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The Determinants of Capital Structure

A Comparison of Listed Large Capitalization Non-Financial Companies in the U.S.A. and Sweden

by

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Summary

Title: The Determinants of Capital Structure: A Comparison of Listed Large Capitalization Non-Financial Companies in the U.S.A. and Sweden
Course: BUSN89 - Degree Project in Corporate and Financial Management.
Authors: Shirley Chen Ye Ekström & Indre Kanaporyte
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Purpose: The aim of this study is to examine the determinants of capital structure via a cross-country comparison between the U.S.A. and Sweden. With the consideration of firm specific factors, the main focus is on researching country effect and macroeconomic impacts on firms' financing policy.
Methodology: Quantitative and explanatory approach and deductive reasoning are applied in this research. Panel data with period fixed effects is used to run regressions, where dependent variable is leverage, which involves three different measures (i.e. total debt to total assets, long-term debt to total assets and short-term debt to total assets) and independent variables include firm-specific factors (i.e. tangibility, firm size, profitability, dividend payout, growth opportunities and non-debt tax shield), macroeconomic factors (i.e. GDP growth, inflation, interest rate, exchange rate, supply of bank funding and demand of bank loan), dummy variable for indicating countries (Sweden = 0; The U.S.A. = 1) and dummy variables for industries.
Theoretical perspective: The theoretical review is based on the M&M Capital Structure Irrelevance Proposition, Trade-off theory, Free Cash Flow theory, Pecking Order theory and Legal Origin theory. Country characteristics of both Sweden and the U.S.A. are presented, as well.
Empirical foundation: The research is based on 45 non-financial Large Cap firms listed on OMX Stockholm in Sweden and 167 non-financial Large Cap firms listed in NYSE in the U.S.A. The analysis covers the annual observations over the 10-year period from 2004 to 2013.
Conclusion: The empirical evidences of this research prove that 1) significant difference exists in the determinants of three leverage measures (total debt ratio, long-term debt ratio and short-term debt ratio); 2) country effect does exist when firms in different countries decide financing policy; 3) industry has stronger explanatory power on leverage compared to the macroeconomic factors; while considering all the significant variables (at 5% significance level) in the regressions, industry effect is revealed to be more influential on capital structure; 4) Trade-off theory and Free Cash Flow theory provide more explanation than Pecking Order theory.

Abstract

The aim of this study is to examine the determinants of capital structure via a cross-country comparison between the U.S.A. and Sweden. With the consideration of firm specific factors, the main focus is on researching country effect and macroeconomic impacts on firms' financing policy. Including both country and macroeconomic factors in the research allows for having a new approach on the topic. The research is based on 45 non-financial Large Cap firms listed on OMX Stockholm in Sweden and 167 non-financial Large Cap firms listed in NYSE in the U.S.A. The analysis covers the annual observations over the 10-year period from 2004 to 2013. The empirical evidences of this research prove that there are significant differences in the determinants of three leverage measures (total debt ratio, long-term debt ratio and short-term debt ratio). Furthermore, the study reveals that country effect does exist when firms in different countries decide financing policy. The research also indicates that industry presents stronger explanatory power on leverage compared to the macroeconomic factors; while considering all the significant variables (at 5% significance level) in the regressions, industry effect is revealed to be more influential on capital structure. Last but not least, the study shows that Trade-off theory and Free Cash Flow theory provide more explanation than Pecking Order theory.

Keywords: capital structure, leverage, country effect, macroeconomic determinants, panel data regression

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1 Introduction

A brief background related to capital structure is firstly presented in this section. Then the problems and research gaps involving existing empirical studies on capital structure are discussed, which leads to the purpose of this study and the specific research questions. In the end, an overview of limitations and the outline of the paper are presented, as well.

1.1 Background

The capital structure decision, i.e. the choice between debt and equity, has long been a hot topic for finance literature. Since Modigliani and Miller first published their capital structure irrelevance proposition in 1958, extensive research in finance literature have been done for finding out what determines a firm's capital structure. However, there is no consensus on this topic and there are still debates about firms' capital structure decision.

Researchers take various perspectives for studies involving capital structure. Majority of research works are focusing on the impact of firm specific determinants on capital structure decision. Some researchers exert their efforts on providing various modeling for optimal capital structure, such as the financial structure industry equilibrium model by Mackay and Philips (2002); while some other studies reveal that firms adjust their capital structure over time based on various firm specific and macroeconomic situations, and thus the capital structure choice often presents a certain pattern. This is exemplified by Korajczyk and Levy (2002) in their research work: "aggregate equity issues vary pro-cyclically and aggregate debt issues vary counter-cyclically for firms that access public financial markets" (p.3). Additionally, they claimed that firms with high level of financial constraints do not present an obvious counter-cyclical pattern on issuing debt; but both macroeconomic conditions and firm specific factors are the driving force behind the capital structure decision (Korajczyk & Levy, 2002, p.3). Such a proposition is confirmed by the model developed by Hackbarth et al. (2006).

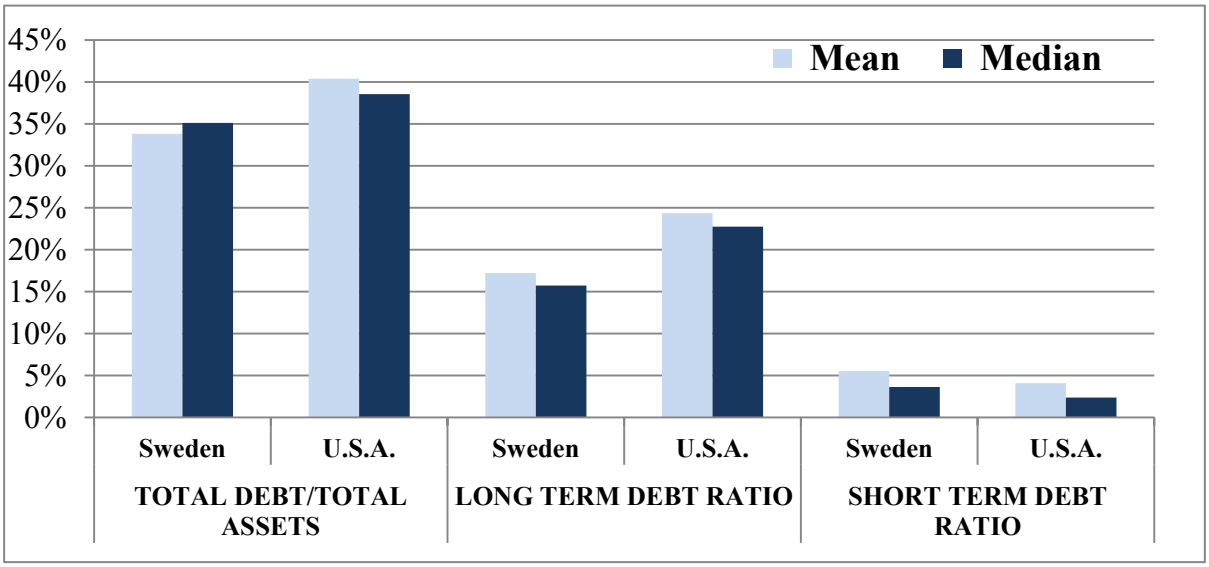
Except for considering the firm specific and macroeconomic factors, another important determinant for capital structure decision worthwhile mentioning is the role of countries, such as the development of economy, institutional framework and financial system. Different countries have different economic structures, legal system and public governance. Each country's financial sector's contribution for firms' debt financing and their ability for dealing with debt when facing financial distress or bankruptcy are also different. Those factors have a strong impact on firms' capital structure decision. Such a proposition has support from many

researchers (Rajan & Zingales, 1995; Booth et al. 2001; Antoniou et al. 2008; Kayo & Kimura, 2011; Fan et al. 2012) who offer evidence that country specific determinants have impact on the firm's capital structure decision.

Wald (1999) analyzes and compares empirical data from five countries with different institutional framework and financial system in order to test capital structure theories within an international context. He presents indirectly that various country specific institutional framework have significant impact on capital structures decision via different solution to agency problem and information asymmetry problem (Wald, 1999, p.161). Fan et al. (2012) point out that the types of financial system and institutional origin, the strength of law and the level of corruption in government are often strongly associated with the corporate debt ratio. Countries with common law system, such as the U.S.A and U.K., are generally considered to be stricter and have a higher transparency, a stronger protection of shareholder and creditor rights compared to countries with civil law system. According to Demirguc-Kunt and Levine (1999), common law countries have a stronger tendency to be more market-based; while countries with civil law tradition, such as France, Germany, Sweden and Japan tend to have bank-based system. The financial system is also associated with the firms' ownership concentration. A relative higher degree of ownership concentration characterizes firms in bank-based countries.

In a bank-oriented economy, banks play an important role, such as gathering information and monitoring managers' self-serving behavior, which effectively mitigate the agency problem and lower the agency costs. Therefore, it is reasonable to believe that Swedish firms are generally higher levered than American firms since Swedish banks have significant influences on firms; while the relationship between banks and corporations in the U.S.A. is more arms' length market based. However, some researchers, such as Venanzi et al. (2014), claim that the debt ratio is expected to be higher with firms under market-based financial system. In addition, *Figure 1* below (based on the collected data sample of this paper) shows that firms in the U.S.A. have higher total debt ratio but lower short-term debt ratio. The contradictory result makes it worthwhile conducting a cross-country analysis on capital structure choice.

Figure 1. Mean and Median of Leverage Ratio for Large Cap Non-Financial Firms in Sweden and the U.S.A. during 2004-2013



1.2 Problem Discussion

Numerous perspectives are taken for capital structure research; while the empirical studies mainly are dedicated to single country study about the role of firm specific factors on the choice of financing mix, which is consistent with the assertion from Antoniou et al. (2008) about two major gaps existing in theoretical literature of capital structure study: 1) the firm specific factor alone are often the focus of the major research works; 2) few research works dedicated to revealing the relationship between capital structure decision and the types of financial system, i.e. bank-based or market-based economy. Therefore, seeking to contribute to the empirical study on capital structure if not mitigating the above mentioned gaps in theoretical studies, this paper, by conducting a cross-country analysis, concentrates on identifying the contribution of macroeconomic conditions and the country specific factors, such as the financial orientation of the economy, to capital structure choice.

Macroeconomics should be a major concern of management since firms operate under certain macroeconomic environment and the macroeconomic changes, which are beyond the control of management, affect firms' performance (Oxelheim & Wihlborg, 2008, p.3). Macroeconomic variables are interdependent and have strong impact on firm's performance via various channels. Being aware of and having a better understanding of macroeconomic shocks and disturbances would help the management minimize the macroeconomic uncertainty and make timely appropriate financial decisions (Oxelheim & Wihlborg, 2008).

In terms of country effect, it is generally accepted in the academic studies that country effect is more linked to firm-specific determinants than to industry-specific determinants (Antoniou et al. 2008; Kayo & Kimura, 2011; Venanzi et al. 2014). However, according Venanzi et al. (2014), if the country effect is not omitted from regression, it is often merged into the interpretation of industry effect, since it is usually "included as industry dummies (fixed industry effect), no matter which characteristics they [country effect and industry effect] differ for" (Venanzi et al. 2014, p.4). Additionally, Venanzi et al. (2014) include macroeconomic scenario in country characteristics. This paper separates country dummy and macroeconomic variables from the industry dummies and tries to detect their impact on capital structure separately.

Regarding cross-country comparative analysis, it is not as prevailing as single-country analysis among the empirical studies and only a few researchers, such as Wald (1999), Fan et al. (2010) and Venanzi et al. (2014), take the focus on a cross-country comparison. Wald (1999) chooses relatively big economy countries (France, Germany, Japan, U.K. and the U.S.A) as the research objectives and reveals the links between firms' capital structure decision and the country specific legal and institutional characteristics. Fan et al. (2010) examine firms in 39 countries, both developed and developing countries, in order to disclose the impact of institutional environment on leverage and debt maturity ratios. However, Venanzi et al. (2014) analyze small-medium companies operating in bank-based civil law countries within European Union.

This research is thus inspired by the above mentioned research and chooses two countries, the U.S.A and Sweden, as the research objectives in order to study the country specific and macroeconomic variations' impacts on capital structure. It is interesting to conduct a cross-country analysis on these two particular countries due to their differences in economy size, institutional origin and financial system. The classification of countries with different law origin and financial system is based on the findings of La Porta et al. (1996). The U.S.A is a big economy with common law origin and a market-based financial system. However, Sweden is a relatively small economy with civil law origin characterized with bank-oriented financial system.

Compared to single-country study, international comparison has certain advantages, which are also the driving force behind the decision of cross-country analysis design. The cross-country comparison examines the legal and institutional variations across countries and reveals the links between those variations and the choice of financing mix via connecting with the

classical capital structure theories, such as agency theory. Wald (1999) proclaims as well that cross-country comparison "builds a correspondence between legal and institutional differences in corporate governance and capital markets" (p.162).

1.3 Purpose

This paper examines the determinants of capital structure via a cross-country comparison between the U.S.A. and Sweden. With the consideration of firm specific factors, the main focus is on researching country effect and macroeconomic impacts on firms' financing policy by providing the answers for the following questions.

- How do firm specific factors affect different measures of leverage in terms of total debt ratio, long-term debt ratio and short-term debt ratio? Which classical capital structure theories are they consistent with?
- Which and how macroeconomic factors do affect the firms' choice of capital structure?
- In terms of country effect, how does financial system orientation (i.e. bank-oriented or market-oriented) affect the capital structure? Is it true that Swedish firms in a bank-oriented economy have higher leverage than American firms in a market-oriented economy?

1.4 Research Limitations

There are some possible limitations existing in this paper. Firstly, the sample involves very few companies in a big range of industries from both countries. For example, there are several industries that include only two or three firms. Hence, this could provide a less reliable result for the industry impact on the capital structure choice. Secondly, another potential problem leading to less reliable results is using book value instead of market value.

The choice of leverage proxy makes the third limitation, since we chose to use total assets in all three ratios of debt instead of total capital. However, some researchers, such as Rajan and Zingales (1995), point out that total debt to total capital ratio probably provides the best view of firms' past financing decision, since total assets might lead to a potential risk of biased results due to the level of trade credit included, such as unpaid bills and makes up bulk of accounts payable (Song, 2005, p.7).

The outliers in dividend payout ratio account for the fourth limitation. The outliers are not eliminated from the sample since they are mostly related to the Swedish firms, which have a

limited amount of observations. The removal of any firm will thereby result in less representative data. On the other hand, keeping those extreme values might lead to biased results.

Last but not least, the possible endogeneity problem might still exist even if some conventional method for tackling endogeneity problems, such as lagged variables and fixed effect model, are used in this research.

1.5 Outline of the Thesis

The paper is constructed in the following way. Section 2 presents relevant theories of the capital structure and overviews previous empirical studies on the capital structure. In the same section, the U.S.A's and Sweden's specific characteristics are outlined, as well. Section 3 describes and explains methods used in this study. Sample choice, variables, the validity and reliability of this research are also discussed here. In Section 4, the findings are presented and analyzed using the theories mentioned in Section 2. Section 5 concludes the paper by summarizing the study and giving suggestions for further research.

2 Literature Review and Country Characteristics

This section presents theories about capital structure, such as M&M Capital Structure Irrelevance Proposition, Trade-off theory, Free Cash Flow theory and Pecking Order theory. Besides, Legal Origin theory and country characteristics are discussed. Furthermore, the previous empirical researches related to the theories are overviewed.

2.1 Literature Review

2.1.1 M&M Capital Structure Irrelevance Proposition

The Modigliani and Miller Irrelevance Theorem (M&M theorem), known since 1958, is a fundamental theory for the later modern corporate finance theories about the capital structure determinants (Villamil, 2008, p.1) and it is set under the five assumptions of an ideal capital market, which state that: (1) capital markets are frictionless, i.e. there are no transaction costs or no taxes; (2) all market participants share homogeneous expectations, i.e. all value-relevant information is available; (3) all market participants are atomistic, i.e. the market price could not be affected by any market participants; 4) the firm's investment program is fixed and known to all investors; and 5) the firm's financing is fixed, i.e. the capital structure is fixed (Ogden et al. 2003, p.30-31).

The main idea of M&M theorem is revealed by several propositions. One of them indicates that "[t]he market value of a firm is constant regardless of the amount of leverage (i.e. debt relative to equity) that the firm uses to finance its assets" (Ogden, 2003, p.31). In other words, the firm's market value "depends only on the income generated by its assets" (Modigliani, 1980, p.xiii) and it (the value of the firm) cannot be changed by its management's financing decisions. The second M&M proposition suggests that if cost of equity increases, then debt-to-equity ratio rises, as well, indicating that the weighted average cost of capital is a linear function of the leverage (Villamil, 2008, p.1).

In addition to these propositions, holding the same perfect capital market assumptions, Miller and Modigliani (M&M) (1961) present the irrelevance of dividend policy to the value of firm's equity "as long as the firm's capital investments and debt policy are fixed" (Ogden et al. 2003, p.462). Miller and Modigliani (1961) add that dividend policy is also irrelevant to investors, since investors are able to regulate the stock's return by themselves because: 1) if

they feel that firm's dividends are not high enough, and if they need more money than they can receive from dividends, investors can sell their stocks seeking to get the expected amount of cash (Ogden et al. 2003, p.463); and 2) if investors find that dividends are high enough and now they do not need these received cash from dividends, they can reinvest it and buy new shares (Ogden et al. 2003, p.463).

After all, some researches have shown that the M&M theorem has some weaknesses. For example, Modigliani and Miller (1963) claimed that taxes also play an important role in making decisions about the capital structure because firms can benefit from the tax shield of debt by choosing more debt. Moreover, they suggest for a company to hold 100% of debt. Hirshleifer (1966) and Stiglitz (1969) argue against the M&M theorem published in 1958 by pointing out that the reality is not perfect since there is not just one price in the market (i.e. negate that market participants are atomistic), and that a financial distress and bankruptcy costs are possible, as well (i.e. frictionless market assumption is denied). Besides, they disprove that "firm's investment program is fixed and known to all investors" (Ogden et al. 2003, p.31). Myers and Majluf (1984) present the information asymmetry by giving arguments against one of the ideal capital market assumptions. In addition, some other theories discussed in the following subsections are also contradictory to M&M theory.

To summarize, many elements, including taxation and transaction costs (relevant to Trade-off Theory), information asymmetry and adverse selection (discussed in Pecking Order theory), agency costs (analyzed in Free Cash Flow theory), etc., were not taken into consideration by Modigliani and Miller in 1958. However, M&M irrelevance theorem is still relevant and could not be neglected or rejected in the imperfect world because it leads to a development of further theories. And as a support, Miller (1988) points out in his work that "[s]howing what *doesn't* matter can also show, by implication, what *does*" (p.100).

2.1.2 Trade-off Theory

The Trade-off theory is a theory that relaxes one of the M&M theorem's assumptions that capital markets are frictionless, indicating that transaction costs and taxes do matter to the decision of capital structure. Hence, the Trade-off theory is relevant to this study of capital structure.

Before going into more detailed discussion of this theory, it is important to mention that this theory consists of two subsections: the Static Trade-off theory, which is based on "a single period trade-off between the tax benefits of debt and the deadweight costs of bankruptcy"

(Frank & Goyal, 2007, p.9) and the Dynamic Trade-off theory, which states that "the firm has a target level of leverage and if deviations from that target [the balance of tax savings against bankruptcy costs] are gradually removed over time" (Frank & Goyal, 2007, p.9). Since the rebalancing time to the optimal capital structure is not estimated, this paper focuses just on the Static Trade-off theory.

To start with, it should be noted that Static Trade-off theory was created seeking to negate the Miller and Modigliani's (M&M) study in 1963, which proposes a capital structure of 100% of debt. Several researchers, such as Baxter (1967) and Kraus and Litzenberger (1973), show that a capital structure of 100% of debt is too costly for firms due to the bankruptcy costs. However, they do not deny the fact that firms could benefit from a tax shield. Therefore, the Static Trade-off theory suggests an optimal capital structure "by balancing the advantages of borrowing, mainly tax savings, with the cost associated with borrowing including bankruptcy costs" (Abdeljawad et al. 2013, p.102), where bankruptcy costs could be also considered as a deadweight cost, according to Haugen and Senbet (1978). Moreover, the Static Trade-off theory states that firms are already in their optimal point; and, in the case of any deviation from the optimal capital structure, firms should rebalance their debt-to-equity ratio, seeking to have the highest market value of the firm (Iqbal et al. 2012).

Additionally, the Static Trade-off theory claims that higher leverage should be held by large, profitable and stable firms, since they can take advantage of the interest tax shield; while firms with high bankruptcy costs and firms under double taxation on equity financing or high personal tax should use less debt (Ghosh et al. 2012).

To summarize, the Static Trade-off theory indicates that transaction costs and taxes do matter to the decision of capital structure and claims that every firm has an optimal capital structure, which is determined by the trade-off between the borrowing benefits and borrowing costs.

2.1.3 Free Cash Flow Theory

As mentioned earlier, Modigliani and Miller (M&M) model is theoretically valid. However, in practice, a firm's financial decision will not be irrelevant to firm's performance, if the assumptions of perfect capital market are relaxed and the agency problem is taken into consideration. Therefore, the agency problem and agency costs are important for capital structure decision. Generally speaking, Free Cash Flow theory is a derivative of Trade-off theory, which deviates from the key features of Trade-off theory (taxation and bankruptcy), but introducing the agency problem and agency costs (Frank & Goyal, 2007, p.11).

The Free Cash Flow theory is closely linked to the agency theory, which can be traced back to the 18th century when Smith (1776) mentioned in *Wealth of Nations* that a conflict of interests arises between owners of the wealth and managers, who deal with other people's wealth. Berle and Means (1932) developed the agency theory and proclaimed that the source of agency problem is the separation of ownership and control (Berle & Means, 1932, p.66-68). Jensen and Meckling (1976) defines the agency relationship as "a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent" (p.5). In a firm, the principles are thus the owners/shareholders of the firm and the agents are managers, who are hired by the principles to manage the firm.

The management is supposed to act in line with the shareholders' interests and ensure the shareholders' interests are satisfied. However, the managers (agents) have their own interests and have intentions to take actions to maximize their own interests instead of the shareholders' interests (Jensen & Meckling, 1976, p.5). Managers' self-serving behavior includes employing the excess cash flow available for empire building and investing in NPV negative projects, which leads to overinvestment problem. In order to align the interests of two parties and decrease the agency problem, agency costs in forms of monitoring costs, bonding costs and shirking costs are generated (Jensen & Meckling, 1976, p.6).

Agency theory is important to a firm's financial structure decision since the free cash flow has a substantial impact on agency costs. Agency conflicts involving managers' control of free cash flow have thus a firm linkage to a firm's capital structure decision. The agency costs of free cash flow can be reduced via introducing debt into the organization structure and motivate managers to disgorge the free cash available for empire building or investing in low NPV or even negative NPV projects (Jensen, 1986; Pinegar & Wilbricht, 1989; Lubatkin & Chatterjee, 1994; Roshan, 2009).

Jensen's (1986) control hypothesis for debt creation indicates that debt has a control or monitoring effect on managers' discretionary spending. These control effects of debt have significant impact on capital structure (Jensen, 1986, p.324). Managers have the control over the future free cash flows, but they hold a weak promise to distribute the excess cash flow (Jensen, 1986, p.324). Debt enables an effective binding between managers' promise to the actual actions of paying out future cash flow. Therefore, "debt reduces the agency costs of free cash flow by reducing the cash flow available for spending at the discretion of managers" (Jensen, 1986, p.324).

Jensen's control hypothesis has support from other theorists. Lubatkin and Chatterjee (1994) also point out that debt creation facilitates a more efficient business operation since the free cash flow are used for fulfilling the debt obligation instead of investing in negative NPV projects. According to Ross (1977), in a world with information asymmetry, debt is considered as a costly signal to the market for showing that firms have a stable cash flow (p.29). Stulz (1990) finds that a firm's financing policy is critically dependent on both the firm's free cash flow and its investment opportunities. Firms with negative expected free cash flow and poor investment opportunities tend to use debt to ensure that managers have less control on free cash flow; while firms with positive expected free cash flow and good investment opportunities more prone to issue equity for avoiding underinvestment problem (p.4).

Stulz (1990) continues to argue that debt payments have both positive and negative effects on shareholders' wealth since managers are obliged to pay off debt and reduce investments on non-profitable project; while the negative effects come from the potential underinvestment due to obligation on debt payments (p.4). The increase of debt also leads to an increase of agency costs of debt, which in turn increases the expected costs of bankruptcy. As a result, the optimal capital structure is a trade-off between benefit of debt and cost of debt, i.e. the firm's value is maximized at the point where the marginal costs of debt equals to the marginal benefit of debt (Jensen, 1986, p.324) and "there is a debt payment that maximizes firm value" (Stulz, 1990, p.4).

In summary, Free Cash Flow theory suggests that debt reduces the agency costs generated by the managers' control of future cash flow. Consistent with Trade off theory, Free Cash Flow theory proposes that optimal capital structure is based on the trade-off between benefits and costs of debt.

2.1.4 Pecking Order Theory

The Pecking Order is another theory relaxing one of the M&M theorem assumptions that all value-relevant information is available. The Pecking Order states that information asymmetry and adverse selection costs also exist and they lead to a different choice of capital structure. Due to these reasons, Pecking Order theory is discussed in this paper.

When it comes to the Pecking Order theory, it could be seen that it contradicts the Static Trade-off theory. The Pecking Order theory argues that there is no optimal capital structure and that firm, instead of prioritizing external financing, chooses the internal financing first.

The choice is based on the adverse selection and information asymmetry problems caused by the fact that managers have more information than investors do (Myers, 1984; Myers & Majluf, 1984). Holmes and Kent (1991) add that "[o]wner/managers are strongly averse to any dilution of their ownership interest and control (which are normally one and the same)" (p.145-146), which means that managers are willing to use more retained earnings and excess cash instead of issuing new stocks, especially the ones with voting rights.

Furthermore, Holmes and Kent (1991) and Hamilton and Fox (1998) reveal that in the case of insufficient internal funds, managers choose short-term debt first, as long as it does not require collateral. If the funding is still not enough, then they will take the long-term debt with collateral. Myers (1984) shows that collateralized debt has certain advantages over equity since it minimizes information asymmetry, and according to Baskin (1989), since its transaction costs are less than the costs of issuing equity.

The last choice of firms is external equity (Huang & Ritter, 2009; Bistrova, 2011), which involves the adverse selection problem. Since managers have better information about the real situation and the true value of the firm than outside investors do, they tend to issue equity instead of using retained earnings or debt. This is particularly done by overvalued firms. But if outside investors feel lack of information and they consider equity riskier, they thereby discount the issuing firm's stock price (Myers, 1984; Myers & Majluf, 1984). Consequently, managers would tend to issue less equity and it leads to another argument supporting the preference of retained earnings or debt over equity.

To summarize, the Pecking Order theory mainly focuses on information asymmetry and adverse selection problems that make managers select the least costly and least risky type of financing − internal financing (excess cash and retained earnings). If this way of funding is not enough, then firms firstly choose a risk-free debt, and the last priority is given to external equity.

2.1.5 Legal Origin Theory

The Legal Origin is another theory worth mentioning since it argues that the difference in legal origins leads to the systematic difference in legal rules and regulations across countries, and this difference has impacts on the social and economic outcomes. Therefore, the country specific factors, such as legal system, investor protection, ownership concentration, etc., could influence capital structure (La Porta et al. 1996). Based on these factors, La Porta et al. (1996) group countries into two main categories. The first one, known as the common law, is

originated from England and was spread over England's colonies, including the U.S.A. (La Porta et al. 1996). The second one, known as the civil law, is originated from ancient Roman law and was spread over Europe but also covers a large part of the world (La Porta et al. 1996). The civil law is usually subcategorized into three parts: the French civil law, the German civil law and the Scandinavian civil law (La Porta et al. 1996).

Regarding the comparison of legal origins, La Porta et al. (2008) show that the common law countries are based on judicial opinions, while the civil law system is based on "statutes and comprehensive codes as primary means of ordering legal material" (La Porta et al. 2008, p.289) meaning that the property rights are less secured and that the law enforcement is less developed in the civil law countries. Moreover, La Porta et al. (1996) reveal that in common law system investors have stronger protection and are more secured from the possible loss compared with the civil law system. This results in "improved financial development, better access to finance, and higher ownership dispersion" (La Porta et al. 2008, p.298).

According to Demirguc-Kunt and Maksimovic (1999) and Qian and Strahan (2007), countries with capital market oriented financial system are prone to have more long-term debt without collateral; while bank based countries commonly use more short-term debt due to the lower protections of the investors. La Porta et al. (1999) also point out that "the state has a relatively greater role in regulating business in civil law countries than in common law ones" (p.12). They proclaim that the civil law system usually has less efficient corporate governance due to the same reasons mentioned above.

To summarize, the Legal Origin theory suggests that legal rules and regulations differ systematically due to the different legal origins and the difference in legal rules and regulations have significant impacts on social and economic outcomes. The theory groups countries into two categories: the common law countries, which are often capital market based and tend to use long-term debt, and the civil law countries, which are bank based and tend to use short-term debt.

2.2 Review of Empirical Studies on Capital Structure

Trade-off Theory or Pecking Order Theory

The field of capital structure research is often dominated by the Trade-off theory versus the Pecking Order theory and the results of the empirical studies are not consistent. Bradley et al. (1984) and Auerbach (1985) support the Trade-off theory and conclude that firms appear to

achieve target debt ratio. Frank and Goyal (2003), testing Pecking Order theory based on a broad cross-section data, conclude that the results deviate from the implications of Pecking Order theory. Furthermore, they proclaim in a later research that no current model seems to be able to fully explain firm's capital structure choice. However, Trade-off theory appears to be a more powerful explanation due to evidences showing that "direct transaction costs and indirect bankruptcy costs appear to play important roles in a firm's choice of debt" (Frank & Goyal, 2007, p.1).

Titman and Wessels (1988) present mixed results regarding Trade-off theory. By examining European firms' motivations of issuing convertible debt, Bancel and Mittoo (2004) also present a mixed support for both theories. However, study from Shyam-Sunder and Myers (1998) support Pecking Order theory. In addition, according to Graham (2000), large firms with high profit use less debt, which is against Trade-off theory. He further points out that Trade-off theory has difficulties in explaining a firm's financing choice due to a far higher estimated tax benefit than the estimated financial distress costs.

Since Ross (1977) shows that low quality firms use less debt than high quality firms, the idea that capital structure decision takes the monitoring and signaling effect of debt into consideration is confirmed by many studies. Yan (2009) proves that a firm's financial policy is used as a form of signaling via examining the abnormal return of debt issuing, especially the issuing of convertible bonds (p.36). Zhao et al. (2004) test signaling effect of debt and the Pecking Order theory via using the data from farming business. The result is significantly consistent with both theories (p.22).

Regarding financial flexibility, Graham and Harvey (2001) point out that two most important determinants of capital structure are financial flexibility and good credit rating (p.187). They also find evidences to support both Trade-off and Pecking Order theory but less support for impacts of asymmetric information, free cash flow, personal tax and transaction costs on capital structure choice. Based on a survey of European managers, Bancel and Mittoo (2004) examine the motivation of issuing convertible debt and conclude that financial flexibility has a significant impact on issue of debt.

Macroeconomic Factors

With regard to the impact of macroeconomic factors on firms' capital structure, the model developed by Hackbarth et al. (2006) confirms the evidence provided by Korajczyk and Levy (2002) that debt issues are counter-cyclically (Hackbarth et al. 2006, p.543). The results of

their study, supporting the predictions of Shleifer and Vishny (1992), also suggest that "the firm's debt capacity depends on current economic conditions … when the firm can adjust its capital structure dynamically, both the pace and the size of the adjustments depend on current economic conditions" (Hackbarth et al. 2006, p.543). According to Frank and Goyal (2007), macroeconomic conditions serve as explanatory factors behind the capital structure choice. For example, firms tend to increase the debt ratio when the expected inflation increases. Camara (2012) also suggests that debt issuing depends on both firm characteristics and the macroeconomic factors, such as inflation (p.117)

Bank vs. Market Oriented Financial System

The pioneering study on the impact of institutional difference on capital structure starts from Rajan and Zingales (1995), who analyze the empirical data from each of the G-7 countries for proving that "institutional differences may drive whatever aggregate differences in capital structure that do, indeed, exist" (Rajan & Zingales, 1995, p.1423). Booth et al. (2001), by analyzing firms in developing countries, also suggest that country specific factors, such as institutional features, are reasons behind various capital structure choices across countries.

According to Antoniou et al. (2008) and Kayo and Kimura (2011), firm specific factors' impact on capital structure is significantly affected by the country's law origin and financial system. Therefore, a firm's financing decision is the result of combination of both firm specific factors and country specific factors (Antoniou et al. 2008, p.25). However, Fan et al. (2012) claim that a firm's financing policy is more affected by the institutional environment than by industrial factors. The legal, taxation system and banking system have a profound impact on firms' leverage and debt maturity ratios. "Common law countries have lower leverage and use more long-term debt and firms in countries with an explicit bankruptcy code have higher leverage and use relatively more long-term debt" (Fan et al. 2012, p.30).

The results of Fan et al. (2012) are supported by the study of Venanzi et al. (2014), who examine countries with homogeneous characteristics in terms of law origin and economy orientation. They find out that a firm's financing policy is significantly influenced by its country characteristics directly and indirectly (Venanzi et al. 2014, p.26). They also point out that among all the country specific determinants of capital structure, institutional framework is the most influential factor (Venanzi et al. 2014, p.26). The quality of the law system ensures the effectiveness of the enforcement of the law, such as the protection of the investors, which in turn has an influential impact on a firm's financing decision. Therefore, firms in

countries with a strong creditor-oriented law system have higher leverage; while a highly protective law system towards shareholders makes the firms employ less debt. Regarding economy orientation, firms with higher leverage often appear in the countries with more developed bank system (Venanzi et al. 2014, p.26).

2.3 Country Characteristics

2.3.1 The United States of America

The United States of America (U.S.A.) is the largest economy (Smialek, 2015), the third largest exporting country (Economics and Statistics Administration, 2014, p.2) and the second largest trading country in the world with a negative balance, meaning that it imports more goods and services than exports (Financial Times, 2014). However, export plays an important role in the U.S. economy and help the U.S. economy to come out of the recent economic recession (Economics and Statistics Administration, 2014, p.4).

The U.S.A. belongs to the common law origin indicating that it has a well-developed law system and a better law enforcement, which lead to a higher investor protection and an easier access to finance (La Porta et al. 1996; La Porta et al. 1997; La Porta et al. 2008). This implies that the U.S.A. is more capital market based than bank based. However, it should be noticed that the U.S. creditors are also well protected, especially if we take Chapter 7 and Chapter 11 into consideration. For example, the Chapter 11 say that the creditors have higher voting rights and priority against shareholders indicating that after selling of the firm's assets, the payments to creditors are covered firstly and just then it is compensated for shareholders (Sec.gov, 2009).

Another point worth mentioning is the tax system, especially the tax code to dividends. The tax regime is generally classified into three categories: classical tax system, dividend relief tax system and dividend imputation tax system. The U.S.A. belongs to the classical tax system, which indicates a double taxation on dividend payment, i.e. dividends are taxed not only at personal level but also at the corporate level (Fan et al. 2012, p.11). When it comes to the financial crisis in 2008-2009, it could be noticed that dividends were the first thing that the U.S. firms decreased in order to lower losses. If the dividends cut did not help, and there were no other possibilities to avoid the financial distress, then the Chapter 11 was filled.

2.3.2 Sweden

Sweden is a relatively small economy but has a great significance on world economic system due to its special economic model called Nordic model (Watkins et al., 2006). The Swedish economy is characterized of a large portion of foreign trade, a generous universal welfare system, and a relatively high income tax. As a Scandinavian civil law country, Sweden has a legal system characterized with the stakeholder system, strong bank influences and less protection of external investors. Regarding the enforcement of laws, especially the debt contracts, both the U.S.A. and Sweden have an explicit bankruptcy code that clarifies and limits creditors' rights and claims. *Table 1* presents the creditor/debtor orientation of corporation laws, which shows that both countries sit at the upside of the list for creditor protection. However, Swedish law is more creditor oriented compared to the U.S.A., which indicates that management in Swedish firms would have a stronger incentive to avoid financial distress (Buttwill, 2004, p.7).

Table 1. Creditor Orientation of Corporate Insolvency Law

Scale*	Country
1	Ex British colonies, e.g. Hong Kong, Singapore and some other 60 states
2	Australia, England and Ireland
3	Germany, Netherlands, Indonesia (and other former Dutch states), **Sweden** and Switzerland
4	Scotland, Japan, Korea, New Zealand and Norway
5	**United States** and Canada except Quebec
6	Austria, Denmark and South Africa
7	Italy
8	Greece, Portugal, and most Latin America Countries
9	Belgium, Luxembourg and ex French colonies
10	France

* Scale 1 = the most creditor-oriented; Scale 10 = the least creditor-oriented (i.e. the most debtor-oriented)
Source: *Wood, 1995; Wihlborg & Gangopadhyay, 2002; Buttwill, 2004*

With respect to the tax code of dividends, Sweden belongs to the dividend relief system, in which dividends are taxed at the personal level with a reduced rate, and it is different from the U.S.A., since it has a double taxation on dividend payment (Fan et al. 2012, p.11). Sweden also has a bank-based financial system involving few major external non-bank financial actors, which is a striking contrast to the financial system in the U.S.A. In the U.S.A, there are many different types of banks and non-bank financial actors. Besides, there is a low public trust in the state financial system and its actors (Jonung, 2009, p.16-17). The bank resolution policy

and the profitability of banking system facilitate the rebound of Swedish economy during the current financial crisis (Jonung, 2009, p.14).

The bank crisis during early 1990s had a severe impact on Swedish economy. It ended up with a series of governmental modernization of economic management aiming at stabilizing economy, including transition from demand regulation to supply stimulation, deduction of state expenditure and taxation, adoption of the floating exchange rate and capital infusion to the banking system (Krivorotko, 2009, p.4). As the Swedish economy stumbled out of the crisis and enjoyed a fairly long-term upswing brought by an ordered fiscal house, the strong exports, and increased domestic demand, almost all the other developed countries were paralyzed by a new round of global downturn of 2008-2009. Although Swedish economy slid into the global financial crisis as well, it felt less impact of the recession compared to other major economies (Irwin, 2011; Calmfors, 2012). Since Sweden is traditionally a bank-oriented economy, the system-based banks contribute significantly for the rapid bouncing back of economy during the recent recession.

3 Data and Modeling

This chapter introduces the method used in the study. First of all, the choices of research approach and research design are presented and the motives for that choice are argued. Then the data collection process and the source of data are illustrated. Furthermore, the selection of variables and hypotheses are discussed. Afterwards, the data processing is demonstrated. Finally, the reliability of sources and validity of data are argued, as well.

3.1 Research Approach

Seeking to answer the research questions, which are presented on section *1.3 Purpose*, both quantitative and explanatory research approaches are used. Quantitative method is beneficial since it gives more objective and reliable results. The soundness of results arises from the fact that numerical values are used and these values are independent of us as researchers. Numerical values also have the benefits of involving longer periods of time in the research and enabling researchers to analyze data from different angles. What is more, quantitative method makes it possible to compare our findings with already existing theories, estimate the consistence of these theories, and then test our hypothesis.

Explanatory research method is used to explain our results, especially, when it comes to the relationship between capital structure and its determinants (as firm specific, country specific and macroeconomic factors). Since we included a bit different variables compared with other academic researches, we believe that explanatory method is appropriate in this paper.

3.2 Research Design

Seeking to answer the research questions in an ordered framework, our research follows a deductive reasoning. First of all, relevant theories and other academic findings are discussed. Secondly, hypotheses are formulated for variables based on these theories and our beliefs. Thirdly, data is analyzed and, finally, the outcomes are compared with our expectations in order to specify whether regression results are consistent with our hypotheses or not.

3.3 Data Collection and Source

The primary source of the collected data is Thomson Reuters DataStream, which consists of both macroeconomic data and firm specific financial data across a wide range of industries around the world. OECD StatExtract Complete Database, which includes statistical data across many OECD's database, is used for retrieving certain country specific data, such as

bank deposit and corporate sector's bank loan. The full lists of large capitalization (Large Cap) companies in both Sweden (53 companies) and the U.S.A. (283 companies) are retrieved from the NASDAQ online database. The financial firms are excluded from the sample because they usually have different operating structure and firm characteristics from non-financial firms. If a company is listed separately with both A and B stocks on the stock market, which is especially relevant for Swedish firms, they are not considered as different firms and just one is selected, since A or B stock of a firm only represents the different types of stocks of the same firm that shares the same characteristics. The sample of firms selected is restricted to non-financial Large Cap firms listed on the stock exchange market of each country, i.e. 45 non-financial Large Cap listed on OMX Stockholm in Sweden and 167 non-financial Large Cap listed on NYSE in the U.S.A. are chosen.

The analysis covers the annual observations over the 10-year period from 2004 to 2013. In order to avoid that too many missing observations might lead to less reliable result, firms with more than five missing observations are excluded from the sample. As a result, 45 Swedish firms and 167 American firms are selected. The final sample contains 212 firms in two countries with 1960 observations in total.

Regarding the selection of variable measurement, proxies for all variables are based on previous relevant capital structure studies, except the two country specific variables, i.e. bank deposit to GDP ratio and corporate sector's bank loan to GDP ratio. These two ratios are believed to be able to reflect the financial system orientation of a country and they are estimated manually by using data retrieved from OECD StatExtract Complete Database. In terms of the firm specific variables, it is important to mention that ratios are used in order to avoid the possible discrepancy or bias caused by currency conversion and the natural logarithm helps to control for both non-linearity and heteroskedasticity problems (Salami & Iddirisu, 2011, p.83). In contrast to macroeconomic data that are directly retrieved from the Thomson Reuters DataStream, all ratios or logarithms, except total debt over total assets ratio, are computed manually, since they are not directly observable in Thomson Reuters DataStream.

3.4 The Variables

The dependent variables, as the proxy for leverage, include three ratios: total debt to total assets, long-term debt to total assets and short-term debt to total assets. The independent variables are grouped into two categories: 1) firm specific variables, 2) country specific and

macroeconomic variables. Regarding firm specific determinants of capital structure, tangibility, firm size, profitability, growth opportunities, dividend payout ratio and non-debt tax shields are examined; while in terms of country specific and macroeconomic determinants, GDP growth, inflation, interest rate, exchange rate, bank loan supply and corporate loan demand are analyzed.

The industry characteristics are controlled by using industry dummy variables. The country dummy variable specifies which country the firm is located in: 0 represents Sweden; 1 represents the U.S.A. A detailed discussion about each variable is given in the following subsections and a summary of hypothesis related to each individual explanatory variables are illustrated in the *Appendix A Table 1*.

3.4.1 The Dependent Variable

The total risk of a firm, including both operating and financial risk, is determined by its total leverage, since the total leverage is given by the sum of the fixed operating costs and debt costs (Brealey & Myers, 2003). The total leverage of a firm thus includes two types of leverage: operating leverage and financial leverage. The former generates the operating risk and the latter increases the financial risk. A firm's capital structure, in terms of its financial policy, refers to its financial leverage, which is the dependent variable of this paper. According to various empirical studies, there are many different measures for financial leverage, such as leverage depending on either book value or market value, and leverage depending on how detailed level the debt can be decomposed into.

Some researchers, such as Brealey and Myers (2003) and Song (2005), argue that the misspecification of using book value and market value should be small or even unessential. The reason behind such an argument is the fact that intangible assets (i.e. R&D, advertisement, etc.) are not easy to be sold and the value of such assets often disappears when firms go down (Song, 2005, p.5). This would probably lead to a marginal discrepancy between book value and market value of total assets, even if the value generated by intangible assets is included in the calculation of market value of total assets (Brealey & Myers, 2003; Song, 2005). Therefore, the ratios used as proxies for financial leverage in this paper are all based on book value.

The ratio of total debt to total assets is chosen as one of the proxy of leverage. Compared to total liabilities, total debt excludes certain liabilities for transaction purposes, such as untaxed reserves or accounts payable. Thus, using total debt instead of total liabilities is a more

appropriate measure. Some researchers argue that a detailed analysis of corporate debt is necessary for the capital structure study, because there is significant difference in the determinants of several types of debt, such as long-term debt and short-term debt (Michaelas et al. 1999; Bevan & Danbolt, 2000; Song, 2005). Examining leverage only based on total debt to total assets ratio might disguise the impact of capital structure determinants on long-term debt and short-term debt (Song, 2005, p.3). Hence, we also decompose total debt into long-term debt and short-term debt in order to examine the impacts of financial leverage determinants on the ratio of long-term debt to total assets and short-term debt to total assets.

3.4.2 The Independent Variable

Firm Specific

Tangible Assets - ln [(PP&E + Inventory) / Total Assets)]

Natural logarithm of the sum of property, plant and equipment (PP&E) and inventory to total assets is a proxy for tangible assets. Inventory is chosen to be included in the ratio for two reasons: 1) according to Frank and Goyal (2009), inventory covers short-term debt part; and 2) according to Kremp et al. (1999) and Gaud et al. (2005), inventories still hold some value even if a firm is being liquidated. Tangible assets by itself plays an important role in making decisions about capital structure because it could raise leverage since it is as a guarantee for lenders (Sayılgan et al. 2006) or it could lower leverage by decreasing information asymmetry problem (Gompers, 1995).

The Static Trade-off theory suggests that firms, holding more tangible assets, are more secured and has lower possibility of default, because tangible assets can be used as collateral (Frank & Goyal, 2009). This could reduce the borrowing costs, since it lowers interest rate payments. Larger amount of tangible assets makes it possible for firms to hold more debt because, in the case of any distress, firms would still be able to sell its assets to cover part of the liabilities if not the whole liabilities. Thus, there is a positive correlation between leverage and tangible assets (Rajan & Zingales, 1995). Some researches, such as Allen (1995), Jensen and Heckling (1995), Hirota (1999), Michaelas et al. (1999), and Amidu (2007), confirm that leverage and tangible assets are related positively. Chung (1993) adds that long-term debt would be preferred to short-term debt.

Taking agency costs into consideration, Free Cash Flow theory supports the idea of positive correlation, as well. Harris and Raviv (1991) claim that firms with more tangible assets will have greater liquidation value and thereby hold more debt, seeking to mitigate agency

problem and lower agency costs. Holding more debt will decrease the amount of free cash flow because of the interest payment and debt repayment, and it will also reduce managers' ability to invest (Harris & Raviv, 1991). When it comes to a situation in which a firm does not have enough cash, managers are willing to run current operations; while investors probably prefer to liquidate firm under such a situation, because cost of debt will outweigh benefits of debt and because the value of the firm will be lower than the liquidation value of the firm (Harris & Raviv, 1991). It could be seen from the discussion above that the amount of tangible assets plays an important role since tangible assets have high liquidation value. Hence, a positive relation between tangibility and leverage is found.

On the other hand, the Pecking Order suggests a negative relation between tangible assets and leverage. Gompers (1995) argues that holding more tangible assets mitigates information asymmetry problems since the payoff of tangible assets is more transparent or easily observable to investors, which decreases the monitoring costs and thereby leads to lower demand of debt (Gompers, 1995, p.166). Titman and Wessels (1988) conclude that firms tend to hold more debt if they have lower amount of tangible assets.

We expect leverage and tangible assets to be correlated positively because we believe that having more tangible assets, used as collateral, would, first of all, decrease borrowing costs and thus in turn lead to higher debt ratio. Secondly, larger amount of tangible assets increases the firm's liquidation value, which is important for shareholders seeking to solve agency costs problem.

Hypothesis 1a: Total debt ratio and tangible assets are correlated positively.

Hypothesis 1b: Long-term debt ratio and tangible assets are correlated positively.

Hypothesis 1c: Short-term debt ratio and tangible assets are correlated positively.

Firm Size – ln (Net Sales)

Natural logarithm of net sales is a good proxy for a firm size, since net sales are less likely to be affected by accounting problems compared to total assets (Gaud et al. 2005). Consequently, the natural logarithm of total sales is commonly used as a proxy for firm size (Titman & Wessels, 1988; Rajan & Zingales, 1995; Gaud et al. 2005). Firm size is seen as an indicator for the inverse probability of default (Rajan & Zingales, 1995), since it is believed that larger firms are less likely to go bankrupt because they are mature and their assets, especially cash flows, are less volatile.

In the literature, there are several prevailing opinions about the relationship between leverage and firm size. For example, the Static Trade-off theory suggests that larger firms have better diversified portfolios and face lower financial distress costs, especially when it comes to long-term debt, due to lower possibility of default (Rajan & Zingales, 1995). Chen (2004) also shows that larger firms are distinguished by weaker ownership that results in lower manager's control. So managers, seeking to mitigate the risk of personal loss, which would probably occur in the case of bankruptcy, will take more debt. Hence, there is a positive relation between the leverage and firm size. Marsh (1982) also adds that big firms would prefer to use more long-term debt, while smaller firms prefer short-term debt. This could be a result of the fact that bigger firms are more confident about their future since they are more mature and more stable. So due to these reasons a positive relation for total debt, long-term debt and short-term debt to firm size is expected in this study.

The Pecking Order theory shows a negative relation between leverage and firm size. Some researchers, including Titman and Wessels (1988), support the Pecking Order theory and imply that larger firms can issue more equity due to decreased adverse selection and higher transparency and this is a result of requirement for big firms to reveal more information about themselves to outsiders and creditors. Since large firms can issue more equity, they may use less debt, i.e. big firms will have lower leverage. Sogorb-Mira and Lopez-Gracia (2008) also add that bigger firms may be able to use internal funds than external funds to finance firms' investment programs due to lower information asymmetry, which indicates a negative relation between leverage and firm size.

Hypothesis 2a: Total debt ratio and firm size are correlated positively.

Hypothesis 2b: Long-term debt ratio and firm size are correlated positively.

Hypothesis 2c: Short-term debt ratio and firm size are correlated positively.

Profitability - Operating Income / Net Sales

Operating income over net income is a good proxy for profitability since it shows how much revenue is left for a firm after the deduction of production costs. Profitability by itself is important to capital structure because it reveals firm's ability to survive in the future (Shubita & Alsawalhah, 2012). Hence, profitability is taken into consideration in this paper.

There are two schools of thoughts: the one that supports a positive relation (Static Trade-off theory, Free Cash Flow theory) and the other, which suggests a negative relation (Pecking Order theory). The Static Trade-off theory claims that profitable firms have lower bankruptcy

possibility and, as a result, are able to have higher leverage. In other words, firms may use more debt because they are willing to maximize benefits from a tax shield.

Free Cash Flow theory argues that profitable firms have more free cash flow and it leads to increased agency costs of managerial incentives because managers tends invest suboptimally in less profitable or even negative NPV projects. Seeking to prevent managers from overinvestment, more debt is used. According to Jensen's (1986) control hypothesis of debt, higher leverage helps to ensure that excess cash is paid out as dividends to investors but not used by managers for unprofitable projects. So holding more debt when firm is profitable, leads to a positive relationship between leverage and profitability. This relationship is also supported by some other researchers, such as Ross (1977), DeAngelo and Masulis (1980), Heinkel (1982), Jensen (1986), Hovakimian (2001), Frank and Goyal (2009).

The Pecking Order theory shows contradictory results, claiming that "[t]he attraction of interest tax shields and the threat of financial distress are assumed to be second-order" (Myers, 1989, p.85). According to Myers (1989), the debt would be preferred just if firm lacks internal financing for profitable projects or if it seeks to pay out dividends. For other situations internal funds would be used (Myers, 1989). Myers and Majluf (1984) suggests that this choice of profitable firms is a consequence of decreased agency costs meaning that managers are made to act in shareholder's interest. Myers (1989) also adds that internal fund is favored to external funds because of equity has higher issuing costs. Putting all things together, it indicates a negative relation between leverage and profitability. This type of correlation is supported by a vast majority of researchers, including Myers (1977), Myers and Majluf (1984), Friend and Lang (1988), Titman and Wessels (1988), Rajan and Zingales (1995), Booth et al. (2001), Fama and French (2002), Chen (2004), Gaud et al. (2005), Flannery and Rangan (2006), Wald and Long (2007), Daskalakis and Psillaki (2008), and Kayo and Kimura (2010).

We also agree with majority, who suggest a negative relationship between profitability and leverage, because we believe that there is no point in taking debt as long as the firm is able to cover all costs by using internal financing, and at the same time, the firm is still able to have some excess cash. Due to interest payments that often make firms pay back a higher amount than they borrowed, debt lowers firms' free cash flow and possibility to invest in profitable projects in the future.

Hypothesis 3a: Total debt ratio and profitability are correlated negatively.

Hypothesis 3b: Long-term debt ratio and profitability are correlated negatively.

Hypothesis 3c: Short-term debt ratio and profitability are correlated negatively.

Dividend Payout Ratio - Cash Dividends / Net Income

The dividend payout ratio is considered as a proxy for firm's financial situation. Paying out dividends decreases the internal funding (retained earnings and excess cash) and leads to an increase in external financing, which in turn raises the firm's leverage if debt is chosen over equity.

There are two schools of thoughts: the one that suggests a negative relationship between leverage and dividend payout ratio (Static Trade-off theory and Free Cash Flow theory) and the other reveals a positive correlation (Pecking Order theory). The Static Trade-off theory suggests that the better firm performs and the less debt it has, the more dividends should be paid and vice versa, i.e. the higher leverage a firm holds, the lower dividends should be paid out. Since higher level of debt leads to higher interest payments and higher principal amount, it results in an increased possibility of default. Therefore, inverse relationship between leverage and dividend payout ratio exists. This negative correlation receives support from some researchers, such as Jensen et al. (1992), Agrawal and Jayaraman (1994), Crutchley and Hansen (1989), Faccio and Lang (2001), Gugler and Yurtoglu (2003), Al-Malkawi (2007), Al-Kuwari (2009), Frank and Goyal (2009), Osegbue et al. (2014).

Furthermore, Rozef (1982), MacKie-Manson (1990), Chang and Rhee (1990) and Asgharian (1997) add that tax system also plays an important role because the higher taxes on dividends a country has; the lower dividends firms will be willing to pay due to higher costs of tax. These researchers also take agency costs into consideration because paying out dividends mitigates agency problem, which in turn lowers the amount of free cash flow available to managers for overinvestment. Thus, firms with higher dividend payout tend to have lower leverage since it is unnecessary to use debt for monitoring managers' self-serving behavior. Agreeing with the arguments discussed above, we expect an inverse relation between dividend payout ratio and leverage.

Based on the Pecking Order theory, a positive relation between leverage and dividends payout ratio is concluded. Pecking Order theory proposes that paying out dividends decreases the internal funds, even if it mitigates information asymmetry problem, which reduces the monitoring costs. When facing investment opportunities, firms with high dividend payout might need to resort to the external financing, preferably debt. Myers (1989) argues that less

profitable firms that are willing to pay dividends tend to have higher leverage. Allen (1993), Shyam-Sunder and Mayers (1999), and Frank and Goyal (2009) also support such arguments about positive relationship.

Hypothesis 4a: Total debt ratio and dividend payout ratio are correlated negatively.

Hypothesis 4b: Long-term debt ratio and dividend payout ratio are correlated negatively.

Hypothesis 4c: Short-term debt ratio and dividend payout ratio are correlated negatively.

Growth Opportunities - Net Sales Growth / Total Assets Growth

Net sales growth to total assets growth is a proxy for growth opportunities. This ratio is chosen due to missing data of R&D costs and advertising expenses. Growth opportunities, as a firm specific variable, should be taken into consideration since it shows firm's ability to develop its business in the future (Mai, 2006; Hermuningsih, 2013). In order to grow, firms need to have enough financing but internal funds alone are often not enough to finance all the profitable investment opportunities that firms are facing (Mai, 2006; Hermuningsih, 2013). Consequently, firms need to reconsider their capital structure, either by taking more debt (which supports Pecking Order theory) or issuing more equity (which is consistent with Trade-off theory).

Pecking Order theory suggests a positive relationship between leverage and growth opportunities, meaning that firm may use more debt when there are more growth opportunities, due to limited amount of internal funds. In other words, if a firm is willing to grow, it needs to have higher leverage in order to be able to invest more in profitable projects. Michaelas et al. (1999) add that firms may use more short-term debt than long-term debt, and according to Gaud et al. (2005), using more short-term debt is due to creditors' unwillingness to lend long-term debt. Additionally, as Myers (1977) claims, using more short-term debt is also a consequence of the fact that growing firms tend to invest suboptimally. Due to these reasons we expect both total debt and short-term debt to be positively correlated with growth opportunities.

The Trade-off theory suggests a negative correlation between leverage and growth opportunities because issuing debt involves higher costs than equity issuing, which leads to higher possibility of financial distress and thereby increases the expected financial distress costs. According to Chen (2004), it is because of the fact that firms with growth opportunities are more likely to have greater amount of intangible assets than tangible, meaning that they have lower collateral and their liquidation value is lower. Under such circumstances, creditors

would request higher risk premium that results in higher cost of capital. Therefore, Jung et al. (1996) suggests using more equity instead. Myers (1977) also supports Jung's et al. (1996) idea but adds that equity is preferred since firms with high level of debt tend to foregone profitable projects.

When considering the agency problems, the same inverse relation is proposed by the Free Cash flow theory due to increased agency costs of debt. It suggests that shareholders in growing firms try to expropriate wealth from creditors (Myers, 1997; Jensen, 1986) seeking to "have more flexibility to invest suboptimally" (Chen, 2004, p.1347), i.e. seeking to invest in projects without caring about NPV sign.

Hypothesis 5a: Total debt ratio and growth opportunities are correlated positively.

Hypothesis 5b: Long-term debt ratio and growth opportunities are correlated positively.

Hypothesis 5c: Short-term debt ratio and growth opportunities are correlated positively.

Non-Debt Tax Shield – Depreciation / Total Assets

The ratio of annual depreciation to total assets is considered as a proxy for non-debt tax shields (Titman & Wessels, 1988; Wanzenried, 2002; Song, 2005), since depreciation is regarded as one important non-debt item. Tax benefit of interest reduces the tax burden for firms and thus tax shield is an important reason behind a firm's adjustment on its capital structure. Tax shield is related not only to the size of debt, but also to the size of non-debt items, such as depreciation and investment tax credits. The non-debt tax shields probably serve as a less expensive alternative for tax reduction (Cloyd, 1997). Therefore, the corporate tax shield related to the tax deduction of depreciation also affects firms' capital structure choices.

According to DeAngelo and Masulis (1980), the tax shield generated from debt financing can be substituted by the tax benefit from non-debt items. The larger non-debt tax shields are, the less amount of debt is employed by the firms (DeAngelo & Masulis, 1980; Bowen et al. 1982; MacKie-Mason, 1990; Givoly et al. 1992; Allen, 1995; Cloyd et al. 1997; Ayers et al. 2001). Schulman et al. (1996) claim that tax shields generated from depreciation reduces the taxable income to a great extent, which indicates that using more debt might not generate additional tax benefit. Therefore, non-tax items, such as depreciation, have a significant impact on firm's financing decision.

The tax substitution hypothesis proposed by DeAngelo and Masulis (1980) indicates a negative relationship between non-debt tax shield and firms' leverage, since there is an inverse relationship between depreciation and tax benefit from debt (Wanzenried, 2002). Agreeing with DeAngelo and Masulis, we expected that non-debt tax shields negatively affect firms' capital structure due to the substitution effect of tax benefit from non-debt items discussed in the previous paragraph. However, Bradley et al. (1984) argue for a positive relationship between non-debt tax shields and firms' debt ratio in the case of investing greatly in intangible assets, which creates greater amount of depreciation and tax credits. The positive relation, explained by Graham (2004), is due to the positive correlation between non-debt items in forms of depreciation and profitability and/or investment.

Hypothesis 6a: Total debt ratio and non-debt tax shield are correlated negatively.

Hypothesis 6b: Long-term debt ratio and non-debt tax shield are correlated negatively.

Hypothesis 6c: Short-term debt ratio and non-debt tax shield are correlated negatively.

Country Specific and Macroeconomic Variables

GDP Growth

GDP growth is often considered as the measure of a country's overall state of economy. Demirguc-Kunt and Maksimovic (1995) consider GDP growth as a proxy for the demands of firms' financing because it measures a country's economic growth and "the growth opportunities available to firms" (p.353). They conclude that GDP growth has a significant inverse relationship with firms' leverage, especially the total debt ratio and the short-term debt ratio (Demirguc-Kunt & Maksimovic, 1996, p.357). Other empirical studies also confirm that GDP growth has significantly negative impact on the capital structure (Gajurel, 2005; Gajurel, 2006; Bokpin, 2009; Dincergok and Yalciner, 2011; Camara, 2012). However, Booth et al. (2001) and Venanzi et al. (2014) discover GDP growth increases firms' leverage, i.e. a positive correlation between GDP and leverage.

We expect a negative correlation between GDP growth and leverage based on the theoretical argument that "growth options should not be financed by debt" (Demirguc-Kunt & Maksimovic, 1996, p.353), which can be linked to Pecking Order theory. As mentioned earlier, higher GDP growth often leads to higher profitability and more investment opportunities, which increase firms' financing needs. Facing a comparative larger excess cash flow generated from increased profitability under high GDP growth, firms prefer the internal cash financing for investment to debt financing.

Hypothesis 7a: Total debt ratio and GDP growth are correlated negatively.

Hypothesis 7b: Long-term debt ratio and GDP growth are correlated negatively.

Hypothesis 7c: Short-term debt ratio and GDP growth are correlated negatively.

Inflation Rate

Inflation is considered as one of the important explanatory factors for financing policy due to its considerable influence on the riskiness of the financing (Demirguc-Kunt & Maksimovic, 1996, p.353). Empirical studies suggest that inflation is usually unanticipated and thus uncertain. The uncertainty of inflation has impact on the capital costs and expected cash flow from investments (Hatzinikolaou et al. 2002). It thus influences firms' decision on investment (Chen & Boness, 1975), which in turn affects firms' business risks. When facing business risk, such as insolvency risk, firms probably choose to adjust their leverage due to the uncertainty of tax shield of debt (Hatzinikolaou et al. 2002).

Regarding inflation rate as the determinant of capital structure, there are mixed findings in empirical studies. Some empirical studies claim that inflation is positively related to the leverage (Sett & Sarkhel, 2010; Hanousek & Shamshur, 2011; Mokhova & Zinecker, 2014); some argue for a negative relation between inflation and debt ratio (Demirguc-Kunt & Maksimovic 1996; Gajurel, 2006; Venanzi et al. 2014); while some other researchers claim that firms' financing decision or at least the book leverage is not affected by inflation at all (Bastos et al. 2009; Frank & Goyal, 2009).

Demirguc-Kunt & Maksimovic (1996) conclude that inflation has a significant negative impact on leverage, especially on short-term debt and total debt (Demirguc-Kunt & Maksimovic, 1996, p.357). Such a conclusion receives supports from Gajurel (2006) and Venanzi et al. (2014). Booth et al. (2001) via cross-country study based on data from developing countries. They further point out that such an inverse relationship also applies to the long-term debt ratio. However, Gajurel (2006) discovers that inflation has a significant positive relationship with long-term debt ratio.

We expect a negative correlation between inflation rate and leverage based on the argument that higher inflation leads to higher risk of debt financing. Seen from the supply side, investors would be reluctant to lend during the high inflation period due to uncertainty of their return of investment. From the perspective of borrower, since the debt contracts are often written in nominal term, a high inflation often leads to a high interest rate, which in turn raises the cost of capital. If the inflation is not reflected adequately in the interest rate, the real value

of debt repayment will be reduced, which might increase leverage ratio for firms. However, the business risk caused by inflation uncertainty will eventually make firms choose to take on less debt.

Hypothesis 8a: Total debt ratio and inflation are correlated negatively.

Hypothesis 8b: Long-term debt ratio and inflation are correlated negatively.

Hypothesis 8c: Short-term debt ratio and inflation are correlated negatively.

Interest Rate

Interest rate, measured by the prime lending rate, is considered important to firms' financing policy due to its close relation to costs of capital, the tax benefit and bankruptcy risk. Interest rate has an obvious relationship with the costs of debt. Higher interest rate leads to a higher cost of capital and thus increases firms' risk of financial distress or bankruptcy; while interest payments are tax deductible and, hence, bring the tax benefit to firms by decreasing the taxable income. The tax effect on firms' financing decision is conventionally stronger when there is a high interest rate (MacKinlay, 2012, p.1).

The positive effect of interest rate on leverage stemming from tax benefit and the negative impact caused by the bankruptcy risk are confirmed by findings of Abzari et al. (2012). In addition, consistent with Trade-off theory, Cekrezi (2013) claims that interest rate has a positive impact on capital structure (p.94). However, Antoniou et al. (2002) suggest an inverse relationship with leverage ratio. Such a proposition is also confirmed by Hatzimikolaou et al. (2002) and Dincergok and Yalciner (2011). We also believe that interest rate will affect negatively the debt ratio due to its positive impact on the capital costs.

Hypothesis 9a: Total debt ratio and interest rate are correlated negatively.

Hypothesis 9b: Long-term debt ratio and interest rate are correlated negatively.

Hypothesis 9c: Short-term debt ratio and interest rate are correlated negatively.

Exchange Rate

Trade weighted index is chosen as a proxy for exchange rate and exchange rate is considered to have an impact on firms' capital structure decision due to the country characteristics. We choose the United States of America and Sweden as our target countries of study. Sweden is heavily dependent on export, but its home currency, Swedish Krona, is not considered as an international settlement currency. Foreign currencies thereby will be used as settlement

currencies during the international trading. As mentioned earlier in the section *2.3.1 The United States of America,* the U.S.A. is the second largest trading country in the world. Although the country's exports only take approximately 14% of GDP (Economics and Statistics Administration, 2014, p.2), it is the third biggest exporting country in the world. In addition, almost 30% of its GDP growth during 2009 and 2013 came from the export growth (Economics and Statistics Administration, 2014, p.2). Because of its steady growth, export has played a more and more important role in the U.S. economy since 2010, which ensures the country's economy coming out of the economic recession. What is more, the multi-national firms in both countries have opportunities to access the international capital market and borrow foreign debt. It is clear that exchange rate risk will have impact on the financing policy of firms, especially those involving in international business.

Froot (1990) mentions that the impact of exchange rate risk on the cost of capital depends on whether the risk of exchange rate is diversifiable and whether investors are willing to pay for a risk premium if exchange rate risks cannot be avoided (p.313). From the macroeconomic viewpoint, the foreign direct investments could cause the fluctuation of exchange rate, which in turn has a powerful influence on firms' financing policy (Broll et al. 2005). For firms involving international business, especially importing and exporting companies, fluctuation of exchange rate causes a fluctuation of cash flow, which, according to Pecking Order theory, affects capital structure decision (Abzari et al. 2012, p.133). Some economists claim that, besides agency costs and political costs, risk premium for exchange rate uncertainty is also one of the reasons that multinational companies are prone to use lower leverage (Lee & Kwok, 1988; Burgman, 1996; Chen et al. 1997).

We assume that multinational companies have possibility to take advantage of the exchange rate and export more during high exchange rate, but importing more during the low exchange rate. This behavior probably has a positive impact on the firms' cash flow, which lower firms' leverage based on Pecking Order theory. We expect a negative correlation between exchange rate and leverage.

Hypothesis 10a: Total debt ratio and exchange rate are correlated negatively.

Hypothesis 10b: Long-term debt ratio and exchange rate are correlated negatively.

Hypothesis 10c: Short-term debt ratio and exchange rate are correlated negatively.

Financial System Orientation - Bank Deposit / GDP and Corporate Bank Loan / GDP

The difference in financial system as a determinant of capital structure choice has been confirmed by many researchers. Rajan and Zingales (1995) claim that the influence of the banks plays a significant role in deciding the financing policy, even if other institutional differences have influential impact on the financing policy (p.1437; p.1441). They argue that "difference 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" (Rajan & Zingales, 1995, p.1441). From the aspect of corporates' demand of bank loan, we thus consider bank loan to GDP as one of the indicators of the economy orientation. Regarding the supply of bank funds, we consider the ratio between bank deposits and GDP as a proxy, which also provides indication for the type of financial system. According to Fan et al. (2010), bank deposits to GDP can be considered as a proxy for banks' supply of funds because it measures how much funds the banking sector have access to (p.11).

Demirguc-Kunt and Masksimovic (1996) find a significant negative relationship between debt ratio (both long-term and short-term debt) and stock market development, and a positive relationship between bank sector's size and firms' capital structure (p.366). Compared to the countries with market-based financial system, bank-oriented countries have relatively less well-developed capital market, since they have weaker legal system and public enforcement of law in terms of protection of outside investors (Fan et al. 2010, p.5). Moreover, countries with stronger creditor rights and protection often have larger banking sector (Demirguc-Kunt & Maksimovic, 1999, p.321) and they tend to use more debt (Fan et al. 2010, p.10). Thus, we expect that both ratios (bank supply and bank demand) have positive impact on the leverage, especially on the short-term debt financing.

Since Sweden is considered to be more bank-based and the U.S.A. is regarded as a market-based country, bank influence on firms in Sweden is much stronger than that in the U.S.A. We thus expect that Swedish firms use more debt, especially short-term debt; while firms in the U.S.A. use more long-term debt.

Hypothesis 11a: Total debt ratio and supply of bank funding are correlated positively.

Hypothesis 11b: Long-term debt ratio and supply of bank funding are correlated positively.

Hypothesis 11c: Short-term debt ratio and supply of bank funding are correlated positively.

Hypothesis 12a: Total debt ratio and corporate demand of bank loan are correlated positively.

Hypothesis 12b: Long-term debt ratio and corporate demand of bank loan are correlated positively.

Hypothesis 12c: Short-term debt ratio and corporate demand of bank loan are correlated positively.

Hypothesis 13a: Total debt ratio and country dummy are correlated negatively.

Hypothesis 13b: Long-term debt ratio and country dummy are correlated positively.

Hypothesis 13c: Short-term debt ratio and country dummy are correlated negatively.

3.5 Modeling and Econometrics Tests

3.5.1 Model Structure

Academic literature provides various econometric models for investigating the capital structure determinants. Panel data model with both fixed effects and random effects is a commonly used model among financial research. This paper employs panel data regression analysis, as well, due to certain advantages of the model.

Panel data model contains data set from both time series and cross-sectional elements (Brooks, 2008, p.487). It thus can address a broader range of issues and deal with more complicated or complex problems (Brooks, 2008, p. 488), since panel data regression examines the same cross-sectional unit over a period of time. Compared to the simple time series Ordinary Least Square (OLS) regression, a panel data regression contains more observations and variations, which results in an increased power of test by increasing degrees of freedom and a reduced problem of multicollinearity (Brooks, 2008, p.488-489). In addition, the individual heteroskedasticity of data can be controlled by fixing either time dimension or cross-sectional dimension, which in turn tackles the endogeneity caused by missing variables.

In attempting to compare the country effect on financing mix and the impact of capital structure determinants not only on total leverage, but also on long-term debt and short-term debt, the following linear equations are estimated in EViews based on the fixed effect panel data model.

$$\begin{aligned} Leverage_{it} = {} & \alpha + \beta_1 TANG_{it} + \beta_2 F\_SIZE_{it} + \beta_3 PROF_{it} + \beta_4 DIV_{it} + \beta_5 GROW_{it} \\ & + \beta_6 NONTAX_{it} + \beta_7 COUN_{it} + \beta_8 GDP_{it} + \beta_9 INFL_{it} + \beta_{10} INTR_{it} \\ & + \beta_{11} EXCH_{it} + \beta_{12} DEPO_{it} + \beta_{13} LOAN_{it} \\ & + \sum_{k=14}^{25} \beta_k \, Industry\ Dummy_{it} + \lambda_1 D1_1 + \cdots + \lambda_t DT_t + v_{it} \end{aligned} \quad (1)$$

$$Leverage_{it} = \alpha + \beta_1 TANG_{it} + \beta_2 F\_SIZE_{it} + \beta_3 PROF_{it} + \beta_4 DIV_{it} + \beta_5 GROW_{it} + \beta_6 NONTAX_{it} + \beta_7 COUN_{it} + \sum_{k=8}^{19} \beta_k \, Industry\ Dummy_{it} + \lambda_1 D1_1 + \cdots + \lambda_t DT_t + v_{it} \quad (2)$$

$$Leverage_{it} = \alpha + \beta_1 TANG_{it} + \beta_2 F\_SIZE_{it} + \beta_3 PROF_{it} + \beta_4 DIV_{it} + \beta_5 GROW_{it} + \beta_6 NONTAX_{it} + \beta_7 COUN_{it} + \beta_8 Macro_{it} + \sum_{k=9}^{20} \beta_k \, Industry\ Dummy_{it} + \lambda_1 D1_1 + \cdots + \lambda_t DT_t + v_{it} \quad (3)$$

where dependent variable *Leverage* represents all three measures of leverage and during the test it is replaced by either total debt ratio, long-term debt ratio or short-term debt ratio. In the regression (3), independent variable *Macro* represents all six macroeconomic variables (GDP, inflation, interest rate, exchange rate, supply of bank funding and demand of bank loan) and it is replaced by one of the six variables individually during the test. The index *i* denotes the firm (*i* = 1, 2, …N; N = 212), and *t* denotes the year (t = 1, 2, …, T; T = 10, i.e. observations from 2004 to 2013). $\lambda_1 D1_1 + \cdots + \lambda_t DT_t$ represents the period fixed effect, since the cross-country comparison with macroeconomic variables indicates a control of heterogeneity in the time dimension. v_{it} is the error term. The rest of the explanatory variables are:

TANG = Tangibility of assets, i.e. ln [(PP&E + inventory) / total assets]
F_SIZE = Firm size, i.e. ln (net sales)
PROF = Profitability, i.e. operating income / net sales
DIV = Dividends payout ratio, i.e. cash dividends / net income
GROW = Growth opportunities, i.e. annual sales growth / annual assets growth
NONTAX = Non-debt tax shields, i.e. depreciation / total assets
COUN = Country dummy, where 0 represents Sweden and 1 represents the U.S.A.
GDP = Annual GDP growth rate
INFL = Inflation rate
INTR = Interest rate, i.e. the prime lending rate
EXCH = Exchange rate
DEPO = Supply of bank funding, i.e. bank deposit / GDP
LOAN = Demand of bank loan, i.e. corporate sector's loan / GDP

3.5.2 Econometrics Tests

Heterogeneity Test

When a panel data regression is pooled, the regression is estimated under the assumption that there is no dependence or relation among observations, since the data is treated like a simple time series or cross-sectional regression alone (Brooks, 2008, p.488). However, in practice, such an assumption is not always valid and error terms are often correlated within either time dimension or cross-sectional dimension, which leads to the heterogeneity problem. Some other sources for heterogeneity include heteroskedasticity and parameter differences, such as random parameters (Stack Exchange, 2011).

Heterogeneity problem could cause inefficient coefficient, underestimated variability and thereby incorrect inference. However, it can be tested in various ways, such as pooled regression residual plot, redundant fixed effects test, and Chow test. The first two tests are conducted in this study for checking the potential heterogeneity problem. The test result will be discussed in the section *4.1 Descriptive Statistics, Correlation Matrix and Heterogeneity Test*.

Endogeneity Discussion

Endogeneity, defined as the correlation between independent variables and the error terms (Roberts & Whited, 2011, p.6), is quite a common problem for empirical finance studies. Endogeneous variables lead to biased and inconsistent parameter estimation and there are four causes behind endogeneity: measurement error, omitted variables, reverse causality or simultaneity, and selection bias (Roberts & Whited, 2011, p.6).

In this research, variables and proxy selection, especially the firm specific variables, are based on the previous empirical studies. According to economic intuition and the previous empirical study, endogeneity, caused by measurement error, does not exist in the explicit sample data used in this paper. Selection bias often only appears in treatment effects model, which is not employed in this research and thus no selection bias related endogeneity exists in the explicit data sample.

With regard to omitted variables related endogeneity, no research can ensure all variables with explanatory power would be included, since the capital structure decision is such a complicated issue, which involves both observable and unobservable factors. For example, variables selected in this paper do not include the corporate governance variables, which

could, as well, have impacts on financing policy. However, fixed effect in panel data model employed in this research effectively controls the endogeneity caused by omitted variables.

When it comes to reverse causality or simultaneity, it is almost impossible to argue for reversal causality between firms' capital structure decision and country specific or macroeconomic condition. As far as firm specific variables are concerned, most of the empirical studies do not argue about the endogeneity problems since their study focus is on the capital structure determinants. However, endogeneity does exist. For example, leverage can influence profitability and tangibility. A few researchers exert their efforts on those endogeneous variables and offer solutions to improve the results. Based on the argument that financial leverage affects cost of capital and thus has impacts on the profitability and stock prices of firms (Miller, 1977; Myers, 1984; Sheel, 1994), Yoon & Jang (2005) propose that the impact on firms' profitability from financial leverage is especially significant when firms are characterized with a high-cost nature. Mahmoudi (2014) also confirms that firms' profitability depends on the capital structure at a high significant level. The causality between financial leverage and profitability thus leads to a potential endogeneity.

Moreover, Campello and Giambona (2011) also mention the possible endogeneity between capital structure and tangibility. The tangibility of assets refers to the mix of used assets type in a firm, which is strongly affected by the industry where a firm operates (Campello & Giambona, 2011, p.2). It could be argued that a firm's capital structure decision has impact on its assets tangibility, for example, a firm takes debt to finance purchases of tangible assets or disposes certain assets for debt payment. Trading of tangible assets, especially disposal of tangible assets, depends on the assets redeployability or the liquidity of market. Although the classical theories suggest that tangible assets are often illiquid, Campello and Giambona (2011) still prove the endogeneous problem arising from assets tangibility by studying real estate firms, which usually have a relatively high redeployability of tangible assets and which face a more liquid secondary market of the tangible assets, such as land.

In attempt to mitigate the potential estimation bias caused by simultaneity, the general convention of lagged variables is employed in this research, i.e. all the independent variables are one year lagged. However, it is worthwhile mentioning that the lagged variables might not solve all the estimation biases caused by simultaneity due to the persistence of variables. For example, the operating income and sales are persistent over time, i.e. current year's operating income or sales depends on the previous year's operating income or sales.

3.6 Validity and Reliability

Seeking to ensure validity and reliability of our results, three main steps were taken. First of all, reliable sources, such as academic journals and course literature, are used for the theoretical ground for this paper. Secondly, the data for variables is collected from global databases, i.e. Thomson Reuters DataStream, OECD StatExtract Complete Database and Economics and Statistics Administration, without any specific expectations from us. Lastly, theories and previous findings are used as a fundament for the discussion of results. Meanwhile, skeptical and logical thinking is applied for data analysis in order to avoid biased viewpoints.

4 Results and Analysis

This chapter presents the discussion of the results for group descriptive statistics, correlation matrix and heterogeneity test. Afterwards, the regression results are illustrated and explained with a detailed analysis via comparison between the regression results and our hypotheses.

4.1 Descriptive Statistics, Correlation Matrix and Heterogeneity Test

The group descriptive statistics for the sample data (*Appendix A Table 2 Panel 1*) reveals that all the variables, except firm size, are not normally distributed, since the Jarque-Bera test rejects the null hypothesis of normality. In addition, variable DIV presents an extreme skew of the distribution. The mean for variable DIV is 9.5764; which is over 32 times of the median value. This gives a skewness of 44.02 and a kurtosis of 1943.25. The reason behind such an extreme skew of the distribution is the existence of a few really extreme values in the data sample that pushes up the mean value. Those extreme values, mostly related to the Swedish firms, are not excluded from samples due to the limited amount of observations from Swedish firms. This might bias the regression result. It is worthwhile pointing out that the sub-sample group descriptive statistics (*Appendix A Table 2 Panel 2 & 3*) reveal that the mean and median of bank funding supply (bank deposit to GDP ratio) in Sweden (1.3207 and 1.2935, respectively) is higher than that in the U.S.A. (0.6910 and 0.7744, respectively).

Correlation matrix (*Appendix A Table 3*) spots no multicollinearity problem since the correlation coefficients of any two variables are all less than 0.8. In addition, neither the pooled regression residual plot (*Appendix B Figure 1, 2 & 3*) nor the redundant fixed effects tests results (*Appendix A Table 4*) present any signs of heterogeneity in the sample data. Both F-test and Chi-square test results in the redundant fixed effects tests indicate that period dummies are not significant at all and thus do not reject the null hypothesis of homogeneity.

4.2 Regression Results and Analysis

4.2.1 Firm Specific Effect

Regression results (*Appendix A Table 5*) reveal that tangibility, firm size and profitability have significant positive impacts on total debt ratio and long-term debt ratio. In addition, firm size has also positive correlation with short-term debt ratio at 1% significance level; while dividends payout ratio is only positively correlated to long-term debt ratio at 5% significance

level. Growth opportunity and non-debt tax shield have no significant impact on any leverage ratios. The significant variables will be individually analyzed in the following section.

Tangibility

Consistent with our prediction (*Hypothesis 1a & 1b*), tangibility has highly significant (at 1%) positive correlation with both total debt ratio and long-term debt ratio. However, the result (*Appendix A Table 5*) shows a negative relationship (-0.0009) between tangibility and short-term debt ratio, which is against our expectation (*Hypothesis 1c*), even if such a negative correlation is insignificant. The results also reveal that the influence of tangibility on both total debt ratio and long-term debt ratio is quite small with coefficients of +0.0078 and +0.0047, respectively.

The positive relationship between tangibility and leverage can be explained by Free Cash Flow theory. As discussed earlier in Section *3.4.2 The Independent Variable*, firms with more tangible assets often have higher liquidation value and usually hold more debt in order to mitigate agency problem. First of all, managers are prone to overinvest the free cash flow available in lower NPV or even negative NPV projects, even if shareholders might prefer receive dividends. Such behavior is against shareholder value maximization and leads to agency problem between managers and shareholders. On the other hand, since managers are considered as representatives of shareholders, their suboptimal investing style also creates agency problem between shareholders and creditors. That is because such an investing style brings about an expropriation of wealth from creditors to shareholders. In order to protect themselves, creditors will ask for tangible assets as collateral for their lending. From the perspective of debt supply, creditors would be more willing to lend to firms with larger tangible assets; while from the perspective of firms, higher amount of tangible assets make it possible to take on more debt, since firms with large tangible assets often have greater liquidation value. Considering the controlling effect of debt, taking on debt would be an effective way for monitoring managers' discretionary spending and binding managers' weak promise on distribution of excess cash flow to the actual action of future cash flow payout. Therefore, debt is probably a better device for high tangibility firms to mitigate agency problems and reduce agency costs compared to other possible means. Then it is logical to see such firms present a higher leverage.

Static Trade-off theory contributes to explain the tangibility's positive impact on capital structure, as well. When tangible assets are used as collateral, the risk borne by creditors is

reduced, which in turn lower the risk premium requested by creditors, i.e. the cost of debt decreases. This provides an explanation for firms with higher leverage when holding great amount of tangible assets.

It is also worth noting that the positive relationship between tangibility and long-term debt ratio gives support to debt maturity matching principle, which proposes that long-term debt is often used to finance the tangible assets; while short-term debt is usually considered as a financing for non-fixed assets. The regression result also supports Chung's (1993) argument about positive relationship between tangibility and long-term debt. This could be explained by the fact that firms tend to hold tangible assets, including fixed assets, for a longer period of time, since they are often considered to have longer assets life cycle. Hence, a firm holding more tangible assets is more confident about its ability to sell these fixed assets in the future for covering the debt, which results in a higher possibility for such firms to use long-term debt.

Firm Size

The regression results (*Appendix A Table 5*) reveal that firm size is a highly significant determinant of capital structure and the results are consistent with our expectations (*Hypothesis 2a, 2b & 2c*) for all three measures of leverage. The influence of firm size on total debt ratio (+0.0354) is the strongest among all the significant firm specific variables; while the influence on the long-term debt ratio (+0.0063) and short-term debt ratio (+0.0074) is much weaker. But it is worthwhile mentioning that the impact of firm size on long-term debt is actually the second highest among all the significant firm specific variables. These results are consistent with our expectation that firm size is positively correlated to all three measures of leverage.

Trade-off theory and the relationship between firm size and credit rating provide explanations for the positive impact of firm size on capital structure. As we know, firm size is one of the important elements for determining a firm's credit rating, since it usually indicates a firm's bankruptcy probability. It is commonly expected that large firms are less possible to fail or default, and probably have a higher credit rating, due to their diversification of business and greater amount of collateral as guarantee. Such firms thus face lower financial distress costs and lower bankruptcy risks, especially in the case of long-term debt. In addition, creditors often request lower risk premium when lending to firms with high credit rating due to the fact that such firms are safer and lenders bear less risks. This reduces the costs of debt issuing for

larger firms. Thus, lower bankruptcy risk would also reduce firms' costs of borrowing, and in turn the cost of capital.

Taking all things into consideration, it is reasonable that larger firms are prone to use more debt, especially debt with longer maturity. The positive correlation between firm size and leverage supports the Trade-off theory. It is also interesting to notice that, according to the coefficients of variables in regressions (*Appendix A Table 5 Panel 2 & 3*), firm size has a stronger impact on short-term debt than on long-term debt.

Profitability

Appendix A Table 5 presents contradictory results to our predictions (*Hypothesis 3a, 3b & 3c*) of the correlation between profitability and leverage. Based on the Pecking Order theory, we expected that profitability has a negative impact on all three leverage measurements. However, regression results support the Trade-off theory and confirm a positive correlation between profitability and all three debt ratios. Profitability's impact on total debt ratio and long-term debt ratio are highly significant (5% and 1%, respectively); while its impact on short-term debt ratio is insignificant at all. Regression results also show that impact of profitability on leverage is higher on long-term debt ratio (+0.0482) than on total debt ratio (+0.0268).

Explanations behind the positive correlation between profitability and leverage are more related to tax shield benefits, bankruptcy risk and agency costs. As discussed earlier in the section *3.2.2 Independent Variables,* firms with higher profitability can afford and intend to use more debt since they have lower risk of bankruptcy and are able to enjoy more tax shield benefits brought from higher leverage. When considering agency problem and agency costs, debt is probably an efficient device for high profitable firms to control managers' discretionary disposal of excess cash flow. This is because these firms are able to take on more debt without adding too much risk into the business and the monitoring effect of debt helps high profitability firms to mitigate the agency problem and lower agency costs.

In conclusion, it is reasonable for profitable firms to use more debt due to the reasons discussed above. And these results are consistent with Trade-off theory and Free Cash Flow theory.

Dividend Payout Ratio

The regression results (*Appendix A Table 5*) present that dividend payout ratio is positively correlated with total debt ratio and long-term debt ratio, which is against our prediction (*Hypothesis 4b & 4c*). Unfortunately, the positive correlation between dividend payout ratio

and total debt ratio is insignificant. But the correlation to long-term debt ratio is significant at 5%, even if the impact is really small (+1.61E-5). In terms of short-term debt, the result is consistent with our expectation of negative correlation (*Hypothesis 4c*), but it is insignificant.

The positive correlation between dividend payout and leverage can be explained by Pecking Order theory. Firms with high dividends payout are more possible to face a shortage of internal cash source for investment. When external financing is needed, debt is preferred over equity as argued in Pecking Order theory, because equity is often more costly than debt. In addition, dividends tend to be persistent and it thereby can be a long-term burden for firms. When facing temporary problems of financial flexibility and investment opportunities, firms that pay out higher amount of dividends are forced to resort to the external financing, especially long-term debt. Therefore, it is reasonable to find that long-term debt obligation increases with the dividend payout.

Another possible explanation for the positive relationship is related to the fact that debt is only used for financing dividends payout. Since dividends are signaling the financial situation of firms, management are often reluctant to reduce or stop dividends, which may cause that firms take on debt to finance dividends payout if there is a temporary financial difficulty or constraints.

The two situations discussed above may occur separately or at the same time. But still it does not change the result that leverage and dividend payout ratio are correlated positively, which is consistent with Pecking Order theory.

4.2.2 Macroeconomic and Country Effect

Regarding macroeconomic and country specific variables, when regression includes all the variables (*Appendix A Table 5*), country dummy is only positively correlated to total debt ratio at 5% significance level; while GDP, inflation rate, exchange rate, and demand of bank loan do not have significant impact on any type of leverage ratio. Interest rate is negatively correlated to total debt ratio but positively correlated with short-term debt ratio both at 5% significance level. Moreover, supply of bank loan has a significant impact on total debt ratio but not on the other two leverage ratios. When controlling firm specific, country specific, industry dummy variables, and each macroeconomic variables individually (*Appendix A Table 7 & Table 8*), none of the macroeconomic factors, except interest rate (significant

positive impact on short-term debt ratio at 5%), actually have significant impact on either long-term or short-term debt ratio.

It is also worthwhile mentioning that, according to *Appendix A Table 6*, country dummy presents a highly significant correlation (1% significance) with both total debt ratio and long-term debt ratio but a negative correlation with short-term debt ratio at 5% significance level, if only controlling the firm specific, country specific and industry dummy variables. The following subsections will analyze each significant variable in detail.

Interest Rate

As it is mentioned above, interest rate has a significant negative impact (-0.0116) on the total debt ratio but a significant positive impact (+0.0037) on the short-term debt ratio (*Appendix A Table 5*). The former is consistent with our expectation (*Hypothesis 9a*), while the latter is against our prediction (*Hypothesis 9c*). Unfortunately, the positive correlation between interest rate and long-term debt ratio is inconsistent with our expectation (*Hypothesis 9b*) and the correlation is insignificant, as well. Nevertheless, finding that interest rate has significant impact on certain measures of leverage (i.e. total debt ratio and short-term debt ratio) gives a support to the Trade-off theory. Since the interest rate affects firms' costs of capital and in turn the bankruptcy risk, it is plausible that interest rate is indeed a significant determinant of capital structure.

The negative correlation between interest rate and the total debt ratio indicates that firms tend to use less debt when the interest rate is high. This result is congruous with the findings by Antoniou et al. (2002), Hatzimikolaou et al. (2002) and Dincergok and Yalciner (2011). Besides, Trade-off theory provides certain explanation for this inverse relation. Financial distress and bankruptcy risk are considered to increase with the rise of capital cost, which is also positively related to the interest rate. Firms thereby are reluctant to take on more debt when the interest rate is high, since the high interest commitments would lead to higher risk of financial distress or bankruptcy.

The positive relation between interest rate and short-term debt supports tax benefit argument in the Trade-off theory and is consistent with MacKinlay's (2012) argument about tax effect on firms' financing. A high interest rate generates a high tax benefit and thus firms are probably prone to take more debt in order to enjoy the tax benefit, as long as they do not overpass their optimal leverage ratio. In this study, a short-term interest rate (the prime lending rate) is employed as the proxy for the variable - interest rate. Short-term interest rate

often indicates the volatility in both capital market and the money market. Interest rate is commonly believed to be negatively related to stock price, i.e. a high interest rate results in low prices on the stock market. Therefore, during the time of high interest rate, investors are reluctant to invest in the equity market and firms in need of financing thus tend to choose debt over equity. In addition, compared to the interest payment on long-term debt, interest payment on short-term debt is a commitment for shorter period. With higher interest commitment but for shorter period, firms probably face less bankrupt risk while enjoying the tax benefits, compared to the high long-term interest commitment.

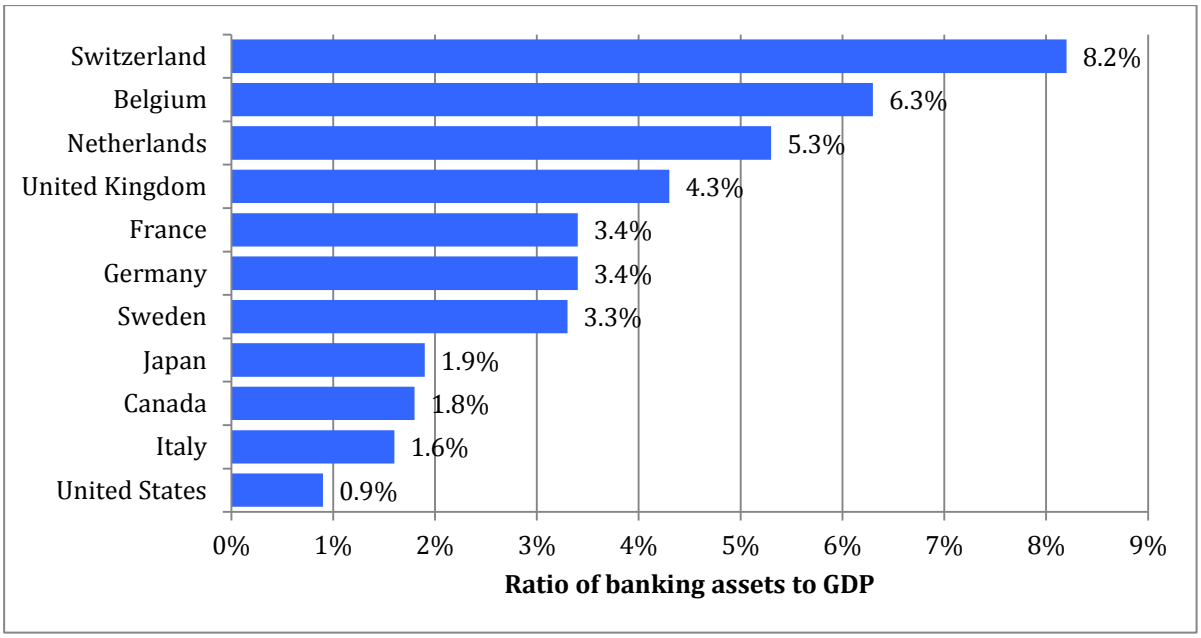
In conclusion, it is reasonable that interest rate is correlated negatively with total debt and positively with short-term debt due to the arguments discussed above. And the Trade-off theory could provide certain explanation to these relationships.

Financial System Orientation and Country Effect

Appendix A Table 5 presents that supply of bank funding is positively correlated to total debt ratio and long-term debt ratio with the coefficient of +0.0992 and +0.0240, respectively, but negatively correlated to short-term debt ratio (-0.0241). The former is consistent with our expectation (*Hypothesis 11a & 11b*), while the latter is opposite to our prediction (*Hypothesis 11c*). However, only the impact on total debt ratio is significant at 5%, while impacts on the other two ratios are not significant at all.

In this paper, bank deposit to GDP ratio is regarded as the proxy for supply of bank funding, which in turn gives indication of financial system orientation of the country. As mentioned earlier, the sub-sample group descriptive statistics (*Appendix A Table 2 Panel 2 & 3*) reveal that Sweden has higher bank deposits to GDP ratio (both mean and median) and *Figure 2* below shows that Sweden (3.3%) has a much bigger banking sector than the U.S.A. (0.9%). These facts confirm the argument that Sweden has a more bank-based financial system, while the financial system in the U.S.A. is more market-based. Therefore, the positive correlation between supply of bank funding and total debt ratio indicates that the higher supply of bank funding, the higher total debt ratio, i.e. Swedish firms are higher levered than American firms, which is consistent with our prediction (*Hypothesis 13a*). However, the country specific variable (country dummy) gives different results.

Figure 2. Size of Banking Sector (as a Ratio of Banking Sector Assets to GDP) in 2009



Source: Statista. Available at http://www.statista.com/statistics/267352/size-of-the-banking-sector-in-selected-countries (Retrieved May 7, 2015)

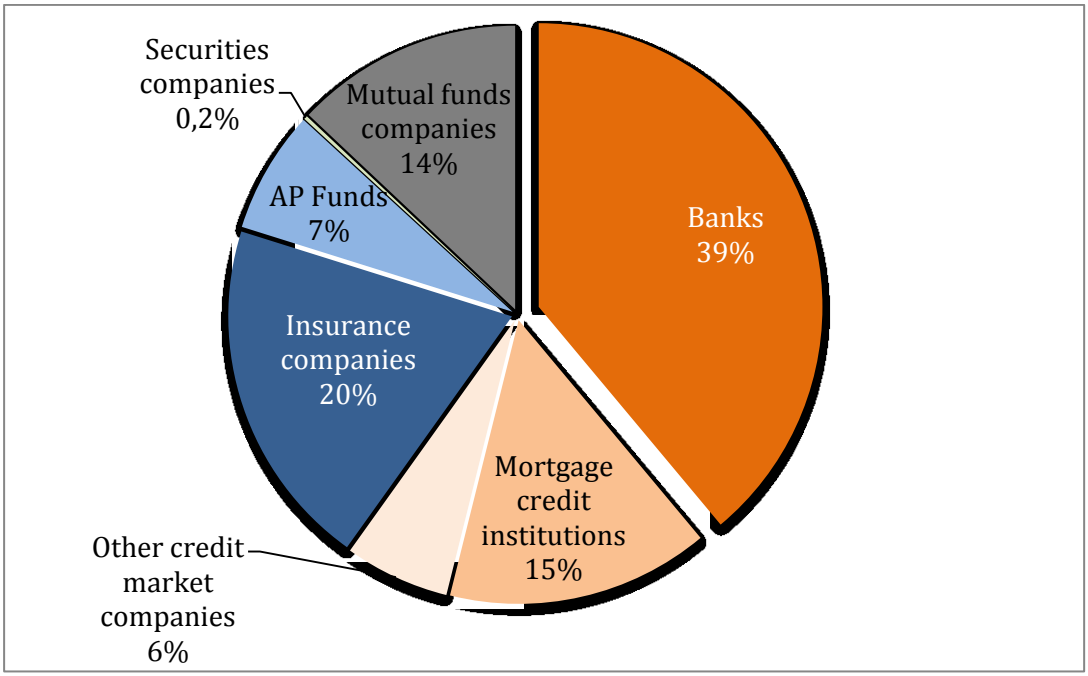
As shown in the *Appendix A Table 5*, dummy variable for country shows a positive relation to the total leverage (+0.2362) at a significance level of 5%. Regarding long-term debt ratio and short-term debt ratio, country variable has a positive impact on long-term debt ratio (+0.0555) but a negative influence on short-term debt ratio (-0.0292). However, neither of them is significant. If only the firm specific, country dummy and industry dummy variables are controlled in the regression (*Appendix A Table 6*), regression results for country variables become highly significant at 1% with a positive correlation to both total debt ratio (+0.0567) and long-term debt ratio (+0.0511); while an inverse correlation to short-term debt ratio (-0.0093) at 5% significance level.

The positive relationship between country variable and total debt ratio indicates that Swedish firms actually use less total debt than firms in the U.S.A., which is opposite to our expectation (*Hypothesis 13a*) and the result indicated by supply of bank loan. Consistent with our expectation (*Hypothesis 13b & 13c*), when decomposing total debt into long-term debt and short-term debt, Swedish firms use more short-term debt; while firms in the U.S.A. use more long-term debt. Such a result confirms the contradiction raised in the introduction section of this paper and it can be explained from the following six aspects:

1. *The Impact of Investors' Preference*

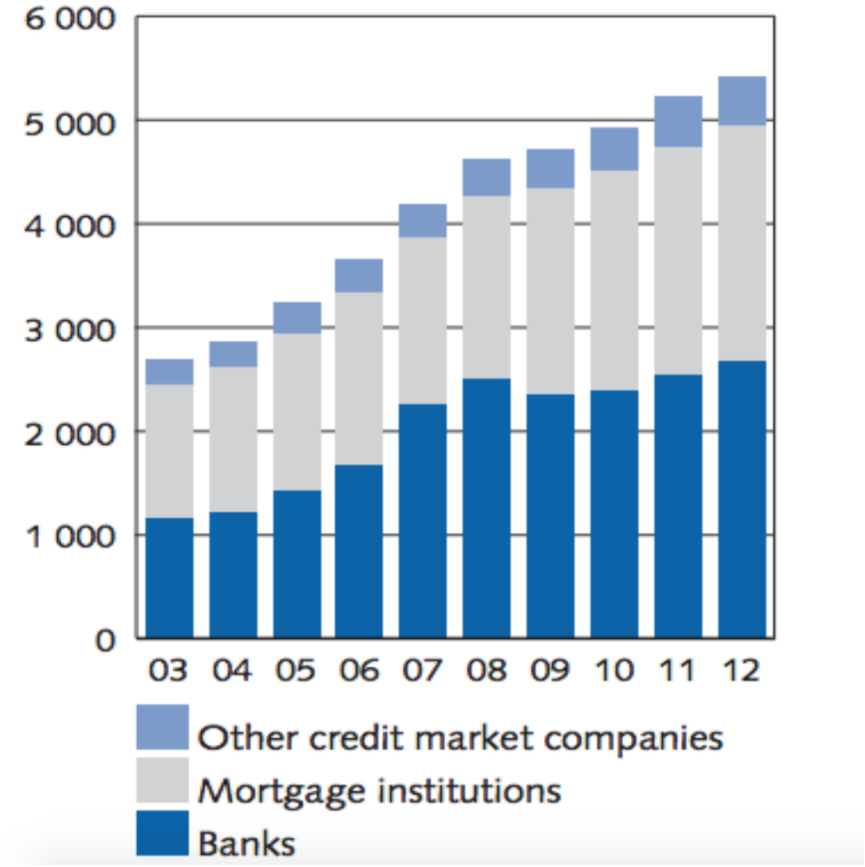
The country effect on short-term debt ratio can be explained by the investors' preference effects on firms' capital structure choice. When debt and equity require different risk premium, the investors would have a preference to hold debt or equity instruments. This preference has impact on firms' financing decision. As discussed earlier, banking sector size in Sweden is much bigger than in the U.S.A. In addition, the Swedish banks had traditionally monopoly on the deposits and have a significant control of the liquidity supply in the Swedish economy. Even if the monopoly has been abolished for over ten years, among all Swedish credit institutions, banks are still the biggest lender (Sveriges Riksbank, 2013). *Figure 3* below reveals that banks are the biggest player in the Swedish financial market; while *Figure 4* shows that Swedish banks account for almost 50% of the total lending to the public. Compared to pension funds and insurance companies, banks probably have comparative advantage on providing short-term funding to firms. Hence, it is reasonable that Swedish firms take more debts with shorter maturities.

Figure 3. Players on the Swedish Financial Market in 2010



Source: European Banking Federation. (2012). European Banking Sector Facts and Figures 2012, pp. 7. Available at http://www.ebf-fbe.eu/uploads/FF2012.pdf (Retrieved May 7, 2015)

Figure 4. Lending by Credit Institutions to the Public in 2003-2012 (SEK billion)



Source: Sveriges Riksbank (2013). The Swedish Financial Market, pp. 73. Available at http://www.riksbank.se/Documents/Rapporter/Finansmarknaden/2013/rap_finansm_130830_eng.pdf (Retrieved May 7, 2015)

2. *Bank Deposit Insurance*

Bank loan deposit insurance is another factor worthwhile considering for firms' financing choice. Deposit insurance is a protection to the depositors from banks' insolvency, which effectively reduces the risk of bank runs (Fan et al. 2010, p.11). Banks tend to provide more credit or more debt with longer maturities to borrowers when the deposit insurance is high. Since deposit insurance is 79% in the U.S.A and only 15% in Sweden (Demirguc-Kunt et al, 2014), it is plausible that American firms tend to use more long-term debt.

3. *Information Asymmetry Problem*

In terms of information asymmetry problem, banks play an important role. The strong bank influences result in a close relation between Swedish banks and firms' management. Such a close relationship ensures the investment information is known by the creditors and mitigates the information asymmetry problem. This monitoring effect not only minimizes the agency costs but also lowers the cost of debt due to the reduced risk premium, requested by the creditors, which in turn affects firms financing decision, i.e. Swedish firms tend to use more

debt, especially short-term debt. However, in the more market-oriented American financial system, the arm-length market relation between creditors and firms makes it difficult for investors to know the investment information and hence creates information asymmetry problem. Creditors request a higher rate of return on their lending for the risk taken. Higher interest rate on debt leads to higher cost of capital, which defers firms' short-term borrowing.

4. *Development of Capital Market*

Considering the development of capital market, the capital market in the U.S.A. is more developed than in Sweden. *Table 2* and *Table 3* below show that both the stock market capitalization and the debt securities market capitalization are much larger in the U.S.A. The highly developed the U.S. capital market ensures a broader supply of funding and less information asymmetry between external investors and firms, which in turn would lower the costs of equity. As a result, American firms tend to consider equity issuing over short-term debt to meet the financing needs.

Table 2. Outstanding of Debt Securities in Sweden and the U.S.A. in 2004-2013 ($ billions)

	Amount Outstanding of Debt Securities ($ billions)	
Period	**Sweden**	**the U.S.A.**
2004	127,17	21 546,98
2005	144,72	23 200,77
2006	169,45	25 123,52
2007	224,88	27 458,76
2008	270,30	29 408,06
2009	328,25	30 746,47
2010	368,39	30 918,86
2011	404,16	31 884,21
2012	436,69	32 811,08
2013	484,87	33 983,70

Source: Economic Research Division Federal Reserve Bank of St. Louis (2014) Available at http://research.stlouisfed.org/fred2/release?rid=327 (Retrieved April 17, 2015)

Table 3. Stock Market Capitalization of GDP in Sweden and the U.S.A. in 2004-2012, %

	Stock Market Capitalization % of GDP	
Period	**Sweden**	**the U.S.A.**
2004	98,71	132,98
2005	103,83	129,61
2006	136,48	140,20
2007	125,56	137,78
2008	49,14	79,75
2009	100,61	104,57
2010	119,00	114,53
2011	83,49	100,79
2012	103,06	115,50

Source: Thomson Reuters DataStream

5. *Legal Origin Perspective*

Legal origin theory proposes that different legal origins with different legal rules and regulations have great impact on economic outcomes. The strength of legal system and corporate governance influence greatly financing policy of firms. The U.S.A. is a common law country with efficient corporate governance and strong law system that provides higher protection to outside investors. The good law enforcement and explicit bankruptcy codes, such as Chapter 11 and Chapter 7, ensure a good financial distress resolution and protection of investor rights. The well-defined bankruptcy procedures facilitate a smooth corporate reorganization and makes default less painful or less onerous, which also provides incentives for American firms to use particularly more long-term debt. Thus, the stronger legal system and law enforcement in the U.S.A. lead to lower amount of short-term debt but higher amount of long-term debt, and higher external financing in form of equity, as well.

Sweden takes Scandinavian civil law origin with strong stakeholder influences and less protection of external investors. Its bankruptcy codes and regulations related to debt contracts are more creditor-oriented. As mentioned earlier in the section *2.3 Country Characteristics*, both Sweden and the U.S.A. have high creditor protection; while Swedish law is more creditor-oriented comparing with American law, which makes management in Swedish firms prone to avoid financial distress and use less debt. This would be a plausible explanation behind the positive correlation between country effect and total debt ratio. Additionally, *Table 5* below shows that in our data sample, both Swedish firms and American firms have a higher proportion of long-term debt in the total debt, which results in the effect of long-term debt outweighs that of short-term debt. Thus, the country effect presents a positive correlation to the total debt ratio, i.e. American firms take higher amount of total debt.

Table 4. Proportion of Short-Term and Long-Term Debt in the U.S.A. and Sweden over 2004-2013, %

	Short-Term and Long-Term Debt of Total Debt, %			
	Sweden		The U.S.A.	
Period	**Short-Term Debt**	**Long-Term Debt**	**Short-Term Debt**	**Long-Term Debt**
2004	23,21	76,79	44,98	55,02
2005	28,42	71,58	44,40	55,60
2006	29,74	70,26	44,06	55,94
2007	30,17	69,83	46,11	53,89
2008	28,53	71,47	47,31	52,69
2009	26,74	73,26	43,50	56,50
2010	27,37	72,63	41,84	58,16
2011	27,05	72,95	44,30	55,70
2012	27,01	72,99	46,00	54,00
2013	27,19	72,81	46,25	53,75

6. Tax Code on Dividends Payment

Tax treatment of dividends and the control hypothesis for debt creation in Free Cash flow theory provide another explanation for the positive country effect on total debt ratio. As mentioned earlier in the section *2.3 Country Characteristics*, The U.S.A. employs double taxation on dividends payment; while Sweden has a dividend relief system. Considering the agency problem and agency costs, dividends payout is believed to be able to mitigate the agency problem due to certain controlling effect of dividends on managers' discretionary spending. Facing higher taxation on dividends, the American firms are probably reluctant to pay higher dividends compared to the Swedish firms. Consequently, with lower dividends payout, American firms are more prone to have higher leverage due to the controlling or monitoring function of debt for mitigating agency problem.

4.2.3 Industry Effect

In terms of industry effects (*Appendix A Table 5*), five out of twelve industry dummy variables (basic materials, energy, healthcare, technology and telecommunications) used in this study do not have explanatory power for total debt ratio structure and five industry dummy variables (basic materials, consumer goods, consumer service, miscellaneous, and public utility) have significant explanatory power for long-term debt ratio. However, for short-term debt ratio, industry dummy has no explanatory power at all. Among those industry dummies with explanatory power, public utility has the strongest impact (+0.3780 for total debt ratio; +0.2180 for long-term debt ratio) on capital structure choice. Comparing the results

from macroeconomic effect and industry effect, it can be seen that industry has both stronger explanatory power and greater impact on the leverage; while considering all the significant variables (at 5% significance level) in the regressions, industry effect is revealed to be more influential on capital structure, since industry dummies appear to have higher coefficients.

4.2.4 Summary of Regression Results

The important empirical findings of this study are summarized as following:

- Consistent with our expectations (*Hypothesis 1a & 1b*), tangibility has a significant positive relation to both total debt and long-term debt. However, the impact on the capital structure is small (+0.0078 and +0.0047, respectively). Tangibility and short-term debt have insignificant negative relation and it is contradictory to our hypothesis (*Hypothesis 1c*). The significant results also provide support to Static Trade-off theory and Free Cash Flow theory.
- Firm size and all three measures of leverage have a significant and positive relation that confirms our expectations (*Hypothesis 2a, 2b & 2c*) and supports Trade-off theory. It is worth mentioning that among all significant firm-specific variables, firm size has the highest impact on total debt (+0.0354) and the second greatest influence for long-term debt (+0.0063).
- Contradictory to our hypothesis (*Hypothesis 3a, 3b & 3c*), profitability has a positive effect to all the measures of leverage. However, for short-term debt the results are insignificant. As for the long-term debt, the impact of profitability is the greatest (+0.0482) among all the significant firm specific variables. The relationship between profitability and total debt is significant, as well, and the effect is relatively high (+0.0268) compared with coefficients of other variables. The significant results support both Trade-off theory and Free Cash Flow theory.
- Supporting Pecking Order theory, the impact of dividend payout ratio on both total debt and long-term debt are inconsistent with our expectations (*Hypothesis 4a & 4b*), since a positive relation is found; while the impact on short-term debt confirmed our hypothesis (*Hypothesis 4c*) that a negative correlation exists. When it comes to the significance, only the long-term debt is meaningful, while other two are not.
- Both growth opportunities and non-debt tax shield are insignificant at all. However, expectations for growth opportunities to total debt and to long-term debt are consistent

with our results (*Hypothesis 5a & 5b*); while the rest do not confirm our hypotheses (*Hypothesis 5c, 6a, 6b & 6c*).

- Consistent with our prediction (*Hypothesis 7a, 7b & 7c*), GDP has negative impact on all three measures of leverage; while against our expectation (*Hypothesis 10a, 10b & 10c*) exchange rate is positively related to all three measures of leverage. Inflation negatively affects total debt ratio and short-term debt ratio, which confirms our prediction (*Hypothesis 8a & 8c*); while its positive impact on long-term debt ratio is against our expectation (*Hypothesis 8b*).
- Supporting Trade-off theory, interest rate and total debt ratio are negatively correlated, which is consistent with our prediction (*Hypothesis 9a*); while against our expectation (*Hypothesis 9b & 9c*), it is positively correlated to both long-term debt ratio and short-term debt ratio. However, except the significant impact of interest on the total debt ratio and short-term debt ratio, all the other macroeconomic factors (GDP, inflation rate, exchange rate) do not have significant influence on capital structure.
- The supply of bank funding has a significant positive correlation with both total debt ratio and long-term debt ratio; while an insignificant correlation with short-term debt ratio. The former is consistent with our prediction (*Hypothesis 11a & 11b*); while the latter is not (*Hypothesis 11c*).
- Consistent with our prediction (*Hypothesis 12a & 12c*), impact of demand of bank loan on total debt ratio and short-term debt ratio is positive; while the impact on long-term debt is against our expectation (*Hypothesis 12b*). However, none of the result is significant.
- Against our prediction (*Hypothesis 13a*), a significant positive country effect on total debt is found, when regression controls all the variables (firm specific, country specific, macroeconomic variables and industry dummies), while the country effect on the other two leverage measures (long-term debt ratio and short-term debt ratio) is insignificant. However, when excluding macroeconomic variables, significant country effects are found for all three measures of leverage. The positive country impact on total debt is against our prediction (*Hypothesis 13a*); while the positive impact on long-term debt ratio and negative impact on short-term debt ratio are both consistent with our expectation (*Hypothesis 13b & 13c*).

- Industry does have impact on firms' financial leverage and public utility tends to have higher leverage. Moreover, industry has also a stronger explanatory power than macroeconomic factors and it is revealed by our data that it has a stronger influence on capital structure among all the significant variables.

5 Conclusion and Discussion

The conclusion based on the analysis of regression results is presented in this chapter and the suggestions for future study are discussed, as well.

5.1 Conclusion

This paper, utilizing panel data regression with period fixed effects, examines how firm specific, country specific and macroeconomic factors affect firms' capital structure decisions based on the sample of firms in Sweden and the U.S.A. A cross-country analysis is conducted to compare the country effect revealed in the regression results. Three measures for leverage (total debt to total assets ratio, long-term debt to total assets ratio and short-term debt to total assets ratio) are employed and the decomposition of total debt into long-term debt and short-term debt allows a more detailed analysis of the impact of capital structure determinants. The empirical evidences of this research prove that 1) significant difference exists in the determinants of three leverage measures (total debt ratio, long-term debt ratio and short-term debt ratio); 2) country effect does exist when firms in different countries decide financing policy; 3) industry has stronger explanatory power on leverage compared to the macroeconomic factors; 4) Trade-off theory and Free Cash Flow theory provide more explanation than Pecking Order theory. The most important findings of this research are summarized as following:

- In terms of firm specific determinants, among all the significant variables, firm size has the strongest impact on total debt ratio and profitability has the biggest influence on long-term debt ratio. With regard to short-term debt ratio, only firm size presents a significant influence.
- Financial system orientation of the country does have effect on firms' capital structure. More developed bank system leads to higher financial leverage. However, regression results of country effect reveal that firms in the U.S.A (as a market-based economy) are actually higher levered in terms of both total debt and long-term debt; while Swedish firms (as a bank-oriented economy) are prone to use more short-term debt.
- The seemingly contradictory results between financial system orientation and country effect are analyzed from six aspects (investor's' preference, bank deposit insurance, information asymmetry problem, development of capital market, legal origin perspective, and tax code on dividends payment). Consequently, we conclude that the

effect of long-term debt overweighs that of short-term debt, which makes American firms actually have higher financial leverage in terms of total debt.

- Based on the data from this research, it seems that industry dummies have stronger impact on both total debt ratio and long-term debt ratio among all the significant variables (at 5% significance level). Compared to the macroeconomic determinants, industry dummies have both greater explanatory power and stronger impacts on capital structure.
- The significant positive impact of tangibility, firm size and profitability on leverage provides support to Trade-off theory and Free Cash Flow theory. Interest rate's effect on capital structure can be explained by Trade-off theory, as well. However, the significant correlation between dividend payout ratio and leverage confirms Pecking Order theory.

5.2 Suggestions for Future Research

From this study, we realize that capital structure is a complicated but interesting topic and some other aspects could be taken into consideration for future study.

Firstly, we suggest selecting some other proxies for the future research because this study reveals that almost all macroeconomic variables present insignificant results. This could stem from the inappropriate choice of proxy. For example, the volatility of exchange rate instead of the exchange rate index can be selected as explanatory variable. Volatility of exchange rate might be a better proxy since it indicates the fluctuation, which might affect business risk of the firm and, consequently, its decision on the capital structure. Including measurements of corporate governance, such as structure of board and ownership, could also help to explain the choice of the capital structure.

Secondly, we suggest studying the influence of financial crisis on the capital structure decision by separating the whole data sample into two sub-samples: 1) pre-crisis period, and 2) post-crisis period, including the crisis period. However, the pre-crisis period should be extended to a longer period of time in order to avoid the potential problems with estimation of regression due to limited number of observations. The comparison study about pre-crisis and post-crisis decisions on firms' financing policy is interesting and highly worthwhile to

conduct since it would provide more valuable empirical insights for theoretical study of capital structure.

Thirdly, another angle to analyze the capital structure could be examining industries individually for each country. Since it is already known that many differences exist between industries, such as the degree of business risk and asset risk, separation of industry would give a better understanding about which firm-specific, country-specific or macroeconomic factors have the strongest impact on the capital structure decision for a specific industry in a specific country.

Finally, including more countries with similar characteristics (i.e. countries sharing same law origin or same type of financial system) in the similar cross-country analysis leads to more reliable results due to the increased observations. Such an analysis could also be conducted to examine the capital structure choice in a set of countries with homogenous characteristics in terms of financial system orientation and institutional origin.

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Appendix A

Table 1. Hypotheses Summary

Determinants	Variable	Measurement (Proxy)	Expected effect on capital structure
Firm-specific			
Tangibility	**TANG**	Ln [(PP&E+Inventory) / Total assets]	**Hypothesis 1a**: Total debt ratio and tangibility of assets are correlated positively. **Hypothesis 1b**: Long-term debt ratio and tangibility of assets are correlated positively. **Hypothesis 1c**: Short-term debt ratio and tangibility of assets are correlated positively.
Firm size	**F_SIZE**	Ln (Total Assets)	**Hypothesis 2a**: Total debt ratio and firm size are correlated positively. **Hypothesis 2b**: Long-term debt ratio and firm size are correlated positively. **Hypothesis 2c**: Short-term debt ratio and firm size are correlated positively.
Profitability	**PROF**	Operating Income / Net Sales	**Hypothesis 3a**: Total debt ratio and profitability are correlated negatively. **Hypothesis 3b**: Long-term debt ratio and profitability are correlated negatively. **Hypothesis 3c**: Short-term debt ratio and profitability are correlated negatively.
Dividend	**DIV**	Dividend Payout Ratio, i.e. Cash Dividends / Net Income	**Hypothesis 4a**: Total debt ratio and dividend payout ratio are correlated negatively. **Hypothesis 4b**: Long-term debt ratio and dividend payout ratio are correlated negatively. **Hypothesis 4c**: Short-term debt ratio and dividend payout ratio are correlated negatively.
Growth opportunities	**GROW**	Sales Growth / Total Assets Growth	**Hypothesis 5a**: Total debt ratio and growth opportunities are correlated positively. **Hypothesis 5b**: Long-term debt ratio and growth opportunities are correlated positively. **Hypothesis 5c**: Short-term debt ratio and growth opportunities are correlated positively.

Determinants	Variable	Measurement (Proxy)	Expected effect on capital structure
Non-debt Tax Shields	**NONTAX**	Depreciation / Total Assets	**Hypothesis 6a**: Total debt ratio and non-debt tax shield are correlated negatively. **Hypothesis 6b**: Long-term debt ratio and non-debt tax shield are correlated negatively. **Hypothesis 6c**: Short-term debt ratio and non-debt tax shield are correlated negatively.
Country-specific and Macroeconomic determinants			
GDP growth	**GDP**	GDP Growth	**Hypothesis 7a**: Total debt ratio and GDP growth are correlated negatively. **Hypothesis 7b**: Long-term debt ratio and GDP growth are correlated negatively. **Hypothesis 7c**: Short-term debt ratio and GDP growth are correlated negatively.
Inflation rate	**INFL**	Inflation Rate	**Hypothesis 8a**: Total debt ratio and inflation are correlated negatively. **Hypothesis 8b**: Long-term debt ratio and inflation are correlated negatively. **Hypothesis 8c**: Short-term debt ratio and inflation are correlated negatively.
Interest rate	**INTR**	Prime Lending Rate	**Hypothesis 9a**: Total debt ratio and interest rate are correlated negatively. **Hypothesis 9b**: Long-term debt ratio and interest rate are correlated negatively. **Hypothesis 9c**: Short-term debt ratio and interest rate are correlated negatively.
Exchange rate	**EXCH**	Exchange Rate	**Hypothesis 10a**: Total debt ratio and exchange rate are correlated negatively. **Hypothesis 10b**: Long-term debt ratio and exchange rate are correlated negatively. **Hypothesis 10c**: Short-term debt ratio and exchange rate are correlated negatively.
Loan supply	**DEPO**	Bank Deposit / GDP	**Hypothesis 11a**: Total debt ratio and supply of bank funding are correlated positively. **Hypothesis 11b**: Long-term debt ratio and supply of bank funding are correlated positively. **Hypothesis 11c**: Short-term debt ratio and supply of bank funding are correlated positively.

Determinants	Variable	Measurement (Proxy)	Expected effect on capital structure
Loan demand	**LOAN**	Corporate Bank Loan / GDP	**Hypothesis 12a**: Total debt ratio and corporate demand of bank loan are correlated positively. **Hypothesis 12b**: Long-term debt ratio and corporate demand of bank loan are correlated positively. **Hypothesis 12c**: Short-term debt ratio and corporate demand of bank loan are correlated positively.
Country	**COUN**	Dummy Variable for Indicating Countries (Sweden = 0; The U.S.A. = 1)	**Hypothesis 13a**: Total debt ratio and country dummy are correlated negatively. **Hypothesis 13b**: Long-term debt ratio and country dummy are correlated positively. **Hypothesis 13c**: Short-term debt ratio and country dummy are correlated negatively.

Table 2. Descriptive Statistics

Panel 1: Descriptive Statistics for firms in Sweden and the U.S.A

	TOTAL DEBT RATIO	SHORT DEBT RATIO	LONG DEBT RATIO	TANG	F_SIZE	PROF	DIV	GROW	NONTAX	GDP	INFL	INTR	EXCH	DEPO	LOAN
Mean	0,3916	0,2256	0,0445	-0,8587	16,5334	0,3951	9,5764	1,5164	0,0307	1,7121	2,1068	4,0005	77,9958	0,8272	0,6141
Median	0,3772	0,2081	0,0260	-0,9719	16,5787	0,2888	0,2961	0,7097	0,0278	2,3000	2,6700	3,2500	76,0200	0,8087	0,4224
Maximum	1,4904	0,7440	0,6567	16,9692	19,7051	4,2986	1,64E+04	2,3690	0,1046	5,7000	3,8100	8,2500	87,1000	1,6570	1,5542
Minimum	-0,1859	0,0000	0,0000	-17,7342	12,5574	-0,5059	-215,2889	-6,0404	0,0012	-5,0500	-2,8000	-0,3200	70,8700	0,0639	0,3717
Std. Dev.	0,2053	0,1349	0,0587	2,5706	1,1362	0,3768	371,3968	5,6682	0,0162	2,1856	1,3399	2,1858	4,7841	0,3431	0,3863
Skewness	0,6179	0,6312	3,0749	2,9798	-0,0519	2,1263	44,0246	3,6640	0,8691	-1,1566	-0,8673	0,5743	0,4307	-0,0971	1,5401
Kurtosis	4,2791	3,3233	18,6656	36,7177	3,1049	14,0662	1943,2540	15,6614	3,9002	4,1659	3,1622	2,4349	1,9170	3,6550	3,6249
Jarque-Bera	257,56	138,24	2,31E+04	9,55E+04	1,77	1,14E+04	3,07E+08	1,99E+08	311,97	546,35	247,09	133,41	155,90	37,99	804,22
Probability	0,0000	0,0000	0,0000	0,0000	0,4120	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Sum	765,20	440,76	86,95	-1,68E+03	3,23E+04	772,00	18,71E+04	2,96E+03	59,93	3,35E+03	4,12E+03	7,81E+03	1,52E+05	1,62E+03	1,20E+03
Sum Sq. Dev.	82,30	35,56	6,72	1,29E+04	2,52E+03	277,29	2,69E+08	6,27E+06	0,51	9,33E+03	3,51E+03	9,3E+03	4,47E+04	229,97	291,48
Observations	1954	1954	1954	1954	1954	1954	1954	1954	1954	1954	1954	1954	1954	1954	1954

Panel 2: Descriptive Statistics for firms in Sweden

	TOTAL DEBT RATIO	SHORT DEBT RATIO	LONG DEBT RATIO	TANG	F_SIZE	PROF	DIV	GROW	NONTAX	GDP	INFL	INTR	EXCH	DEPO	LOAN
Mean	0,3409	0,0567	0,1729	-0,2016	16,9459	0,1052	42,9689	0,0995	0,0312	1,9013	1,2628	1,7536	81,6001	1,3207	1,3258
Median	0,3542	0,0385	0,1587	-1,0200	17,1374	0,0944	0,3903	0,5391	0,0277	2,7600	1,2000	1,7500	83,4800	1,2935	1,4516
Maximum	1,2469	0,4054	0,6762	16,9692	19,7051	0,5725	1,64E+04	1,5969	0,1022	5,7000	3,4000	4,0000	87,1000	1,6570	1,5542
Minimum	0,0000	0,0000	0,0000	-4,6347	12,8998	-0,5059	-4,4717	-1,9000	0,0012	-5,0500	-0,5000	0,2500	71,8000	0,8329	1,0039
Std. Dev.	0,1933	0,0618	0,1265	4,0184	1,2365	0,0972	798,9201	1,5246	0,0193	3,0491	1,2354	1,0498	4,5939	0,1577	0,2001
Skewness	0,5097	2,0666	0,7836	3,4269	-0,1898	0,3687	20,4108	-2,0088	0,8596	-0,9815	0,3791	0,7319	-0,8543	0,7718	-0,5841
Kurtosis	4,6944	9,0332	3,7407	13,7655	3,1258	8,9756	418,3636	9,4201	3,6688	3,2710	1,9859	2,8987	2,7493	3,1348	1,6193
Jarque-Bera	68,75	940,38	52,83	2,86E+03	2,81	637,42	3,06E+06	14,65	59,84	69,04	28,19	37,85	52,44	42,22	57,51
Probability	0,0000	0,0000	0,0000	0,0000	0,2452	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Sum	143,86	23,93	72,96	-85,07	7,15E+03	44,39	1,81E+04	41,97	13,16	802,36	532,90	740,00	3,44E+04	557,32	559,47
Sum Sq. Dev.	15,74	1,61	6,74	6,80E+03	643,68	3,98	2,69E+08	9,79E+04	0,1565	3,91E+03	642,5859	463,99	8,88E+03	10,48	16,85
Observations	422	422	422	422	422	422	422	422	422	422	422	422	422	422	422

Panel 3: Descriptive Statistics for firms in the U.S.A.

	TOTAL DEBT RATIO	SHORT DEBT RATIO	LONG DEBT RATIO	TANG	F_SIZE	PROF	DIV	GROW	NONTAX	GDP	INFL	INTR	EXCH	DEPO	LOAN
Mean	0,4056	0,2401	0,0411	-1,0398	16,4197	0,4749	0,3783	1,9067	0,0305	1,6599	2,3393	4,6195	77,0030	0,6910	0,4181
Median	0,3851	0,2220	0,0237	-0,9500	16,4684	0,4108	0,2649	0,7770	0,0279	2,2500	2,6700	3,2500	75,3200	0,7744	0,4031
Maximum	1,4904	0,7440	0,6567	14,8761	19,5006	4,2986	140,7273	2,3690	0,1046	3,8000	3,8100	8,2500	85,5100	0,9459	0,4864
Minimum	-0,1859	0,0000	0,0000	-17,7342	12,5574	-0,4121	-215,2889	-6,0404	0,0033	-2,8000	-2,8000	-0,3200	70,8700	0,0639	0,3717
Std. Dev.	0,2063	0,1336	0,0574	1,9589	1,0801	0,3860	6,9955	6,3512	0,0153	1,8773	1,2727	2,0041	4,3389	0,2399	0,0367
Skewness	0,6398	0,6283	3,4593	-0,4340	-0,1104	2,0487	-14,0113	3,3216	0,8365	-1,3094	-1,3443	0,6077	0,7873	-1,6724	0,6515
Kurtosis	4,1794	3,2937	22,8367	60,0969	3,0624	14,1941	699,7697	12,6666	3,7359	3,7866	4,7675	2,1271	2,5878	5,0566	2,0429
Jarque-Bera	193,32	106,29	2,82E+04	2,08E+05	3,36	9,07E+03	3,10E+07	1,02E+08	213,24	4,77E+02	660,86	142,94	169,11	984,13	166,86
Probability	0,0000	0,0000	0,0000	0,0000	0,1863	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Sum	621,33	367,80	63,01	-1,59E+03	2,52E+04	727,61	579,50	2,92E+03	46,77	2,54E+03	3,58E+03	7,08E+03	1,18E+05	1,06E+03	640,54
Sum Sq. Dev.	65,18	27,33	5,04	5,88E+03	1,79E+03	228,08	7,49E+04	6,18E+06	0,36	5,40E+03	2,48E+03	6,15E+03	2,88E+04	88,1254	2,06
Observations	1532	1532	1532	1532	1532	1532	1532	1532	1532	1532	1532	1532	1532	1532	1532

Table 3. Correlation Matrix

Correlation Probability	Total Debt Ratio	Long-term Debt Ratio	Short-term Debt Ratio	TANG	F SIZE	PROF	DIV	GROW	NONTAX	GDP	INFL	INTR	EXCH	DEPO	LOAN
Total Debt Ratio	1,0000														

Long-term Debt Ratio	0,5436	1,0000													
	0,0000	-----													
Short-term Debt Ratio	0,0859	0,0099	1,0000												
	0,0001	0,6610	-----												
TANG	0,0863	0,0635	0,0105	1,0000											
	0,0001	0,0050	0,6443	-----											
F SIZE	0,1599	-0,0024	0,1228	-0,0707	1,0000										
	0,0000	0,9154	0,0000	0,0018	-----										
PROF	0,0434	0,1827	-0,0674	-0,0377	-0,3703	1,0000									
	0,0552	0,0000	0,0029	0,0961	0,0000	-----									
DIV	0,0306	0,0308	0,0000	0,0060	-0,0091	-0,0267	1,0000								
	0,1757	0,1740	0,9999	0,7897	0,6878	0,2390	-----								
GROW	-0,0067	0,0035	-0,0026	-0,0055	-0,0175	0,0134	-0,0002	1,0000							
	0,7671	0,8785	0,9073	0,8073	0,4402	0,5547	0,9927	-----							
NONTAX	0,0819	0,0036	0,0719	0,1686	0,0297	0,0036	0,0022	-0,0095	1,0000						
	0,0003	0,8734	0,0015	0,0000	0,1901	0,8741	0,9228	0,6755	-----						
GDP	-0,0667	-0,0679	0,0103	0,0115	-0,0385	0,0054	-0,0231	-0,0472	0,0029	1,0000					
	0,0032	0,0027	0,6479	0,6101	0,0891	0,8115	0,3081	0,0369	0,8991	-----					
INFL	0,0393	0,0526	-0,0109	-0,0414	-0,0840	0,1513	0,0209	-0,0352	-0,0103	0,4265	1,0000				
	0,0826	0,0200	0,6289	0,0670	0,0002	0,0000	0,3559	0,1200	0,6500	0,0000	-----				
INTR	0,0100	0,0705	-0,0115	-0,0627	-0,1664	0,2089	-0,0220	-0,0126	0,0242	0,3122	0,5690	1,0000			
	0,6600	0,0018	0,6102	0,0056	0,0000	0,0000	0,3314	0,5775	0,2856	0,0000	0,0000	-----			
EXCH	-0,1101	-0,0942	0,0390	0,0627	-0,0229	-0,1853	-0,0264	-0,0040	0,0604	0,3815	-0,1373	0,0444	1,0000		
	0,0000	0,0000	0,0847	0,0056	0,3109	0,0000	0,2429	0,8603	0,0076	0,0000	0,0000	0,0500	-----		
DEPO	-0,0554	-0,0603	0,0277	0,0909	0,2103	-0,3004	0,0574	0,0028	-0,0239	-0,1577	-0,3784	-0,6570	0,1485	1,0000	
	0,0144	0,0077	0,2214	0,0001	0,0000	0,0000	0,0111	0,9006	0,2902	0,0000	0,0000	0,0000	0,0000	-----	
LOAN	-0,1132	-0,1127	0,0543	0,1257	0,1971	-0,3914	0,0545	-0,0100	0,0058	-0,0869	-0,3058	-0,5432	0,3410	0,6491	1,0000
	0,0000	0,0000	0,0163	0,0000	0,0000	0,0000	0,0159	0,6602	0,7993	0,0001	0,0000	0,0000	0,0000	0,0000	-----

Table 4. Heterogeneity Test

Panel 1				***Panel 2***				***Panel 3***			
Redundant Fixed Effects Tests				Redundant Fixed Effects Tests				Redundant Fixed Effects Tests			
Equation: EQ_**Total debt/total assets**				Equation: EQ_**Long-term debt ratio**				Equation: EQ_**Short-term debt ratio**			
Effects Test	**Statistic**	**d.f.**	**Prob.**	**Effects Test**	**Statistic**	**d.f.**	**Prob.**	**Effects Test**	**Statistic**	**d.f.**	**Prob.**
Period F	0,8569	-91925,0	0,5636	Period F	0,5465	-91925,0	0,8411	Period F	1,2627	-91919,0	0,2524
Period Chi-square	7,8363	9,0000	0,5507	Period Chi-square	5,0014	9,0000	0,8342	Period Chi-square	11,5370	9,0000	0,2407

Table 5. Regression Results for Total Debt Ratio, Long-Term Debt Ratio and Short-Term Debt Ratio, Considering All Variables

Panel 1, 2 and 3 report the regression results for total debt ratio, long-term debt ratio and short-term debt ratio when controlling all explanatory variables. Sample period includes 10 years from 2004 to 2013.

Panel 1

Dependent Variable: Total debt/total assets
Cross-sections included: 212
Total panel (unbalanced) observations: 1960

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TANG	0,0078	0,0018	4,3616	0,0000
F_SIZE	0,0354	0,0045	7,8037	0,0000
PROF	0,0268	0,0138	1,9374	0,0498
DIV	1,67E-05	0,0000	1,4223	0,1551
GROW	1,22E-05	0,0001	0,1594	0,8733
NONTAX	0,4213	0,2972	1,4174	0,1565
COUN	0,2362	0,0979	2,4124	0,0159
GDP	-0,0037	0,0073	-0,5034	0,6148
INFL	-0,0062	0,0097	-0,6357	0,5251
INTR	-0,0116	0,0058	-1,9963	0,0460
EXCH	0,0014	0,0021	0,6726	0,5013
DEPO	0,0992	0,0513	1,9359	0,0500
LOAN	0,0788	0,0854	0,9229	0,3562
BASIC_MATERIALS	0,2105	0,1151	1,8285	0,0676
CAPITAL_GOODS	0,2890	0,1119	2,5830	0,0099
CONSUMER_GOODS	0,2872	0,1117	2,5699	0,0102
CONSUMER_SERVICE	0,2473	0,1119	2,2105	0,0272
ENERGY	0,1996	0,1127	1,7708	0,0768
HEALTH_CARE	0,1959	0,1114	1,7582	0,0789
INDUSTRY	0,2482	0,1121	2,2143	0,0269
MISCELLANEOUS	0,2639	0,1136	2,3237	0,0202
PUBLIC_UTILITIES		0,1127	3,3533	0,0008
TECHNOLOGY	0,1636	0,1124	1,4558	0,1456
TELECOMMUNICATIONS	0,1185	0,1204	0,9843	0,3251
TRANSPORTATION	0,2921	0,1135	2,5735	0,0101
C	-0,8199	0,2322	-3,5312	0,0004

Effects Specification

Period fixed (dummy variables)

R-squared	0,1529	Mean dependent var	0,3919
Adjusted R-squared	0,1380	S.D. dependent var	0,2054
S.E. of regression	0,1907	Akaike info criterion	-0,4581
Sum squared resid	70,038	Schwarz criterion	-0,3584
Log likelihood	483,91	Hannan-Quinn criter.	-0,4214
F-statistic	10,221	Durbin-Watson stat	0,2243
Prob(F-statistic)	0,0000		

Panel 2

Dependent Variable: Long-term debt ratio
Cross-sections included: 212
Total panel (unbalanced) observations: 1960

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TANG	0,0047	0,0012	4,0613	0,0001
F_SIZE	0,0063	0,0030	2,1402	0,0325
PROF	0,0482	0,0090	5,3229	0,0000
DIV	1,61E-05	0,0000	2,1009	0,0358
GROW	1,79E-05	0,0001	0,3574	0,7209
NONTAX	0,0001	0,1945	0,0006	0,9995
COUN	0,0554	0,0641	0,8656	0,3868
GDP	-0,0041	0,0048	-0,8660	0,3866
INFL	0,0056	0,0064	0,8803	0,3788
INTR	0,0013	0,0038	0,3540	0,7233
EXCH	0,0006	0,0014	0,4247	0,6711
DEPO	0,0240	0,0335	0,7142	0,4752
LOAN	-0,0026	0,0559	-0,0473	0,9622
BASIC_MATERIALS	0,1505	0,0753	1,9984	0,0458
CAPITAL_GOODS	0,1279	0,0732	1,7476	0,0807
CONSUMER_GOODS	0,1512	0,0731	2,0684	0,0387
CONSUMER_SERVICE	0,1914	0,0732	2,6145	0,0090
ENERGY	0,1186	0,0738	1,6081	0,1080
HEALTH_CARE	0,1162	0,0729	1,5936	0,1112
INDUSTRY	0,1304	0,0733	1,7781	0,0755
MISCELLANEOUS	0,2065	0,0743	2,7792	0,0055
PUBLIC_UTILITIES	0,2180	0,0738	2,9560	0,0032
TECHNOLOGY	0,0947	0,0735	1,2881	0,1979
TELECOMMUNICATIONS	0,1355	0,0788	1,7198	0,0856
TRANSPORTATION	0,1209	0,0743	1,6273	0,1038
C	-0,1558	0,1519	-1,0256	0,3052

Effects Specification

Period fixed (dummy variables)

R-squared	0,1579	Mean dependent var	0,2254
Adjusted R-squared	0,1430	S.D. dependent var	0,1348
S.E. of regression	0,1248	Akaike info criterion	-1,3063
Sum squared resid	29,987	Schwarz criterion	-1,2067
Log likelihood	1315,2	Hannan-Quinn criter.	-1,2697
F-statistic	10,615	Durbin-Watson stat	0,2663
Prob(F-statistic)	0,0000		

Panel 3

Dependent Variable: Short-term debt ratio
Cross-sections included: 212
Total panel (unbalanced) observations: 1954

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TANG	-0,0009	0,0005	-1,6413	0,1009
F_SIZE	0,0074	0,0013	5,5606	0,0000
PROF	0,0045	0,0041	1,1096	0,2673
DIV	-2,76E-06	0,0000	-0,8046	0,4211
GROW	-3,30E-06	0,0000	-0,1474	0,8828
NONTAX	0,1279	0,0870	1,4698	0,1418
COUN	-0,0292	0,0287	-1,0201	0,3078
GDP	-0,0026	0,0021	-1,2123	0,2255
INFL	-0,0009	0,0029	-0,3037	0,7614
INTR	0,0037	0,0017	2,2084	0,0273
EXCH	0,0009	0,0006	1,4321	0,1523
DEPO	0,0241	0,0150	1,6088	0,1078
LOAN	-0,0315	0,0250	-1,2599	0,2079
BASIC_MATERIALS	0,0451	0,0337	1,3389	0,1807
CAPITAL_GOODS	0,0486	0,0327	1,4851	0,1377
CONSUMER_GOODS	0,0419	0,0327	1,2827	0,1998
CONSUMER_SERVICE	0,0115	0,0327	0,3510	0,7256
ENERGY	0,0078	0,0330	0,2359	0,8135
HEALTH_CARE	0,0204	0,0326	0,6242	0,5326
INDUSTRY	0,0351	0,0328	1,0695	0,2850
MISCELLANEOUS	0,0589	0,0332	1,7716	0,0766
PUBLIC_UTILITIES	0,0189	0,0330	0,5736	0,5663
TECHNOLOGY	0,0123	0,0329	0,3738	0,7086
TELECOMMUNICATIONS	0,0149	0,0352	0,4240	0,6716
TRANSPORTATION	0,0050	0,0332	0,1518	0,8794
C	-0,1661	0,0680	-2,4421	0,0147

Effects Specification

Period fixed (dummy variables)

R-squared	0,1104	Mean dependent var	0,0445
Adjusted R-squared	0,0946	S.D. dependent var	0,0587
S.E. of regression	0,0558	Akaike info criterion	-2,9155
Sum squared resid	5,9800	Schwarz criterion	-2,8156
Log likelihood	2883,5	Hannan-Quinn criter.	-2,8788
F-statistic	7,0010	Durbin-Watson stat	0,8022
Prob(F-statistic)	0,0000		

Table 6. Regression Results for Total Debt Ratio, Long-Term Debt Ratio and Short-Term Debt Ratio Controlling Firm Specific Variables, Country Dummy and Industry Dummy

Panel 1, 2 and 3 report the regression results for total debt ratio, long-term debt ratio and short-term debt ratio when controlling only firms specific variables, country dummy and industry dummy variables. Sample period extends 10 years from 2004 to 2013.

Panel 1

Dependent Variable: Total debt/total assets
Cross-sections included: 212
Total panel (unbalanced) observations: 1960

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TANG	0,00771	0,00178	4,32601	0,00000
F_SIZE	0,03417	0,00449	7,61886	0,00000
PROF	0,02673	0,01382	1,93471	0,05000
DIV	0,00002	0,00001	1,44702	0,14810
GROW	0,00001	0,00008	0,11271	0,91030
NONTAX	0,44017	0,29678	1,48317	0,13820
COUN	0,05666	0,01398	4,05357	0,00010
BASIC_MATERIALS	0,21086	0,11517	1,83075	0,06730
CAPITAL_GOODS	0,29179	0,11192	2,60722	0,00920
CONSUMER_GOODS	0,28661	0,11181	2,56351	0,01040
CONSUMER_SERVICE	0,24674	0,11194	2,20418	0,02760
ENERGY	0,20109	0,11281	1,78266	0,07480
HEALTH_CARE	0,19583	0,11149	1,75658	0,07910
INDUSTRY	0,24980	0,11214	2,22763	0,02600
MISCELLANEOUS	0,26219	0,11363	2,30746	0,02110
PUBLIC_UTILITIES	0,38182	0,11277	3,38576	0,00070
TECHNOLOGY	0,16965	0,11239	1,50950	0,13130
TELECOMMUNICATIONS	0,12070	0,12045	1,00211	0,31640
TRANSPORTATION	0,29617	0,11354	2,60841	0,00920
C	-0,48660	0,13508	-3,60231	0,00030

Effects Specification

Period fixed (dummy variables)

R-squared	0,14924	Mean dependent var	0,39189
Adjusted R-squared	0,13690	S.D. dependent var	0,20544
S.E. of regression	0,19086	Akaike info criterion	-0,45985
Sum squared resid	70,3431	Schwarz criterion	-0,37728
Log likelihood	479,650	Hannan-Quinn criter.	-0,42950
F-statistic	12,0972	Durbin-Watson stat	0,22415
Prob(F-statistic)	0,00000		

Panel 2

Dependent Variable: Long-term debt ratio
Cross-sections included: 212
Total panel (unbalanced) observations: 1960

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TANG	0,00474	0,00117	4,07051	0,00000
F_SIZE	0,00680	0,00293	2,32034	0,02040
PROF	0,04863	0,00903	5,38416	0,00000
DIV	0,00002	0,00001	2,17878	0,02950
GROW	0,00002	0,00005	0,36220	0,71720
NONTAX	-0,01806	0,19396	-0,09311	0,92580
COUN	0,05113	0,00914	5,59674	0,00000
BASIC_MATERIALS	0,15113	0,07527	2,00779	0,04480
CAPITAL_GOODS	0,12734	0,07314	1,74098	0,08180
CONSUMER_GOODS	0,15177	0,07307	2,07706	0,03790
CONSUMER_SERVICE	0,19180	0,07316	2,62161	0,00880
ENERGY	0,11854	0,07373	1,60789	0,10800
HEALTH_CARE	0,11626	0,07286	1,59566	0,11070
INDUSTRY	0,13023	0,07329	1,77693	0,07570
MISCELLANEOUS	0,20666	0,07426	2,78285	0,00540
PUBLIC_UTILITIES	0,21705	0,07370	2,94489	0,00330
TECHNOLOGY	0,09340	0,07345	1,27157	0,20370
TELECOMMUNICATIONS	0,13519	0,07872	1,71735	0,08610
TRANSPORTATION	0,12029	0,07421	1,62098	0,10520
C	-0,08575	0,08828	-0,97130	0,33150

Effects Specification

Period fixed (dummy variables)

R-squared	0,15622	Mean dependent var	0,22542
Adjusted R-squared	0,14399	S.D. dependent var	0,13482
S.E. of regression	0,12474	Akaike info criterion	-1,31048
Sum squared resid	30,0466	Schwarz criterion	-1,22791
Log likelihood	1313,27	Hannan-Quinn criter.	-1,28013
F-statistic	12,7686	Durbin-Watson stat	0,26702
Prob(F-statistic)	0,00000		

Panel 3

Dependent Variable: Short-term debt ratio
Cross-sections included: 212
Total panel (unbalanced) observations: 1954

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TANG	-0,00083	0,00052	-1,59369	0,11120
F_SIZE	0,00775	0,00132	5,89432	0,00000
PROF	0,00458	0,00406	1,12771	0,25960
DIV	-2,67E-06	0,00000	-0,78013	0,43540
GROW	-1,80E-06	0,00002	-0,08043	0,93590
NONTAX	0,11752	0,08689	1,35254	0,17640
COUN	-0,00934	0,00409	-2,28134	0,02260
BASIC_MATERIALS	0,04500	0,03371	1,33462	0,18220
CAPITAL_GOODS	0,04793	0,03276	1,46285	0,14370
CONSUMER_GOODS	0,04228	0,03273	1,29199	0,19650
CONSUMER_SERVICE	0,01173	0,03277	0,35791	0,72040
ENERGY	0,00759	0,03302	0,22987	0,81820
HEALTH_CARE	0,02039	0,03263	0,62491	0,53210
INDUSTRY	0,03481	0,03283	1,06036	0,28910
MISCELLANEOUS	0,05910	0,03326	1,77694	0,07570
PUBLIC_UTILITIES	0,01806	0,03301	0,54700	0,58440
TECHNOLOGY	0,01078	0,03290	0,32771	0,74320
TELECOMMUNICATIONS	0,01459	0,03526	0,41373	0,67910
TRANSPORTATION	0,00416	0,03324	0,12521	0,90040
C	-0,10927	0,03956	-2,76186	0,00580

Effects Specification

Period fixed (dummy variables)

R-squared	0,10610	Mean dependent var	0,04450
Adjusted R-squared	0,09310	S.D. dependent var	0,05867
S.E. of regression	0,05587	Akaike info criterion	-2,91689
Sum squared resid	6,00856	Schwarz criterion	-2,83411
Log likelihood	2878,80	Hannan-Quinn criter.	-2,88646
F-statistic	8,16041	Durbin-Watson stat	0,80081
Prob(F-statistic)	0,00000		

Table 7. Regression Results for Long-Term Debt Ratio Controlling Firm Specific Variables, Country and Industry Dummy Variables, and Each Macroeconomic Variable Individually

Panel 1-6 report the regression results for long-term debt ratio when controlling firms specific variables, country and industry dummy variables, and each macroeconomic variables individually. Sample period extends 10 years from 2004 to 2013.

Panel 1 with GDP

Dependent Variable: Long-term debt ratio
Cross-sections included: 212
Total panel (unbalanced) observations: 1960

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TANG	0,00475	0,00117	4,07358	0,00000
F_SIZE	0,00681	0,00293	2,32182	0,02030
PROF	0,04858	0,00903	5,37857	0,00000
DIV	0,00002	0,00001	2,16822	0,03030
GROW	0,00002	0,00005	0,37068	0,71090
NONTAX	-0,01856	0,19399	-0,09569	0,92380
COUN	0,05043	0,00918	5,49151	0,00000
GDP	-0,00299	0,00391	-0,76322	0,44540
BASIC_MATERIALS	0,15073	0,07528	2,00212	0,04540
CAPITAL_GOODS	0,12705	0,07315	1,73681	0,08260
CONSUMER_GOODS	0,15151	0,07308	2,07318	0,03830
CONSUMER_SERVICE	0,19155	0,07317	2,61785	0,00890
ENERGY	0,11825	0,07373	1,60378	0,10890
HEALTH_CARE	0,11601	0,07287	1,59193	0,11160
INDUSTRY	0,12992	0,07330	1,77247	0,07650
MISCELLANEOUS	0,20643	0,07427	2,77933	0,00550
PUBLIC_UTILITIES	0,21678	0,07371	2,94092	0,00330
TECHNOLOGY	0,09307	0,07346	1,26695	0,20530
TELECOMMUNICATIONS	0,13481	0,07873	1,71230	0,08700
TRANSPORTATION	0,12000	0,07422	1,61691	0,10610
C	-0,07986	0,08863	-0,90100	0,36770

Effects Specification

Period fixed (dummy variables)

R-squared	0,15648	Mean dependent var	0,22542
Adjusted R-squared	0,14380	S.D. dependent var	0,13482
S.E. of regression	0,12475	Akaike info criterion	-1,30976
Sum squared resid	30,03758	Schwarz criterion	-1,22434
Log likelihood	1313,56600	Hannan-Quinn criter.	-1,27837
F-statistic	12,34570	Durbin-Watson stat	0,26635
Prob(F-statistic)	0,00000		

Panel 2 with inflation

Dependent Variable: Long-term debt ratio
Cross-sections included: 212
Total panel (unbalanced) observations: 1960

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TANG	0,00474	0,00117	4,06810	0,00000
F_SIZE	0,00642	0,00294	2,18490	0,02900
PROF	0,04819	0,00903	5,33486	0,00000
DIV	0,00002	0,00001	2,13116	0,03320
GROW	0,00002	0,00005	0,36116	0,71800
NONTAX	-0,00415	0,19410	-0,02136	0,98300
COUN	0,04301	0,01051	4,09129	0,00000
INFL	0,00748	0,00479	1,56093	0,11870
BASIC_MATERIALS	0,15098	0,07525	2,00646	0,04490
CAPITAL_GOODS	0,12812	0,07312	1,75216	0,07990
CONSUMER_GOODS	0,15168	0,07304	2,07660	0,03800
CONSUMER_SERVICE	0,19178	0,07313	2,62236	0,00880
ENERGY	0,11896	0,07370	1,61419	0,10670
HEALTH_CARE	0,11648	0,07284	1,59926	0,10990
INDUSTRY	0,13071	0,07326	1,78413	0,07460
MISCELLANEOUS	0,20676	0,07424	2,78522	0,00540
PUBLIC_UTILITIES	0,21820	0,07368	2,96144	0,00310
TECHNOLOGY	0,09473	0,07343	1,29006	0,19720
TELECOMMUNICATIONS	0,13590	0,07869	1,72697	0,08430
TRANSPORTATION	0,12101	0,07418	1,63124	0,10300
C	-0,08953	0,08828	-1,01415	0,31060

Effects Specification

Period fixed (dummy variables)

R-squared	0,15729	Mean dependent var	0,22542
Adjusted R-squared	0,14463	S.D. dependent var	0,13482
S.E. of regression	0,12469	Akaike info criterion	-1,31072
Sum squared resid	30,00876	Schwarz criterion	-1,22530
Log likelihood	1314,50700	Hannan-Quinn criter.	-1,27933
F-statistic	12,42147	Durbin-Watson stat	0,26770
Prob(F-statistic)	0,00000		

Panel 3 with interest rate

Dependent Variable: Long-term debt ratio
Cross-sections included: 212
Total panel (unbalanced) observations: 1960

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TANG	0,00473	0,00117	4,06206	0,00010
F_SIZE	0,00649	0,00295	2,20259	0,02770
PROF	0,04859	0,00903	5,38016	0,00000
DIV	0,00002	0,00001	2,15521	0,03130
GROW	0,00002	0,00005	0,34327	0,73140
NONTAX	-0,00791	0,19421	-0,04075	0,96750
COUN	0,04144	0,01313	3,15741	0,00160
INTR	0,00333	0,00324	1,02820	0,30400
BASIC_MATERIALS	0,15087	0,07527	2,00427	0,04520
CAPITAL_GOODS	0,12791	0,07315	1,74874	0,08050
CONSUMER_GOODS	0,15139	0,07307	2,07177	0,03840
CONSUMER_SERVICE	0,19146	0,07316	2,61696	0,00890
ENERGY	0,11873	0,07372	1,61042	0,10750
HEALTH_CARE	0,11616	0,07286	1,59430	0,11100
INDUSTRY	0,13050	0,07329	1,78059	0,07510
MISCELLANEOUS	0,20624	0,07426	2,77718	0,00550
PUBLIC_UTILITIES	0,21786	0,07371	2,95577	0,00320
TECHNOLOGY	0,09481	0,07347	1,29060	0,19700
TELECOMMUNICATIONS	0,13550	0,07872	1,72129	0,08540
TRANSPORTATION	0,12114	0,07421	1,63234	0,10280
C	-0,08681	0,08829	-0,98323	0,32560

Effects Specification

Period fixed (dummy variables)

R-squared	0,15669	Mean dependent var	0,22542
Adjusted R-squared	0,14401	S.D. dependent var	0,13482
S.E. of regression	0,12474	Akaike info criterion	-1,31001
Sum squared resid	30,03019	Schwarz criterion	-1,22459
Log likelihood	1313,80700	Hannan-Quinn criter.	-1,27861
F-statistic	12,36510	Durbin-Watson stat	0,26755
Prob(F-statistic)	0,00000		

Panel 4 with exchange rate

Dependent Variable: Long-term debt ratio
Cross-sections included: 212
Total panel (unbalanced) observations: 1960

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TANG	0,00475	0,00117	4,07124	0,00000
F_SIZE	0,00683	0,00293	2,32847	0,02000
PROF	0,04870	0,00904	5,38984	0,00000
DIV	0,00002	0,00001	2,19346	0,02840
GROW	0,00002	0,00005	0,35929	0,71940
NONTAX	-0,01841	0,19401	-0,09488	0,92440
COUN	0,05292	0,01038	5,10073	0,00000
EXCH	0,00038	0,00105	0,36385	0,71600
BASIC_MATERIALS	0,15088	0,07529	2,00387	0,04520
CAPITAL_GOODS	0,12708	0,07316	1,73687	0,08260
CONSUMER_GOODS	0,15148	0,07309	2,07248	0,03840
CONSUMER_SERVICE	0,19154	0,07318	2,61731	0,00890
ENERGY	0,11829	0,07375	1,60409	0,10890
HEALTH_CARE	0,11603	0,07288	1,59196	0,11160
INDUSTRY	0,13001	0,07331	1,77345	0,07630
MISCELLANEOUS	0,20649	0,07428	2,77987	0,00550
PUBLIC_UTILITIES	0,21680	0,07372	2,94070	0,00330
TECHNOLOGY	0,09312	0,07347	1,26739	0,20520
TELECOMMUNICATIONS	0,13492	0,07874	1,71340	0,08680
TRANSPORTATION	0,12004	0,07423	1,61719	0,10600
C	-0,11716	0,12349	-0,94874	0,34290

Effects Specification

Period fixed (dummy variables)

R-squared	0,15628	Mean dependent var	0,22542
Adjusted R-squared	0,14360	S.D. dependent var	0,13482
S.E. of regression	0,12477	Akaike info criterion	-1,30953
Sum squared resid	30,04458	Schwarz criterion	-1,22411
Log likelihood	1313,33800	Hannan-Quinn criter.	-1,27813
F-statistic	12,32731	Durbin-Watson stat	0,26739
Prob(F-statistic)	0,00000		

Panel 5 with supply of bank funding

Dependent Variable: Long-term debt ratio
Cross-sections included: 212
Total panel (unbalanced) observations: 1960

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TANG	0,00474	0,00117	4,06454	0,00010
F_SIZE	0,00671	0,00293	2,28811	0,02220
PROF	0,04845	0,00904	5,36293	0,00000
DIV	0,00002	0,00001	2,13825	0,03260
GROW	0,00002	0,00005	0,35939	0,71930
NONTAX	-0,01314	0,19409	-0,06770	0,94600
COUN	0,06542	0,02044	3,20002	0,00140
DEPO	0,02287	0,02927	0,78133	0,43470
BASIC_MATERIALS	0,15161	0,07528	2,01389	0,04420
CAPITAL_GOODS	0,12786	0,07316	1,74777	0,08070
CONSUMER_GOODS	0,15221	0,07308	2,08272	0,03740
CONSUMER_SERVICE	0,19224	0,07317	2,62730	0,00870
ENERGY	0,11897	0,07373	1,61344	0,10680
HEALTH_CARE	0,11673	0,07287	1,60187	0,10930
INDUSTRY	0,13065	0,07330	1,78242	0,07480
MISCELLANEOUS	0,20715	0,07427	2,78904	0,00530
PUBLIC_UTILITIES	0,21755	0,07371	2,95122	0,00320
TECHNOLOGY	0,09396	0,07346	1,27898	0,20110
TELECOMMUNICATIONS	0,13570	0,07873	1,72358	0,08490
TRANSPORTATION	0,12069	0,07422	1,62620	0,10410
C	-0,11495	0,09588	-1,19894	0,23070

Effects Specification

Period fixed (dummy variables)

R-squared	0,15649	Mean dependent var	0,22542
Adjusted R-squared	0,14382	S.D. dependent var	0,13482
S.E. of regression	0,12475	Akaike info criterion	-1,30978
Sum squared resid	30,03714	Schwarz criterion	-1,22436
Log likelihood	1313,58000	Hannan-Quinn criter.	-1,27838
F-statistic	12,34684	Durbin-Watson stat	0,26613
Prob(F-statistic)	0,00000		

Panel 6 with demand of bank loan

Dependent Variable: Long-term debt ratio
Cross-sections included: 212
Total panel (unbalanced) observations: 1960

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TANG	0,00476	0,00117	4,08712	0,00000
F_SIZE	0,00684	0,00293	2,33371	0,01970
PROF	0,04867	0,00903	5,38918	0,00000
DIV	0,00002	0,00001	2,15783	0,03110
GROW	0,00002	0,00005	0,37079	0,71080
NONTAX	-0,01378	0,19399	-0,07102	0,94340
COUN	0,08733	0,03350	2,60716	0,00920
LOAN	0,03994	0,03556	1,12325	0,26150
BASIC_MATERIALS	0,15009	0,07527	1,99386	0,04630
CAPITAL_GOODS	0,12678	0,07314	1,73329	0,08320
CONSUMER_GOODS	0,15110	0,07307	2,06789	0,03880
CONSUMER_SERVICE	0,19116	0,07316	2,61295	0,00900
ENERGY	0,11802	0,07372	1,60092	0,10960
HEALTH_CARE	0,11579	0,07286	1,58928	0,11220
INDUSTRY	0,12976	0,07329	1,77066	0,07680
MISCELLANEOUS	0,20622	0,07426	2,77702	0,00550
PUBLIC_UTILITIES	0,21658	0,07370	2,93859	0,00330
TECHNOLOGY	0,09287	0,07345	1,26440	0,20620
TELECOMMUNICATIONS	0,13454	0,07872	1,70922	0,08760
TRANSPORTATION	0,11978	0,07421	1,61412	0,10670
C	-0,13887	0,10015	-1,38667	0,16570

Effects Specification

Period fixed (dummy variables)

R-squared	0,15678	Mean dependent var	0,22542
Adjusted R-squared	0,14410	S.D. dependent var	0,13482
S.E. of regression	0,12473	Akaike info criterion	-1,31011
Sum squared resid	30,02701	Schwarz criterion	-1,22469
Log likelihood	1313,91100	Hannan-Quinn criter.	-1,27872
F-statistic	12,37346	Durbin-Watson stat	0,26673
Prob(F-statistic)	0,00000		

Table 8. Regression results for short-term debt ratio controlling firm specific variable, country and industry dummy variables, and each macroeconomic variable

Panel 1-6 report the regression results for short-term debt ratio when controlling firms specific variables, country and industry dummy variables, and each macroeconomic variable individually. Sample period extends 10 years from 2004 to 2013.

Panel 1 with GDP

Dependent Variable: Short-term debt ratio
Cross-sections included: 212
Total panel (unbalanced) observations: 1954

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TANG	-0,00083	0,00052	-1,59190	0,11160
F_SIZE	0,00775	0,00132	5,89338	0,00000
PROF	0,00457	0,00406	1,12517	0,26070
DIV	-2,68E-06	0,00000	-0,78410	0,43310
GROW	-1,72E-06	0,00002	-0,07685	0,93880
NONTAX	0,11742	0,08691	1,35105	0,17680
COUN	-0,00947	0,00411	-2,30119	0,02150
GDP	-0,00056	0,00175	-0,31814	0,75040
BASIC_MATERIALS	0,04492	0,03372	1,33202	0,18300
CAPITAL_GOODS	0,04787	0,03277	1,46085	0,14420
CONSUMER_GOODS	0,04223	0,03274	1,29015	0,19720
CONSUMER_SERVICE	0,01168	0,03278	0,35636	0,72160
ENERGY	0,00754	0,03303	0,22816	0,81950
HEALTH_CARE	0,02035	0,03264	0,62329	0,53320
INDUSTRY	0,03475	0,03283	1,05832	0,29000
MISCELLANEOUS	0,05906	0,03327	1,77516	0,07600
PUBLIC_UTILITIES	0,01801	0,03302	0,54536	0,58560
TECHNOLOGY	0,01072	0,03291	0,32579	0,74460
TELECOMMUNICATIONS	0,01452	0,03527	0,41163	0,68070
TRANSPORTATION	0,00411	0,03325	0,12355	0,90170
C	-0,10816	0,03973	-2,72269	0,00650

Effects Specification

Period fixed (dummy variables)

R-squared	0,10615	Mean dependent var	0,04450
Adjusted R-squared	0,09268	S.D. dependent var	0,05867
S.E. of regression	0,05588	Akaike info criterion	-2,91592
Sum squared resid	6,00824	Schwarz criterion	-2,83028
Log likelihood	2878,85	Hannan-Quinn criter.	-2,88444
F-statistic	7,87883	Durbin-Watson stat	0,80065
Prob(F-statistic)	0,00000		

Panel 2 with inflation

Dependent Variable: Short-term debt ratio
Cross-sections included: 212
Total panel (unbalanced) observations: 1954

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TANG	-0,00083	0,00052	-1,59438	0,11100
F_SIZE	0,00771	0,00132	5,84036	0,00000
PROF	0,00453	0,00406	1,11484	0,26510
DIV	-2,71E-06	0,00000	-0,79154	0,42870
GROW	-1,81E-06	0,00002	-0,08075	0,93560
NONTAX	0,11909	0,08700	1,36882	0,17120
COUN	-0,01025	0,00471	-2,17630	0,02970
INFL	0,00084	0,00215	0,39327	0,69420
BASIC_MATERIALS	0,04498	0,03372	1,33381	0,18240
CAPITAL_GOODS	0,04801	0,03277	1,46512	0,14310
CONSUMER_GOODS	0,04227	0,03274	1,29139	0,19670
CONSUMER_SERVICE	0,01173	0,03278	0,35776	0,72060
ENERGY	0,00764	0,03303	0,23124	0,81720
HEALTH_CARE	0,02042	0,03264	0,62553	0,53170
INDUSTRY	0,03486	0,03283	1,06176	0,28850
MISCELLANEOUS	0,05911	0,03327	1,77686	0,07570
PUBLIC_UTILITIES	0,01819	0,03302	0,55078	0,58190
TECHNOLOGY	0,01093	0,03291	0,33220	0,73980
TELECOMMUNICATIONS	0,01467	0,03527	0,41591	0,67750
TRANSPORTATION	0,00424	0,03325	0,12762	0,89850
C	-0,10969	0,03959	-2,77093	0,00560

Effects Specification

Period fixed (dummy variables)

R-squared	0,10618	Mean dependent var	0,04450
Adjusted R-squared	0,09270	S.D. dependent var	0,05867
S.E. of regression	0,05588	Akaike info criterion	-2,91595
Sum squared resid	6,00808	Schwarz criterion	-2,83031
Log likelihood	2878,88	Hannan-Quinn criter.	-2,88447
F-statistic	7,88089	Durbin-Watson stat	0,80147
Prob(F-statistic)	0,00000		

Panel 3 with interest rate

Dependent Variable: Short-term debt ratio
Cross-sections included: 212
Total panel (unbalanced) observations: 1954

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TANG	-0,00084	0,00052	-1,61205	0,10710
F_SIZE	0,00748	0,00132	5,66181	0,00000
PROF	0,00455	0,00406	1,12153	0,26220
DIV	-2,82E-06	0,00000	-0,82460	0,40970
GROW	-2,63E-06	0,00002	-0,11722	0,90670
NONTAX	0,12611	0,08694	1,45056	0,14710
COUN	-0,01764	0,00588	-3,00135	0,00270
INTR	0,00285	0,00145	1,96700	0,04930
BASIC_MATERIALS	0,04477	0,03369	1,32888	0,18400
CAPITAL_GOODS	0,04841	0,03274	1,47862	0,13940
CONSUMER_GOODS	0,04195	0,03270	1,28263	0,19980
CONSUMER_SERVICE	0,01143	0,03274	0,34904	0,72710
ENERGY	0,00774	0,03300	0,23467	0,81450
HEALTH_CARE	0,02031	0,03261	0,62277	0,53350
INDUSTRY	0,03503	0,03280	1,06806	0,28560
MISCELLANEOUS	0,05873	0,03324	1,76709	0,07740
PUBLIC_UTILITIES	0,01875	0,03299	0,56838	0,56980
TECHNOLOGY	0,01201	0,03288	0,36510	0,71510
TELECOMMUNICATIONS	0,01486	0,03523	0,42173	0,67330
TRANSPORTATION	0,00489	0,03321	0,14719	0,88300
C	-0,11010	0,03954	-2,78478	0,00540

Effects Specification

Period fixed (dummy variables)

R-squared	0,10790	Mean dependent var	0,04450
Adjusted R-squared	0,09445	S.D. dependent var	0,05867
S.E. of regression	0,05583	Akaike info criterion	-2,91788
Sum squared resid	5,99650	Schwarz criterion	-2,83224
Log likelihood	2880,76	Hannan-Quinn criter.	-2,88640
F-statistic	8,02418	Durbin-Watson stat	0,80346
Prob(F-statistic)	0,00000		

Panel 4 with exchange rate

Dependent Variable: Short-term debt ratio
Cross-sections included: 212
Total panel (unbalanced) observations: 1954

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TANG	-0,00083	0,00052	-1,59018	0,11200
F_SIZE	0,00777	0,00132	5,90946	0,00000
PROF	0,00464	0,00406	1,14257	0,25340
DIV	-2,55E-06	0,00000	-0,74534	0,45620
GROW	-1,92E-06	0,00002	-0,08580	0,93160
NONTAX	0,11723	0,08690	1,34899	0,17750
COUN	-0,00782	0,00465	-1,68168	0,09280
EXCH	0,00033	0,00047	0,69124	0,48950
BASIC_MATERIALS	0,04478	0,03372	1,32794	0,18440
CAPITAL_GOODS	0,04770	0,03277	1,45561	0,14570
CONSUMER_GOODS	0,04204	0,03273	1,28416	0,19920
CONSUMER_SERVICE	0,01150	0,03277	0,35097	0,72560
ENERGY	0,00738	0,03303	0,22343	0,82320
HEALTH_CARE	0,02019	0,03264	0,61857	0,53630
INDUSTRY	0,03462	0,03283	1,05443	0,29180
MISCELLANEOUS	0,05896	0,03327	1,77231	0,07650
PUBLIC_UTILITIES	0,01784	0,03302	0,54044	0,58900
TECHNOLOGY	0,01054	0,03291	0,32033	0,74880
TELECOMMUNICATIONS	0,01435	0,03526	0,40701	0,68400
TRANSPORTATION	0,00395	0,03324	0,11880	0,90540
C	-0,13600	0,05533	-2,45800	0,01410

Effects Specification

Period fixed (dummy variables)

R-squared	0,10633	Mean dependent var	0,04450
Adjusted R-squared	0,09286	S.D. dependent var	0,05867
S.E. of regression	0,05588	Akaike info criterion	-2,91611
Sum squared resid	6,00707	Schwarz criterion	-2,83048
Log likelihood	2879,04	Hannan-Quinn criter.	-2,88463
F-statistic	7,89336	Durbin-Watson stat	0,80059
Prob(F-statistic)	0,00000		

Panel 5 with supply of bank funding

Dependent Variable: Short-term debt ratio
Cross-sections included: 212
Total panel (unbalanced) observations: 1954

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TANG	-0,00084	0,00052	-1,60189	0,10930
F_SIZE	0,00769	0,00132	5,84357	0,00000
PROF	0,00445	0,00406	1,09722	0,27270
DIV	-2,88E-06	0,00000	-0,84134	0,40030
GROW	-1,90E-06	0,00002	-0,08472	0,93250
NONTAX	0,12120	0,08692	1,39431	0,16340
COUN	0,00117	0,00916	0,12783	0,89830
DEPO	0,01682	0,01311	1,28251	0,19980
BASIC_MATERIALS	0,04535	0,03371	1,34521	0,17870
CAPITAL_GOODS	0,04831	0,03276	1,47476	0,14040
CONSUMER_GOODS	0,04260	0,03272	1,30197	0,19310
CONSUMER_SERVICE	0,01206	0,03276	0,36799	0,71290
ENERGY	0,00790	0,03302	0,23936	0,81080
HEALTH_CARE	0,02074	0,03263	0,63562	0,52510
INDUSTRY	0,03511	0,03282	1,06988	0,28480
MISCELLANEOUS	0,05947	0,03326	1,78803	0,07390
PUBLIC_UTILITIES	0,01842	0,03301	0,55806	0,57690
TECHNOLOGY	0,01118	0,03290	0,33985	0,73400
TELECOMMUNICATIONS	0,01496	0,03525	0,42426	0,67140
TRANSPORTATION	0,00446	0,03323	0,13409	0,89330
C	-0,13078	0,04297	-3,04382	0,00240

Effects Specification

Period fixed (dummy variables)

R-squared	0,10687	Mean dependent var	0,04450
Adjusted R-squared	0,09340	S.D. dependent var	0,05867
S.E. of regression	0,05586	Akaike info criterion	-2,91672
Sum squared resid	6,00343	Schwarz criterion	-2,83109
Log likelihood	2879,64	Hannan-Quinn criter.	-2,88524
F-statistic	7,93837	Durbin-Watson stat	0,79933
Prob(F-statistic)	0,00000		

Panel 6 with demand of bank loan

Dependent Variable: Short-term debt ratio
Cross-sections included: 212
Total panel (unbalanced) observations: 1954

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TANG	-0,00083	0,00052	-1,59397	0,11110
F_SIZE	0,00775	0,00132	5,89181	0,00000
PROF	0,00458	0,00406	1,12715	0,25980
DIV	-2,67E-06	0,00000	-0,77870	0,43630
GROW	-1,81E-06	0,00002	-0,08085	0,93560
NONTAX	0,11742	0,08693	1,35080	0,17690
COUN	-0,01019	0,01501	-0,67866	0,49740
LOAN	-0,00094	0,01594	-0,05899	0,95300
BASIC_MATERIALS	0,04502	0,03373	1,33491	0,18210
CAPITAL_GOODS	0,04794	0,03277	1,46286	0,14370
CONSUMER_GOODS	0,04230	0,03274	1,29211	0,19650
CONSUMER_SERVICE	0,01174	0,03278	0,35828	0,72020
ENERGY	0,00760	0,03303	0,23018	0,81800
HEALTH_CARE	0,02040	0,03264	0,62508	0,53200
INDUSTRY	0,03482	0,03283	1,06041	0,28910
MISCELLANEOUS	0,05911	0,03327	1,77677	0,07580
PUBLIC_UTILITIES	0,01807	0,03302	0,54719	0,58430
TECHNOLOGY	0,01080	0,03291	0,32800	0,74290
TELECOMMUNICATIONS	0,01460	0,03527	0,41404	0,67890
TRANSPORTATION	0,00417	0,03325	0,12554	0,90010
C	-0,10802	0,04488	-2,40680	0,01620

Effects Specification

Period fixed (dummy variables)

R-squared	0,10610	Mean dependent var	0,04450
Adjusted R-squared	0,09263	S.D. dependent var	0,05867
S.E. of regression	0,05588	Akaike info criterion	-2,91587
Sum squared resid	6,00855	Schwarz criterion	-2,83023
Log likelihood	2878,80	Hannan-Quinn criter.	-2,88439
F-statistic	7,87506	Durbin-Watson stat	0,80079
Prob(F-statistic)	0,00000		

Appendix B

Figure 1. Pooled Regression Residual Plot for Total Debt Ratio

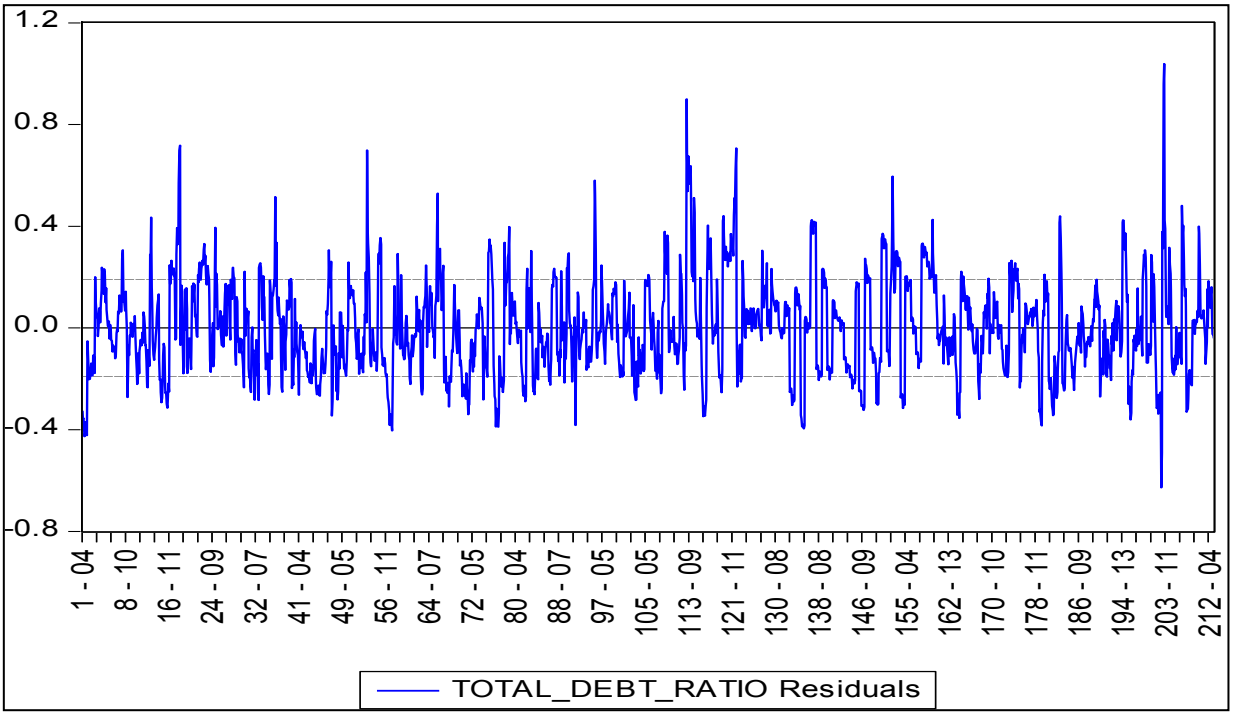

Table 2. Pooled Regression Residual Plot for Long-Term Debt Ratio

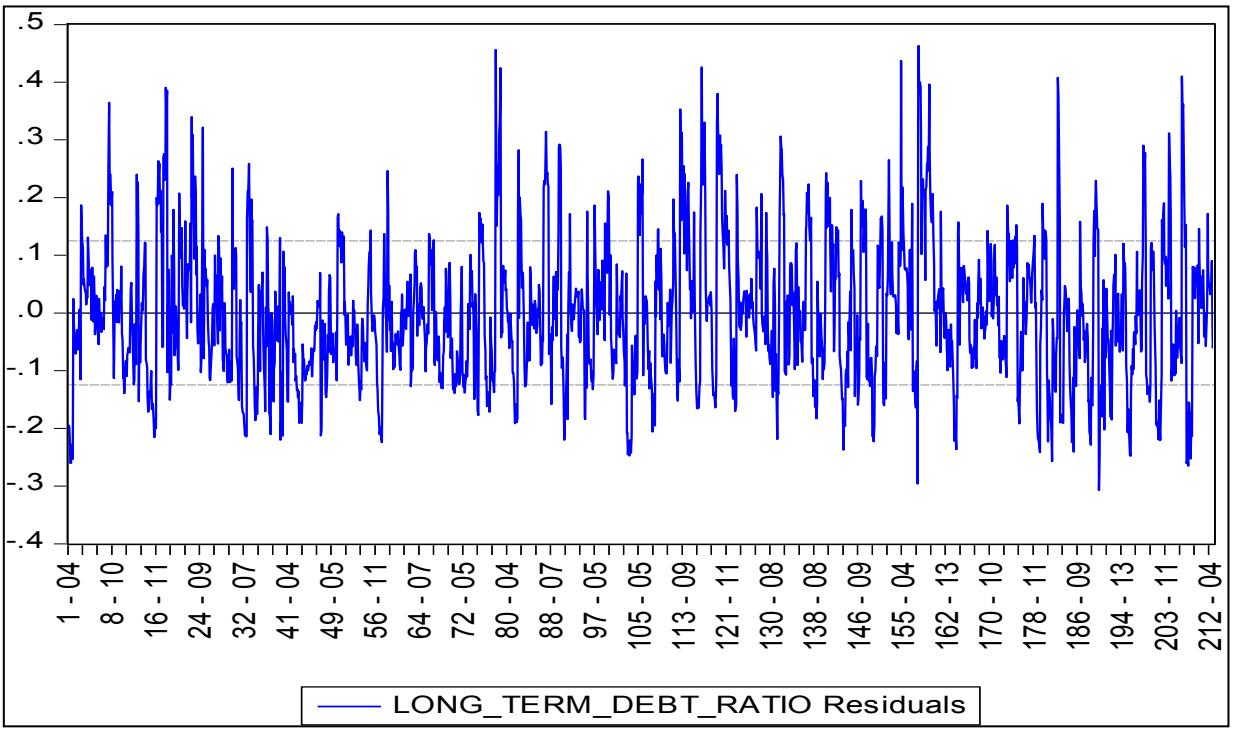

Table 3. Pooled Regression Residual Plot for Short-Term Debt Ratio