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# Do Small Firms Follow a Pecking Order When They Raise Capital?

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*Abstract*

*This paper examines whether the Pecking Order Theory (POT) is capable of explaining the capital structure changes of small firms in the US and in Europe. Contrary to previous studies, this study focusses on small firms. One of the main reasons for this is that the Pecking Order Theory is an information asymmetry model. Information asymmetry is largest for smaller firms, and considering that the POT is a conditional theory, it is logical to examine it under a set of conditions in which it is most likely to hold. It was found that the POT holds to some extend for US firms, but this is not the case for European firms. Overall, the conclusion is that the Pecking Order Theory only has limited explanatory power.*

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## 1) Introduction

At the origin of the capital structure puzzle lies the work of Miller and Modigliani. They argue that financing decisions do not affect a firm´s market value and that therefore capital structure is irrelevant (Miller & Modigliani, 1958). However, empirically the Capital Structure Irrelevance Proposition doesn´t hold. Nowadays it is recognized that Capital Structure is relevant and that capital structure changes can in fact influence a firm´s market value. However, it can do so in a number of ways, and since the precise mechanisms are unclear, Capital Structure is one of the most discussed topics in Corporate Finance (Myers, 1984). By relaxing some of the Miller and Modigliani assumptions, several theories have surged over the years that attempt to explain how firms finance themselves. However, most of these theories have unconvincing performances continuing the Capital Structure debate.

This paper will attempt to solve part of this mystery by focusing and empirically testing one of the traditional capital structure theories, namely the *Pecking Order Theory* (*POT*). Capital Structure refers to the mix of equity and debt firms use to finance their operations (Myers, Capital Structure, 2001). The *POT* considers three types of capital sources: retained earnings, equity and debt. The *Pecking Order Theory* is an information asymmetry model. Information asymmetry occurs when the perfect information assumption fails to hold empirically: it refers to the situation when one party possesses more information that its counterparty (Akerlof, 1970). The *Pecking Order Theory* makes a distinction between existing and new investors. Furthermore, the theory makes assumes that management acts in the interest of current shareholders and the existence of perfect capital markets (Myers & Majluf, 1984).

The *POT* assumes that investors have less information available regarding the firm´s future cash flows relative to firm insiders. This information asymmetry makes it almost impossible for investors to fairly value a firm (Myers, 1984). Most firms are thus either overvalued or undervalued. If an undervalued firm issues equity, wealth is transferred from old shareholders to new ones. If the firm is overvalued, the wealth transfer goes the other way. Given managements, incentives, only overvalued firm will issue new equity. Investors are aware of managements incentives and thus equity issue announcements are followed by a (negative) market price correction. Whenever firms need to raise capital they follow a pecking order: first they resort to retained earnings. Once internal funds are no longer sufficient firms recur to external funding. Given that debt is cheaper, it is preferred over equity. Only once the cost of debt becomes higher than the cost of equity will a firm issue equity (Myers & Majluf, 1984). In equilibrium, a firm will only issue debt (Myers, 1984). Leverage can therefore be interpreted as the firm's cumulative need for external financing (Myers, 2001). (A detailed explanation of the *POT* is offered in the Literature Review)

The scope of this paper comprises small cap firms, listen in the US. or in Europe between 2010 and 2015. The *Pecking Order Theory* is a conditional theory. This implies, that if it holds, it should do so under the set of conditions upon which it is based. Given that the

pecking order theory is an information asymmetry model, it is logical to test it using a sample of firms that have a high degree of information asymmetry.

Information asymmetry is closely related to firm size. Generally, smaller firms are surrounded by uncertainty as they still have to prove themselves to the market. Moreover, this type of firms is often unfamiliar to investors. Also, due to the fact that smaller firms are younger, they are listed for less time relative to larger firms. Smaller firms therefore have less public financial information available. Larger firms tend to be older, have a historical and a reputation on financial markets. For these reasons, smaller firms are prone to have higher degrees of information asymmetry.

This study extends to both the U.S. and Europe for the following reasons: First, to see whether the relation between a certain factor and leverage only holds locally or if it also does so internationally. Secondly it serves a robustness check. If factors are found to be significantly related to leverage in both regions then this improves the validity and the strength of the findings.

This study will focus on the leverage component of capital structure. Theoretically this is justified by the *Pecking Order Theory* itself as, in equilibrium, external financing will be mainly through debt. The empirical relevance of leverage is illustrated by the fact that the majority of external finance consists of debt (Myers, 1984).

Given the objective of this study and its scope, the research question is as follows: **Does the *Pecking Order Theory* hold for small firms in the US and Europe*?***

By focussing on small cap firms in the U.S. and Europe, this paper contributes and complements the existing literature in the following way: to my knowledge, this is one of the first studies on leverage that has an emphasis on small firms. In this way, it fills up this gap in the literature. Furthermore, it can provide further insight into some of the conflicts between the empirical findings and the theoretical predictions, such as the one described in the preceding paragraph.

Besides, the academic contribution, this study is also empirically relevant. Some firms prefer to forgo on positive NPV-projects because they are unwilling to raise capital externally (Myers, 1984). This is especially true for most small firms, which are characterised by being financial constrained. Consequently, they are often incapable to capitalize on their investment opportunities. In order to solve these problems, it is first necessary to better understand capital structure in general. Doing so creates the possibility to find strategies that lower the costs of raising (external) capital.

In the academic literature, a set of factors was found to be closely related to leverage. These so called conventional leverage variables are Tangibility, Firm Size, Profitability and Growth Opportunities (Frank & Vidhan, 2009; Frank & Goyal, 2003; Rajan & Zingales, 1995). The *POH* makes predictions about the nature of the relation between leverage and each one of the conventional factors mentioned. In order to answer its research, question this paper will examine whether these predictions hold empirically.

## 2) Literature Review

*Capital Structure*

Due to the strict assumptions that Miller and Modigliani make, their Capital Structure Irrelevance Proposition fails to hold empirically. Nevertheless, the M&M proposition remains theoretically relevant. Proof of this is that most of the existing capital structure theories derive from their propositions. The most prominent theories focus either on taxes or information asymmetry as the determinants of capital structure (Myers, 2001).

*The Static Trade-Off Theory*

One theory that focuses on taxes is the Static Trade-Off Theory of Leverage. According to this particular theory, when deciding on their capital structure, firms balance the advantages and the disadvantages of leverage (Miller & Modigliani, 1958). The major advantage of leverage comes from the fact that interest payments are tax deductible. This creates is the so-called interest tax shield which allows firms to increase their market value by around 9,7% (Graham, 2000). Another advantage of leverage is that it decreases the ability of managers to act in their own interest which is not necessarily aligned with the interests of shareholders. This principal-agent problem may lead the firm to invest in projects that have sub-optimal outcomes (Jensen, 1986). The most significant costs associated with leverage are financial distress costs and bankruptcy costs. If the debt ratio becomes too high firms may no longer be capable of fulfilling their obligations towards creditors. Financial distress and bankruptcy risks are directly reflected in the cost of debt. They also affect a firm´s credit rating and its market value (Myers, 2001). The *Static Trade-Off Theory* says that the trade-off firms face between the benefits and the costs of debt which leads to an optimal leverage ratio. This optimal leverage ratio is the point at which the firm maximises its market value. Despite it being in the firm's best interest to stay as close as possible to their target ratio, deviations from are frequent and can last for considerable periods of time (Graham & Harvey, 2001). The reason for this is that otherwise constant adjustments to capital structure are necessary, which are costly. Instead of a strict target ratio, firms often set a themselves a loose target ratio, and only make periodic adjustments when they perceive the deviation from their optimal leverage ratio to be too large. These readjustment decisions are made highly subjective as they are made at the discretion of the firm´s management (Graham & Harvey, 2001).

*The Pecking Order Theory*

The *POT* considers three sources of capital in the form of retained earnings, equity and debt. The latter are classified as a firm´s internal capital funds whereas the former two are classified as external sources of capital (Myers & Majluf, 1984). The *Pecking Order Theory* assumes perfect capital markets, the existence of information asymmetry and that managers act in the interest of the existing or "old" shareholders. Information asymmetry is present in that managers are better informed regarding the firm´s fundamental value and its future prospects. The information investors have about these two factors is very limited (Billet & Xue, 2007). Therefore, it is difficult for investors to

accurately price any new securities that the firms might issue. The higher the degree of information asymmetry the more difficult the valuation task becomes for investors. From here it also follows that in the *POT,* information asymmetry only plays a role for external capital sources (Myers, 1984).

Let us look at a scenario when a firm decides to issue equity. If it does so because it needs capital in order to invest in a positive-NPV project, then this is beneficial for new investors (Myers, 2001). A central point of the *POT* is that information asymmetry makes it very unlikely firms to be fairly valued by the market. This implies that most of the times, shares are either undervalued or overvalued. If a firm issues undervalued shares, wealth is transferred from its existing shareholders to the new ones. On the other hand, if overvalued shares are issued, the wealth transfer goes from the new to the old investors (Myers & Majluf, 1984). Since it is assumed that managements acts in the interest of old shareholders, in equilibrium firms will only issue overvalued shares.

New investors may be unaware of the fair value of a firm, but they do know what management´s incentives are (Myers, 1984). Equity issue announcements are thus interpreted by financial markets as sign that firms are overvalued. What follows is and inevitable market correction (Myers, 1984). The fact that firms are not fairly valued doesn´t imply that all firms are overvalued. Some firms will inevitably be undervalued, and some of those might have valuable growth opportunities. As mentioned earlier, if these firms where to issue equity, both old and new investors would benefit. However, due to the strong market reaction to equity issue announcements, the cost of issuing equity will almost always outweigh the benefits and thus very few firms will do so (Myers, 2001)

Let us turn now to external financing through debt. Debt has a prior claim over retained earnings and assets whereas equity is only a residual claim. Debt investors suffer therefore less from any valuation mistakes than equity investors (Myers, 1984). Information asymmetry problems are thus less severe. Due to the negative market associated to equity issuances, issuing debt is a cheaper, and therefore preferred alternative (Myers & Majluf, 1984). Thus first, firms prefer internal over external capital. Whenever retained earnings are no longer sufficient to cover capital expenditures firms raise capital externally. When choosing between external sources, firms prefer to issue debt over equity (Myers & Majluf, 1984).

A large number of studies that empirically previously tested the *POH.* To have a complete overview, a methodological approach is required. An intuitive way to group them is by separating those who focus on equity and those who focus on leverage.

Helwege and Liang (1996) test the theory by analysing the characteristics of firms that issue equity. They examine firstly whether the availability of internal funds affects the decision to obtain external financing. The evidence they found was disappointing for the *POT*: the probability of raising external funds is unrelated to the internal cash deficit. Furthermore, they found that some of the firms that issued equity hadn´t reached their debt limit (Helwege & Liang, 1996). This is in contradiction to the theory. According to the pecking order, the already negative market reaction associated with IPO/SEO

announcements should be even stronger if investors know that a firm could have issued debt instead (Myers, 1984). Moreover, according to the theory firms will only issue equity as a last resort. That is, they only do so when they no longer can issue debt or it becomes too costly to do so.

The majority of the studies that tested the *Pecking Order Theory* focussed on the characteristic of firms that issued debt. Shyam-Sunder and Myers (1999) ignored equity completely as they argue that in equilibrium firms only issue debt. They found that the *POT* had more explanatory power than the competing *Static Trade-Off Theory*. Their findings suggest that the *Pecking Order Theory* holds, at least for larger, more mature firms. More generally, they found evidence that the *POT* had actual explanatory power regarding some of the financing patterns empirically observed. However, the authors admit that the model that they used is somewhat oversimplified and that there are other factors to be considered other than those mention in the *Pecking Order Theory* (Shyam-Sunder & Myers, 1999).

More complete studies, such has the one from Frank and Goyal (2003), found the evidence for the theory less compelling: it was found that external financing is more important than the pecking order suggests, and that equity financing actually has a significant share of external financing. In fact, net equity issues commonly exceed net debt issues. Perhaps the most striking finding was that net equity issue track the financing deficit much more closely that net debt issues (Frank & Goyal, 2003). This is in sharp contrast with the study of Shyam-Sunder and Myers, where the case is made that net debt issue track the financing deficit on a one-to-one scale (Shyam-Sunder & Myers, 1999).

Previous studies thus yielded contradicting results. However, a common finding of several studies was that the pecking order is more likely to hold for larger firms than for smaller firms (Frank & Goyal, 2003; Shyam-Sunder & Myers, 1999). It must be noted that most of these studies use samples that are biased towards large firms. Therefore, the findings of past studies regarding smaller firms should be interpreted with caution

Rajan and Zingales (1995) did a cross-sectional study of capital structure across the G-7 economies. Contrary to what the literature suggests, they found that levels of leverage are fairly similar across the G-7 economies. Furthermore, they found that these levels were not random but rather conscious financing decisions made by management. The scope of their study allowed them to conclude that although intuitional differences have some explanatory power when it comes to aggregate capital structure, there are underlying mechanism in place that determine company's capital structure (Rajan & Zingales, 1995).

*Conventional Factors of Leverage and the Economics Mechanisms*

1) Tangibility

Tangibility is determined by the ratio of fixed assets over total assets. Fixed assets can be used as a collateral for loans. In this case, tangibility will be positively correlated with leverage (Rajan & Zingales, 1995). On the other hand, tangibility is an often-used proxy

for information asymmetry (Frank & Goyal, 2003). Following the example of the majority of the literature on the *POH,* tangibility is the main independent variable of interest in this study. Firms that have low tangibility levels are usually thought to have higher degrees of information asymmetry (Rajan & Zingales, 1995). According to the *Pecking Order Theory*, information asymmetry is positively correlated to leverage. Consequently, the theory predicts tangibility to be negatively correlated to leverage. This leads to the following hypothesis:

*H1: Changes in tangibility are negatively related to changes in leverage.*

2) Firm Size

Larger firms are more diversified, and are therefore perceived to be less risky. Furthermore, they often have better credit ratings (Frank & Vidhan, 2009). Larger firms thus tend to be more leveraged implying a positive relation between firm size and leverage. However, academics agree that smaller firms are prone to have larger degrees of information asymmetry relative to larger firms. In the latter case firm size will be negatively correlated with leverage.

Despite the scope of this paper being already restricted to small firms, it is important to include this factor in this study. The first reason for this are the conflicting theoretical predictions about the relation between firm size and leverage. The second reason for doing so is that there is no "clean" variable that is able to capture the full effects of information asymmetry on its own. Considering that the theory being tested is an information asymmetry model, it is necessary to model it as accurately as possible.

The relation between information asymmetry and leverage according to the *POH* leads to the second hypothesis:

*H2: Changes in Firms size are negatively related with changes in leverage.*

3) Profitability

Profitable firms are expected to have lower costs of financial distress. Furthermore, these firms greatly benefit from the interest tax shield associated with debt to (Frank & Vidhan, 2009). In this scenario, the relation between leverage and profitability will be positive. At the same time, profitability is an indicator of a firm's internal capital funds (Frank & Goyal, 2003). As internal capital increases, firms have less need to rely on external capital. Also, more profitable firms are more capable to repay their outstanding debt (Rajan & Zingales, 1995).

According to the Pecking Order Hypothesis, profitable firms can cover more of their capital expenditures with their internal funds, therefore reducing the need to raise capital externally. The theoretical predictions lead to next hypothesis:

*H3: Changes in profitability are negatively related to changes in leverage.*

4) Growth Opportunities

Frank and Goyal (2009) state that the risk associated with pursuing growth opportunities increase financial distress costs. This would then negatively influence leverage. The *Pecking Order Hypothesis* assumes a 1-on-1 relation between leverage and a firm´s finance deficit. Investments in growth opportunities represent an outflow of cash which increase the financing deficit. This is increase in the deficit should theoretically be offset by increases leverage (Myers & Majluf, 1984). This lead to the following hypothesis:

*H4: Growth opportunities are positively associated to leverage.*

## 3) Data

As previously mentioned, this study focusses on small cap firms in the U.S. and in Europe. The starting point to obtain the necessary sample are the constituents of the S&P 600 Small Cap Index and the MSCI Europe Small Cap Index. The former is a capitalization-weighted index from Standard & Poor´s, consisting of 600 firms which are representative of most U.S. listed small cap firms. On the other hand, the MSCI Europe Small Cap Index comprises 943 firms from 15 countries of Europe (Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the UK). Due to the number of firms and the geographical diversity of the MSCI Europe Index, it is representative of most small cap firms listed in Europe.

Besides the cross-sectional component, the data also consists of a time-series component. The latter comprises yearly data from January 2010 until December 2015. The data used in this study is thus classified as panel-data. An attempt was made to include the most recent data available. However, not all firms had the required data available for most recent years. The trade-off between a recent sample and a sample that is large enough resulted in selecting the above-mentioned time-period. This was found to be the most recent sample that included a sufficient number of firms in order to make the sample as representative as possible of the general population.

From the initial total sample of 1543 firms, all financial firms were excluded. Most firms operating in the financial sector are subject to tight regulations. As a result, any changes in capital structure made by these firms cannot be interpreted in the same fashion as capital structure changes made by other firms. The sample was further narrowed by imposing firms, depending on the country they are listed in, to be included in either the Compustat North-America or Compustat Global databases.

Both databases offer a large range of financial information making it the go-to databases for studies on capital structure. The major difference between the two is that Compustat North-America consists of firms operating only in North-America, whereas Compustat Global consist of firms operating in every region of the globe with the exception of North-America. Another difference is the fact that the two databases do not share all financial variables. An example of this is market value. This variable is included in Compustat North-America but not in Compustat Global. Because of this data limitation, it was no possible to compute the M/B ratio for European companies. Firms that had missing values for any one of the 6 years of the time-period were removed from the

sample. This was done to ensure that the panel was balanced and to prevent firms with incomplete observations to influence test outcomes. The same was done to extreme outlier's due to the fact that these observations greatly bias the outcome of regression analysis. The total end sample consisted of 225 firms, from which 150 were listed in European countries and 75 were listed in the U.S.

*Descriptive Statistics*

***Table 1: Descriptive Statistics U.S. Firms.*** *Leverage is determined by the ratio of total debt over total assets. Tangibility is computed as the ratio of plant, property & equipment over total book assets. Size is computed as the natural logarithm of Sales. Profitability is determined by EBITDA over total book assets. M/B is defined as the ratio of market capitalization over a firm´s book value. Growth Opportunities is determined as the natural logarithm of total assets. Difference in Leverage is the annual change in leverage. Difference in Tangibility represents the annual change in tangibility. Difference in Profitability is the annual change in profitability. Difference in Size is the annual change in firm size. Difference in MB is the annual change in M/B. Difference in Growth Opportunities is the annual difference in Growth Opportunities.*

| Variable | Observations | Mean | S.D. | Minimum | Maximum |
|---|---|---|---|---|---|
| Leverage | 375 | 0.2456 | 0.1046 | 0.1 | 0.7728 |
| Tangibility | 375 | 0.3973 | 0.2149 | 0.0506 | 0.941 |
| Size | 375 | 3.0311 | 0.3681 | 1.8944 | 3.9972 |
| Profitability | 375 | 0.118 | 0.0468 | -0.0872 | 0.2744 |
| Market-to-Book | 375 | 2.1528 | 1.0092 | 0.4338 | 4.9024 |
| Growth Opportunities | 375 | 2.9976 | 0.321 | 2.0455 | 3.853 |
| Difference in Leverage | 375 | 0.3016 | 0.1337 | -0.4694 | 0.6335 |
| Difference in Tangibility | 375 | -0.0044 | 0.1309 | -0.6632 | 0.5107 |
| Difference in Size | 375 | 0.0399 | 0.1368 | -0.5797 | 0.5942 |
| Difference in Profitability | 375 | -0.0016 | 0.5731 | -0.2287 | 0.3653 |
| Difference in Market-to-Book | 375 | 0.1492 | 0.9878 | -3.8282 | 4.495 |
| Difference in Growth Opportunities | 375 | 0.0407 | 0.1381 | -0.5626 | 0.5508 |

***Table 2: Descriptive Statistics European Firms.*** *Leverage is determined by the ratio of total debt over total assets. Tangibility is computed as the ratio of plant, property & equipment over total book assets. Size is computed as the natural logarithm of Sales. Profitability is determined by EBITDA over total book assets. Growth Opportunities is determined as the natural logarithm of total assets. Difference in Leverage is the annual change in leverage. Difference in Tangibility represents the annual change in tangibility. Difference in Profitability is the annual change in profitability. Difference in Size is the annual change in firm size. Difference in Growth Opportunities is the annual difference in Growth Opportunities.*

| Variable | Observations | Mean | S.D. | Minimum | Maximum |
|---|---|---|---|---|---|
| Leverage | 624 | 0.2456 | 0.1338 | 0.1012 | 0.8916 |
| Tangibility | 624 | 0.3973 | 0.2592 | 0.0506 | 0.948 |
| Size | 624 | 3.0311 | 0.4375 | 1.6784 | 3.9927 |
| Profitability | 624 | 0.118 | 0.061 | -0.2688 | 0.4364 |
| Growth Opportunities | 624 | 2.9976 | 0.4299 | 1.6915 | 3.9983 |
| Difference in Leverage | 624 | 0.3016 | 0.1181 | -0.5594 | 0.5076 |
| Difference in Tangibility | 624 | -0.0044 | 0.1529 | -0.6964 | 0.6964 |
| Difference in Size | 624 | 0.0399 | 0.1612 | -0.5854 | 0.5939 |
| Difference in Profitability | 624 | -0.0016 | 0.0547 | -0.3709 | 0.3365 |
| Difference in Growth Opportunities | 624 | 0.0407 | 0.1387 | -0.5629 | 0.5953 |

Tables 1 and Table 2 contain the descriptive statistics of the sub-sample of firms in the U.S. and Europe, respectively. The European sub-sample has almost twice as much observations as the U.S. sub-sample. This is explained by the number of constituents of each Index.

There are some similarities between the two sub-samples. For instance, on average, the levels of leverage, tangibility and profitability are alike for American and European firms. However, American firms, on average where smaller (3.03 US, 3.10 Europe) and had less growth opportunities (2.99 US, 3.14 Europe). At first sight, the difference doesn´t seem striking. However, these two variables are defined differently than the others requiring a different interpretation.

The general tendency was for firms to become more leveraged over time. Firms in Europe on average, yearly increased their leverage by 0.03% whereas the annual average increase in leverage for American firms was 0.028%. Both American and European firms experienced a decrease in their levels of tangibility. Firms listed in America had an annual decrease in tangibility of 0.004%, on average. Firms listed in Europe the annual decrease in tangibility was significantly larger, averaging 0.1%. On the other hand, the average increase in firm size was almost twice as large as that of European firms (0.39% US, 0.23% Europe). Profitability decreased in both sub-samples. This happened at different rates per region. America firms the annual loss in profitability averaged 0.016% this whereas this figure was significantly higher for European firms (-0.04%).

*Variables Definition*

The required variables (leverage, profitability, tangibility, firm size, and growth opportunities) as defined by the pecking order are not readily available. Instead they have to be computed from items present in firm's financial statements.

Following the majority of academic literature, leverage is defined as the ratio of total debt (short term + long term) over total assets (Myers, 2001). In the literature tangibility

is often computed as the ratio of fixed assets over total assets. However, tangibility is a very subjective term, and accounting practices differ depending on country. For these reasons, in this study tangibility is defined as the ratio of plant, property and equipment (PP&E) over total assets. Taking into account accounting differences this definition allows for international comparison. Furthermore, it is still representative of a firm's tangibility to the extent that PP&E represents the majority of firm´s tangible assets. Following the method used in previous studies, profitability is measured by looking at return of assets (ROA). ROA is measured by the ratio of EBITDA to total assets (Rajan & Zingales, 1995). An often-used definition of firm´s size is the natural logarithm of sales (Frank & Goyal, 2003). Similar to previous studies, the same measure of firm's size was used in this study. Market-to-book ratio is computed as the ratio of a firm's market value (equal to its market capitalization) to the book value of the firms. The market-to-book ratio in this study is used as a proxy of a firm´s growth opportunities. Due to the data limitation previously described it was not possible to compute M/B values for European firms. As an alternative proxy of a firm´s growth opportunities, the variable suggested by Frank and Goyal (2009) was used, namely the annual change in the natural logarithm of total assets. To capture the annual change of each variable, first differences were computed. This was done by subtracting the value of each variable in a specific year by its value in the year immediately preceding it.

4) Methodology

According to the *Pecking Order Theory* firms have no optimal debt ratio. Instead, debt can be interpreted as the cumulative need of firms to obtain external finance (Myers, 1984). Therefore, the *POT* is not a theory that attempts to explain absolute levels of leverage. Instead, it attempts to explain *changes* in leverage. For this reason, a simple cross-sectional regression on absolute levels would be an incorrect method to test this theory. Besides this, running a simple cross-sectional regression on absolute variable levels would ignore the importance of time. It would be naïve to assume that a variable has an almost instantiations impact on leverage. A more reasonable assumption is that it takes time for the effect of factors to occur.

To solve the problem that time delays the impact of factors an often-used method in capital structure studies is to use panel data. Doing so allows the computation of first differences which represent the change of a variable. The first difference of a variable can be easily obtained by subtracting the absolute value of a variable in the most recent time period (t) by the value of the same variable in the preceding time-period (t-1). The panel data available for this study has a time-series component that consists of yearly data. For this reason, the first difference captures the annual change in the relevant variables. Once the first differences were obtained, they were treated as "regular" variables.

The major problem Capital Structure studies face is that the factors used in the theory are not available. This implies that proxies must be used, but these will never fully accurately represent a factor. What further complicates the matter is that most variables are proxies of several factors simultaneously. Not all of the factors that are

proxied by a variable are relevant to capital structure. Including these variables into a model would severely threaten its internal validity. The relations captured by such a model will most likely not be representative and lead to misleading conclusions (Shyam-Sunder & Myers, 1999).

In the case of the *Pecking Order Hypothesis*, the literature identified a set of variables that best represent the relevant theoretical factors (the so called conventional variables of leverage). Of course, there are other variables that impact leverage. For instance, the leverage depends on the type of industry a firm operates in. However, previous studies found that including a dummy variable for the type of industry does not significantly alter the outcome of the model (Frank & Goyal, 2003). Moreover, both of the subsamples are well diversified, that is to say, there is no particular industry that is over-represented. For these two reasons, the impact of the type of industry on leverage is of no concern for this particular study.

This paper follows the recommendations of the literature: the model used describes how changes in the set of conventional leverage variables affect changes in leverage. The extensive testing of the conventional leverage variables in previous studies let to the development of the prevailing model used to examine changes in leverage (Frank & Goyal, 2003). The regressions used in this study, presented below, are direct derivations from the prevailing model.

The following model was used to test for changes in leverage for the U.S. sub-sample:

$$\Delta Leverage = \alpha + \beta 1 * \Delta Tangibility + \beta 2 * \Delta Size + \beta 3 * \Delta Profitability + \beta 4 * \Delta \frac{M}{B} + B5 * \Delta Log(Assets) + \varepsilon i$$

Given that it was not possible to compute M/B for the European subsample, the model for this sub-sample was slightly different:

$$\Delta Leverage = \alpha + \beta 1 * \Delta Tangibility + \beta 2 * \Delta Size + \beta 3 * \Delta Profitability + B4 * Log(Assets) + \varepsilon i$$

As already mentioned the pecking order hypothesis is based on information asymmetry. Therefore, the most important variable included in the two regressions is Tangibility, as this variable is the main proxy used to capture the existing information asymmetry. According to the pecking order theory, firms that suffer from larger degrees of information asymmetry are likely to be more leverage (Rajan & Zingales, 1995). Therefore, if the pecking order is to hold it is expected that $\beta 1 < 0$. Given that there is no clean variable capable to capture the entirety of information asymmetry, firms size is included in addition to better capture this factor. Smaller firms are more likely to suffer from higher degrees of information asymmetry. As such, the pecking order hypothesis predicts that $\beta 2 < 0$. According to the literature, if the pecking order holds then one can expect that increases in profitability will lead to a decrease in leverage. Therefore, the theory predicts $\beta 3 < 0$. Finally, the theory being tested predicts that increases in growth opportunities negatively related to changes in leverage. If it turns out that this is empirically the case, then both $\beta 4$ and $\beta 5$ will be positive

## 5) Results and Discussion

In this section, the regression results of the American and European sub-samples will be presented and discussed. Initially, this will be done on an individual basis for each sub-sample. This will be followed by a comparison between the two sub-samples pointing out any similarities and differences. This will serve as a sort of "internal" robustness-check. Afterwards, the main results and implications will be discussed from an economical point-of-view. Finally, the findings of this paper will be compared with that of previous studies which will serve as a kind of "external" robustness-check.

*Results*

The interpretation will touch-upon the statistical outcomes, such as the coefficients and their t-statistic. With respect to the latter, the significance level in this paper is set at α=5%. This means that only variables whose t-statistic is lower than 0.05 are classified as statistically significant.

***Table 3.*** *Regression results for the conventional model of leverage w.r.t the American sub-sample. The model is specified as follows: ΔLeverage = α + β1*ΔTangibility + β2*ΔSize + β 3*ΔProfitability + β 4*ΔM/B + β 5*ΔLog(Assets) + εi. Table 3 present the coefficient and their respective t-statistic which indicate their statistical significance. In the footnote under table 3 a summary is presented with the definition of each variable.*

| Change in Leverage | Coefficient | Standard Error | T-Stat. | P-Value |
|---|---|---|---|---|
| Difference in Tangibility | -0.0974 | 0.4868 | -2 | 0.046 |
| Difference in Size | 0.2474 | 0.0477 | 5.18 | 0 |
| Difference in Profitability | -0.6971 | 0.1176 | -5.93 | 0 |
| Difference in Market-to-Book | 0.0248 | 0.0067 | 3.66 | 0 |
| Difference in Growth Opportunities | 0.1932 | 0.0463 | 4.17 | 0 |

*Note: Difference in Leverage represents the annual change in leverage, with the latter being defined as total debt over total assets. Difference in Tangibility refers to the first difference of Tangibility with Tangibility being determined by PP&E over total assets. Difference in Profitability is the variable name of the first difference in Profitability, with Profitability being defined by EBITDA over total assets. Difference in MB represent the annual change in M/B which is the market value of the company divided by its book value. Difference in Growth Opportunities represents the annual change in Growth Opportunities, with the latter being the natural logarithm of fixed assets.*

Table 3 presents the regression results for the American sub-sample model. The main independent variable, ΔTangibility, was statistically significant (p=0,046<0.05). A 1% increase in tangibility was, on average, associated with a decrease in Leverage of 0.1%. The first hypothesis stated a negative relation between changes in tangibility and changes in leverage. Thus, the results support the hypothesis and as such it can´t be rejected. The annual change in firm size was found to have a statistically significant

relationship with any changes in leverage (p=0.00<0.05). However, this relation was found to be positive, whereas the *POT* predicts this relation to be negative. Consequently, the second hypothesis is rejected. ΔProfitability (p=0.00) was found to be statistically significant at all levels, including at α=5%. On average, an 1% increase in profitability was associated with a 0.7% decrease in Leverage. Given that these results support the third hypothesis, it can´t be rejected. Both market-to-book ratio and changes in log(assets) were statistically (p=0.00<0.05) significant and positive related to increase in leverage. These two variables were proxies for the growth opportunities of firms. The *Pecking Order Hypothesis* predicts that firms with more growth opportunities have higher levels of leverage. The evidence supports this claim leading to the rejection of the last hypothesis.

***Table 4.*** *Regression results for the conventional model of leverage w.r.t the European sub-sample. The model is specified as follows: ΔLeverage = α + β1*ΔTangibility + β2*ΔSize + β 3*ΔProfitability + β 4*ΔLog(Assets) + εi. Table 4 present the coefficient and their respective t-statistic which indicate their statistical significance. In the footnote under table 3 a summary is presented with the definition of each variable.*

| Change in Leverage | Coefficient | Standard Error | T-Stat | P-Value |
|---|---|---|---|---|
| Difference in Tangibility | 0.1415 | 0.03 | 4.71 | 0 |
| Difference in Size | 0.0872 | 0.0292 | 2.99 | 0.003 |
| Difference in Profitability | -0.3965 | 0.0847 | -4.68 | 0 |
| Difference in Market-to-Book | -0.0338 | 0.0336 | -1.01 | 0.315 |

*Note: Difference in Leverage represents the annual change in leverage, with the latter being defined as total debt over total assets. Difference in Tangibility refers to the first difference of Tangibility with Tangibility being determined by PP&E over total assets. Difference in Profitability is the variable name of the first difference in Profitability, with Profitability being defined by EBITDA over total assets. Difference in MB represent the annual change in M/B which is the market value of the company divided by its book value.*

Table 4 represent the results for the second sub-sample model. For European firms, on average, a 1% increase in tangibility was associated with a 0.14% increase in leverage. This relation was statistically significant at all levels. This result doesn´t support the predictions of the *Pecking Order Theory* and as such the first hypothesis is rejected. The second Hypothesis states that changes in firm's size are linked with decreases in leverage. Empirically, it was found that for European listed-firms the opposite was true (p=0.03<0.05) leading to the rejection of the second hypothesis. The third hypothesis states that profitability is negatively correlated with changes in leverage. Results show that this relation holds for the European sub-sample. As such, the third hypothesis can´t be rejected. The last hypothesis predicts that changes in growth opportunities are positively related to changes in leverage. The proxy used for growth opportunities,

Δlog(assets), was found to be statistically insignificant (p=0.315>0.05). On this basis, the fourth hypothesis must be rejected.

In half of the cases the two sub-samples models yielded similar results: Both rejected the 2nd hypothesis and accepted the 3rd. The 1st hypothesis was not rejected in the American model whereas it was rejected by the European model. In the European sub-sample, the 4th hypothesis relating growth opportunities and leverage was rejected. However, it must be noted this sub-sample suffered from a data limitation which made it impossible to compute the market-to-book ratio. This is the most common used proxy for a firm´s growth opportunities. Instead, the model applied to this sub-sample used the second-best alternative, namely the annual change in log(assets) (Frank & Vidhan, 2009). In the American sub-sample, a more complete model is used that includes both of the growth opportunity proxies: M/B and log(assets). For these reasons, more importance should be given to the results of latter model.

*Discussion*

The findings presented in the previous section have relevant implications. In this study tangibility is used as a proxy for information asymmetry. According to the *POT* firms with high degrees will have lower levels of leverage (Myers, 2001). The aim of the first hypothesis was to test this claim. The outcomes of the tests were mixed. In the American sub-sample evidence was found in favour of the hypothesis. The opposite occurred in the European sub-sample where the hypothesis was rejected. The mixed results shouldn´t be a surprise since the theoretical predictions themselves are also conflicting. Besides being a proxy for informational asymmetry, tangibility relates to leverage through other channels. Tangible firms have more fixed assets they can use as collateral for loans, which would make it easier and cheaper to raise capital through debt. This would then imply a positive relation between the two factors which would be consistent with the results of previous studies (Rajan & Zingales, 1995; Frank & Goyal, 2003). However, the results of this study indicate both a positive and a negative relation between tangibility and leverage, making it hard to determine which one of the two is predominant effect.

In both sub samples, increases in firm size were found to be associated with increases in leverage. This result is shared with previous studies (Rajan & Zingales, 1995; Frank & Goyal, 2003). The *Pecking Order Theory* is uncappable to explain this since it assumes that changes in firm's size (a proxy for information asymmetry) are negatively related to changes in leverage. However, like tangibility, firm size is related in multiple ways to leverage. For instance, it is the case that larger firms are generally more diversified. Moreover, they often have good reputation, are perceived as less risky and often have better credit ratings (Frank & Vidhan, 2009). Therefore, a positive relation between firm's size and leverage is not unsurprising.

To the extent that profitability is an indicator of a firms internal earning the *Pecking Order Theory* predicts a negative relation between profitability, it is expected that these firms will rely less on external capital sources. Moreover, more profitable firms have better conditions to repay their outstanding debt

To the extent that profitability is and indicator of internal funds, profitable firms are less dependent on external sources of capital. Alternatively, if firms don´t need to raise capital to invest, they can use their retained earnings to repay outstanding debt (Myers, 2001). The negative relation between leverage and profitability is in accordance with the *Pecking Order Theory* and has been frequently documented (Graham & Harvey, 2001; Rajan & Zingales, 1995; Frank & Goyal, 2003).

In this study, a positive relation was found between growth opportunities and leverage. However, it is not exactly clear what the implications of these findings are for the *POT* as the theory itself is vague. On one hand, investing in growth opportunities is an outflow of money that increases the financing deficit. In this case, the positive relation is supportive of the *Pecking Order Theory* as the finance deficit and leverage are related on a 1-on-1 scale (Harris & Raviv, 1991). However, Myers (2001) argues that leverage limits the ability of firms to capitalize on growth opportunities. This hints on a negative relation between growth opportunities and leverage. This ambiguity also persists in the literature as previous studies found relations of both types (Frank & Goyal, 2003; Harris & Raviv, 1991; Myers, 1984; Rajan & Zingales, 1995).

## 6) Conclusion

*Summary*

Capital Structure has been a topic of much debate within Corporate Finance. Over the years, a number of theories have been developed that attempt to clarify the matter. However, most of those theories, if not all, remain unproven. The objective of this paper was to empirically test one of the prevailing capital structure theories: *The Pecking Order Hypothesis*. In order to do so, the following research question was asked: *Does the Pecking Order Theory hold for small firms in the US and Europe?*

In order to provide an answer, the prevailing econometric model to examine determinants of leverage was used (Rajan & Zingales, 1995; Frank & Goyal, 2003). Previous studies were done on the *POT* but the majority used a sample that was biased towards larger firms and consequently so were their conclusion. The major contribution of this paper is that it used a sample of small firms in both US. and Europe. This allowed to test the *POT* in its ideal setting, that is, in the presence of large degrees of information asymmetry and at the same time to complete the current spectrum of academic literature.

In general, the results obtained are consistent with that of previous studies. This implies that the factors that are leverage determinants for larger firms have an equally role with similar effects for smaller firms. However, this also means that no definitive conclusion can be drawn as the results are mixed. In the European sub-sample, there was little evidence in support of the *Pecking Order Theory.* None of the proxies for information asymmetry and growth opportunities behaved as predicted by the theory. On the other hand, in the American sub-sample the results were mostly supportive of the *POH.*

*Limitations*

No econometric study is perfect, and this one is no different. The sample period ranges from 2010 until 2015, which is shortly after the financial crises of 2008. This crisis had severe and long-lasting consequences for both European and American listed-firms. It is thus unclear to what extent the financial conditions that persisted in the sample are representative of "normal" financial conditions. Questions can thus be asked regarding the generalization of this paper´s findings.

Regarding the internal validity of this study, several remarks should be made. First, for almost all of the factors mentioned in the *Pecking Order Hypothesis* no variables are available that accurately represent them. Variables must be constructed form accountancy items which must then act as proxy. A lot can go wrong in this chain. For instance, information asymmetry is an abstract concept and there is no unique variable capable to accurately measure. Instead, proxies such as tangibility and firm size must be used. Due to the sophisticated nature of capital structure, these proxies related in multiple ways to leverage. This makes it difficult to know which is the dominant effect. So, the fact that firm size is positively related to leverage doesn´t necessary imply that the *POT* doesn´t hold. One could argue that better proxies should be used but the problem is that it is difficult to find better proxies than the existing ones. In other words, the conventional set of leverage determinants are so called for a reason: these factors were found to have to be consistent and reliable (Rajan & Zingales, 1995).

This paper followed the literature recommendation to use a simpler model over a more complex one. In the case of *POH*, the costs of including additional variables outweigh their benefits w.r.t. the model´s internal validity (Frank & Vidhan, 2009). However, the use of simpler models has the consequence that only a limited number of factors are included from an extensive list. The model thus suffers from Omitted Variables Bias, but do the nature of capital structure this is almost inevitable. Nevertheless, including more variables in the model potentially might have influenced the outcome.

*Recommendations for Further Research*

The number of studies on capital structure is considerable. Despite this, more studies in this field are warranted. This study is limited to solely testing the *Pecking Order Hypothesis,* but there are more theories such as the *Static Trade-off Theory* and the *Market-timing Theory*. Future studies should extend to the empirical testing of these theories. This will give an indication of which path to follow to increase our general understanding of Capital Structure.

One other limitation is that this paper is restricted to the study of leverage. Capital structure refers to the mix of capital sources firms use to finance their operations. Obviously, there are many more sources of capital other than leverage. It is thus desirable for next studies to extent the amount of capital sources being tested.

One of the striking results of this study, is that the results changed considerably between Europe and the US. It would therefore be interesting to see what might have caused such disparity by looking into institutional, regulatory and accountancy differences

between the two regions. As mentioned in the previous section, the use of more complex models might yield different results. It would thus be valuable to employ more elaborate model(s) that would include more factors relevant, not only to capital structure, but also differences between the two regions such as the ones mentioned above.

7)

Appendix

***A) Descriptive Statistics U.S. Firms.*** *Leverage is determined by the ratio of total debt over total assets. Tangibility is computed as the ratio of plant, property & equipment over total book assets. Size is computed as the natural logarithm of Sales. Profitability is determined by EBITDA over total book assets. M/B is defined as the ratio of market capitalization over a firm´s book value. Growth Opportunities is determined as the natural logarithm of total assets. Difference in Leverage is the annual change in leverage. Difference in Tangibility represents the annual change in tangibility. Difference in Profitability is the annual change in profitability. Difference in Size is the annual change in firm size. Difference in MB is the annual change in M/B. Difference in Growth Opportunities is the annual difference in Growth Opportunities.*

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Leverage | 375 | .2457562 | .1046137 | .100014 | .7728175 |
| Tangibility | 375 | .3973856 | .2149179 | .0506194 | .9410137 |
| Size | 375 | 3.03112 | .3681211 | 1.894449 | 3.997294 |
| Profitabil~y | 375 | .1180371 | .0468977 | -.0872918 | .2744866 |
| MB | 375 | 2.152841 | 1.009264 | .4338403 | 4.902437 |
| LogAssets | 375 | 2.997609 | .3210676 | 2.045546 | 3.853096 |
| DifLev | 375 | .0301651 | .133702 | -.4694985 | .6335904 |
| DifTang | 375 | -.0044511 | .1309003 | -.663264 | .510749 |
| DifSize | 375 | .039917 | .1368567 | -.5797664 | .5942895 |
| DifProf | 375 | -.0016035 | .0573108 | -.2287481 | .3653227 |
| DifMB | 375 | .0149217 | .9878889 | -3.828234 | 4.495069 |
| DifLogAssets | 375 | .0407504 | .1381649 | -.5626903 | .550863 |

***B) Descriptive Statistics European Firms.*** *Leverage is determined by the ratio of total debt over total assets. Tangibility is computed as the ratio of plant, property & equipment over total book assets. Size is computed as the natural logarithm of Sales. Profitability is determined by EBITDA over total book assets. Growth Opportunities is determined as the natural logarithm of total assets. Difference in Leverage is the annual change in leverage. Difference in Tangibility represents the annual change in tangibility. Difference in Profitability is the annual change in profitability. Difference in Size is the annual change in firm size. Difference in Growth Opportunities is the annual difference in Growth Opportunities.*

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Leverage | 624 | .2783082 | .1338127 | .101282 | .8916001 |
| Tangibility | 624 | .4235776 | .2592058 | .0506766 | .9480623 |
| Size | 624 | 3.103344 | .4375675 | 1.6784 | 3.992713 |
| Profitabil~y | 624 | .1148378 | .0610099 | -.2688071 | .4364995 |
| LogAssets | 624 | 3.144154 | .4299512 | 1.691568 | 3.998347 |
| DifLev | 624 | .0028104 | .1181469 | -.5594677 | .5076319 |
| DifTang | 624 | -.0100618 | .1529427 | -.6964119 | .6964119 |
| DifSize | 624 | .0233149 | .1612926 | -.5854496 | .5939164 |
| DifProf | 624 | -.0042755 | .0547148 | -.3709111 | .3365428 |
| DifLogAssets | 624 | .0295514 | .1387915 | -.562973 | .5953728 |

**C)** ***Regression results for the conventional model of leverage w.r.t the American sub-sample****. The model is specified as follows: ΔLeverage = α + β1*ΔTangibility + β2*ΔSize + β 3*ΔProfitability + β 4*ΔM/B + β 5*ΔLog(Assets) + εi.*

| Source | SS | df | MS | Number of obs | = | 375 |
|---|---|---|---|---|---|---|
| | | | | F(5, 369) | = | 17.22 |
| Model | 1.26462179 | 5 | .252924358 | Prob > F | = | 0.0000 |
| Residual | 5.42108548 | 369 | .014691289 | R-squared | = | 0.1892 |
| | | | | Adj R-squared | = | 0.1782 |
| Total | 6.68570728 | 374 | .017876223 | Root MSE | = | .12121 |

| DifLev | Coef. | Std. Err. | t | P>\|t\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| DifTang | -.0974544 | .048681 | -2.00 | 0.046 | -.1931814 | -.0017273 |
| DifSize | .2474146 | .0477289 | 5.18 | 0.000 | .1535598 | .3412694 |
| DifProf | -.6971215 | .1176237 | -5.93 | 0.000 | -.9284183 | -.4658246 |
| DifMB | .0248214 | .0067809 | 3.66 | 0.000 | .0114875 | .0381554 |
| DifLogAssets | .1932521 | .0463498 | 4.17 | 0.000 | .1021091 | .2843951 |
| _cons | .0104919 | .0067476 | 1.55 | 0.121 | -.0027767 | .0237606 |

***D) Regression results for the conventional model of leverage w.r.t the European sub-sample****. The model is specified as follows: ΔLeverage = α + β1*ΔTangibility + β2*ΔSize + β 3*ΔProfitability + β 4*ΔLog(Assets) + εi.*

| Source | SS | df | MS | Number of obs | = | 624 |
|---|---|---|---|---|---|---|
| | | | | F(4, 619) | = | 13.74 |
| Model | .709228277 | 4 | .177307069 | Prob > F | = | 0.0000 |
| Residual | 7.98703958 | 619 | .012903133 | R-squared | = | 0.0816 |
| | | | | Adj R-squared | = | 0.0756 |
| Total | 8.69626786 | 623 | .013958696 | Root MSE | = | .11359 |

| DifLev | Coef. | Std. Err. | t | P>\|t\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| DifTang | .1415965 | .0300376 | 4.71 | 0.000 | .0826086 | .2005844 |
| DifSize | .0872489 | .0292243 | 2.99 | 0.003 | .0298581 | .1446398 |
| DifProf | -.3965892 | .0847811 | -4.68 | 0.000 | -.5630827 | -.2300958 |
| DifLogAssets | -.0338133 | .03362 | -1.01 | 0.315 | -.0998363 | .0322097 |
| _cons | .0015045 | .0046951 | 0.32 | 0.749 | -.0077158 | .0107249 |

## 8) Bibliography


Akerlof, G. (1970). The Market for "Lemons": Quality Uncertainty and the Market Mechanism. *The Quarterly Journal of Economics*, 488-500.

Billet, M., & Xue, H. (2007). Share Repurchases and the Need for External Finance. *Journal of Applied Corporate Finance*, 42-55.

Frank, M., & Goyal, V. (2003). Testing the Pecking Order Theory of Capital Structure. *Journal of Financial Economics*, 217-248.

Frank, M., & Vidhan, G. (2009). Capital Structure Decisions: Which Factors Are Reliably Important? *Financial Management*, 1-37.

Graham, J. (2000). How Big are the Tax Benefits of Debt? *The Journal of Finance*, 1901-1941.

Graham, J., & Harvey, C. (2001). The Theory and Practice of Corporate Finance: Evidence from the Field. *Journal of Financial Economics*, 187-241.

Harris, M., & Raviv, A. (1991). The Theory of Capital Structure. *The Journal of Finance*, 297-355.

Helwege, J., & Liang, N. (1996). Is There a Pecking Order? Evidence from a Panel of IPO Firms. *Journal of Financial Economcis*, 429-458.

Jensen, M. (1986). Agency Costs of Free Cash Flows, Corporate Finace and Takeovers. *The American Economic Review*, 323-329.

Leary, M., & Roberts, M. (2010). The Pecking Order, Debt Capacity and Information Asymmetry. *Journal of Financial Economics*, 332-355.

Miller, M., & Modigliani , F. (1958). The Cost of Capital, Corporate Finance and the Theory of Investment. *The American Economic Review*, 261-287.

Myers, S. (1984). Capital Structure Puzzle. *The Journal of Finance*.

Myers, S. (2001). Capital Structure. *Journal of Economics Perspectives*, 81-102.

Myers, S., & Majluf, N. (1984). Corporate Financing and Investment Decisions When Firms Have Information hat Investors do not Have. *Journal of Finance*.

Rajan, & Zingales. (1995). What do we know abaut capital structure? Some evidence from international data. *Journal of Finance*, 609-631.

Shyam-Sunder , L., & Myers, S. (1999). Testing Static Tradeoff Against Pecking Order Models of Capital Structure. *Journal of Financial Economics*, 219-244.