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Capital Structure Adjustment Speed – the Effects of Firm Internationalization and Recessions on Swedish Firms

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Abstract

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Five key words: capital structure, adjustment speed, partial adjustment, multinationality, recessions.

Purpose: The purpose of this study was threefold. First, we wanted to examine the capital structure adjustment speed for a typical Swedish firm. Second, we wanted to examine whether multinationality had effects on the capital structure adjustment speed. Third, we wanted to examine whether recession periods had effects on the capital structure adjustment speed.

Methodology: We applied a partial adjustment model developed by Flannery & Rangan (2006). Both ordinary least squares (OLS) and two stage least squares (TSLS) regressions were run using panel data.

Theoretical perspectives: M&M propositions, pecking order theory, trade-off theory, market timing theory, dynamic trade-off theory.

Empirical foundation: The thesis studied non-financial Swedish firms classified as large- and mid-caps listed on Stockholm Stock Exchange active in 2009 throughout the time period 1990 to 2009. The firms were divided into multinational and domestic firms using a foreign sales ratio. Recession periods were defined as periods with negative GDP growth.

Conclusions: We found that the speed at which a typical Swedish non-financial firm offsets a deviation from optimal leverage throughout the period 1990 – 2009 was 3, 55 years (28, 17 %). The adjustment speed was not affected by recession periods or multinationality of firms.

Definitions

Here we present frequently used terms in the thesis and describe them shortly.

Capital Structure Adjustment Speed

Defined as the speed at which firms offset deviations from a target or optimal leverage ratio. It is computed from the regression coefficient of the explanatory variable lagged market debt ratio. In this paper, we use target and optimal leverage synonymously since the optimal leverage is assumed to be the target.

Target or Optimal Leverage/Debt Ratio

An optimal leverage/debt ratio defined by certain firm characteristics.

The Trade-off Theory

Firms trade off tax benefits of debt against bankruptcy costs and choose the capital structure which maximizes the value of the firm (Kraus & Litzenberger, 1973).

The Pecking Order Theory

Firms prefer internal financing to external financing due to information asymmetry and choose securities to issue after riskiness in ascending order (Myers & Majluf, 1984).

The Market Timing Theory

Firms exploit miss-priced equity opportunities in the market hence capital structures are just a result of miss-pricing and exploited opportunities (Baker & Wurgler, 2002).

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1. Introduction

In this chapter we introduce the reader to the subject and relevant theories. We present motives for the thesis, research questions, and delimitations. The chapter is closed with further outline of the paper.

1.1. Background

Various theories try to explain choice and determinants of capital structure which has been a heavily researched field in corporate finance since the pioneering work of Modigliani and Miller (1958). Much of the earlier empirical research has focused on testing the validity of the trade-off theory first expressed by Kraus and Litzenberger (1973) and the pecking order theory first expressed by Myers and Majluf (1984). More recently researchers have started to focus on managers' actions to decrease deviations from an optimal leverage ratio and on the speed of adjustment toward this ratio.

Since the traditional models were not able to address the issue of dynamic capital structure adjustments, other theories have been developed (Graham & Leary, 2011). Several factors, such as shocks to asset values and/or specific market timing opportunities that managers exploit, can affect actual leverage and cause it to deviate from the current ratio (ibid.). The market timing theory tries to explain this kind of deviation and argues that firms exploit miss-priced equity opportunities in the market (Baker & Wurgler, 2002). In particular, firms repurchase equity when their equity prices are low and issue equity when their equity prices are high. Thus, capital structures according to the market timing theory is just a result of miss-pricing and exploited opportunities, and no optimal or target debt ratios exist.

The dynamic trade-off theory supported by Leary and Roberts (2005) and Flannery and Rangan (2006) argues, in contrast, that firms adjust their actual leverage ratio toward target leverage ratios partially following deviations. The adjustments are partial and not complete due to market imperfections (i.e. transaction costs). Clark,

Francis and Hasan (2009) and Cook and Tang (2010) gave further evidence to these empirics.

Other researchers have suggested that firms might have target leverage range ratios, but no specific target ratios (Fischer, Heinkel & Zechner, 1989; Hovakimian & Li, 2009). Accordingly, as long as firms are in that range, they will not adjust their capital structures since the costs of operating with sub-optimal leverage are lower than the transaction costs of adjusting.

Several researchers have analyzed capital structure adjustments and the speed of adjustment toward a target debt ratio in particular. However, the main focus has been on differences in firm size and firm characteristics (Flannery & Rangan, 2006; Heshmati, 2001). Only few researches have examined the speed of adjustment in combination with macroeconomic conditions (Cook & Tang, 2010; Hovakimian & Li 2009; Huang, 2010), and barely any of them have considered the differences in internationalization of firms in this context.

Economic conditions are important when considering business strategies, pricing strategies, market positions etc. (Oxelheim & Wihlborg, 2008). Recession periods in particular have a strong influence on firms' financing decisions (Baum, Chakraborty & Liu, 2010). Capital structures tend to vary over time depending on business cycles and economic situations (Choe, Masulis & Nanda, 1993; Erel, Julio, Kim & Weisbach, 2010; Korajczyk & Levy, 2003). Cook and Tang (2010), for example, found that firms tend to adjust their capital structures faster toward their target leverages in favourable macroeconomic states and slower in unfavourable macroeconomic states mainly because it is easier to access capital markets in favourable macroeconomic states. Hovakimian and Li (2009) believed firms would fully adjust their capital structures under favourable macroeconomic states, but not under unfavourable macroeconomic states. No full adjustments were found however, hence the evidence is inconclusive.

Following this discussion, the recent global financial crisis and earlier financial crises might have had strong influences on firms' access to capital markets, their capital structure adjustments, and the speed of adjustment in particular.

The degree of internationalization is another factor affecting firms' access to funding and thus their ability to adjust their capital structures. Increased diversification due to a higher degree of international activity might lead highly multinational firms to lower risk exposure (Reeb, Mansi & Allee, 2001). However, foreign exchange risks, political risks and labour imperfections simultaneously increase the riskiness of equity capital (Michel & Shaked, 1986). Therefore, even if multinational companies tend to have lower costs of debt due to better access to funding (Reeb et al, 2001), increased leverage might increase the cost of equity enough to offset the benefits (Singh & Nejadmalayeri, 2004). Whether the net effect is positive or not, depends on the degree of internalization and the level of debt financing.

Even if the whole world was affected by the collapse of the U.S. sub-prime mortgage market in 2008 several economies have recovered better than others. Sweden, even being highly dependent on export and the global financial situation, has emerged from the current financial crisis as one of the strongest economies in Europe (U.S. Department of State, 2010). In addition, since Sweden is known for its small open economy and limited capital markets, Swedish firms have larger incentives to internationalize compared to U.S. firms (Andersson, Gabrielsson & Wictor, 2006). Thus, one can expect to see a higher degree of internationalization among Swedish firms. It is therefore in our interest to examine the issue of capital structure adjustments in Sweden as most studies have been done in the U.S. Heshmati (2001) is one of the few authors that have examined the issue of capital structure adjustment speed in Sweden. His research was restricted to micro and small Swedish firms, however. The degree of multinationality was not taken into account.

1.2. Problem Formulation

Whether firms adjust their actual capital structures toward target capital structures following a deviation, to what extent and to what speed, is a very important topic for several reasons. First and most important, it can explain whether managers consider the dynamic trade-off theory to be of primary importance. Second, it can partly reveal what factors explain managers' and firms' behaviour when making capital structure decisions.

It has been debated whether firms have optimal capital structures. Being either underleveraged or overleveraged impairs firm value. Therefore, in absence of

transaction costs, firms would offset deviations immediately if optimal capital structures exist. However, under these conditions, since transaction costs are not absent and recapitalizations are costly, firms would only recapitalize when the benefits of recapitalization exceed the transaction costs (Flannery & Rangan, 2006). Thus, it is hard to find conclusive evidence in either direction without further testing empirically.

Internationalization of firms and financial integration are important factors for a country's economical growth. The greatest development of the Swedish financial sector was seen during the 1990s (Alsén, 2008). However, despite a continuing development Sweden has still not reached the level of the U.S. with a highly developed financial sector (ibid.). Because of these differences, in addition to the expected higher degree of firm internationalization among Swedish firms, opportunities to raise capital, especially during recession periods, can differ from U.S. firms, and is therefore of interest to examine.

1.3. Research Question

What is the capital structure adjustment speed for a typical Swedish firm? Does multinationality of firms have significant effects? Do economic recessions have significant effects?

1.4. Purpose

The purpose of this study is threefold. First, we want to examine the capital structure adjustment speed for a typical Swedish firm. Second, we want to examine whether multinationality of firms has significant effects on the capital structure adjustment speed. Third, we want to examine whether recession periods have significant effects on the capital structure adjustment speed.

1.5. Delimitations

In this thesis, we restrict ourselves to testing the dynamic trade-off theory. However, the partial adjustment model we apply is general enough to test the pecking order theory and the market timing theory by modifying the explanatory variables in the regression specification.

1.6. Outline

This thesis is outlined as follows:

In Chapter 2 we describe the data selection and summarize the sample. We also present assumptions used to define multinationality of firms and recession periods.

In Chapter 3 we motivate and describe the choice of method. Further we present the partial adjustment model developed by Flannery & Rangan (2006) and explain the variables used to construct the regression.

In Chapter 4 we present summary statistics and an analysis of the results. Besides, we explain how we run the regressions and generate the output, as well as summarize results from previous studies in comparison to ours.

In Chapter 5 we present several robustness tests.

In Chapter 6 we conclude the results and provide suggestions for further research.

2. Data and Empirical Specifications

In this chapter we explain the data selection, summarize the sample and further elaborate it by including definitions used to classify the variables.

2.1. Data Selection and Specifications

Panel data, used in this thesis, contains both cross-sectional and times series data. Panel data allows us to examine how the variables and the relationship between them vary dynamically (Brooks, 2008). Structured correctly, it also has the advantage to deal with certain variable bias in the regression (ibid.).

The dataset includes all large- and mid-cap firms that were active on the Stockholm Stock Exchange in 2009 throughout the period 1990 – 2009. The Stockholm Stock Exchange is then used to categorize the firms in industries and as large- and mid-caps. Since capital structure and the speed of adjustment toward an optimal leverage might be highly influenced by the size of the firm (Heshmati, 2001), we exclude small-cap firms from the sample. This is because the relatively higher adjustment costs for small firms are very likely to exceed the benefits of operating with optimal leverage (ibid.). Including small firms might therefore lead to biased results. Firm size is also a very important variable for observation of firms' probability of default (Chittenden, Hall & Hutchinson, 1996). Due to a better diversification ability and easier access to equity markets, larger firms tend to less likely fall in default. In addition, larger firms are normally higher leveraged because of lower monitoring costs and reduced moral hazard and adverse selection costs (ibid.).

Consistent with earlier studies, we exclude financial firms and regulated firms since their capital structure decisions might be determined by special factors (Cook & Tang, 2010; Fama & French, 2002; Korajczyk & Levy, 2003).

Thomson DataStream database is used to collect firm specific data. Since the regression specification includes lagged variables, we need at least two consecutive

years of data for every firm included in the sample (Flannery & Rangan, 2006). For all observations fiscal year ends are used.

To compute the independent variables used to construct the regression defined in a later section, we collect nine different types of firm data from Thomson DataStream database. These are total debt (WC03255), EBIT (WC18191), market value of equity (MV), depreciation (WC01148), total assets (WC02999), fixed assets/common equity (WC08266), common shareholders' equity (WC03501), R&D (WC01201) and foreign sales/total sales (WC08731).

To ensure that the gathered data from Thomson DataStream is correct we control it with the original firm data reported in the firms' annual reports. Several random samples of firm-year data were chosen to make the quality control, and no deviations from the original reported values were found. Therefore we can conclude that the gathered firm data later used to compute the regression variables is reliable.

The Swedish consumer price index (CPI) is used to deflate the independent variables that are defined as absolute values in the regression specification. The index is gathered from Statistics Sweden [SCB].

To sum up, the sample consists of 899 firm-year observations, which consist of 87 firms with an average of 11, 74 years each and a median of 11 years. The minimum number of years per firm is 2 and the maximum is 20.

2.2. Classification of Multinationality of Firms

Earlier empirics have suggested several ways to define multinationality of firms. Foreign sales ratio (foreign sales / total sales) has been widely used to distinguish between multinational and domestic firms (Fatemi, 1988; Michael & Shaked, 1986)¹. Lee and Kwok (1988) suggested using the foreign tax ratio. Bae and Noh (2001) suggested a combination of foreign tax ratio and foreign sales ratio. Oxelheim (1984)

¹ Michael and Shaked (1986) used 20 % foreign sales ratio and direct investment in at least 6 countries outside the U.S. Fatemi (1988) used a list provided by Moody's *Directory of Corporate Affiliations* to determine what firms engaged in overseas operations and further defined multinationality by using foreign sales ratio of 25 %.

suggested a slightly different approach and defined multinational firms as firms with the largest exports, foreign sales, and employees abroad².

Foreign sales ratio succeeds to capture firms' sales abroad and thus multinationality in a satisfying manner. A higher foreign sales ratio implies a higher international dependence whereas a lower ratio does not. However, this measure has some limitations since there is a risk that foreign sales in foreign subsidiaries could be mixed with exports from the parent company (Bae & Noh, 2001). Oxelheim's (1984) definition provides a solution to this problem by including the additional variables exports and employees abroad. Yet, this method requires a large amount of unavailable data, especially with a quantitative approach where all data has to be collected for every year and firm separately. Thus, we decide to use the foreign sales ratio as a measure of multinationality. In particular, a ratio of 25 % is used to categorize the firms as multinational as suggested by Fatemi (1988). This method allows us to identify whether firms' multinationality have changed over the years.

One could possibly obtain different results if one sets the ratio at 50 %, for example, rather than 25 %. Consequently, it can be argued that a ratio used to categorize firms as multinational in 1988 in the U.S. could be irrelevant in Sweden today due to the continuous increasing globalization and the higher expected degree of multinationality of firms in Sweden. However, rather than setting the ratio arbitrarily, we consider it better to follow established empirics of multinationality not to obtain futile or biased results. We perform a robustness test in a later section to see whether the used foreign sales ratio is appropriate.

Later empirics have argued that the distinction between domestic and multinational firms has become smaller due to the increased globalization where all firms are exposed to the global marketplace in one way or another (Oxelheim & Wihlborg, 2008). All firms are influenced by various risks and opportunities that their competitors, suppliers, customers and other direct or indirect parts experience. However, we still believe a distinction is relevant since the degree of international dependence will always vary.

² Oxelheim (1984) constructed a Venn diagram with the largest firms in all three mentioned categories to see which firms were included in all three categories. These firms were defined as multinational and were included in the sample.

2.3. Classification of Recession Years

There are several ways to define economical downturns. Generally, most of the recessions identified by the National Bureau of Economic Research [NBER] (2011) consist of two or more quarters of declining GDP. In Sweden recessions have been defined by different sources. We apply Edvinsson's (2010) identification that has widely been used in empirics to classify the period 1990 – 2000. Edvinsson (2010) defined recession periods as periods with negative GDP growth, i.e. when GDP in one year is below the level two years earlier. To be consistent, we follow his definition when grouping the years for the period 2000 – 2009. However, more often other variables, such as decline in real income, employment, industrial production and wholesale-retail sales are taken into account to determine a decline in an economy (NBER, 2010). Therefore, to further define periods we apply a classification of recession years from the Nordic Financial Outlook (SEB, 2010) and the Swedish National Institute of Economic Research [Konjunkturinstitutet] (2011)³. In both sources besides GDP, additional economical factors are included, which makes our classification more valid.

Other researchers, for example Cook and Tang (2010), used term spread, default spread, GDP growth and dividend yield to classify good macroeconomic states in their study. The results found were tested with NBER's classification of business cycles. Despite the differences in measuring macroeconomic uncertainty, Cook and Tang (2010) concluded that their results were similar to those obtained when using NBER's classification. For this reason we believe our classification is reliable.

We summarize the recession years in Sweden below:

³ Identified with a barometer indicator based on a questionnaire study on the current and future economical situation; answered by Swedish companies and the Swedish household sector (Konjunkturinstitutet, 2011).

Table 1 Classification of Recession Years in Sweden

Recession years
1990-1993*
2000-2001**
2008-2009**

* Defined by Edvinsson, 2010

** Defined by SEB, 2010 and Konjunkturinstitutet,2011

Sweden being a small open economy with a huge export sector is strongly affected by the international economic situation. Therefore, business cycles are said to be imported (Wickman - Parak, 2008). To validate the findings and mapping of Swedish recession years, we look at the U.S. business cycle classification made by NBER (2011) (see table 2). Not surprisingly, the periods look similar except for the 1990 and 2001 crisis that hit the Swedish economy stronger.

Table 2 Classification of Recession Years in U.S.

Peak	Through	Recession years
1990/7	1991/3	1990
2001/3	2001/11	2001
2007/12	2009/6	2007-2009

3. Method

In this chapter we clarify and specify the method used to answer our research questions. Alternative methods, as well as some critique are discussed to explain the choice.

3.1. Model Choice

The partial adjustment model developed by Flannery and Rangan (2006) is superior to earlier models when testing capital structure adjustment speed toward a target for several reasons.

First and foremost, it allows for incomplete (partial) adjustments. It assumes that there is an optimal debt ratio (the dependent variable) firms strive to maintain. The response to deviations from the optimal debt ratio, however, is not immediate or complete due to costs of adjustment, and the optimal debt ratio is allowed to vary across firms and over time. This will be developed further in the regression specification.

Second, panel regressions are preferred to cross-sectional specifications used by Fama and French (2002) and Korajczyk and Levy (2003) among others when stable and unobserved effects are prevalent and affecting the optimal debt ratio (Flannery & Rangan, 2006). Moreover, cross-sectional specifications imply that the actual debt ratio is also the target debt ratio. Flannery and Rangan (2006) demonstrated that this implication is unjustified by adding the lagged dependant variable to the regression. It appeared to have a vastly significant coefficient and is, thus, warranted in the regression.

Third, the model is general enough to test various estimation techniques. It has been used to demonstrate that many previous estimation techniques have imposed unjustifiable assumptions about the dynamic properties of target leverage leading to biased results (Flannery & Rangan, 2006). Baker and Wurgler (2002), Fama and French (2002), Huang and Ritter (2005), and Welch (2004), for example, implicitly

assumed that transaction costs are non-existent, implying that capital structure adjustments are costless.

Nothing revolutionary has happened that has improved the partial adjustment model since the work of Flannery and Rangan (2006) was published. Further explanatory variables can be included in the regression to modify it. Consequently, we find no reason to apply another model.

3.2. Model Critique

Some critique has arisen against capital structure adjustment speed estimates in general. Lemmon, Roberts and Zender (2008) found that capital structure adjustment speed is little affected whether one stipulates the target as a function of time-varying characteristics or as a firm-specific constant. Moreover, Iliev and Welch (2010) found that capital structure adjustment speed is little affected whether one simulates data under a known target debt ratio or an unknown target debt ratio.

Further critique stated that much of the unexplained variation in leverage is firm specific (Graham & Leary, 2011). Flannery and Rangan (2006) realized this, however, but argued that while the bias is significant, it is economically unimportant.

3.3. Model Specification

Here we present the partial adjustment model developed by Flannery and Rangan (2006). The optimal level of market debt ratio (MDR – as will be developed in the next section) is allowed to vary across firms and time. Deviations are not necessarily offset immediately and the optimal level varies stochastically every year but is adjusted only periodically (Flannery & Rangan, 2006).

The optimal level of MDR cannot be observed in the regression equation. Instead, the actual level of MDR is observed. The actual level of MDR is dependent upon the adjustment process and is then, naturally, allowed to vary over time (Barreto & Howland, 2006).

Firm i 's annual difference in market debt ratio between year t and year $t+1$ is defined as:

$$MDR_{i,t+1} - MDR_{i,t} = \lambda (MDR_{i,t}^* - MDR_{i,t}) + \delta_{i,t+1}$$

The equation can be rearranged to make it evaluable:

$$MDR_{i,t+1} = (\lambda \beta) X_{i,t} + (1 - \lambda) MDR_{i,t} + \delta_{i,t+1}$$

Every year, firm i offsets the fraction λ of the gap between actual ($MDR_{i,t}$) and optimal debt ratio ($\beta X_{i,t}$ – as will be developed in the next section). Note that the lagged dependent variable belongs in the regression equation. Thus, λ indicates a gap between firm i 's actual and optimal debt ratio. Adjustment speed, λ , is interpreted as the average adjustment speed for a “typical firm” and is the measure of interest.

The adjustment speed can further be estimated as:

$$\lambda = 1 - \beta_l$$

Where β_l is the regression coefficient for lagged market debt ratio.

When estimating capital structure adjustment speed, it might help to look at the extremes to get a better understanding. If λ would equal 0, there would be no adjustment; if λ would equal 1, there would be an immediate adjustment indicating that the market debt ratio would always be at its target; if λ would be higher than 1, the market debt ratio would be adjusted beyond its target; and if λ would be lower than 0, the adjustment would make little or no economic sense (Barreto & Howland, 2006).

It is hard to strictly set a limit at which the speed of adjustment is fast enough to imply that the dynamic trade-off theory is the prior explanatory theory for the long-term adjustment toward a target debt ratio. One can say, however, with the previous mentioned extremes in mind that a faster adjustment speed indicates that the dynamic trade-off theory can explain much of the convergence toward a target whereas a slower adjustment speed cannot explain the variations in firms' leverages by convergence toward a target (Flannery & Rangan, 2006). Consequently, with a slower adjustment speed, other theories such as the market timing theory and/or the pecking order theory are more likely to explain the capital structure decisions.

Flannery and Rangan (2006) found that the MDR regression coefficient is biased upward in an ordinary least square regression (OLS) because the residual component of MDR is correlated with the unobserved effect in the error term. This unobserved

effect explains a significant part of the cross-sectional variation in target debt ratio without setting other firm characteristics ($X_{i,t}$) aside (Flannery & Rangan, 2006).

Firm-fixed effects can be included to deal with the time invariant error term that comes forth in the OLS regression and thus capture these unobserved effects on each firms' target leverages (Flannery & Rangan, 2006; Heshmati, 2001). However, firm-fixed effects will bias the MDR regression coefficient downward since the “within transformation” instates a correlation between the transformed lagged dependent variable and the lagged error term (Flannery & Rangan, 2006).

To receive unbiased estimates of the MDR regression coefficient, one can apply a two-stage least square regression (TSLS) – a regression that is based on a two-step OLS regression procedure (Flannery & Rangan, 2006). First, instrument variables must be constructed. Second, the parameter of interest can be estimated (Barreto & Howland, 2006). According to Greene (2008), if an instrument that is correlated with the lagged dependent variable can be found, but not with the error term, the TSLS regression will yield unbiased estimates of the levels regression. The MDR regression coefficient should then be expected to lie in between the simple OLS estimate and the fixed effect OLS estimate and thus yield the average adjustment speed in a satisfying manner (Bond, 2002).

3.4. Market Debt Ratio

Both book and market debt ratios have been used in earlier studies to define capital structure. Fama and French (2002) preferred book values since book values are independent of factors that are not under the firms' direct control. However, market values better reflect agency problems between creditors and equity holders (Welch, 2004). In our thesis we follow Flannery and Rangan (2006) and use market debt ratio as the dependent variable.

MDR, as defined by Flannery and Rangan (2006):

$$MDR_{i,t} = D_{i,t} / (D_{i,t} + S_{i,t} * P_{i,t}),$$

Where $D_{i,t}$ is the book value of firm i 's interest bearing debt at time t , $S_{i,t}$ is the number of common shares outstanding at time t , and $P_{i,t}$ is the price per share at time t .

Previous studies have defined leverage and market debt ratio in several ways. However, empirics have concluded that estimates of capital structure adjustment speed are not dependent upon the definition of leverage (Cook & Tang, 2010; Flannery & Rangan, 2006). Therefore, we apply only one definition of leverage, i.e. the above-mentioned market debt ratio.

Firms have different optimal debt ratios depending on firm level characteristics. Firm i 's desired (optimal) leverage ratio at $t+1$ is defined as follows:

$$MDR^*_{i,t+1} = \beta X_{i,t},$$

Where $X_{i,t}$ (a set of independent variables) is a vector which describes costs and benefits of operating with different debt ratios and thus determines the optimal debt ratio. β is a coefficient vector. The parameters that define $X_{i,t}$ have commonly been used in the literature field to determine optimal debt ratio. These parameters are EBIT / Total Assets, Market Value of Equity / Book Value of Equity, Depreciation / Total Assets, LN (Total Assets), Fixed Assets / Total Assets, R&D / Total Assets, Industry Debt Median, and a dummy variable included for firms that do not report R&D expenses separately (Cook & Tang, 2010; Flannery & Rangan, 2006; Hovakimian, Opler & Titman, 2001). In addition to these variables, we apply recession dummy variables for each recession year and firm to test whether recessions have had any influences on the capital structure adjustment speed. Dummy variables are also applied for multinational firms to test whether multinationality has had any influence on the capital structure adjustment speed. Generally, dummy variables are used to track actions that affect a value of a variable at particular points in time but not throughout the entire period of study (Baretto & Howland, 2006).

3.5. Explanatory Variables

In this section firm characteristics ($X_{i,t}$) that affect the optimal debt ratio are explained.

EBIT_TA: A higher EBIT to Total Asset ratio could possibly affect the target debt ratio in either way. Higher retained earnings, for example, decrease the leverage ratio mechanically. The ability to meet debt payments, on the other hand, could give incentives to operate with higher leverage (Flannery & Rangan, 2006). Concerning

the case of Sweden, a study of capital structure determinants of larger Swedish firms, presented by Asgharian (1997), suggested that profitability, as well as dividend payments and stock returns could affect leverage negatively.

MB: A higher Market to Book ratio of equity could signal future growth opportunities and thus give incentives to operate with a lower debt ratio (Flannery & Rangan, 2006).

DEP_TA: A higher Depreciation to Total Asset ratio could give incentives to operate with a lower debt ratio since a higher ratio decreases the benefits gained from interest reductions (Flannery & Rangan, 2006).

LnTA: Larger firms tend to operate with a higher debt ratio because they are more transparent, have lower asset volatility and better access to capital markets (Flannery & Rangan, 2006). The natural logarithm is used to mitigate the size differences (ibid.). Since this variable is not a fraction, we deflate all reported values with 1980's Swedish consumer price index (CPI).

FA_TA: A higher Fixed Asset to Total Asset ratio increases debt capacity and thus gives incentives to operate with a higher debt ratio (Flannery & Rangan, 2006).

R&D_TA: Firms with a higher proportion of intangible assets have incentives to operate with a higher equity ratio and thus a lower debt ratio (Flannery & Rangan, 2006).

R&D_DUM: This dummy variable (1) is included for firms that do not report R&D expenses in their financial reports (Flannery & Rangan, 2006). For these firms we set zero (0) at R&D expenses.

Ind_Median: Several studies have found that firms' deviations from their target leverages are dependent upon the industries they operate in (Smith, Chen & Anderson, 2010; Stoja & Tucker, 2007). As suggested by Flannery and Rangan (2006), we include industry median debt ratio to control for industry characteristics that have not been captured by other variables and to deal with the risk of operating in a specific industry.

REC123_DUM: This dummy variable (1) is included for all firms during the years of all three recession periods, i.e. 1990 – 1993, 2001 – 2003 and 2008 – 2009. During

unfavorable economic conditions firms tend to operate with higher leverage ratios due to limited access to capital markets (Cook & Tang, 2010).

MULT_DUM: This dummy variable (1) is included for all multinational firms during the period 1990 – 2009. We set one (1) for all companies that had a foreign sales ratio of 25 % and more, and zero (0) for firms that reported foreign sales ratio lower than 25 % or did not report it at all.

Some empirics suggest including an additional explanatory variable which explains the effects of a firm having a public debt rating (Faulkender & Petersen, 2006). Due to data restrictions, we have to exclude this explanatory variable from our sample. Fortunately, it has been argued that this variable has a modest effect on the estimates (Flannery & Rangan, 2006).

3.6. Instrument Variables

It is generally complicated to find relevant instruments to the TSLS regression since the instrument variables have to be highly correlated with the endogenous variable but not with the error term. Therefore, we follow Flannery and Rangan (2006) and use lagged book debt ratio and $X_{i,t}$ as instruments. Using lagged book debt ratio to instrument for lagged market debt ratio is in line with other empirics (Bond, 2002).

4. Empirical Study

In this chapter obtained results are presented and further analysed in comparison to previous results from other studies. In addition, different regressions are tested and the choice of the final one is further developed.

4.1. Descriptive Statistics

We summarize the statistics for years 1990 – 2009 below.

Table 3 Descriptive Statistics

V a r i a b l e	M e a n	M e d i a n	M a x i m u m	M i n i m u m	S t d. D e v.	O b s e r v a t i o n s
BDR	0.237218	0.234537	0.930916	0	0.147414	899
DEP_TA	0.033193	0.033479	0.182408	0	0.017673	899
EBIT_TA	0.097620	0.098824	0.570291	-2.470650	0.154259	899
FA_TA	0.261463	0.241972	0.896510	0.001827	0.188945	899
IND_DEBT_MED	0.247498	0.252097	0.826476	0.007591	0.145948	899
LNTA_CPI_	14.81217	14.74694	18.60441	10.58227	1.772280	899
MB	2.345768	0.993772	83.19780	0.005319	6.151489	899
MDR	0.265534	0.226514	0.995290	0	0.223220	899
MULTINATIONALITY	0.783092	1	1	0	0.412369	899
R_D_DUM	0.441602	0	1	0	0.496854	899
R_D_TA	0.028687	0.005093	1.731033	0	0.095708	899
REC123	0.441602	0	1	0	0.496854	899

From the descriptive statistics we note that large-cap and mid-cap firms in Sweden have a mean leverage of 23, 7 % (book to debt ratio) - 26, 6 % (market to debt ratio). As revealed from the statistics, large-cap and mid-cap firms in our sample are less leveraged than the small-cap and micro firms studied by Heshmati (2001). Swedish

firms in his study⁴ were almost three times more leveraged (with a mean leverage of 74 %) compared to firms in our sample, which is inconsistent with the theory we discussed when excluding small-cap firms from our sample. Hesmati (2001), however, explained that the high leverage of small firms in Sweden was due to the unattractiveness of equity financing at the time. A better comparable mean leverage, defined as market debt ratio, is from the sample of U.S. firms presented by Flannery and Rangan (2006) (27, 8 %).

The descriptive statistics further reveal that more than 78 % of the firms are classified as multinational throughout the period 1990 – 2009. Recession periods account for 44 % of the firm-year observations.

A correlation matrix is constructed (see table 4 in appendix). No severe multicollinearity is found between the variables. Moreover, data is normally distributed in all run regressions.

4.2. Regression Results

To generate the output we use Eviews 7 software. First, we construct an OLS regression with and without time- and firm-fixed effects. We then apply the adjustment speed formula and compute the capital structure adjustment speed under the assumptions specified in the method section.

Under the simple OLS estimate (see table 5 in appendix), we find that a typical Swedish non-financial firm adjust its debt ratio toward its target by 20, 78 % on an average annually. When recession dummies are applied, the speed falls to 20, 68 %. When multinational dummies are applied, the speed rises to 20, 90 %. When both recession and multinational dummies are applied, the speed is 20, 80 %.

Under the fixed effects OLS estimate (see table 6 in appendix), we find that a typical Swedish non-financial firm adjust its debt ratio toward its target by 41, 34 % on an average annually. When recession dummies are applied, the speed rises to 41, 35 %. When multinational dummies are applied, the speed rises to 41, 63 %. When both recession and multinational dummies are applied, the speed is 41, 64 %.

⁴ Heshmati (2001) used a sample of 2261 small and micro Swedish firms throughout the period of 1993/4 – 1997/8.

To deal with the biases that come forth in the OLS regression estimates, we follow Flannery and Rangan (2006) and construct a TSLS regression (see table 7 in appendix) with an instrument variable that is correlated with the lagged dependent variable but not with the error term as was discussed in the method section.

Consistent with Bond (2002) and Flannery and Rangan (2006), we find that the estimate of the MDR coefficient with a TSLS regression falls in between the estimates with a simple OLS regression and a fixed-effects OLS regression. We find that a typical Swedish non-financial firm adjust its debt ratio toward its target by 28, 17 % on an average annually. When recession dummies are applied, the speed is still 28, 17 %. When multinational dummies are applied, the speed rises to 28, 33 %. When both recession dummies and multinational dummies are applied, the speed remains at 28, 33 %. The TSLS regressions are used going forward.

4.3. Analysis of Results

The analysis is based on four TSLS regressions (see table 7 in appendix) run with firm- and time-fixed effects. The regressions and their output vary, naturally, with the explanatory variables and specifications included. Regression number one is run plain and simple with no dummies included for internationalization or recession periods. Regression number two is run with recession period dummies. Regression number three is run with multinational dummies. Regression number four is run with recession period dummies and multinational dummies.

As can be seen from the regression outputs, several explanatory variables do not appear to be significant when running the TSLS regressions and the OLS regressions with fixed effects as is the case when running the simple OLS regressions⁵. One reason might be that much of the variation is firm-specific. Adjusted r-squared, however, is still high (coefficients between 0, 8181 – 0, 8184 for all run regression), which implies that the method of choice is reliable. In particular, over 81, 81 % of MDR can be explained by the explanatory variables and the fixed effects.

A higher EBIT_TA ratio could affect optimal leverage in either way as discussed under the method section. Higher retained earnings, by nature, lower actual debt ratio, which in accordance with the regression specification decrease optimal debt ratio

⁵ Significance is explained by the t-statistics ratio.

(Flannery & Rangan, 2006). The increased ability to meet debt payments, on the other hand, might give firms incentives to operate with a higher leverage ratio (ibid.). The negative results obtained from the regression coefficient EBIT_TA (-0, 111532; -0, 111531; -0, 111516; -0, 111515) suggest that the optimal debt ratio decreases when earnings to assets are higher. This is in line with the mechanics of higher retained earnings, suggesting that this factor is significantly more important than the incentives to operate with a higher leverage ratio. The t-statistics reveal statistic significance.

A higher FA_TA ratio was argued to give incentives to operate with a higher debt ratio that indicates a higher optimal debt ratio in accordance with the regression specification. This is because a higher ratio leads to increased debt capacity (Flannery & Rangan, 2006). The regression coefficient FA_TA (0, 152596; 0, 152579; 0,154803; 0,154784) is positive as predicted which indicates that firms' debt capacity increases when the relative amount of fixed assets increases. The t-statistics reveal statistic significance.

A higher DEP_TA ratio was expected to decrease the optimal debt ratio since higher depreciations decrease the benefits gained from interest expense deductions. The regression coefficient DEP_TA is negative (-0, 115335; -0, 115151; -0, 130721; -0, 130508), but the t-statistics reveal no statistic significance, hence no conclusion about the effects on optimal debt ratio can be drawn.

A higher LnTA ratio was expected to increase the optimal debt ratio as discussed in the method section. The stated reason was that larger firms tend to operate with a higher leverage ratio since they are more transparent, have lower asset volatility, and better access to capital markets (Flannery & Rangan, 2006). However, we find no statistic significance that strengthens this case. The reason might be that the difference between large-caps, between mid-caps, and between large- and mid-caps are not large enough as could be the case with large- and mid-caps compared to small-caps. In addition, the natural logarithm has been used to mitigate the size differences as discussed in the method section. We note, however, that the t-statistic reveal statistic significance in the simple OLS regression, which indicates that it more likely has to do with the regression specification.

A higher MB ratio was expected to decrease the optimal debt ratio since it signals future growth opportunities (Flannery & Rangan, 2006). The regression coefficient

MB's t-statistics reveal no statistical significance, however, so no conclusions about the effects on optimal debt ratio can be drawn.

A higher R&D_TA ratio was expected to decrease the optimal debt ratio since a higher proportion of intangible assets give firms incentives to operate with a higher equity ratio (Flannery & Rangan, 2006). The regression coefficient R&D_TA's t-statistics reveal no statistical significance, however, so no conclusions about the effects on optimal debt ratio can be drawn.

The variable Ind_Median was included to examine the explanatory power of the industry firms operate in. Predictions were not made about the effects on optimal debt ratio. The regression coefficient Ind_Median's t-statistics reveal no statistical significance, hence no conclusions about the effects on optimal debt ratio can be drawn either. One reason might be that we categorized the firms after the industries specified on the Stockholm Stock Exchange. The categorization might have been too narrow with too few firms in each category leading to insignificant results. In addition, most firms were not alive throughout the entire period of study, which further could have affected the results.

It was argued in the introduction section that firms' degree of internationalization could affect optimal leverage in either ways, as is the case with a higher EBIT_TA ratio. A higher degree of internationalization could possibly increase diversification and thereby decrease the risk of equity capital resulting in a higher optimal debt ratio (Reeb et al, 2001). On the other hand, increased foreign exchange risks, political risks, and labor imperfections could possibly increase the risk of equity capital and thereby lower the optimal debt ratio (Michel & Shaked, 1986). The variable used to test the effects of internationalization (MULT_DUM) has a positive regression coefficient (0, 005495), which indicates that a higher degree of internationalization could lead to an increased optimal debt ratio. However, the coefficient's t-statistics show no statistical significance in neither of the run regressions, so no effect conclusions can be drawn. The results can be interpreted in two ways, however. Either multinationality has significant effects on optimal leverage, but as the effects go in two directions, they offset each other; or multinationality has no significant effects on optimal leverage. It is important to stress that applying different foreign sales ratio do not affect the

results. A robustness test for different definitions of multinationality is presented in the following section (see table 10).

It is unclear whether and how recession periods affect firms' optimal debt ratios. All regressions that were run presented insignificant t-statistics for the recession dummy coefficients (0, 012082). This suggests that unfavorable macroeconomic conditions are insignificant when considering Swedish firms' optimal debt ratios. Even if earlier empirics have found that economical downturns limit firms' access to capital markets and affect the capital structure adjustment speed negatively (Cook & Tang, 2010; Hovakimian & Li, 2009), the same conclusions cannot be applied to Swedish firms. The insignificance of the variable used to test recession periods' impact on optimal debt ratio could depend upon the exceptional Swedish economy, which during the latest recession managed to recover better and faster than other countries (US Department of State, 2010). Moreover, a higher degree of internationalization does affect firms' access to capital markets positively, and since Swedish firms are highly internationalized, they might be unaffected by the capital restrictions less internationalized firms in other countries experience during recession periods.

In addition, the relative small sample of firms and the relative short recession periods might be an explanation to the recession periods' insignificance on optimal debt ratios. The definition used to categorize recession periods might also have affected the results. As explained earlier, other researchers have used alternative methods. For example, some of them included term spread, market dividend yield and default spread in addition to GDP (Cook & Tang, 2010). Further developing macroeconomic conditions and including these additional variables in the classification could be a suggestion for further research in the field.

It is important to note that we do not state that recession periods or multinationality are insignificant for Swedish firms in general. The model was applied to analyze optimal debt ratio and the capital structure speed of adjustment toward this ratio; therefore we restrict the conclusions to these issues.

4.4. Previous Results

We cannot explicitly compare the adjustment speed results obtained from this study with results obtained from other studies because of a simple reason. The additional

explanatory variables included in the regression specification do not affect the speed of adjustment directly, only indirectly by affecting the optimal debt ratio. Consequently, since the speed of adjustment is computed from the regression coefficient lagged market debt ratio, any explicit comparison will be biased. However, we believe it is important to present earlier results from similar studies to get a better understanding of factors that might have affected the obtained results.

Previous studies found that it takes between two to four years to correct a deviation from current leverage to optimal leverage for a typical non-financial firm in general (Flannery & Rangan, 2006; Leary & Roberts, 2005). This is consistent with our results signifying that it takes approximately 3, 55 years ($= 1/ 28, 17 \%$) for a typical non-financial Swedish firm to close the gap between current and optimal debt ratio. Flannery and Rangan (2006) applied the same partial adjustment model (except for some modifications regarding the explanatory variables) and found that firms adjusted their current debt ratios toward their optimal debt ratios at a speed of over 30 % annually. Compared to these results, our observed adjustment speed of Swedish firms is slower than the adjustment speed of U.S. firms. The minor difference can be explained by a number of explanatory variables that were significant for U.S. firms but appeared to be insignificant for Swedish firms.

Heshmati (2001) found a very slow adjustment speed of 8, 2 years ($= 1/ 12, 2 \%$) for Swedish small and micro firms. This can be explained by size effects and relative large adjustment costs of small firms (Heshmati, 2001). In addition, we recall the discussion we had about the choice of model and unwarranted specifications of target leverage.

78, 3 % of our studied firms were defined as multinational throughout the period, yet, the average Swedish firm is smaller than the average U.S. firm. Drobetz, Pensa and Wanzenried (2006) concluded that larger and faster growing firms adjust their actual leverage ratios toward target leverage ratios more readily and that large deviations lead to faster adjustments. However, Cook and Tang (2010) found that a faster adjustment speed is not attributable to the larger sizes of firms. Thus, it is unclear whether the difference can be explained by the variance in firms' sizes in different countries.

Clark, Francis and Hasan (2009) found that the speed of adjustment differed between developing and already developed countries, and that the variation was explained by legal, institutional and other country-level factors. Faster adjustments to target capital structures were found in developing countries where legal and institutional variables⁶ were more important to firms' leverage compared to firms' leverage in already developed countries.

⁶According to Clark et al. (2009), higher expected bankruptcy costs, managerial agency costs, needs for financial flexibility and tax rates, as well as strong creditor and shareholder rights were associated with faster adjustment in developing countries.

5. Robustness Tests

In this chapter we present several robustness tests. We test for speed of adjustment robustness over time, robustness across market debt ratios and whether the definition of multinationality of firms affects the obtained results.

5.1. Stability over Time

One might find reasons to believe that speed of adjustment estimates vary over time. We test the stability by dividing the sample into two equally sized periods, 1990 – 1999 and 2000 – 2009 (see table 8). Since the sample consists of a twenty-year-long period, dividing it into two ten-year-long samples is the most appropriate way. Dividing it into three or four equally sized samples would yield biased regression coefficients given the short time horizon and the estimated average adjustment speed of 3,55 years (28,17 %) during the entire period of study. Both samples are run using fixed effects TSLS regressions with no dummy variables applied for multinationality of firms or recession periods.

We find that the capital structure adjustment speed for a typical firm differ over time. This might depend upon the unequally spread firm-year data: the first time period 1990 – 1999 captures only 35 firms, while the second time period 2000 – 2009 captures 87 firms, which is the total number of firms observed in the original sample. It might also depend upon a more developed financial sector in the later period, resulting in an easier access to capital markets and/or lower transaction costs of adjusting. The continuously increasing globalization and internationalization of firms discussed previously might also play a part. The European Union, for example, increased its amount of country members during the years 2000 – 2009, opening up for a more integrated markets which could possibly affect the speed of adjustment positively among Swedish firms.

Table 8 Stability over time

Dependent Variable: MDR (+1)

Method: TSLS (fixed effects)

Variable	1990-1999*		2000-2009**		1990-2009***	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
MDR	0.537004	4.58397	0.679031	12.20913	0.718324	17.47231
	Adjusted R-squared	0.859757	Adjusted R-squared	0.800169	Adjusted R-squared	0.859757

* firms included 35, total observations 234
**firms included 87, total observations 634
***firms included 87, total observations 868

5.2. Stability across Market Debt Ratios

One might also find reasons to believe that speed of adjustment estimates vary across different levels of market debt ratio. We test this by dividing the firm-year data into two samples by the degree of market debt ratio (see table 9). The first sample includes all firm-year data for firms with a MDR ratio between 0 - 50 % and the second sample includes all firm-year data for firms with a MDR ratio between 51 – 100 %. The initial intention was to divide the firm-year data into three or four samples (MDR of 0 – 25 %, 26 – 50 %, 51 – 75 %, and 76 – 100 %) to test whether the obtained estimation of the adjustment speed is just a matter of mean reversion. Our model specifications, however, and the restriction in firm-year data hindered us from further dividing. Recall that we need at least two consecutive years of firm-year data to obtain unbiased results.

We find that the majority of Swedish non-financial firms had a leverage of less than 50 % during the entire time period and that these firms tended to adjust their debt ratios more readily toward a target compared to more leveraged firms. Firms with a MDR of 0 – 50 % had a speed of adjustment of 2, 55 years ($= 1 / 39, 2 \%$) while firms with a MDR of 51 – 100 % had a speed of adjustment of 3, 77 year ($= 1 / 26, 5 \%$).

Table 9 Stability across market debt ratios

Dependent Variable: MDR (+1)
Method: TSLS (fixed effects)

Variable	MDR 0 - 50 %*		MDR 51 – 100 %**		MDR 0 - 100 %***	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
MDR	0.608934	12.27844	0.734746	2.733534	0.718324	17.47231
	Adjusted R-squared	0.753360	Adjusted R-squared	0.632005	Adjusted R-squared	0.818490

* firms included 86, total observations 737
**firms included 24, total observations 99
***firms included 87, total observations 868

5.3 Alternative Definitions of Multinationality of Firms

Multinationality of firms, as discussed in the data section, can be defined using several different measures. Here we test different degrees of foreign sales ratio to see if they affect firms' optimal debt ratios differently. The regressions presented below (see table 10) are run separately including multinationality dummies for three different degrees: over 25 %, over 50 %, and over 75 %.

We find that different degrees of foreign sales ratio used to categorize firms as multinational do not change the results. This enables us to conclude that multinationality of firms is irrelevant to the optimal debt ratio of a typical Swedish firm.

Table 10 Alternative Definitions of Multinationality of Firms

Dependent Variable: MDR (+1)

Method: TSLS (fixed effects)

Firms included 87, total observations 868

Variable	Foreign Sales Ratio					
	> 25 %*		> 50 %		> 75 %	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Multinationality	0.005495	0.422620	0.002379	0.227085	-0.002369	-0.230184
	Adjusted R-squared	0.818413	Adjusted R-squared	0.818292	Adjusted R-squared	0.818265

6. Conclusion

In this chapter we present a short conclusion of our work and suggest possible discussion for future research.

6.1. Summary and Conclusion

This study had three purposes. The first one was to examine the capital structure adjustment speed for a typical Swedish firm. The other two were to examine whether multinationality and recession periods had significant effects on the capital structure adjustment speed throughout the period of study. Internationalization and recessions' effects on a country's economy are topical issues in Sweden and were therefore of interest to examine. The results were obtained using a dynamic partial adjustment model that allowed for incomplete adjustments. Panel data was used.

Two variables out of nine (in addition to lagged market debt ratio) were significant variables when determining the optimal debt ratio for Swedish firms when running the TSLS regressions. These variables were earnings before interest and taxes (EBIT) to total assets and fixed assets to total assets. Other variables, such as depreciation to total assets, the natural logarithm of total assets, market to book ratio of equity, industry median debt ratio, and research and development expenses to total assets, had no significant effects, as was the case for many of them in the OLS regressions and in the work of Flannery and Rangan (2006). The additional dummy variables included for recession periods and for multinational firms appeared to be insignificant as determinants of firms' optimal debt ratios with the preferred regression specification, too.

However, the explanatory variables included in the regression successfully explained more than 81 % of the market debt ratio, which was used to find the capital structure adjustment speed for a typical Swedish firm. We found that the speed at which a typical firm offsets a deviation from optimal leverage throughout the period 1990-2009 was 3, 55 years (28, 17 %). The adjustment speed was, as mentioned, not

affected by the recession periods; however, it increased with a few decimals when the multinationality of firms was taken into account, yet not significantly. The fast adjustment speed indicates that a typical Swedish non-financial firm considered a target leverage ratio and adjusted toward it throughout the period, thus revealing the importance of the dynamic trade-off theory.

To conclude, in this thesis we found the capital structure adjustment speed for a typical Swedish firm. Multinationality of firms and economic recessions appeared to have no significant effects on the speed of adjustment. The results were robust across different degrees of firm multinationality, but varied across time and across different levels of market debt ratio.

6.2. Suggestions for Further Research

Our work enlightened a relatively unexplored field of research in Sweden and could therefore be used as a benchmark to further develop the issue of capital structure adjustment speed in Sweden. In addition to testing the significance of the dynamic trade-off theory, researchers could test the significance of other theories such as the pecking order theory and the market timing theory in Sweden, simply by modifying some of the explanatory variables in the regression specification. We did not examine this issue further in this thesis, but we concluded that firms strive to maintain a target debt ratio, thus revealing the importance of the dynamic trade-off theory. A broader understanding of what affects capital structure decisions is always warranted.

In addition, our findings on firms' internationalization and recession periods' influence on firms' capital structure revealed conflicting evidence compared to earlier empirics. These factors appeared to be insignificant as determinants of firms' optimal debt ratios following our specification and could thus, with other specifications, be analyzed further to validate our findings.

Another classification of recession periods could be done by including additional macroeconomic variables as determinants, as was suggested earlier in the analysis section. The definition of firms' internationalization could be improved by separating foreign sales from exports and by including the additional variable employees abroad, as was discussed in the data and empirical specifications section.

A broader sample of firm-year data could be gathered. An interesting approach could be to include small-cap firms to examine whether the relatively higher adjustment costs of small firms affect the speed of adjustment for a typical Swedish firm. Another interesting approach could be to do an identical study in another country for comparison, or to include additional countries similar to Sweden with a relatively high amount of internationalized firms in the sample to contrast and compare. A better understanding of the uniqueness of the Swedish economy is always justified.

Reference List

Research Papers and Articles:⁷

Alsén, N. (2008). Finansiella sektorn bär frukt. Analys av den finansiella sektorn ur ett svenskt perspektiv. *Bilaga 5 till Långtidsutredningen 2008*. SOU 2008:12. Retrieved April 5, 2011 from <http://www.sweden.gov.se/content/1/c6/09/80/26/c1d1f5aa.pdf>

Andersson, S., Gabrielsson, J., & Wictor, I. (2006). Born Globals' foreign market channel strategies. *International Journal of Globalisation and Small Business*, 1 (4), 356-373.

Bae, S.C., & Noh, S. (2001). Multinational corporations versus domestic corporations: a comparative study of R&D investment activities. *Journal of Multinational Financial Management*, 11, 89–104.

Baker, M., & Wurgler, J. (2002). Market timing and capital structure. *Journal of Finance*, 57, 1-32.

Baum, F., Chakraborty, A., & Liu, B. (2010). The impact of macroeconomic uncertainty on firms' changes in financial leverage. *International Journal of Finance and Economics*, 15, 22-30.

Bond, S. (2002). Dynamic panel data models: a guide to micro data methods and practice. *Portuguese Economic Journal*, 1 (2), 309-326.

Chittenden, F., Hall, G., & Hutchinson, P. (1996). Small firm growth, access to capital markets and financial structure: Review of issues and an empirical investigation. *Small Business Economics*, 8, 59-67.

Choe, H., Masulis, R., & Nanda, V. (1993). Common stock offerings across the business cycle: theory and evidence. *Journal of Empirical Finance*, 1, 3–31.

⁷ All articles are gathered from LibHub service available through Lund University, if nothing else is stated.

- Clark, B. J., Francis, B., & Hasan, I. (2009). *Do firms adjust toward target capital structures? Some international evidence*. Retrieved February 16, 2011 from <http://ssrn.com/abstract=1286383>
- Cook, D.O., & Tang, T. (2010). Macroeconomic conditions and capital structure adjustment speed. *Journal of Corporate Finance*, 16, 73-87.
- Drobetz, W., Pensa, P., & Wanzenried, G. (2006). *Firm characteristics and dynamic capital structure adjustment*. Retrieved April 24, 2011 from <http://ssrn.com/abstract=952268>
- Edvinsson, R. (2010). Major Recessions in Sweden 1850-2000: from pre-capitalist to modern types of crises. *Scandinavian Journal of History*, 35 (4), 403-426.
- Erel, I., Julio, B., Kim, W., & Weisbach, M.S. (2010). *Macroeconomic conditions and the structure of securities*. A Research Report from Institute for Financial Research, 74. Stockholm: Institute for Financial Research [SIFR].
- Fama, E.F., & French, K.R. (2002). Testing trade-off and pecking order predictions about dividends and debt. *The Review of Financial Studies*, 15, 1-33.
- Fatemi, A.M. (1988). The effect of international diversification on corporate financing policy. *Journal of Business Research*, 16, 17-30.
- Faulkender, M., & Petersen, M. (2006). Does the source of capital affect capital structure? *Review of Financial Studies*, 19, 45-79.
- Fischer, E.O., Heinkel, R., & Zechner, J. (1989). Optimal dynamic capital structure choice: theory and tests. *The Journal of Finance*, 44, 19-40.
- Flannery, M.J., & Rangan, K.P. (2006). Partial adjustment toward target capital structures. *Journal of Financial Economics*, 79, 469-506.
- Graham, J.R., & Leary, M.T. (2011). A review of empirical capital structure research and directions for the future. *Annual Review of Financial Economics*, 3. Retrieved April 28, 2011 from <http://ssrn.com/abstract=1729388>
- Heshmati, A. (2001). On the growth of micro and small firms: evidence from Sweden. *Small Business Economics*, 17 (3), 213-228.

- Hovakimian, A., & Li, G. (2009). *Do firms have unique target debt ratios to which they adjust?* Retrieved February 16, 2011 from <http://ssrn.com/abstract=1138316>
- Hovakimian, A., Opler, T., & Titman, S. (2001). The debt-equity choice. *Journal of Financial and Quantitative Analysis*, 36, 1-24.
- Huang, H. (2010). *Company Characteristics, Macroeconomic conditions and dynamic capital Structure adjustment in China*. 17Th International Conference on Industrial Engineering and Engineering Management (pp. 186-190). Xiamen, China.
- Iliev, P., & Welch, I. (2010). *Reconciling Estimates of the Speed of Adjustment of Leverage Ratios*. Retrieved February 17, 2011 from <http://ssrn.com/abstract=1542691>
- Korajczyk, R.A., & Levy, A. (2003). Capital structure choice: macroeconomic conditions and financial constraints. *Journal of Financial Economics*, 68, 75-109.
- Kraus, A., & Litzenberger, R.H. (1973). A state-preference model of optimal financial leverage. *The Journal of Finance*, 28 (4), 911-922.
- Leary, M.T., & Roberts, M.R. (2005). Do firms rebalance their capital structure? *Journal of Finance*, 60 (6), 2575 – 2619.
- Lee, K.C., & Kwok, C.C.Y. (1988). Multinational corporations vs. domestic corporations: international environmental factors and determinants of capital structure. *Journal of International Business Studies*, 19 (2), 195-217.
- Lemmon, M. L., Roberts, M.R., & Zender, J. F. (2008). Back to the beginning: persistence and the cross-section of corporate capital structure. *The Journal of Finance*, 63 (4), 1575-1608.
- Michel, A., & Shaked, I. (1986). Multinational corporations vs. domestic corporations: financial performance and characteristics. *Journal of International Business Studies*, 17 (3), 89-100.
- Modigliani, F., & Miller, M.H. (1958). The cost of capital, corporation finance and the theory of investment. *The American Economic Review*, 48 (3), 261-297.

Myers, S.C., & Majluf, N.S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13, 187-221.

Reeb, D.M., Mansi, S.A., & Allee, J.M. (2001). Firm internationalization and the cost of debt financing: evidence from non-provisional publicly traded debt. *Journal of Financial and Quantitative Analysis*, 36, 395–414.

Singh, M., & Nejadmalayeri, A. (2004). Internationalization, capital structure, and cost of capital: evidence from French corporations. *Journal of Multinational Financial Management*, 14, 153–169.

Smith, J. D., Chen J., & Anderson, H.D. (2010). *Partial adjustments towards target capital structure: evidence from New Zealand* (Massey U. College of Business Research Paper 15). Retrieved April 24, 2011 from <http://ssrn.com/abstract=1640324>

Stoja, E., & Tucker, J.P. (2007). *Long and Short-Run Capital Structure Dynamics in the UK - An Industry Level Study*. Retrieved February 17, 2011 from <http://ssrn.com/abstract=1045101>

Wickman-Parak, B. (2008). *Finns en typisk konjunkturcykel?* Sweden: Sveriges Riksbank.

Welch, I. (2004). Capital structure and stock returns. *Journal of Political Economy*, 112, 106–131.

Books:

Asgharian, H. (1997). *Essays on capital structure* (Lund Economic Studies No. 64). Lund: Lund University.

Barreto, H., & Howland, F.M. (2006). *Introductory econometrics: using Monte Carlo simulation with Microsoft Excel*. New York: Cambridge University Press.

Brooks, C. (2008). *Introductory econometrics for finance*. Cambridge: Cambridge University Press.

Greene, W. (2008). *Econometric analysis* (7th ed). New York: Prentice Hall.

Oxelheim, L. (1984). *Exchange risk management in the modern company – a total perspective*. Täby: Scandinavian Institute for Foreign Exchange Research.

Oxelheim, L., & Wihlborg, C. (2008). *Corporate decision-making with macroeconomic uncertainty. Performance and risk management*. Oxford: Oxford University Press.

Electronic Sources:

Konjunkturinstitutet. The National Institute of Economic Research, NIER. *Barometerindikatorn*. Retrieved March 1, 2011 from <http://www.ekonomifakta.se/sv/Fakta/Ekonomi/Tillvaxt/Konjunkturen---Barometerindikatorn/>

SEB (2010, May). *The nordic financial outlook: May 2010*. Retrieved April 5, 2011 from www.seb.se

Swedish Statistics [SCB]. Swedish consumer price index (Konsumentprisindex). Retrieved February 17, 2011 from http://www.scb.se/Pages/TableAndChart____272151.aspx

The National Bureau of Economic Research [NBER] (2010). *US business cycle expansions and contractions*. Retrieved March 1, 2011 from <http://www.nber.org/cycles/cyclesmain.html>

US Department of State (2010). *Diplomacy in actions*. Retrieved March 31, 2011 from <http://www.state.gov/r/pa/ei/bgn/2880.htm>

Databases:

Thomson Reuters DataStream, available through Lund University Finance Society (LINC).

Appendix

Table 4 Correlation Matrix

Variable	BDR	DEP_TA	EBIT_TA	FA_TA	IND_DEBT_MED	LNTA_CP	MB	MDR	MULTINATIONALITY	R_D_DUM	R_D_TA	REC123
BDR	1	-0.004760	-0.200944	0.183986	0.218908	0.141473	0.036500	0.673088	0.004206	-0.093190	-0.013038	0.102390
DEP_TA	-0.004760	1	0.025791	0.608417	0.227113	0.142948	-0.062046	0.063330	0.045594	-0.024232	-0.091364	-0.001521
EBIT_TA	-0.200944	0.025791	1	0.044629	-0.036186	0.052743	0.060263	-0.221074	0.103868	0.064600	-0.586307	-0.146746
FA_TA	0.183986	0.608417	0.044629	1	0.406296	0.208146	-0.135410	0.316307	-0.087081	0.012328	-0.158958	-0.039505
IND_DEBT_MED	0.218908	0.227113	-0.036186	0.406296	1	0.185249	-0.237412	0.553923	-0.081333	0.123284	-0.234900	0.319545
LNTA_CP	0.141473	0.142948	0.052743	0.208146	0.185249	1	-0.286300	0.298435	0.268524	-0.307537	-0.161639	-0.032269
MB	0.036500	-0.062046	0.060263	-0.135410	-0.237412	-0.286300	1	-0.281908	0.042577	-0.068957	0.160609	-0.051921
MDR	0.673088	0.063330	-0.221074	0.316307	0.553923	0.298435	-0.281908	1	-0.083859	0.041170	-0.174442	0.182801
MULTINATIONALITY	0.004206	0.045594	0.103868	-0.087081	-0.081333	0.268524	0.042577	-0.083859	1	-0.265710	-0.073235	-0.042870
R_D_DUM	-0.093190	-0.024232	0.064600	0.012328	0.123284	-0.307537	-0.068957	0.041170	-0.265710	1	-0.266702	0.048195
R_D_TA	-0.013038	-0.091364	-0.586307	-0.158958	-0.234900	-0.161639	0.160609	-0.174442	-0.073235	-0.266702	1	0.040982
REC123	0.102390	-0.001521	-0.146746	-0.039505	0.319545	-0.032269	-0.051921	0.182801	-0.042870	0.048195	0.040982	1

Table 5 Simple OLS Regression

Dependent Variable: MDR (+1)

Method: OLS simple

Variable	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
MDR	0.792219	37.11399	0.793230	37.18768	0.791032	36.93781	0.792031	37.01142
DEP_TA	-0.716976	-2.841743	-0.688697	-2.726721	-0.699283	-2.757780	-0.670729	-2.642311
EBIT_TA	-0.105099	-3.351420	-0.108490	-3.456330	-0.105127	-3.351358	-0.108525	-3.456510
FA_TA	0.095298	3.768327	0.087728	3.420017	0.092668	3.625661	0.085050	3.281246
LNTA__CPI_	0.006152	7.740316	0.006260	7.859734	0.006579	6.629126	0.006692	6.735678
MB	-0.000372	-0.636563	-0.000333	-0.570622	-0.000337	-0.574085	-0.000298	-0.507501
IND_DEBT_MED	-0.114687	-3.761497	-0.096927	-3.010195	-0.115208	-3.776480	-0.097416	-3.023902
R_D_DUM	-0.002834	-0.398259	-0.002071	-0.290734	-0.004006	-0.548612	-0.003256	-0.445466
R_D_TA	-0.204036	-3.384363	-0.197196	-3.267210	-0.208485	-3.439158	-0.201684	-3.323419
REC123			-0.013039	-1.699244			-0.013067	-1.702478
MULTINATIONALITY					-0.006697	-0.719503	-0.006778	-0.728978
	R-squared	0.763811	R-squared	0.764603	R-squared	0.763953	R-squared	0.764749
	Adjusted R-squared	0.761611	Adjusted R-squared	0.762134	Adjusted R-squared	0.761477	Adjusted R-squared	0.762004

Table 6 Fixed Effects OLS Regression

Dependent Variable: MDR (+1)

Method: OLS (fixed ffects)

Variable	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
C	-0.101851	-0.753961	-0.100017	-0.732361	-0.108509	-0.801998	-0.106766	-0.780554
MDR	0.586563	20.15441	0.586498	20.13334	0.583707	19.93980	0.583647	19.91940
DEP_TA	-0.152699	-0.396185	-0.154101	-0.399262	-0.185192	-0.478412	-0.186505	-0.481140
EBIT_TA	-0.149018	-3.739254	-0.149006	-3.736451	-0.148793	-3.733112	-0.148781	-3.730327
FA_TA	0.190821	4.176890	0.190931	4.175189	0.195315	4.250301	0.195416	4.248410
LNTA__CPI_	0.012101	1.338257	0.012125	1.339476	0.011957	1.322028	0.011980	1.323131
MB	-0.000549	-0.481295	-0.000549	-0.481132	-0.000530	-0.464572	-0.000530	-0.464420
IND_DEBT_MED	0.008337	0.146203	0.008427	0.147670	0.007735	0.135627	0.007821	0.137026
R_D_DUM	-0.008875	-0.608450	-0.008860	-0.606967	-0.008368	-0.573191	-0.008353	-0.571806
R_D_TA	-0.160455	-2.105795	-0.160319	-2.102239	-0.153982	-2.011966	-0.153855	-2.008651
REC123			-0.005163	-0.094298			-0.004897	-0.089429
MULTINATIONALITY					0.011673	0.914955	0.011666	0.913864
	R-squared	0.846534	R-squared	0.846535	R-squared	0.846704	R-squared	0.846706
	Adjusted R-squared	0.823300	Adjusted R-squared	0.823067	Adjusted R-squared	0.823261	Adjusted R-squared	0.823028

Table 7 Fixed Effects TSLS Regression

Dependent Variable: MDR (+1)

Method: TSLS (fixed effects)

Variable	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
C	0.049762	0.353363	0.049532	0.348359	0.046261	0.327519	0.045993	0.322502
MDR	0.718324	17.47231	0.718339	17.45164	0.716661	17.26056	0.716679	17.24065
DEP_TA	-0.115335	-0.295186	-0.115151	-0.294294	-0.130721	-0.333003	-0.130508	-0.331991
EBIT_TA	-0.111532	-2.706763	-0.111531	-2.704944	-0.111516	-2.705849	-0.111515	-2.704026
FA_TA	0.152596	3.243807	0.152579	3.239926	0.154803	3.265041	0.154784	3.261140
LNTA__CPI_	0.000769	0.081082	0.000766	0.080594	0.000729	0.076839	0.000725	0.076291
MB	-0.000617	-0.533815	-0.000617	-0.533442	-0.000608	-0.525753	-0.000608	-0.525381
IND_DEBT_MED	-0.056448	-0.948969	-0.056464	-0.948371	-0.056575	-0.950973	-0.056593	-0.950416
R_D_DUM	-0.005345	-0.361087	-0.005347	-0.360949	-0.005115	-0.345275	-0.005117	-0.345166
R_D_TA	-0.112317	-1.441202	-0.112332	-1.440254	-0.109386	-1.399066	-0.109403	-1.398183
REC123			0.000671	0.012082			0.000782	0.014083
MULTINATIONALITY					0.005495	0.422620	0.005495	0.422379
	R-squared	0.842356	R-squared	0.842355	R-squared	0.842499	R-squared	0.842498
	Adjusted R-squared	0.818490	Adjusted R-squared	0.818247	Adjusted R-squared	0.818413	Adjusted R-squared	0.818170