628	-0.215191	0.8298	-
DEBT_ASSETS_W(-1)	-0.106053	0.028967	-3.661118	0.0003	***

R-squared	0.085721	Mean dependent var	0.004103
Adjusted R-squared	0.065932	S.D. dependent var	0.066538
S.E. of regression	0.064307	Akaike info criterion	-2.625310
Sum squared resid	0.955271	Schwarz criterion	-2.537511
Log likelihood	317.0992	Hannan-Quinn criter.	-2.589921
F-statistic	4.331643	Durbin-Watson stat	2.684961
Prob(F-statistic)	0.000870		

U.K.

Dependent Variable: DEBT_ASSETS_W-DEBT_ASSETS_W(-1)
Method: Panel Least Squares
Date: 02/10/13 Time: 22:14
Sample: 1990 2011 IF COUNTRY=1
Periods included: 21
Cross-sections included: 75
Total panel (unbalanced) observations: 1084
Period SUR (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Significance
C	0.024149	0.012913	1.870187	0.0617	*
MAR_BOOK_W(-1)	-0.000133	0.014001	-0.009465	0.9924	-
PPE_W(-1)	0.013675	0.008520	1.605041	0.1088	-
EBITDA_W(-1)	0.042595	0.024153	1.763535	0.0781	*
SALES_W(-1)	0.000176	0.002375	0.073902	0.9411	-
DEBT_ASSETS_W(-1)	-0.144871	0.019852	-7.297674	0.0000	***

R-squared	0.079085	Mean dependent var	0.002322
Adjusted R-squared	0.074813	S.D. dependent var	0.070075
S.E. of regression	0.067402	Akaike info criterion	-2.550752
Sum squared resid	4.897448	Schwarz criterion	-2.523141
Log likelihood	1388.507	Hannan-Quinn criter.	-2.540299
F-statistic	18.51495	Durbin-Watson stat	2.087474
Prob(F-statistic)	0.000000		

Determinants of Annual Changes in Leverage and Components

Least Squares regressions of each component of change in book leverage (net equity issue , net debt issue and changes in newly retained earnings) on four determinants of Capital structure and lagged value of book leverage .The four determinants of Capital structure are : market-to-book ratio, fixed assets, profitability, firm size, and lagged leverage.

$$\left(\frac{D}{A}\right)_t - \left(\frac{D}{A}\right)_{t-1} = = -\left(\frac{e}{A}\right)_t - \left(\frac{\Delta RE}{A}\right)_t - \left[E_{t-1}\left(\frac{1}{A_t} - \frac{1}{A_{t-1}}\right)\right] a + b\left(\frac{M}{B}\right)_{t-1} + c\left(\frac{PPE}{A}\right)_{t-1} + d\left(\frac{EBITDA}{A}\right)_{t-1} + elog(S_{t-1}) + f\left(\frac{D}{A}\right)_{t-1} + u_t$$

Germany

Dependent Variable is net equity issues (-e/A)

Dependent Variable: -NET_E_W
Method: Panel Least Squares
Date: 02/10/13 Time: 22:27
Sample: 1990 2011 IF COUNTRY=2
Periods included: 21
Cross-sections included: 22
Total panel (unbalanced) observations: 195
Period SUR (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Significance
C	-0.091334	0.027008	-3.381665	0.0009	***
MAR_BOOK_W(-1)	0.084700	0.034260	2.472260	0.0143	*
PPE_W(-1)	-0.017479	0.027773	-0.629350	0.5299	-
EBITDA_W(-1)	0.125387	0.049288	2.543982	0.0118	*
SALES_W(-1)	0.004081	0.003455	1.180985	0.2391	-
DEBT_ASSETS_W(-1)	0.003223	0.024714	0.130397	0.8964	-

R-squared	0.042045	Mean dependent var	-0.004338
Adjusted R-squared	0.016702	S.D. dependent var	0.054962
S.E. of regression	0.054501	Akaike info criterion	-2.950892
Sum squared resid	0.561408	Schwarz criterion	-2.850184
Log likelihood	293.7119	Hannan-Quinn criter.	-2.910116
F-statistic	1.659051	Durbin-Watson stat	1.983604
Prob(F-statistic)	0.146467		

Dependent Variable is residual asset growth

Dependent Variable: COEFF
Method: Panel Least Squares
Date: 02/10/13 Time: 22:47
Sample: 1990 2011 IF COUNTRY=2
Periods included: 21
Cross-sections included: 23
Total panel (unbalanced) observations: 237
Period SUR (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Significance
C	0.068166	0.031030	2.196790	0.0290	**
MAR_BOOK_W(-1)	-0.104526	0.031600	-3.307733	0.0011	***
PPE_W(-1)	-0.016876	0.030144	-0.559830	0.5761	-
EBITDA_W(-1)	0.354111	0.067724	5.228729	0.0000	***
SALES_W(-1)	-0.003208	0.003525	-0.909924	0.3638	-
DEBT_ASSETS_W(-1)	0.001360	0.027927	0.048715	0.9612	-

R-squared	0.280627	Mean dependent var	0.029487
Adjusted R-squared	0.265056	S.D. dependent var	0.063095
S.E. of regression	0.054091	Akaike info criterion	-2.971318
Sum squared resid	0.675861	Schwarz criterion	-2.883519
Log likelihood	358.1012	Hannan-Quinn criter.	-2.935929
F-statistic	18.02260	Durbin-Watson stat	1.866566
Prob(F-statistic)	0.000000		

Dependent Variable is change in retained earnings

Dependent Variable: -CH_RE_W
Method: Panel Least Squares
Date: 02/14/13 Time: 18:37
Sample: 1990 2011 IF COUNTRY=2
Periods included: 21
Cross-sections included: 23
Total panel (unbalanced) observations: 237
Period SUR (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.009665	0.033623	-0.287445	0.7740
MAR_BOOK_W(-1)	-0.024908	0.035372	-0.704163	0.4820
PPE_W(-1)	0.073798	0.031702	2.327866	0.0208
EBITDA_W(-1)	-0.235452	0.074071	-3.178743	0.0017
SALES_W(-1)	0.002961	0.003552	0.833609	0.4054
DEBT_ASSETS_W(-1)	0.009716	0.028299	0.343331	0.7317

R-squared	0.095850	Mean dependent var	-0.020023
Adjusted R-squared	0.076279	S.D. dependent var	0.053933
S.E. of regression	0.051835	Akaike info criterion	-3.056511
Sum squared resid	0.620667	Schwarz criterion	-2.968712
Log likelihood	368.1965	Hannan-Quinn criter.	-3.021122
F-statistic	4.897688	Durbin-Watson stat	1.782558
Prob(F-statistic)	0.000280		

U.K.

Dependent Variable is Net equity Issues (-e/A)

Dependent Variable: -NET_E_W
Method: Panel Least Squares
Date: 02/10/13 Time: 22:55
Sample: 1990 2011 IF COUNTRY=1
Periods included: 21
Cross-sections included: 75
Total panel (unbalanced) observations: 1076
Period SUR (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Significance
C	-0.008074	0.023877	-0.338138	0.7353	-
MAR_BOOK_W(-1)	0.018280	0.027280	0.670076	0.5030	-
PPE_W(-1)	0.012953	0.016516	0.784239	0.4331	-
EBITDA_W(-1)	-0.176728	0.044783	-3.946300	0.0001	***
SALES_W(-1)	-0.002669	0.004132	-0.645905	0.5185	-
DEBT_ASSETS_W(-1)	-0.007432	0.036971	-0.201014	0.8407	-

R-squared	0.019544	Mean dependent var	-0.032590
Adjusted R-squared	0.014962	S.D. dependent var	0.107090
S.E. of regression	0.106286	Akaike info criterion	-1.639809
Sum squared resid	12.08745	Schwarz criterion	-1.612033
Log likelihood	888.2170	Hannan-Quinn criter.	-1.629290
F-statistic	4.265800	Durbin-Watson stat	1.861089
Prob(F-statistic)	0.000759		

Dependent Variable is residual asset growth

Dependent Variable: COEFF
Method: Panel Least Squares
Date: 02/10/13 Time: 22:58
Sample: 1990 2011 IF COUNTRY=1
Periods included: 21
Cross-sections included: 75
Total panel (unbalanced) observations: 1086
Period SUR (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Significance
C	0.089402	0.022686	3.940760	0.0001	***
MAR_BOOK_W(-1)	-0.109565	0.026165	-4.187434	0.0000	***
PPE_W(-1)	0.000367	0.016200	0.022680	0.9819	-
EBITDA_W(-1)	0.199278	0.044094	4.519361	0.0000	***
SALES_W(-1)	-0.000188	0.003822	-0.049247	0.9607	-
DEBT_ASSETS_W(-1)	-0.098041	0.035658	-2.749465	0.0061	***

R-squared	0.109978	Mean dependent var	0.032482
Adjusted R-squared	0.105858	S.D. dependent var	0.102019
S.E. of regression	0.096468	Akaike info criterion	-1.833694
Sum squared resid	10.05064	Schwarz criterion	-1.806123
Log likelihood	1001.696	Hannan-Quinn criter.	-1.823257
F-statistic	26.69067	Durbin-Watson stat	1.782426
Prob(F-statistic)	0.000000		

Dependent Variable is change in retained earnings(-ΔRE/A)

Dependent Variable: -CH_RE_W
Method: Panel Least Squares
Date: 02/14/13 Time: 18:38
Sample: 1990 2011 IF COUNTRY=1
Periods included: 21
Cross-sections included: 75
Total panel (unbalanced) observations: 1076
Period SUR (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.013931	0.021322	0.653336	0.5137
MAR_BOOK_W(-1)	0.033263	0.025527	1.303068	0.1928
PPE_W(-1)	-0.009760	0.014297	-0.682662	0.4950
EBITDA_W(-1)	-0.116455	0.041357	-2.815853	0.0050
SALES_W(-1)	-0.005845	0.003685	-1.586059	0.1130
DEBT_ASSETS_W(-1)	-0.033267	0.033560	-0.991294	0.3218

R-squared	0.015908	Mean dependent var	-0.019756
Adjusted R-squared	0.011309	S.D. dependent var	0.101096
S.E. of regression	0.100522	Akaike info criterion	-1.751311
Sum squared resid	10.81210	Schwarz criterion	-1.723536
Log likelihood	948.2052	Hannan-Quinn criter.	-1.740792
F-statistic	3.459352	Durbin-Watson stat	1.892555
Prob(F-statistic)	0.004166		

Determinants of Leverage

Least Squares regressions of book and market leverage on the historical market-to-book ratio and the current market-to-book ratio, fixed assets, profitability, and firm size.

$$(Leverage)_t = a + b\left(\frac{M}{B}\right)_{EFWAMB,t-1} + c\left(\frac{M}{B}\right)_{t-1} + d\left(\frac{PPE}{A}\right)_{t-1} + e\left(\frac{EBITDA}{A}\right)_{t-1} + flog(S_{t-1}) + e_t$$

We do not report *a*. Leverage is defined either as book debt to book assets (book value) or book debt to the result of total assets minus book equity plus market equity (market value) and is expressed in percentage terms.

Germany

Book leverage

Dependent Variable: B_LEV_W
Method: Panel Least Squares
Date: 02/10/13 Time: 23:07
Sample: 1990 2011 IF COUNTRY=2
Periods included: 21
Cross-sections included: 18
Total panel (unbalanced) observations: 101
Period SUR (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Significance
C	0.114814	0.038108	3.012864	0.0033	***
EFWA_TEMP(-1)	-0.010832	0.003952	-2.740693	0.0073	***
MAR_BOOK(-1)	0.808499	0.032021	25.24934	0.0000	***
PPE(-1)	0.083216	0.037893	2.196053	0.0305	**
EBITDA(-1)	-0.142597	0.074397	-1.916699	0.0583	*
SALES(-1)	0.002032	0.005570	0.364816	0.7161	-

R-squared	0.874056	Mean dependent var	0.646460
Adjusted R-squared	0.867427	S.D. dependent var	0.143960
S.E. of regression	0.052417	Akaike info criterion	-3.001619
Sum squared resid	0.261012	Schwarz criterion	-2.846265
Log likelihood	157.5817	Hannan-Quinn criter.	-2.938727
F-statistic	131.8602	Durbin-Watson stat	2.161190
Prob(F-statistic)	0.000000		

Market leverage

Dependent Variable: M_LEV_W
Method: Panel Least Squares
Date: 02/10/13 Time: 23:15
Sample: 1990 2011 IF COUNTRY=2
Periods included: 21
Cross-sections included: 18
Total panel (unbalanced) observations: 101
Period SUR (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Significance
C	-0.066134	0.102226	-0.646942	0.5192	-
EFWA_TEMP(-1)	-0.001543	0.007251	-0.212767	0.8320	-
MAR_BOOK(-1)	0.835041	0.073061	11.42932	0.0000	***
PPE(-1)	0.421003	0.105420	3.993585	0.0001	***
EBITDA(-1)	-0.791578	0.183866	-4.305197	0.0000	***
SALES(-1)	0.009393	0.012124	0.774757	0.4404	-

R-squared	0.758448	Mean dependent var	0.531118
Adjusted R-squared	0.745735	S.D. dependent var	0.199687
S.E. of regression	0.100692	Akaike info criterion	-1.695937
Sum squared resid	0.963189	Schwarz criterion	-1.540583
Log likelihood	91.64481	Hannan-Quinn criter.	-1.633045
F-statistic	59.65802	Durbin-Watson stat	1.265048
Prob(F-statistic)	0.000000		

U.K.

Book leverage

Dependent Variable: B_LEV_W
Method: Panel Least Squares
Date: 02/10/13 Time: 23:21
Sample: 1990 2011 IF COUNTRY=1
Periods included: 21
Cross-sections included: 72
Total panel (unbalanced) observations: 806
Period SUR (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Significance
C	0.103178	0.019677	5.243654	0.0000	***
EFWA_TEMP(-1)	-0.000748	0.003221	-0.232212	0.8164	-
MAR_BOOK(-1)	0.852621	0.016701	51.05124	0.0000	***
PPE(-1)	0.002029	0.012079	0.167970	0.8666	-
EBITDA(-1)	-0.029774	0.032873	-0.905748	0.3653	-
SALES(-1)	-0.003322	0.003426	-0.969473	0.3326	-

R-squared	0.787241	Mean dependent var	0.578618
Adjusted R-squared	0.785911	S.D. dependent var	0.187715
S.E. of regression	0.086855	Akaike info criterion	-2.041729
Sum squared resid	6.035082	Schwarz criterion	-2.006800
Log likelihood	828.8168	Hannan-Quinn criter.	-2.028316
F-statistic	592.0237	Durbin-Watson stat	1.893793
Prob(F-statistic)	0.000000		

Market leverage

Dependent Variable: M_LEV_W
Method: Panel Least Squares
Date: 02/10/13 Time: 23:24
Sample: 1990 2011 IF COUNTRY=1
Periods included: 21
Cross-sections included: 72
Total panel (unbalanced) observations: 805
Period SUR (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Significance
C	0.194928	0.040806	4.776890	0.0000	***
EFWA_TEMP(-1)	0.013818	0.004419	3.127233	0.0018	***
MAR_BOOK(-1)	0.433242	0.036789	11.77631	0.0000	***
PPE(-1)	0.120214	0.031828	3.776963	0.0002	***
EBITDA(-1)	-0.873124	0.070372	-12.40731	0.0000	***
SALES(-1)	-0.000900	0.006629	-0.135687	0.8921	-

R-squared	0.436454	Mean dependent var	0.351770
Adjusted R-squared	0.432928	S.D. dependent var	0.168832
S.E. of regression	0.127137	Akaike info criterion	-1.279671
Sum squared resid	12.91497	Schwarz criterion	-1.244708
Log likelihood	521.0676	Hannan-Quinn criter.	-1.266244
F-statistic	123.7617	Durbin-Watson stat	0.968886
Prob(F-statistic)	0.000000		

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