



# UNIVERSITY OF GOTHENBURG

## SCHOOL OF BUSINESS, ECONOMICS AND LAW

The linkage between liquidity management and capital structure- a comparative analysis essay between real estate and IT companies in Sweden

Bachelor thesis

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## Abstract

This thesis tries to contribute to corporate finance through the study of the link between liquidity and capital structure of two different sectors in Sweden. The link between liquidity and capital structure is ambiguous and previous studies about the subject indicates inconsistent relationships between them. Some researchers proclaim a positive correlation<sup>1</sup> whereas others assume that it is a negative correlation or no correlation<sup>2</sup>. Moreover, all the above research related to the relation between the liquidity and capital structure was conducted on a combine or a separate analysis. Thus, our study underlines the fact that a comparative analysis between different sectors is required.

The aim of the thesis is to conduct a comparative analysis by investigating the linkage between capital structure and liquidity of firms in IT and real estate sectors. In order to accomplish the aim of the thesis two research questions have been established. The first research question addresses a literature study of the linkage between liquidity and capital structure. This lays out as a basis for examining and analyzing the second research question. Furthermore, in order to answer the second research question a quantitative research strategy has been pursued. This comprised an analysis of historical data for companies in IT and real estate sectors. Data have been gathered from annual reports between 2003 and 2014 for 11 IT companies and 12 real estate companies listed on Nasdaq OMX. Moreover, a simple regression analysis has been performed to investigate the relationship between liquidity and capital structure. The analysis was done by using a statistical program called JMP.

The results from this thesis indicate that there is a correlation between liquidity and capital structure in both sectors. What is interesting though is that there seem to be different correlations between the sectors. In the case of real estate companies the result shows a positive correlation whereas the result for the IT companies depicts a negative correlation instead. This is an interesting observation that invites further studies on the subject.

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<sup>1</sup>Williamson, 1988, p 567-591, Shleifer & Vishny, 1992 p 1343-1366

<sup>2</sup>Frieder and Martell, 2006; Lipson and Mortal, 2010 p 611-644



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# 1.Introduction

Researchers have examined determinants that influence the managers' choice of capital structure in firms such as profitability, information asymmetry, size and growth<sup>3</sup> for many years. However, liquidity as a determinant for capital structure has been quite absent in empirical studies<sup>4</sup>. Even though liquidity has not been as examined as the other above mentioned determinants, it has been a source of debate lately<sup>5</sup>. Moreover, the implications of the linkage between liquidity and capital structure is not agreed upon in researches<sup>6</sup>. Some researchers claim that there are a positive correlation between liquidity and leverage<sup>7</sup>. The underlying reasoning for the positive correlation is that liquid assets trade at higher cost, and hence, increases the cost of bankruptcy and debt<sup>8</sup>. Contrary, other researchers have found negative or no correlation between liquidity and leverage<sup>9</sup>. This implies that firms with higher liquid assets tend to issue more equity compared to those companies that have lower liquid assets<sup>10</sup>.

All the above research related to the relationship between liquidity and capital structure were conducted on a combine or a separate analysis. Our study underlines the fact that a comparative analysis between different sectors is required. Thus, this thesis tries to contribute to corporate finance through the study of the link between liquidity and capital structure of two different sectors in Sweden.

The following introductory section introduces the research topic of capital structure and liquidity management and tries to emphasize the importance of the topic from both a managerial and academic point of view. Moreover, the purpose, research questions and the delimitations of the study are presented.

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<sup>3</sup>Haddad, 2012

<sup>4</sup>Hovakimian, Opler, Titman p 1-24 2001; Fama and French, 2002 p1-33

<sup>5</sup>Sibilkov, 2007

<sup>6</sup>Sibilkov, 2007

<sup>7</sup>Williamson, 1988 , p 567-591, Shleifer & Vishny, 1992 p 1343-1366

<sup>8</sup>Sibilkov 2007

<sup>9</sup>Frieder and Martell, 2006; Lipson and Mortal, 2010 p 611- Morellec, 2001 p 173-206; Myers & Rajan, 1998 p 733-771; Udomsirikul, Jumreornvong, Jiraporn, 2010

<sup>10</sup>Haddad, 2012



## 1.1 Background

The concept and importance of capital structure has for a long time been highly debated among researchers and practitioners. One major reason for this is that it has been disagreements on how the choice of capital structure affect the performance of a firm. According to Myers (2001) the majority of research has been paying its attention to the ratio of debt versus equity obtained on the right side of firm's balance sheet. However, there is no general theory that dictates which proportions of debt and equity to pursue (Myers, 2001). Today, some theories and concepts are well established and also quite accepted. However, there are still some areas regarding capital structure that are not so well understood.

Using debt as a means of financing a firm is a good decision if the income that is derived from the usage of debt is exceeding the cost of capital<sup>11</sup>. However, to use external sources, or conversely, use internal sources when financing is still an open question<sup>12</sup>. For the internal sourcing, the liquidity of a firm's assets becomes a critical determinant in its ability to finance its operations.

Sibilkov (2007) states that how liquidity affect the capital structure of a firm has been become a hot research topic over the years<sup>13</sup>. The implications of the linkage between liquidity and capital structure is however not agreed upon in research<sup>14</sup> (Sibilkov, 2007).? Therefore, it is of interest to further investigate the relation between liquidity and capital structure, which also is the aim of this study.

## 1.2 Purpose and research questions

The purpose of this thesis is conduct a comparative analysis by investigate the linkage between capital structure and liquidity of firms in the real estate and IT sector. As already mentioned, this

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<sup>11</sup>Šarlija, Hanc 2012, p 30-36

<sup>12</sup>Šarlija, Hanc 2012, p 30-36

<sup>13</sup>Šarlija, Hanc 2012, p 30-36

<sup>14</sup>Šarlija, Hanc 2012, p 30-36

this thesis aims at contributing to corporate finance through the study of the link between liquidity and capital structure of two different sectors in Sweden.

Since previous studies have indicated on positive, negative or no correlation this thesis have been chosen two different sectors in the investigation to see if there are any differences between sectors. The sectors real estate and IT companies have been chosen due to its differences in how capital intensive they are. The relationship between capital structure and liquidity has been analyzed through the ratios of leverage and current ratio. In order to make it more clear for the reader a conceptual model of the relation is depicted in Figure 1.

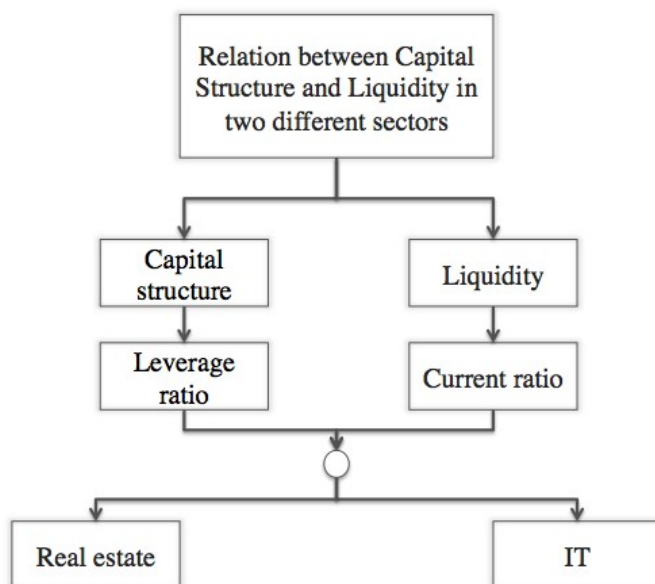


Figure 1: Conceptual model (Source: Authors)

In order to provide a guidance in research, two research questions have been formulated. The first research question is a theoretical question and will be answered in the theoretical framework. The first research question helps to establish a better understanding of the research subject. Also, this provides a basis for answering the second research question, which involves conducting a comparative analysis between capital structure and liquidity in two sectors in Sweden. The research questions are formulated in the following manner:

*RQ1: How are liquidity management and capital structure described in literature?*

*RQ2: Does liquidity affect leverage in IT companies as well as real estate companies and are there any differences between those sectors in how liquidity affect leverage.*

### **1.3 Delimitations**

This thesis only considers Swedish IT and real estate companies listed on OMX Nasdaq Stockholm. Moreover, companies recently listed on OMX are not analysed as well. The reason for choosing such companies on OMX Nasdaq is due to the fact that it is easier to get access to reliable and relevant data.

## 2.Theoretical framework

Literature studies about capital structure and liquidity management have been done in order to achieve a basic understanding of how those two areas relate to each other, which facilitated the collection and analysis of data. As for now, this chapter provides insights into some of the most important concepts regarding capital structure and liquidity management.

### 2.1 An introduction to capital structure

Capital structure tells how a firm finances its assets<sup>15</sup>, and refers to the relation between its debt and equity. Knowledge about capital structure is important, and a wrong decision about capital structure may cause financial distress and eventually bankruptcy<sup>16</sup>. Moreover, Šarlija & Harc express that firms that have too high degree of debt may lose its flexibility and create problems in attracting investors<sup>17</sup>. However, debt also entails its benefits. If a firm's debt is regularly monitored, kept under control and used in a proper manner it may result in higher return on investment<sup>18</sup>. During the last decades some conventional theories have been established and developed regarding the choice of capital structure. This chapter aims at giving an historical overview of some of the theories and concepts of capital structure that are deemed relevant for this research.

#### 2.1.1 Modigliani and Miller

The starting point in the modern theory of capital structure is the publication by Modigliani and Miller in the year 1958<sup>19</sup>. The main conclusion from this paper was that the value of a company is independent on its capital structure, also known as the “capital structure irrelevance”<sup>20</sup>. This conclusion was however based on the assumption that firms act in a perfect market, in which Modigliani and Miller assume that *“individuals can borrow and lend at the risk-free rate and there are only two types of finance which is risk-free debt and risky equity. In the hypothesis of MM theory, all firms are in the same level of risk, no growth, symmetry information and no agency costs”*<sup>21</sup>. The assumptions of perfect market were quite restrictive since the majority of

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<sup>15</sup>Šarlija, Harc 2012, p 30-36

<sup>16</sup>Eriotis, Vasiliou, Ventoura-Neokosmidi 2007 p 321-331

<sup>17</sup>Šarlija, Harc 2012, p 30-36

<sup>18</sup>Šarlija, Harc 2012, p 30-36

<sup>19</sup>Harris & Raviv, 1991, p 297-355

<sup>20</sup>Eriotis, Vasiliou, Ventoura-Neokosmidi 2007 p 321-331

<sup>21</sup>Lim, Chai, Chao, 2012 p 75-85

markets did not show any signs on perfect market. Thus, a lot of researchers, including Modigliani and Miller continued the researching and investigated the relation between capital structure and firm's value under less restrictive assumptions<sup>22</sup>. As part of this, Modigliani and Miller (1963) brought in taxation under their consideration, which lead to their conclusion that firms should utilize as high leverage as possible in order to attain the optimal capital structure<sup>23</sup>. This proposal was based on the fact that debt entails tax benefits in terms of that interest payments are deducted when calculating taxable income, granting *tax shields* for companies<sup>24</sup>. Hereinbelow, the two propositions of Modigliani and Miller are presented.

#### M&M: proposition 1 without taxes

Their first proposition emphasizes that the value of a levered firm equals the value of an unlevered firm. Thus, when the assumptions about a perfect market holds true, the following equation also holds:

$$V_L = V_U$$

$V_L$  = Value of a levered firm

$V_U$  = Value of an unlevered firm

#### M&M: proposition 2 without taxes

Since the value is the same for levered and unlevered firms the different combinations of debt and equity thus gives a constant expected return on asset. This means that the result from the following equation is constant:

$$r_{WACC} = D/(D + E) * r_D + E/(D + E) * r_E$$

This equation is in literature also called Weighted Average Cost of Capital (WACC). The variable  $R_D$  relates to the cost of debt whereas  $R_E$  to the cost of equity. After rearranging this equation the following formula can be obtained:

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<sup>22</sup>Eriotis, Vasiliou, Ventoura-Neokosmidi 2007 p 321-331

<sup>23</sup>Eriotis, Vasiliou, Ventoura-Neokosmidi 2007 p 321-331

<sup>24</sup>Eriotis, Vasiliou, Ventoura-Neokosmidi 2007 p 321-331

$$r_E = r_A + D/E * r_A - r_D$$

This equation illustrates the second proposition of Modigliani and Miller.

### M&M: proposition 1 with taxes

As already mentioned, in the development of Modigliani and Miller's propositions they later on decided to include taxes in order to make the models more realistic. In terms of proposition 1, the value of the tax shield was added to the equation as seen in the equation below.

$$V_L = V_U + T_C$$

### M&M: proposition 2 with taxes

Similar as in Modigliani and Miller proposition 2 without taxes, this proposition also shows a positive relation between leverage and return on equity:

$$r_E = r_A + D/E * (1 - T_C) * (r_A - r_D)$$

Adding taxes also gives the following WACC equation:

$$r_{WACC} = D/(D + E) * r_D * (1 - T_C) + E/(D + E) * r_E$$

Thus, WACC decreases with increasing taxes, which leads to higher value of the firm. This implies that firms should strive for issuing 100% debt.

### 2.1.2 The trade-off theory

According to Modigliani and Miller (1963), the value of a firm increases with debt due to the benefits of tax shields<sup>25</sup>. This means that firms should strive for as high debt/equity ratio as possible. However, this is not what is seen in the real world because of the fact that other factors determine the optimal level of capital structure as well. One theory that develops this further is

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<sup>25</sup> Modigliani and Miller 1963

the trade-off theory. This theory emphasizes a moderate borrowing of external sources by tax paying companies<sup>26</sup>. Basically, the theory states that there is a trade-off between the benefits of leverage, such as tax shields, and increased cost of financial distress. Moreover, according to this theory it seems that firms strives for an optimal ratio between debt and equity. The concept behind the trade off theory is illustrated in Figure 2:

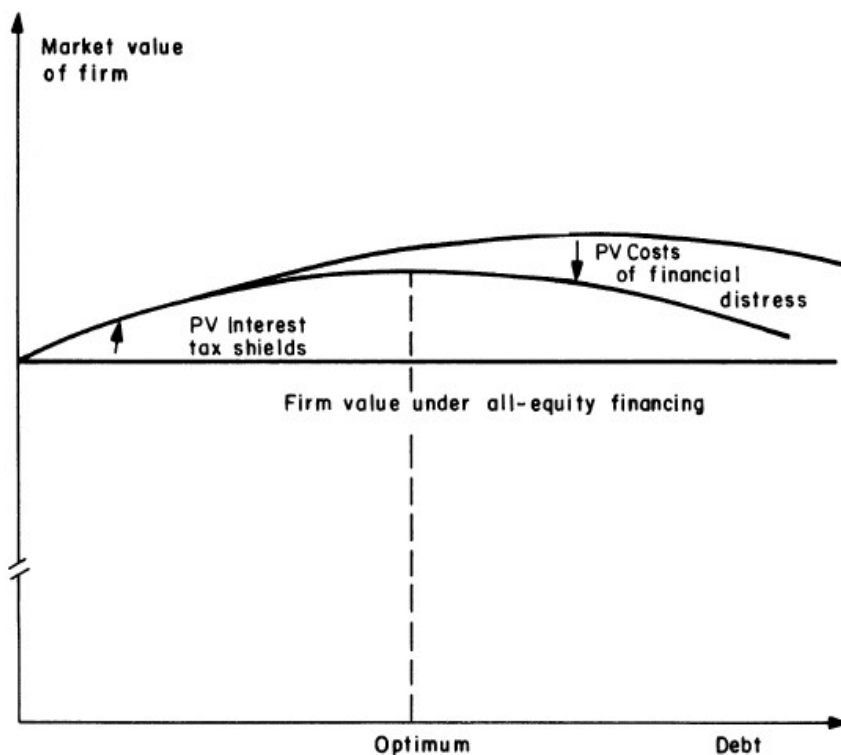


Figure 2: An illustration of the trade-off theory<sup>27</sup>

The figure illustrates that there is initially an increase in the market value of the firm when increasing the level of debt. However, the higher debt ratio the higher the risk of bankruptcy, or financial distress, which leads to a lower market value. Thus, as seen in the figure there should exist an optimal debt/equity ratio. The optimal point occurs where the marginal present value of

<sup>26</sup>Myers, 2001

<sup>27</sup> Myers, 1998

the tax shield and the cost of financial distress are equal<sup>28</sup>. To sum up what the theory emphasizes, Berk & DeMarzo gave an overall explanation of the theory by stating that<sup>29</sup>:

*“According to the trade-off theory; the total value of a levered firm equals the value of the firm without leverage plus the present value of the tax savings from debt, less the present value of financial distress costs.”*

### Financial distress

According to Myers(1984) the cost of financial distress comprise<sup>30</sup> *“the legal and administrative costs of bankruptcy, as well as the subtler agency, moral hazard, monitoring and contracting cost which can erode firm value even if formal default is avoided.”*

As mentioned earlier, debt has tax advantages due to the tax shield but too high leverage increases the risk to financial distress since the firm have an obligation to pay interest and amortization even if they are short of cash. If the firm cannot pay their obligations to debtholders, the creditors can take legal actions and confiscate the firm’s assets<sup>31</sup>. When financial distress appear, the bankruptcy risk also increases<sup>32</sup>. There are two kinds of financial distress costs; indirect and direct<sup>33</sup>.

### Direct and indirect cost

Direct costs is an additionally cost that appear when outside professionals need to be involved such as lawyers, accounting experts, auctioneers and others with experience selling distressed assets.<sup>34</sup>

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<sup>28</sup>Jibran, Wajid, Waheed, Muhammed, 2012 p 86-95

<sup>29</sup>Berk & DeMarzo 2007, p 501

<sup>30</sup> Myers, 1984, p 8

<sup>31</sup> DeMarzo, Berk, p 543

<sup>32</sup>Ross, Westerfield, Jaffe, p 422

<sup>33</sup>DeMarzo, Berk p 543-544

<sup>34</sup>DeMarzo, Berk p 543-547



Indirect costs is associated to the financial distress but it is hard to calculate and measure these costs and are substantially superior to direct costs in most cases. Some examples of indirect costs;<sup>35</sup>

Decrease of customers' frequency, since they are worried for future support, warranties and services. This also happens for suppliers that will be reluctant to distribute their products if they know that the firm have financial problems. It could also be key employees with important skills and knowledge that chose to transfer to a competitive firm. Another cost that could arise is if they are forced to sell their assets quicker and to a lower price than the market value. A research by Gregor Andrade and Steven Kaplan described a highly levered firm where they calculated with a loss between 10-20% of the value of the firm<sup>36</sup>. It signifies that the financial distress costs heavily affect the value of the firm.

#### 2.1.4 Agency costs

One of the benefits in using debt as a mean to finance a firm's assets can be explained by the agency theory<sup>37</sup>. According to Stretcher and Johnson (2011), the owners' incentives might differentiate from the agents' (the managers) incentives regarding the decision on what capital structure to pursue. Moreover, Jensen and Meckling (1976) emphasize that managers may have incentives to use the company's cash in a wasteful manner<sup>38</sup>.

When there exist debt in a firm, eventually a conflict between stockholders and bondholders will occur, under the condition when the outcome of investment decisions affect the value of debt and equity. Managers often take equity holders side in these conflicts due to the reason that they have a personal interest to increase the value of equity and the second reason is that they are elected by the board and the board is chosen by stockholders of the company. Such actions from the managers can decrease the firm value.<sup>39</sup> During the condition of financial distress, disagreements between stakeholders come to surface and the cost of solving those disputes are named agency costs. Thus agency problems can never totally be solved, because shareholders'

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<sup>35</sup> DeMarzo, Berk p 543-547

<sup>36</sup> Andrade, Kaplan, 1998

<sup>37</sup> Stretcher & Johnson, 2011 p788-804

<sup>38</sup> Jibrán, Wajid, Waheed, Muhammed, 2012 p 86-95

<sup>39</sup> DeMarzo, Berk p 553

interests will always be subordinated when managers wealth are at stake. On the other hand, De Marzo Berk argue that managers in a firm exposed to high levels of financial distress may favor shareholders and disfavor debtholders which will lead to decrease in firm value<sup>40</sup>.

Ross, Westerfield, Jaffe mentioned three kinds of selfish strategies that stockholders use against bondholders<sup>41</sup>. Those strategies are costly and will decrease the firm's value. The strategies are implemented only under the condition of risk for bankruptcy in a levered firm.

**Selfish investment strategy 1: *taking large risks***

Firms that are close to bankruptcy, tend to take bigger risks since they think they are playing with others money.

**Selfish investment strategy 2: *underinvestment***

When the firm probably will be bankrupt, firm may discover investment with a positive net present value that will benefit creditors and disfavor the stockholders and thus the incentives from stockholders to invest decreases.

**Selfish investment strategy 3: *milking the property***

Under heavy financial distress extra dividend can be paid out, which leaves much less equity to creditors.

### 2.1.5 The pecking order theory

The pecking order theory originates from a publication by Myers in 1984<sup>42</sup>. This theory of financial choice presumes that companies do not specifically aim for a certain debt ratio, but instead use external sources of financing only when internal sources are not sufficient<sup>43</sup>. Myers (1984) states that adverse selection entails that retained earnings should be preferred over debt and that it is better to finance the operations from debt instead of equity. Basically, an

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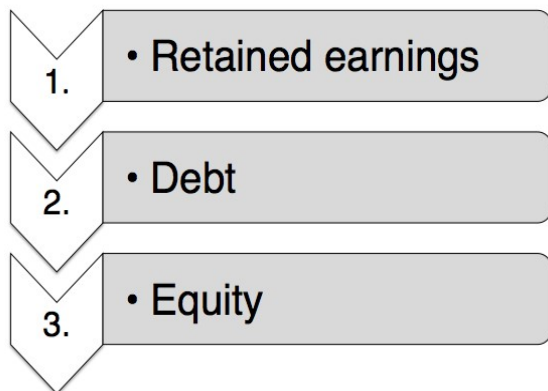
<sup>40</sup>DeMarzo, Berkp553, Ross, Westerfield, Jaffe, p 15, p 427

<sup>41</sup>Ross, Westerfield, Jaffe p 427-429

<sup>42</sup>Frank & Goyal, 2005

<sup>43</sup>Graham & Harvey, 2001 p187-243; Myers, 1984

assumption of the pecking order theory is that a company have three means of financing its business. Moreover, Frank and Goyal (2005) emphasizes that the specific order emanate from several different sources such as taxes and agency conflicts. Figure 3 illustrates the pecking order proposed by Myers (1984).



*Figure 3: The pecking order*

As a contradiction to the trade-off theory, this ordering opposed the presence of an optimal level of debt due to the fact that both internal and external sources of financing involved equity.

Firms may choose to adopt a hierarchy when selecting financial sources due to the information asymmetry emerged between managers and investors<sup>44</sup>. Serrasqueiro and Caetano (2012) further state that the more profitable a firm is, the greater the capability is to acquire retained earnings, and hence there is a lower obligation to use external sources. With this reasoning, it should be a negative correlation between debt and profitability, which means that high profitable firms should have lower debt/equity ratios.

Stewart Myers hypothes assume that managers will use retained earnings for investment purposes rather than issuing equity<sup>45</sup>.The pecking order theory is consistent with the trade-off theory of capital structure, but there is evidence that firms is not always using a strict pecking

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<sup>44</sup>Serrasqueiro and Caetano (2012)

<sup>45</sup>DeMarzo, Berk p 570, Footnote 50- the capital Structure Puzzle “Journal of Finance 39 1984 575-592”

order This is because firms often issue equity instead of debt financing even under conditions when they could borrow money<sup>46</sup>.

The theory was originally designed when confronting the information asymmetry problem, and managers do not want to issue undervalued equity, because they have information that external sources does not have knowledge about the “real value” of the stocks, so they in such circumstances during asymmetric information condition have a stronger incentive to take up a leverage position instead of issuing equity to an underpriced stock price<sup>47</sup>.

Pecking order theory originally come from Myers and Majluf (1984)<sup>48</sup> The theory assume perfect capital markets with the exception that investors are excluded information about the true value of either the assets or the investments opportunity, which result in difficulties to estimate an exact value of the securities issued to finance the new investment. The pecking order of capital structure theory can be concluded into 4 sections.<sup>49</sup>

1. Firms want to use internal financing instead of external financial resources
2. Decreases in dividends are not used to finance capital expenditures
3. If the company need external financing they will according to this theory issue the security with less risk in the first hand.<sup>50</sup>
4. The debt ratio significate its requirement for external financing.

The pecking order theory illustrate why the main part of external financing comes from debt. It shows why firms that generate positive earnings borrow less. Firms that generate profits have higher degrees of internal financing because they have more liquid funds. Firms with lower levels of positive earnings require external financing through debt.<sup>51</sup>

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<sup>46</sup>DeMarzo, Berk p 570, Footnote 51 The pecking order, Debt Capacity and information asymmetry, Journal of financial Economics, 95 (2010) p 332-355

<sup>47</sup>Encyclopedia of finance Paragraph 39

<sup>48</sup>Myers and Majluf 1984 p 91 (Capital structure Stewart Myers 2001)

<sup>49</sup>(Myers 2000) capital structure, Stewart C Myers, Journal of perspectives economics, volume 15, nr 2, p 92-93

<sup>50</sup>Myers 2001- Footnote 11 Myers and Majluf 1984

<sup>51</sup>(Myers 2000) capital structure, Stewart C Myers, Journal of perspectives economics, volume 15, nr 2, p 93

## 2.2 Liquidity

According to Owolabi (2012), liquidity plays a decisive role in the prosperous functioning of a firm<sup>52</sup>. The impact on how the liquidity of a firm's assets affect leverage have been a popular topic in debates for many years<sup>53</sup>. According to Sibilkov (2007) some researchers have found a positive correlation between liquidity and optimal leverage<sup>54</sup>, whereas other have found that liquidity has a negative effect on leverage<sup>55</sup>.

Liquidity is cash or other short-term assets that easily can be transformed into cash without partly losing the value in the assets in form of conversion costs.<sup>56</sup> According toHarc and Sarlija it is stated that money is the most liquid form of assets and cash has a prominent role in financing<sup>57</sup>. Liquid assets is practical to use when the company have a lower degree of earnings or when the company is having a hard time to get financed through the capitalmarket<sup>58</sup>.

Operating capital is used as a financing resource for the firm's payment obligations, and a firm is using its positive cash-flow for their ongoing payments and investments instead of using debt or equity. A firm can maintain the liquidity and does not need to take a leverage position when investing or fulfilling their payment obligation, and the firm is not forced to sell bonds or equity.

Current assets consists of four different parts: cash, marketable securities, account receivables and inventories.<sup>59</sup> On the right hand side of the balance sheet current liabilities are positioned, and on its opposite side current assets. Current liabilities that are anticipated to be paid within a year and those liabilities are, account payables, accrued wages, taxes and other expenses.<sup>60</sup>

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<sup>52</sup>Owolabi and Obida, 2012

<sup>53</sup>Sibilkov, 2007

<sup>54</sup>Williamson, 1988 p 567-591; Shleifer & Vishny, 1992 p 1343-1366

<sup>55</sup>Morellec, 2001 p 173-206; Myers & Rajan, 1998 p733-771

<sup>56</sup>Ross, Westerfield Jaffe p 746

<sup>57</sup>Harc and Sarlija 2012 p 31

<sup>58</sup>Ross, Westerfield Jaffe p746

<sup>59</sup>Ross, Westerfield Jaffe p 746

<sup>60</sup>Ross, Westerfield Jaffe p 747

### 2.2.1 Liquidity ratios

Liquidity ratios are used to compare current liabilities with current available funds to handle current liabilities<sup>61</sup>. When financial analyst analyze the information in the balance sheet they have different tools. The outcome of the different methods is to measure if the company have a good probability to fulfill their payment obligations<sup>62</sup>. Liquidity ratio is a measure of a company's ability to solve its short-term payment obligations, and furthermore also a definition of a firm's ability to handle other operating expenses.<sup>63</sup>

Berk and De Marzo mention three kind of measurements of liquidity ratios:<sup>64</sup>

$$\text{Current ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$\text{Quick ratio} = \frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}}$$

$$\text{Cash ratio} = \frac{\text{Cash}}{\text{Current Liabilities}}$$

A higher quick ratio or current ratio implies less risk for the company to be short of cash in the near future. A more narrow measurement is quick ratio that is excluding the inventory, because they are difficult to convert into cash. If the inventories increases, it could be an indicator that the company have problems to sell their products.<sup>65</sup>

In an optimal way, a firm can always fulfill their obligation to their employees and other payment obligations. If the company are short of cash, it could lead to more costs.<sup>66</sup>

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<sup>61</sup>Harc and Sarlija 2012 p 31

<sup>62</sup>Berk, DeMarzo p 36-37

<sup>63</sup><http://financial-dictionary.thefreedictionary.com/Liquidity+Ratios> 2015-08-01

<sup>64</sup>Berk, DeMarzo p37

<sup>65</sup>Berk, DeMarzo p 37

<sup>66</sup>Berk, DeMarzo p 37

## 2.2.2 Liquidity and leverage relationships

Sarilja and Hanc and other studies concluded that there is different results concerning liquidity's impact on capital structure.<sup>67</sup> According to Sarilja and Hanc there has been made several research studies on this topic, which have generated different outcomes and results when looking for relationship between these two terms. Different views of the relationship of these terms are compared below.<sup>68</sup>

Williamson's study published 1988 argues that the limitation of debt levels is determined by the liquidity of their assets. Sibilkov (2004 ) came to the conclusion that high degrees of liquid assets results in higher levels of leverage and debt in firms. Lipson and Mortal showed 2009 in their study that firms with high levels of liquidity are mainly financed through internal resources and are less leveraged. Anderson's research from 2002 illustrates the correlation between high leverage, high liquidity and slower growth rate of firms.

Liquidity affects capital structure and to summarize it.<sup>69</sup>

- 1) The higher the ratio of liquidity is, the lower will the leverage ratio be in the firm.
- 2) A decrease in liquidity tends to lead to lead to an increase in leverage.

## 2.2.3 Short-term and long-term debt and their relationship with leverage and liquidity??

Andersson (2002) states that corporations with assets that are more liquid tends to choose a higher degree of long-term leverage capital. Furthermore Andersson point at a negative correlation between short-term debt and liquid assets, which will lead to an increase in short terms debts and the liquid assets will then decrease in the condition of low level of cash (and substitute condition). According to his study he showed that it exist a positive connection between liquid assets and long term debt, which imply that if the company increase long term debt it will also increase the liquid assets.<sup>70</sup>

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<sup>67</sup>Hanc and Sarlija 2012 p 31

<sup>68</sup>Hanc and Sarlija 2012 p 31

<sup>69</sup>Hanc and Sarlija 2012 p 31, 35-36

<sup>70</sup>Hanc and Sarlija 2012 p31

Companies that financed their business with long-term debt tend to have a higher amount of liquidity ratio than firms with short-term debt, when managers are assumed to not take initiatives into risky projects and when they are not inclined to take short-term loans.

The research results regarding the relationship between short-term borrowing and liquid assets, indicated a negative correlation between these two variables.

### 2.3 Free cash flow theory

Jensen define free cash flow in the following way:<sup>71</sup> *“cash flow in excess of that required to fund all projects that have positive net present values when discounted at the relevant cost of capital”*

For wasteful investment purposes firms needs cash. This is of big importance of the free cash flow hypothesis, which states that non optimized spending more frequently will occur when firms has an excess of liquid means. When firms are directed to a strict budget-restraint, managers are totally motivated at managing the company in an efficient way. This theory reveals why a high leverage ratio generates a higher value of the firm, because under a high leverage position managers will be focused to fulfill their interest rate payment obligations instead of using their excess of cash in a non-efficient way.<sup>72</sup>

Free cash flow theory says that dangerously high levels of debt results in higher value of the firm despite the risk of higher financial distress costs under specific circumstances.<sup>73</sup>

La Lang R Stulz, R. Walking have found evidence that managers in firms with a higher degree of free cash flow tend to make less good acquisitions than firms that have a lower free cash flow<sup>74</sup>.

A company with high leverage positions where the risk for a financial distress condition

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<sup>71</sup>Jensen, 1986.p.323. financial encyclopedia 27.3.3

<sup>72</sup>DeMarzo, Berk p 561

<sup>73</sup>Stewart C. Myers, Capital structure. The journal of economic perspectives Vol 15. No 2 2001

<sup>74</sup>Ross, Westerfield, Jaffe p 437, La Lang R Stulz, R. Walking ”Mangerial Performance , Tobins Q and the Gains in Tender Offers,” Journal of Financial Economics(1989)



increases managers face the risk of getting fired, which may motivate the managers to pursue higher performance, which may lead to that their incentives to make bad investment decisions and be sloppy with the firm's money decreases. When financial distress occurs, creditors will eventually monitor the manager's behavior closely.<sup>75</sup>

### 2.3.1 Monitoring of free cash flow

The free cash flow hypothesis is very important for capital structure. When dividends are being paid, it results in a decrease in free cash flow and the payment to shareholders leads to a decrease in the risk of managers being wasteful with cash and making bad investment decisions.

Another effect which also has a contribution to shareholders' benefits is when a firm fulfills its interest rate payment obligations and amortization payments. This also reduces free cash flow, which gives managers smaller opportunities of taking bad investment decisions because of the outflow of cash.<sup>76</sup>

The latter is a prominent and a more important factor than the first mentioned dividend example, because if the firm does not fulfill the payment obligations related to interest rate payments and debt obligations, it will lead to an economic collapse for the firm and it will be bankrupt. On the other hand if the firm changes their dividend payout policy and decides to decrease the dividend payouts, the firm's managers will meet less problems, because the firm has not an obligation for dividend payouts to their stockholders. Thus, "free cash flow hypothesis" states that a displacement from equity to debt will be positive for the firm's value<sup>77</sup>.

Free cash flow hypothesis reduces the managers' incentives to take bad investment decisions and minimizes their opportunity to spend money in a bad way. Free cash flow hypothesis is also providing another reason for firms to issue debt<sup>78</sup>.

Jensen argued (1986) that managers usually have a resistance against dividend payouts because such payments will result in less funds for the managers to monitor. Another factor why there is

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<sup>75</sup>DeMarzo, Berk p561

<sup>76</sup>Ross, Westerfield, Jaffe p 437

<sup>77</sup>Ross, Westerfield, Jaffe p 437

<sup>78</sup>Ross, Westerfield, Jaffe p 437

a fundamental resistance from manager to engage in dividend payouts is that managers are personally motivated by bonus systems, and dividend payouts will not gain their personal wealth<sup>79</sup>.

If a firm chooses to have a more restricted payout policy it does not need to take up debt or issue equity for financing their investments. And due to the lack of dividends to stockholders the attention from the stock market will be increased. The company can keep a certain amount of free cash for takeover initiatives so the firm can grow even if they know that such investments will be less profitable than the return on equity<sup>80</sup>.

This behavior follows and confirm an empirical study which describe the behavior of overdiversification and non-efficient behavior which occur when the company's managers try to expand the company beyond the borders of what is an optimal size of the firm<sup>81</sup>.

Furthermore, there exist an incentive for managers to not have too much free cash flow for an extension of a longer time, cause they would then expose them self as target for a hostile takeover check<sup>82</sup>.

#### Free Cash Flow formula

$$FCF = (Revenues - Cost)(1 - Tc) - CapEx - \Delta NWC + Tc (Depreciation)$$

This formula 8.6 is called depreciation tax shield. Since depreciation have no impact on the cash flow, except for the tax cost of the depreciation ( $Tc * Depreciation$ ).<sup>83</sup>

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<sup>79</sup>Jensen, 1986.p 323, financial encyclopedia 27.3.3

<sup>80</sup>Financial encyclopedia 27.3.3 Rozeff (1982), Easterbrook (1984)

<sup>81</sup>Jensen, 1993.p.324. financial encyclopedia 27.3.3

<sup>82</sup>Financial encyclopedia 27.3.3, Jensen 1986

<sup>83</sup>De Marzo, Berk p 243

### 3. Research methodology

This chapter presents the research methodology of this study. The concepts that is described and elaborated on in this chapter are: research strategy, research design, research methods and research quality. Finally, some reflections and implications of the research methodology will be provided.

#### 3.1 Research strategy

A research strategy could either be a qualitative or a quantitative study<sup>84</sup>. The distinction between qualitative and quantitative may be quite ambiguous. Basically, a qualitative study is related to words whereas a quantitative study is concerning numbers in the collection and analysis of data. In order to answer the research questions a quantitative research strategy have been chosen. A quantitative strategy has been chosen because it made it possible to make a comparative analysis from a larger sample than would be possible in a qualitative approach for this time frame.

Another important aspect when considering an appropriate research strategy is the approach of how theory will be derived. Basically, such an approach can either deductive or inductive. A deductive approach is when researchers deduces hypothesis from already established theories. Conversely, an inductive approach is instead building a new theory based on some sort of observations. However, a study is rarely entirely deductive or entirely inductive which means that a research often contains influences from each one of them.

Due to the choice of a quantitative approach and the formulation of research questions this study will mainly follow a deductive approach. Consequently, literature have work as a foundation for establishing hypotheses that were tested empirically by analyzing quantitative data.

#### 3.2 Research design

According to Bryman and Bell (2011) a research design functions as a framework in the collection and analysis of data. Moreover, they conclude that a research design can be

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<sup>84</sup>Bryman & Bell, 2011

categorized in one of the following five areas: experimental design, longitudinal design, cross-sectional design, case study and comparative design.

The research design chosen for this study is of comparative nature. A comparative design can be used to study different objects or social phenomena in one point in time or for a period of time and the intention of it is to compare two or more contrasting cases<sup>85</sup>. Bryman and Bell (2011) further express that by comparing a social phenomenon, it could easier be understood. This is also one of the reasons for why a comparative design has been chosen.

### 3.3 Research method

In order to answer the research questions a major part of this study involved literature reviews of relevant topics. These literature reviews were conducted continuously throughout the whole thesis. Basically, there was a need to establish a fundamental understanding of how capital structure and liquidity management are described in literature. The literature studied were mainly collected from databases such as google scholar and Summon. Some of the keywords that were used in the database search were: capital structure; liquidity management; and liquidity and capital structure (Mars 2015 - August 2015).

In addition to literature review, the second research question involved testing the correlation between liquidity and capital structure empirically. This was be done by doing a linear regression analysis in the program JMP statistics.

#### 3.3.1 Data collection and context of the analysis

The data were obtained from secondary sources. Quantitative data were primarily retrieved from annual reports and databases that compile key figures and data from annual reports. The databases that were used were borsdata.se and retriever business and the data were gathered from Swedish companies listed on Nasdaq OMX. The data were collected from annual reports between 2003 and 2014. However, some data could be collected from the whole time frame whereas data from other companies only partly could be collected.

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<sup>85</sup>Bryman & Bell, 2011

The validation of the assumptions depends on the context of the analysis. The context refers to the sample chosen in terms of geographical area, sector and activity of the companies and the size of it among some. Moreover, it is also of great importance to choose companies that are quite similar in context in order to obtain relatively homogeneous samples. Having too diverse companies in one sample may lead to difficulties in the analyzing part. Thus, this study has tried to choose companies in a context that is not too broad nor too narrow. This is because a too broad context entails difficulties in finding certain relations whereas a context that is too narrow might limit the amount of data, which might entail problems in finding any significant relations. The context in which the companies have been chosen from are presented by the following criteria:

- Geographical location: Sweden
- Private companies listed on the OMX Nasdaq
- Listed more than 4 years on OMX Nasdaq

Companies that have been chosen for this research are shown in the Table1. After thinning through the criteria described above, there were 11 IT companies and 12 real estate companies left.

| IT companies | Real estate companies |
|--------------|-----------------------|
| Acando       | Wallenstam            |
| Addnode      | Kungsleden            |
| HiQ          | Wilhborgs             |
| Softtronic   | Diös Fastigheter      |
| Knowit       | Castellum             |

|               |                   |
|---------------|-------------------|
| Diadrom       | Klövern           |
| ENEA          | Atrium Lungberg   |
| Fortnox       | Fabege            |
| Genesis IT    | Fastighet Partner |
| I.A.R Systems | Heba              |
| Novotek       | Tribona           |
|               | Saga              |

*Table 1: Companies analysed in each sector*

### 3.3.2 Definition of measurements

For the linear regression analysis the correlation between the liquidity and leverage will be analyzed through the calculation of two ratios that represent a certain level of liquidity and leverage respectively.

The level of liquidity in a firm can be calculated differently depending on the purpose of the analysis. Two common ratios used to determine the liquidity are the current ratio and the quick ratio. The difference between the two ratios is that the current ratio includes inventory whereas the inventory is subtracted from the nominator in the quick ratio. Since inventory is either low or non-existing in both IT consulting firms and real estate companies the ratio chosen for this analysis is the current ratio. The current ratio used to describe the liquidity of firms in this investigation is defined as follows:

$$\text{Current ratio} = \text{Current Assets} / \text{Current liabilities}$$

As with current ratio, the leverage of a firm can also be calculated in various ways. However, this study estimates the level of leverage by the ratio between debt and equity as it is a common

way of determining liquidity. Moreover, capital structure can be defined as the ratio between debt and equity (Encyclopedia of Finance, 2006). Thus, the leverage ratio used in this study is shown in the following equation:

$$\text{Leverage} = \text{Debt} / \text{Equity}$$

### 3.3.3 Regression model and process

This section aims to present the regression analysis used in this thesis. First, the hypothesis that are tested are introduced, which follows by a short description of the regression process. Second, some statistical characteristics of the variables are described. Finally, the section ends with introducing the OLS regression model and the assumptions behind it.

In order to answer the second research question two null hypotheses have been established; one for each sector. The hypothesis have been formulated in the following way:

*H.0\_real estate = There is no correlation between capital structure and liquidity for real estate companies in Sweden.*

*H.0\_IT = There is no correlation between capital structure and liquidity for IT companies in Sweden.*

In order to test those hypothesis two regressions have been performed according to Figure 4. Furthermore, the results from the regressions have worked as basis for the comparative analysis between the sectors.

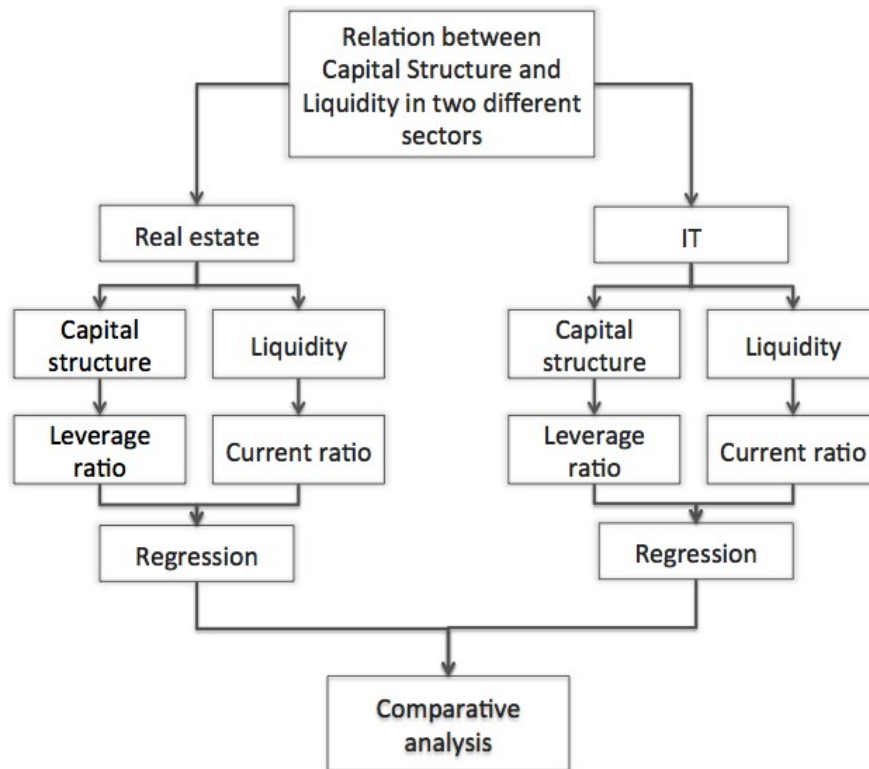


Figure 4:

### OLS model

A simple regression model involves two variables. Thus, one dependent variable is explained by one independent variable, which means that the model can be set up as:  $y = \beta_0 + \beta_1x + \varepsilon$ . In this model,  $\beta_0$  is a constant,  $\beta_1$  is the coefficient of the independent variable and  $\varepsilon$  is the error term.

The model that predicts the leverage - liquidity relation regarding real estate companies in this research is defined as:

$$CS_i = \beta_{1,i} + \beta_{2,i}CR_i + \varepsilon_i$$

where,

$CS_i$  is denotes the dependent variable (debt/equity)



$i = \text{RE, IT}$

RE = real estate

IT = information technology

$\beta_1$  is the intercept

$\beta_2$  is the slope of the model

$\varepsilon_i$  is the error term

### Assumptions

In order to achieve valid results of the study some assumptions have to be established. According to Wooldridge (2006) there are four assumptions that have to be made in order to obtain unbiasedness of OLS estimators. Thus, the assumptions established for the regression above are as follows:

SLR 1. Linear in parameters

SLR 2. Random sampling

SLR 3. Sample variation in the explanatory variable

SLR 4. Zero conditional mean - the error term has an expected value equal to zero independent of the explanatory variable

SLR 5. Homoscedasticity - the variance of the error term is independent of the explanatory variable

## 3.4 Quality of research

To ensure good quality in research, some aspects regarding reliability, replicability and validity has to be considered<sup>86</sup>. This part of the methodology chapter aims at elaborating and reflecting on the quality of this thesis's methodology in accordance with previous mentioned criteria.

### 3.4.1 Validity

Validity is about measuring what the researcher is meant to measure and can be divided into the subsections: measurement validity, internal validity, external validity<sup>87</sup>. In assuring as valid

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<sup>86</sup>Bryman & Bell, 2011

results as possible, this study has used those subsections as a base for elaborating on how valid results could be achieved.

Measurement validity has to do with the inquiry of whether or not a variable is measuring what it is supposed to measure and is also commonly referred to as construct validity<sup>88</sup>. Thus, does debt/equity measure leverage of a firm in a sufficient way? Similarly, is current assets divided by current liabilities a proper measurement for liquidity? Those two measurements are quite accepted ratios in literature when measuring leverage and liquidity. So the question is more about whether or not those measurement describe leverage and liquidity of IT and real estate sectors in an appropriate manner. Moreover, there could be measurements that describe the situation in a more valid way. For instance, is the quick ratio, which excludes the inventory when calculating liquidity a more valid measurement than the current ratio? Those were some of the questions that were considered upon when choosing ratios for the regression analysis.

Internal validity can be mainly referred to as causality<sup>89</sup>. Thus, internal validity concerns whether a conclusion of relationship between two or more variables can be drawn<sup>90</sup>. In other words, it is a question of how certain the cause and effect relationship between the variables analyzed in this study is. Liquidity is deemed by some researchers to have an influence on the leverage of a firm<sup>91</sup>, which increases the internal validity of this study.

External validity is about the generalizability of the results<sup>92</sup>. In other words, can the results be generalized beyond the context of this research. To achieve external validity in quantitative research it is desirable to collect representative samples<sup>93</sup>. Thus, this study has been chosen samples out of a defined and specific context in order to increase the generalizability. The generalizability of the results are deemed to depend a lot of the other research context. Moreover,

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<sup>87</sup>Bryman & Bell, 2011

<sup>88</sup>Bryman & Bell, 2011

<sup>89</sup>Bryman & Bell, 2011

<sup>90</sup>Bryman & Bell, 2011

<sup>91</sup>Williamson, 1988 p 567-591; Shleifer & Vishny p 1343-1366, 1992; Morellec, 2001 p 173-206; Myers & Rajan, 1998 p 733-771

<sup>92</sup>Bryman & Bell, 2011

<sup>93</sup>Bryman & Bell, 2011

the results might be generalizable to other research context that are quite similar to the context of this study.

### 3.4.2 Reliability

Reliability concerns the repeatability of a study and in quantitative research that has often to do with the stability of the measure<sup>94</sup>. In other words, a research should get more or less similar results if it was conducted again by other researchers. This means that independent researchers should get similar results if the same phenomena is studied accordingly. Due to the fact that the data has be gathered from annual reports and that the ratios in the analysis is clearly presented in this report there should not be any difficulty in repeating this study and obtain similar results.

### 3.4.3 Replicability

A study's ability to be replicable is in a large extent very desirable by a lot of researcher that are conducting quantitative research<sup>95</sup>. There might be several different reasons for researcher to replicate others findings. In order to increase the replicability of this study the procedure and the methodology are explained concrete way.

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<sup>94</sup>Bryman & Bell, 2011

<sup>95</sup>Bryman & Bell, 2011

## 4. Empirical results

This chapter constitutes the empirical findings from the regression analysis. First, descriptive statistics of the debt/equity and the current ratios are described. Second, the linear regressions (OLS) of the two samples are presented.

### 4.1 Descriptive statistics

In order to provide the reader with an overview of the characteristics of the variables in the regression model some descriptive statistics are presented in Table 2 and Table 3. The first table presents the statistics of the explained variable *debt/equity* and table XX presents the statistics of the explanatory variable *current ratio*.

| Sector      | Number of Observations | Mean  | Std Dev | Std Err Mean | Upper 95% Limit | Lower 95% Limit |
|-------------|------------------------|-------|---------|--------------|-----------------|-----------------|
| Real estate | 105                    | 2,010 | 0,702   | 0,069        | 2,146           | 1,874           |
| IT          | 103                    | 0,736 | 0,578   | 0,057        | 0,849           | 0,623           |

Table 2: Debt/Equity ratio

As shown in Table 1, real estate companies in Sweden have higher debt/equity ratio than IT companies, which means that they are more leveraged in comparison to IT companies. Real estate companies had an average debt/equity ratio of 2,010 with a standard deviation of 0,702. The differences is highly significant and no testing was deemed necessary. In the columns to the right in the table the confidence limits are shown for both of the sectors.

| Sector      | Number of Observations | Mean  | Std Dev | Std Err Mean | Upper 95% Limit | Lower 95% Limit |
|-------------|------------------------|-------|---------|--------------|-----------------|-----------------|
| Real estate | 105                    | 0,340 | 0,297   | 0,029        | 0,394           | 0,282           |

|    |     |       |       |       |       |       |
|----|-----|-------|-------|-------|-------|-------|
| IT | 103 | 1,818 | 0,858 | 0,085 | 1,986 | 1,650 |
|----|-----|-------|-------|-------|-------|-------|

Table 3: Current ratio

What could be seen in Table 3 is that IT companies have higher liquidity in terms of current ratio than real estate companies. The mean value of liquidity in real estate companies was 0,340 with a standard deviation of 0,297. For IT companies, the corresponding number was 1,818 with a standard deviation of 0,858. In the columns to the right in the table the confidence limits are shown for both of the sectors.

## 4.2 Regression

A regression analysis was done in order to find out if there is any significant correlation between liquidity and capital structure. As the second research question addresses how liquidity affects the choice of capital structure in both IT companies and real estate companies, two regressions had to be performed.

### 4.2.1 Regression IT companies

For IT companies a negative correlation between debt/equity and current ratio could be found. This relationship is depicted in Figure 5.

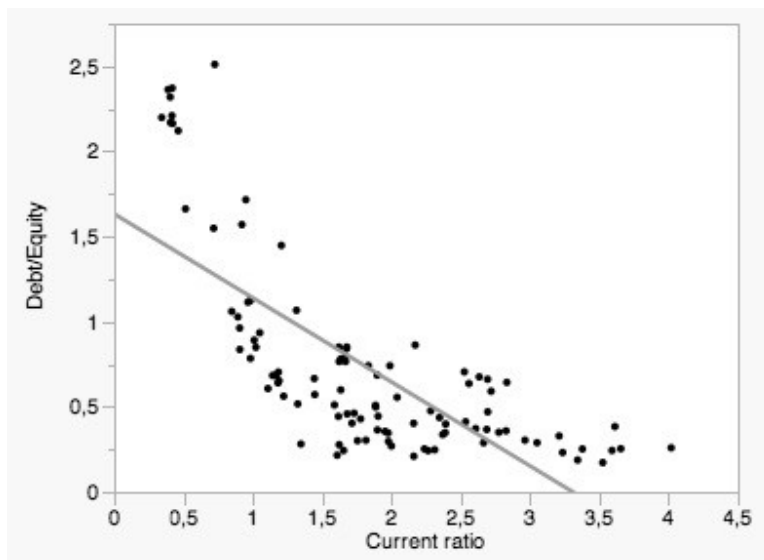


Figure 5: Regression between Debt/Equity and current ratio in IT companies

The statistics of the regression line is shown in Table 4. In this table, the linear fit, parameter estimates, analysis of variance and summary of fit are complied.

**Linear Fit**

$$\text{Leverage} = 1,162 - 0,297 * \text{Liquidity}$$

**Parameter Estimates**

| Term      | Estimate | Std Error | t Ratio | Prob>t |
|-----------|----------|-----------|---------|--------|
| Intercept | 1,162    | 0,079     | 14,77   | <0,001 |
| Liquidity | -0,297   | 0,037     | -7,97   | <0,001 |

**Analysis of Variance**

| Source   | DF  | Sum of Squares | Mean Square |
|----------|-----|----------------|-------------|
| Model    | 1   | 4,867          | 4,867       |
| Error    | 101 | 7,746          | 0,077       |
| C. Total | 102 | 12,613         |             |

**Summary of Fit**

|                        |       |
|------------------------|-------|
| R <sup>2</sup>         | 0,386 |
| R <sup>2</sup> Adj     | 0,38  |
| Root Mean Square Error | 0,278 |
| Mean of Response       | 0,574 |
| Observations           | 103   |

*Table 4: Statistics of the regression line for IT companies*

As seen in Table 4 the coefficient in the model is -0,297. This means that one unit increase in liquidity decreases the leverage by -0,297. The t-value for this coefficient is equal to -7,97, and hence, the null hypothesis can be rejected. Thus, there is a significant relationship between the variables. Moreover, a R<sup>2</sup> value of 0,386 tells that 38,6% of the variation can be explained by the model.

**4.2.2 Regression real estate companies**

Contrary to the negative correlation for IT companies a positive correlation was found for real estate companies. This relationship is illustrated in Figure 6.

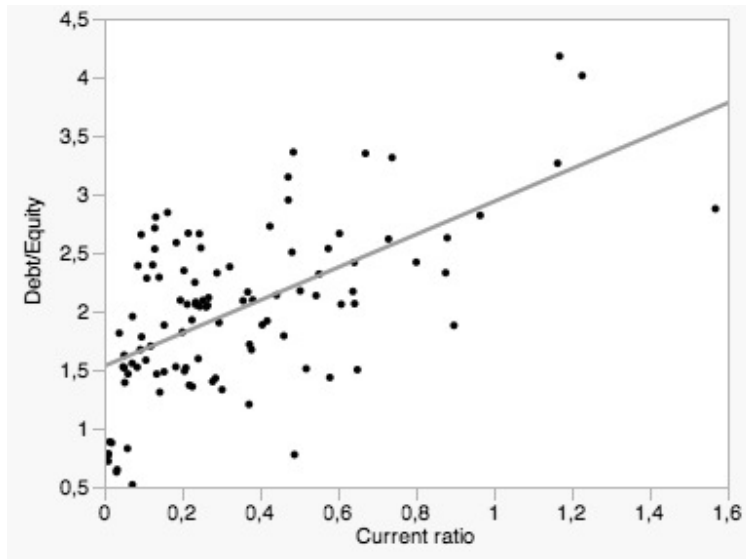


Figure 6: The correlation between dept/equity and current ration in real estate companies

The statistics of the regression line is shown in Table 5. In this table, the linear fit, parameter estimates, analysis of variance and summary of fit are complied.

**Linear Fit**

$$\text{Leverage} = 1,533 + 1,405 * \text{Liquidity}$$

**Parameter Estimates**

| Term      | Estimate | Std Error | t Ratio | Prob>t |
|-----------|----------|-----------|---------|--------|
| Intercept | 1,533    | 0,084     | 18,18   | <0,001 |
| Liquidity | 1,405    | 0,187     | 7,51    | <0,001 |

**Analysis of Variance**

| Source   | DF  | Sum of Squares | Mean Square |
|----------|-----|----------------|-------------|
| Model    | 1   | 18,15          | 18,15       |
| Error    | 103 | 33,163         | 0,322       |
| C. Total | 104 | 51,313         |             |

**Summary of Fit**

|                        |       |
|------------------------|-------|
| R <sup>2</sup>         | 0,354 |
| R <sup>2</sup> Adj     | 0,347 |
| Root Mean Square Error | 0,567 |
| Mean of Response       | 2,01  |
| Observations           | 105   |

Table 5: Statistics of the regression line for real estate companies

As seen in Table 5 the coefficient in the model is 1,405, which means that one unit increase in liquidity increases the leverage by 1,405. The t-value for this coefficient is equal to 7,51, and hence, the null hypothesis can be rejected. Thus, there is a significant relationship between the variables. A  $R^2$  value of 0,354 means that 35,4% of the variation can be explained by the model.



## 5. Comparative analysis between IT and real estate sectors

### 5.1 Regression in real estate's companies;

The outcome of our regression analyses were  $R^2 = 0.354$ . This means that 35,4% of the variation in leverage can be explained by the model. Furthermore, the regression shows a vague positive linear relationship between current ratio and the leverage ratio, which means that the greater the levels of current assets we have, the more debts is issued when companies finance its businesses. Because it should be easier to borrow money if the firm have a higher liquidity level, and since real estate businesses is capital intensive activities they tend to utilizing the debt financing possibility offered to them when they have enough liquidity to satisfy the debt holders. What is important to mention is that current assets is not exclusively composited of liquid means, but mainly contains assets that easily can be transformed into liquid funds. If current assets is greater than current liabilities, the company have liquid means which hopefully will satisfy the debt holders and investor's requirements which would possibly increase the possibility for the company to take up a leverage position.

Regarding the correlation between leverage ratio and current ratio, our study vaguely indicate that the higher degree of current assets, the more debt financed capital is used for the company's investments purposes resulting in an increase in the leverage ratio.

What is a contradiction here in our regression analysis is that the lower the current ratio is the more equity-financed capital (debt / equity axis). This can be seen in Chart XX where the data plots are clustered near the origo of the graph. (The diagram indicates that initially the company is short of cash, and then it can be difficult to get access to debt financed capital since the *"Creditors often compare a firm's current assets and current liabilities to assess whether the firm has sufficient working capital to meet its short terms needs"* (De Marzo Berk p 37). That is to say it will be hard to get access to leveraged capital to finance its operations when you have low liquidity, and then the company presumably will have to finance their investments with equity instead of debt.

In real estate corporations, the general trend in our studies, indicate that if the company have a high degree of liquidity it will result according to our studies to a high leverage ratio.

It is implied that real estate companies want to borrow money if they have the opportunity to do so because this kind of business is highly capital-intensive, but financiers will only be willing to contribute with investment capital if the company has enough of liquid funds to meet payment obligations that the leveraged capital causes, such as interest and principal payments.

## 5.2 Regression in IT -companies

Our correlation analysis in Swedish IT companies indicates that it exist a negatively linear relationship with  $R^2 = 0.386$ , which is a slightly stronger linear relationship between leverage ratio and current ratio here than compared with the real estate sector.

The negative linear relationship here imply that the higher degree of liquidity, the lower is the degree of debt financed capital. (higher current ratio will lead to low leverage ratio).

This scenario would indicate that the company will choose to not take a hefty leverage position when they have a higher degree of liquid means available. However, what goes against the general trend in our study, that there is a vague negative linear relationship between current ratio and leverage ratio is that initially at the start-up of operations when liquidity is very low the company tend to need more debt financing, which could be seen with the correlation plots in sector D/E (2-2,5) in upper left corner. IT industries is not a heavy capital intensive business and IT companies doesn't need so much capital to finance their operations. Only initially in the introduction phase they need capital.

## 6. Conclusion

The purpose of this thesis has been to conduct a comparative analysis by investigate the linkage between capital structure and liquidity of companies in the real estate sector as well as in the information technology sector. In this section, the conclusion and main contributions in the field of corporate finance are presented.

The main contribution that this study adds to the field of corporate finance is that the correlation between liquidity and capital structure seem to differ between the real estate and information technology sector. There seems to be a positive correlation between the ratios in real estate companies whereas the findings indicates a negative relation between the ratios in the information technology sector.

The result that we have got in our research paper is rather ambiguous and possibly additional researching and investigations is desirable. However, as mentioned earlier in our analysis it vaguely indicates that it exists a linearly correlated relationship between the degree of liquidity and leverage ratio within the IT companies and real estate companies that we have used in our datasets.

### **Shortcomings and possible improvements**

It seems reasonable to believe that there are more independent variables (that have been omitted in this analysis) that correlate with the dependent variable (leverage). Including more data could also be good in order to increase the quality of the report

During the process when we with a correlation analysis investigated the correlation between leverage ratio and current ratio of the IT-companies, we identified a cluster of outliers in the periphery in our diagram. Those cluster of plots did not uniformly followed the straight linear correlation line. What is noteworthy to mention of these plots is that we concluded that it eventually exists an exponential relationship rather than a linear relationship, which another type of regression model probably could ascertain and solve in a more proper way.

Another possible shortcoming in our study is regarding the confirmation of causation that eventually could have been done in a more constructive way, i.e. is it with a 100% certainty ensured that the outcome of our result is related to the dependent and independent variable. Could it be that it exists another variable that is not in the empirical data but which still affect the outcome of our regression analysis.

It may be interesting to highlight which of the companies in our study that are profitable and which one that generate the highest profit levels, and even compare them with companies that are less profitable and compare them with each other. Another variable that may also be of importance is the growth levels and according to these variables construct a regression analysis

It could also be of interest to specify where on the timeline the company is positioned; specifically it could be of great importance to know if the company is in the startup phase , cause then it could clarify the linkage between current ratio and leverage ratio in a more constructive way, and it would consequently also effectively improve the ease to determinate those variables, and it would be easier to estimate the level of impact on leverage ratio with different current ratios

## Future research

For further expansion of our analysis we suggest that if a researcher want to strengthen and improve the validity of the regression analyses, following thoughts could be considered.

To ensure and validate the statistical results and the outcome of our investigation, a future researcher could use a larger amount of empirical data, which would contribute to strengthen the evidence and further validate the relevance of our hypotheses.

A future researcher could potentially divide the companies into different sectors depending of for example different geographically areas.

Other options for a researcher could for example add more delimitations into the study, and he or she could also specify and divide real estate companies into different sections and subdivisions based on what kind of property portfolios and segments the companies are active in. For example commercial properties and private residential properties could presumably be divided into two different sections.

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