Determinants of Capital structure: Pecking order theory. Evidence from Mongolian listed firms

Author: Bazardari Narmandakh
University of Twente
P.O. Box 217, 7500AE Enschede
The Netherlands

b.narmandakh@student.utwente.nl

ABSTRACT
Capital Structure decisions have implications for the success and survival of any firm. This paper analyzes the determinants of capital structure of Mongolian listed firms, employing accounting data from the year 2010 to 2013, of 23 firms. This study has been guided by the capital structure theory i.e. Pecking Order Theory. Pecking order theory is the main focus of this study as few studies found that firms in transitional economy do not follow the traditional pecking order theory but follow the modified pecking order theory. As in other studies, leverage in Mongolian firms decreases with profitability and liquidity. Leverage decreases with asset tangibility, this is contradicting to the predictions by the pecking order theory, however this behavior is explained by the maturity matching principle. Leverage also increases with size, this is not in line with the pecking order theory but is in line with static trade off theory. Overall Mongolian firms make use of retained earnings, when external financing is needed short term debt is preferred over long term debt, but equity is preferred over long term debt. Hence there is moderate support for modified pecking order theory in Mongolian listed firms.

Supervisors:
Dr. X. Huang
Dr.R.Kabir
H.C. van Beusichem MSc

Keywords
Capital structure decisions, Pecking order theory, firm-specific determinants, leverage, Mongolian listed firms.

1. INTRODUCTION

Capital structure is defined as the way a corporation finances its operations through combination of equity, debt, or hybrid security (Hillier, Clacher, Ross, Westerfield, and Jordan, 2011). The importance of capital structure cannot be ignored as, any firm may it be listed firm, Small Medium Enterprise or family business, capital structure decision will have an crucial effect on the survival of the business entity. It is also important to make the right decision regarding how the business entity will be financed, as any change in financing will change the stock prices when it is announced (Myers, 1984).

Nevertheless, numerous research have been done on the factors affecting capital structure decisions firms make. It is well known that the choice between debt and equity depends on firm-specific characteristics. Several authors have tried to base the factors that affect capital structure choice on the three most accepted theoretical models of capital structure. These theories are known as the static trade off theory, the agency theory and the pecking order theory.

The pecking order theory, which was developed after the static trade off theory, has the potential to explain the financing behavior of firms as well as the static trade of theory. The pecking order theory was developed first by the author Myer (1984), based on asymmetric information problems. The theory predicts that firms will prefer internal financing to issuing security, and if the need to use external financing arises, a firm will deploy the least risky source of external financing first i.e. debt. This theory explains the many observed patterns in corporate finance including the tendency of firms not to issue stock and their choice to hold large cash reserves and other forms of financial slack (Chen, 2004). The pecking order theory is specifically interesting to study as Helwege and Liang (1996) found large firms that have access to capital markets do not follow the pecking order when choosing the type of security to offer. They concluded that equity is not the least desirable source of financing, as pecking order theory suggested. Another stimulating view on this theory is that the author Chen (2004) illustrated that firms in the Chinese economy do not follow the old pecking order theory but in fact follow the modified pecking order theory, which proposes firms use retained profit, equity and then long term debt.

Although the capital structure theories explain well the financing behaviors of many corporations, the main downfall of the theory is that, it was developed using data from large corporations based in the USA. The extent to which these theories still can be applied to developing countries is still doubtable. In order to fill this gap, Rajan and Zingales (1995) applied the capital structure theories to firms in the G7 countries and established factors that affect USA firms leverage also affected the G7 countries the same way. However on the other hand, the recent study done by De Jong, Kabir and Nguyen (2008) found that firm-specific determinants of capital structure differ across countries. Firm-level determinants, such as profitability, firm risk, firm size, asset tangibility and liquidity do not have the same level of significance in all countries as stated by previous studies. Consequently this contradicting view on firm specific determinants that affect capital structure gives a room for further study.

Thus the main focus of paper will be to test whether firm level determinants, which are identified within the pecking order theory, are applicable to developing countries such as Mongolia. Pecking order theory has been chosen as the focus of this paper, as few authors found that the old pecking order theory cannot be applied to transitional economies. They found that firms do not prefer to rely on debt as first resort of external financing, but in fact make use of equity as first resort when external financing is needed (Chen, 2004; Delcoure, 2007; Helwege and Liang, 1996). This is contradicting to the pecking order theory, whereby equity is the most unfavorable source of financing. Hence this pattern of equity being made use of prior to debt in transitional economies, which are similar to the case of Mongolia gives a room to study further. Research conducted on the capital structure of Mongolian listed firms is very limited to virtually non- existent. This lack of research provides an opportunity to test whether firm-specific determinants have the same level of significance as other authors suggest as well as testing whether the pecking order theory can be applied to the case of Mongolia. Hence the research question that will be overarching this study is:

To what extent can capital structure decisions of Mongolian listed firms be attributed to the pecking order theory?

The research question will be further explored by making use of data of Mongolian listed firms in the period 2010 to 2013. The time period emerges from the fact that prior to the credit crunch there is a period of credit expansion, where firms become highly reliant on debt financing. During the economic recession credits are tightened and owners reappraise and delay investment decisions. The extent to which reduction in private sectors credit is a result of supply or demand side responses to financial and economic shocks is still unclear (Bhaird, 2013). In line with this argument the Mongolian economy has seen the similar movement, in the period of 2006-2008 bank credit to SMEs and listed firms increased by 47 percent, however in late 2008 banks virtually stopped lending due to the crisis. Later in the years 2010 to 2011 when the economy slowly recovered from the damages of the crisis, credit gradually increased accounting 49 percentage of the Gross Domestic Product.

This study will add to the existing literature by giving further support in filling the gap of whether theories developed in the context of developed countries can still be applied to developing countries. As well as providing with further proof on whether the firm-specific determinants have the same level of significance across countries, by examining if these factors are significant in the case of Mongolia. Mongolia is an interesting country to carry out the analysis as it is categorized as a transitional economy, whereby it has been only 22 years since the communist regime broke down. The country has been making progress towards, becoming a market based economy.

The remainder of the paper is organized into five sections. Section 2 covers a brief literature review on the theories of capital structure, the firm specific determinants of capital structure arising from pecking order theory that will be used for further analysis and some institutional background on Mongolian firms. Section 3 provides the methodology on how the data is gathered and research method. Section 4 provides the results of the analysis, and finally Section 5 concludes the study with implications of the findings and the suggestions for further research.

2. LITERATURE REVIEW

This section examines the underlying capital structure theories, firm-specific determinants and reviews existing empirical evidence on capital structure. As well as the institutional background of Mongolian listed firms. Last the hypothesis development can be found.

2.1 Capital structure theories

In the seminal paper by Modigliani and Miller (1958), they showed that in a world of perfect markets (i.e. without taxes, with perfect and credible disclosure of all information, and no transaction cost) the value of the firm is independent of its capital structure, and hence debt and equity are prefect alternatives for each other. However, once the greatest assumption of Modigliani and Miller is relaxed and assumed that the capital market is not perfect; capital structure choice becomes an important value determining factor (Deemsomsak, Paudyal and Pescetto, 2004). This new assumption that the capital market is not perfect and has transaction costs, bankruptcy costs, taxes and information asymmetric has led to the development of alternative capital structure theories, that help to explain the choice between debt and equity.

The first theory that was developed to explain the determinants of capital structure of firms was the static trade off theory. Within this theory a firm has a target debt-to-equity ratio and gradually moves towards the target. A firm's leverage is determined by the tradeoff between the costs and benefits of borrowing, holding the firm's assets and investment plans constant (Myers, 1984). Benefits of borrowing include the tax deductibility of interest paid, use of debt as an indication of high quality company performance and to reduce the likelihood of managers investing excess cash on unprofitable projects. Cost of borrowing include, the likelihood and cost of inefficient liquidation, and the agency costs due to the debtor's incentives towards taking action that may be harmful to the lender (Bontempi, 2000). Hence the main proposition of static trade off theory is that a firm balances the benefits and the cost of debt to determine the optimal debt-to-equity ratio. Mainly a firm is portrayed as balancing the value of interest tax shields, against costs, until the value of a firm is maximized. Using debt as a means of financing is attractive since the benefit from the tax shield outweighs the costs related to debt (Tongkong, 2012). Therefore, firms with high profitability will tend to have higher level of leverage. However, some studies observed firms tendency not to issue stock and their choice to hold large cash reserves and other forms of financial slack (Chen, 2004). This pattern lead to the development of the second capital structure theory, it tries to explain why profitable firms were using retained earnings, while according to static trade off theory they can benefit from deploying higher levels of debt.

The second capital structure theory which was developed to explain the behavior of firms which static trade off theory failed to explain is the pecking order theory. Within this theory it is suggested that firms make use of internal finance first and if it is necessary firms issue the safest security first. They start with debt, then hybrid securities such as bond, then as a last resort equity (Myers, 1984). This suggests that there is a certain level of hierarchy in the capital structure of firms. The reason why firms deploy retained earnings as a source of financing investment is to avoid issue cost. The reason for debt being preferred over equity is related to the high cost of issuing equity as well as fear of losing control of the firm when new equity is issued. However these factors do not explain fully the hierarchical capital structure firms deploy. The most influential factor that influenced the development of this theory is the problem of asymmetric information. Whereby, it is argued that if managers know more than the rest of the market about their firm's value, the market penalizes the issuance of new securities like equity whose expected payoffs are significantly related to the assessment of such a value (Myers, 1984).

Even though, the theories explain to some extent the capital structure choices firms make. The extent, to which the theories that were mainly developed and tested based in developed countries such as USA, can still be applied to other less developed countries remains puzzled. Studies done by authors such as Rajan and Zingalas (1995) studied the determinants of capital structure choice of public firms in the G7 countries and concluded that capital structure choices are similar across the G7 countries. They found that 19% of the variation in the firms leverage in the G7 is explained by company size, asset tangibility, growth rate and profitability. The findings by Rajan and Zingales was also supported by the author Wald (1999), who extended Rajan and Zingales paper to study the capital structure determinants including France, Germany, Japan, the United Kingdom and the United States. Also the authors Fama and French (2002) reached a similar conclusion and found that pecking order and trade-off theories explain some companies financing behavior, and none of them can be rejected.

However, some researchers argue that neither the trade-off theory nor the pecking order theory provides convincing explanation to the capital structure choices some firms make. In the study done by Chen (2004) which tested the determinants of capital structure in Chinese listed companies found that Chinese companies do not follow the pecking order theory or the trade-off theory. They concluded that Chinese firms follow the Modified Pecking order theory with retained earnings, equity and then last debt. It points to the fact that assumptions underpinning the Western models are not valid in the case of China. In line with the argument made by Chen another study done by Delcoure (2007), which also studied the capital structure determinants but in Central and Eastern European countries, found that neither trade off theory, pecking order theory, nor the agency theory explains the capital structure choice. Both studies, gives a room to make generalized assumption that the theories may actually not be applicable once it has been taken out from the origins it was developed. Chen (2004) and Delcoure (2007) both reached the conclusion that firms prefer equity over debt as it is not obligatory. Short term debt is much more deployed by firms in the Chinese market as well as in the former soviet countries, as there are other constraints such as the financial constraints in the banking system that influences capital structure.

2.2 Determinants of capital structure

Prior studies on the capital structure of firms, have attempted to identify firm-specific determinants of capital structure choices as function of the factors that underpin the theories such as trade off theory and pecking order theory. Researchers have identified few firm-specific determinants of capital structure, based on the most accepted theoretical models of capital structure: the static trade off theory, the agency theory and the pecking order theory. Modigliani and Miller (1963) have used factors such as taxes and bankruptcy cost, which is central to the static trade off theory. Myers (1977) has used agency and moral hazard costs as determinants of capital structure, which is central to the pecking order theory.

The firm specific determinants many previous studies have used to determine their impact on the capital structure decisions include firm size, profitability, growth opportunity, tax shield effects, cost of financial distress, asset tangibility and liquidity (Chen, 2004; Deemsomsak, Paudyal and Pescetto,2004; De Jong, Kabir and Nyugen, 2008). In the study done by Booth, Aivazian,

Demirguc-Kunt & Maksimovic (2001) it was observed that capital structure of firms are usually explained by several variables arising out of static trade of theory, agency theory or information asymmetric theory. Therefore this section will develop variables that explain the capital structure of firms arising from the theory that is in focus.

2.2.1 Profitability:

Profitability is defined as earnings before interest and tax (EBIT) scaled by total assets. According to the authors Huang and Song (2006) tax based models suggest that more profitable firms will use more debt, as they have greater need to shield the income from corporate taxes. However, in the pecking order theory it is suggested that firms will use more retained earnings as first resort of investment and then move to bonds and new equity last, suggesting profitable firms will make use of debt far less. Many empirical studies on the determinants of capital structure find that leverage is negatively related to the profitability of the firm. Rajan and Zingales (1995) confirmed this finding in the G7 countries and Booth, Aivazian, Demirguc-Kunt & Maksimovic (2001) for developing countries.

2.2.2 Asset Tangibility:

Asset tangibility is measured as the total fixed asset over the total asset of a firm. If firm's tangible assets are high, then these assets can be used as collateral when issuing debt, which in return will protect lenders from the problem of moral hazard. Indicating that firms with high level of tangible assets would make more use of debt financing. Theories such as the static trade of theory suggest that companies use tangible assets as collateral to provide lenders with security in the event of financial distress. This view is also supported by the authors such as Chen (2004) and Rajan and Zingales (1995), whom report significant positive relations between asset tangibility and a firm's debt structure.

2.2.3 Liquidity:

Liquidity is defined as current asset divided by current liabilities. Pecking order theory, suggests that firms with high liquidity will borrow less. As managers can manipulate liquid assets in favor of shareholders against the interest of debt holders, increasing the agency cost of debt (Deesomsak, Paudyal & Pescetoo, 2004). Another author Oztekin & Flannery (2012) found firms with more liquid assets can use them as another internal source of funds instead of debt, leading to lower levels of debt. Thus a negative relationship between liquidity and leverage is expected.

2.2.4 Firm size:

Firm size is usually measured using the natural logarithms of sales or natural logarithm of total assets. According to the pecking order theory firm size and leverage is negatively related. This pattern is found as larger firms suffer less from the problem of information asymmetric and have better access to capital markets; hence they would deploy more equity and less debt. Smaller firms suffer higher from the information asymmetric problem; therefore tend to use more debt than equity (Rajan and Zingales, 1995). Wald (1999) concluded that in Germany negative relationship between size and leverage is found as small number of professional managers control sizable percentage of big industrial firm's stocks and can force management to act in the stockholders interest.

Empirical studies agree to some extent firm-specific determinants indeed do influence capital structure of firms. Booth, Aivazian, Demirguc-Kunt & Maksimovic (2001) analysis the capital structure choices of firms in 10 developing countries and provides evidence that capital structure decisions are affected by the same variables as in developed countries. On the contrary, De Jong, Kabir & Nyugen(2008) studied the capital structure determinants in 42 countries both in developed and developing countries, concluded that it is unfounded to assume that all determinants of capital structure affect firms the same way across the world. They found that in each country one or more firm-specific factors are not significantly related to leverage. For example conventional theories suggest that negative relationship between liquidity and leverage should be found, however De Jong, Kabir & Nyugen (2008) find that there is limited significant results to support this view. The following contradicting views suggest that the study on determinants of capital structure is not yet complete and gives a room for further studying the topic.

2.3 Mongolia's corporations and its institutional environment:

The recent reform from the planned economy to a market based economy in the early 1990 has advanced successfully, and the economy has grown rapidly. The transformation involved the implementation of fundamental economic reforms including price liberalization, privatization, opening the economy to foreign competition, and establishing market institutions.

The transformation has led to the development of the Mongolian Stock Exchange (MSE) on 18th January 1991. MSE was established with the purpose of implementing its privatization policy and developing investment and securities market. After the establishment of MSE between the periods 1992 to 1995, 96.1 million shares worth 8.2 billion MNT (Mongolian Tugrug) of 475 state owned entities were traded through MSE. The first securities and exchange law was enacted in 1994 and the corporate law in 1995, followed by the development of the secondary market. The number of firms listed on MSE in 1995 was 461 but has rapidly declined to 329 firms in 2012 and currently in the year 2014 only 181 firms are listed. This sharp decline is due to the fact that many listed firms were delisted and turned into private firms and also due to the fact that limited options are available on the stock market in raising much needed external financing.

The stock market capitalization as a percentage of the GDP of Mongolia has dramatically increased from 1.86 percent in 1995 to 14.46 percent in 2007; the peak was in 2011 with 18.02 percent (The Global Economy, 2014). Stock market capitalization of about 50 percent of GDP and more is an indication of a well-developed stock market. However Mongolia is far from reaching this point compared to other countries, the stock market capitalization in Germany was 32.89 percent in 2011 and in the USA it was 104.33 percent. The stock market turnover ratio, which reflects how active the stock market of a country is, has seen a sudden decrease over the years. The value was at its highest in 1997 with 37.5 percent and has decreased to 2.85 percent in 2012 (The Global Economy, 2014). This indicator depicts how inactive the stock market is in Mongolia and explains to certain extent why firms opt to use the traditional short term bank loans as a source of external finance.

Until the 1st of January 2014 there were only two kinds of securities available at the stock exchange, which were shares and bonds. The trade volume of shares has increased over the years from 64.5 million in year 2010 worth 62.9 billion MNT to 133.8 million in 2012 worth 144.7 billion MNT but has seen a decline

to 65.8million worth 97.6 billion MNT in 2013. Compared to the equity market the bond market is dominated by government bonds. In the year 2011 trade value of bond was 236.7 billion MNT of which 98 percent was government bond and only 2 percent corporate bond. Later in the year 2013, government bond worth 1.01 billion MNT was traded however zero corporate bonds were traded. Almost all the corporate and government bonds are bought by banks. Industries in Mongolia are still heavily reliant on debt financing. Majority of the corporate bonds traded are short term. According to a 2011 report by the International Monetary Fund, in September 2010, the 14 registered commercial banks accounted for 96 percent of total financial assets in the country (Milyutin, 2012). The non-bank financial sector constitutes less than 3 percent of the total assets in the financial sector and the capital market contributes less than 1 percent. Instruments available for long-term investment remain limited (Milyutin, 2012).

Only one third of the firms in Mongolia had a bank loan and of these only 3 percent had loans with maturities of more than 5 years. Many firms in Mongolia are unable to obtain a bank loan, due to the difficulty banks have in assessing the credit risk. The difficulty in assessing credit risk derives from the problem of poor corporate governance and the lack of transparency in business operations, which makes it difficult for potential lenders to assess borrower's creditworthiness (Ianchovichina and Gooptu, 2007). Besides the problem of creditworthiness, banks are unwilling to carry out debt to firms as the bankruptcy and debt recovery framework in Mongolia is underdeveloped, thereby increasing the risk for the lenders. In the World Bank (2006) Investment Climate survey it was shown that creditors recover only 17 percent of total claims from insolvent firms in Mongolia, compared to 24 percent for East Asia and 73.8 percent for OECD countries (Ianchovichina and Gooptu, 2007). In response to this giant obstacle, banks in Mongolia have been forced to rely heavily on collateralized lending and to charge high risk premiums on their loans (Ianchovichina and Gooptu, 2007). This requires firms who wish to employ debt to have high level of fixed asset. The high collateral requirements have caused limited access to credit. The ratio of collateral required to loan value is 224 percent in Mongolia compared to the average for East Asia is 78 percent (Ianchovichina and Gooptu, 2007).

As the capital market is primitive and banks offer limited range of products to firms, Mongolian firms have also relied heavily upon retained earnings to sources their investment and capital needs. Additional obstacle that exists in Mongolian firms obtaining debt is the problem of corruption. Mongolia was ranked 9th out of 62 countries, which firms reporting corruption is major obstacle. According to calculations in World Bank the total cost of fines, fees and unofficial payment made up over half of the direct financial costs incurred by firms (Ianchovichina and Gooptu, 2007). Till now this problem has not gotten any better only worse. Another major point worth mentioning that hinder firms ability to deploy debt is the legal rights for creditors and borrowers. The average value for the Index of legal rights for creditor and borrowers in Mongolia has been and still is 6 points, while the value for countries such a UK has score of 10 and Australia value of 9. Mongolia's legal and institutional framework is still incomplete. Debt holders are not given any control rights in liquidation. There is a lack of clearly defined property rights markets, lack of effective capital market for external corporate control, lack of efficient bankruptcy procedures and lack of clear rules for financial disclosure.

Even though above mentioned downsides related to debt financing hampers Mongolian firms, they still deploy short term debt to finance capital needs, as the stock market is inactive and does not offer many opportunities to raise well needed capital.

In order to minimize the risk associated with external financing and to increase the effectiveness of the capital markets. Mongolian parliament has recently launched "Revised Securities Law" on January 1st 2014. This amended law is hoped to increase liquidity and capital raising opportunities, increase investor protection during Initial Public offering and take over, enhance monitoring and regulations of market participants, preventing insiders dealing and market abuse, increase market transparency and reporting/disclosure requirements and last to increase the monitoring and efficient regulation. The main features of this law are that dual listing on Mongolian stock exchange and other foreign stock exchange is permitted and varieties of financial instruments have been introduced, including options, futures, derivatives and convertible securities.

Above mentioned law is intended to create an environment where firms can access needed external financing and to increase the efficiency of the capital markets.

2.4 Hypothesis development:

In this section, relevant hypothesis will be developed in order to aid the answering of the research question, based on the institutional framework and the capital structure determinants built above.

Hypothesis 1: Profitability of the firm will be negatively related to the leverage of Mongolian listed firms.

Pecking order theory suggests that firms that are more profitable will make use of retained earnings to finance investment, hence using less debt as investment source. Profitable firms make use of less debt due to the problem of information asymmetric and hardly make use of equity as their equity will be undervalued (Shyam-Sunder & Myers, 1999). In the study done by Shyam-Sunder & Myers (1999) they found that highly profitable firms work down to low debt ratios. This is also supported by Rajan and Zingales (1995) and Titman & Wessels (1988) who find strong negative relationships between leverage and past profitability. Profitability is an important variable to use in the case of Mongolia, as acquiring external finance is found to be very expensive and many firms make use of retained earnings before issuing external finance. Hence Mongolian firms which are profitable will make use of less debt.

Hypothesis 2: Liquidity of the firm will be negatively related to the leverage of Mongolian listed firms.

This relationship is expected as pecking order theory suggests more liquid firms are in possession of higher internal funds that can be used first to finance investments. Saarani & Shahadan (2013) found in their studies that liquidity is negatively related to leverage. They concluded that liquidity reflects the ability of the firms to deal with their short term liabilities. Hence firms that have high liquidity use less debt and follow the pecking order theory. More liquid firms are able to generate higher cash inflows for their business activities, hence making use of lesser debt (Saarani & Shahadan, 2013). As the stock exchange in Mongolia is very inactive and obtaining external finance is expensive, firms which are high in liquidity will make use of more internal finance and will use debt less.

Hypothesis 3: Asset tangibility of a firm will be positively related to the leverage of Mongolian listed firms.

This relationship is expected as many studies have found positive relationship between asset tangibility and firm leverage. Firms can make use of tangible assets as collateral when issuing debt. This indicates that firms with higher asset tangibility will make use of higher debt levels. In the study done by Jensen and Meckling (1976), which studied agency cost, ownership and capital structure they pointed out that if firm's tangible assets are high, then these assets can be used as collateral, diminishing the lenders risk of suffering such agency cost of debt. Hence, high asset tangibility is expected to be related with high levels of leverage. Huang and Song (2006) also found the same association between asset tangibility and leverage. They found that Chinese firms leverage increases with asset tangibility. As mentioned in the section above Mongolian firms need to have high level of collateral in order to issue debt and banks in Mongolia rely heavily on collateralized lending. Hence higher asset tangibility will indicate higher level of debt financing in the case of Mongolian firms.

Above three hypotheses will be tested using the ordinary least square regression (OLS) in the coming sections.

3. METHODOLOGY

3.1 Regression model

Since the sample contains data across firms and over time, the panel data method will be employed. To estimate the panel data model this study will use the ordinary least square regression method. Panel data method is preferred over cross-sectional method, as it gives a larger number of observations, which will increase the degrees of freedom and hence improve the efficiency of the econometric estimates. The advantage of using the panel data method is that it accounts for the unobserved heterogeneity among the cross-sectional firms over time in the form of unobserved firm-specific effects (Ilyas, 2008). Hence the model is specified as follows:

$$Y_{it} = \propto + \beta_1 Profitability_{it} - 1 + \beta_2 Liquidity_{it} - 1 + \beta_3 Asset\ tangibility_{it} - 1 + \beta_4 Size_{it} - 1 + \varepsilon_{it}$$

Where Y_{it} is firm i's leverage at time t, measured at the accounting year end. $\propto$ Represents the company specific intercept and ε_{it} is the residual error term. The dependent variable is the leverage of the year 2013 and the explanatory variables are averages of 2010-2012. Using this averaging process reduces the possibility of measurement error and the effect of random fluctuations in the variable. The independent variables are lagged one period behind the dependent variable, in order to avoid the potential reverse. This method has been used by several authors such as by the authors Deemsomsak, Paudyal & Pescetto (2004), who studied the determinants of capital structure in Asian Pacific Region.

To test the expected relationships outlined in the hypothesis in the previous sections a statistical test will be carried out. Univariate analysis will be made first to describe the distribution of the dependent variable leverage and the independent variables profitability, asset tangibility and liquidity. In order to test whether there exists relationship between the dependent and independent variables a bivariate analysis will be carried out.

Specifically within the bivariate analysis to measure the dependence Pearson's correlation will be done. Pearson's correlation is a suitable measure to use as both the independent and the dependent variables are continuous. Lastly in order to test the existence of pecking order theory in Mongolian listed firms an Ordinary Least Square Regression will be executed.

3.2 Variables and Hypothesis

Booth, Aivazian, Demirguc-Kunt & Maksimovic (2001) observed that capital structures of firms are usually explained by several variables arising out of static trade-off, agency and pecking order considerations. As pecking order theory is in the focus of this study, variables arising from this theory will be used further to develop the hypothesis. To test the firm-specific determinants using pecking order theory, many studies have used the variables such as profitability, size, asset tangibility and liquidity. Several studies such as by Chen (2004) and Delcoure (2007) have measured the dependent variable leverage by total debt scaled to total assets. This formula $\frac{total\ debt}{total\ asset}$ is a suitable measure for debt in a sample where the firms mostly make use of short term debt. As it was observed that Mongolian firms were using more short term debt than long term debt, this formula will be used to calculate leverage. The independent variables are profitability, asset tangibility and liquidity. Hence the hypothesis is as follows:

> Hypothesis 1: Profitability will be negatively related to the leverage of Mongolian listed firms.
>
> Hypothesis 2: Liquidity of the firm will be negatively related to the leverage of Mongolian listed firms.
>
> Hypothesis 3: Asset tangibility of a firm will be positively related to the leverage of Mongolian listed firms.

Following the study done by the authors Deemsomsak, Paudyal & Pescetto (2004), the independent variable profitability is measured by earnings before interest and tax scaled to total assets, the variable liquidity is measured by current assets scaled to current liabilities and the last independent variable asset tangibility is measured by total fixed asset scaled to total assets.

In order to avoid spurious relationship between the dependent and the independent variables, size will be used as a control variable. To measure the control variable size the natural logarithms of total assets will be made use of. Many studies such as those of Chen (2004), Delcoure (2007), Deemsomsak, Paudyal & Pescetto (2004) and Seifert & Gonene (2008) have used the natural logarithms of total assets to calculate the variable size. Under pecking order theory, size is regarded as a proxy for information asymmetry between firm insiders and capital markets. Hence, larger the firm, the more information is provided to the outsiders and adverse selection costs when issuing new equity is diminished (Drobetz, Gounopoulos, Merikas & Schroder, 2013). Therefore with this notion an inverse relationship between size and leverage is expected under pecking order theory. Authors such as Salami & Iddirisu (2011) have used size as a control variable in their study to control for any possible non-linearity in the data and the likely resulting problem of heteriskedasticity.

3.3 Sample set

The annual data are obtained from ORBIS database and the website of Mongolian Stock Exchange to cover the period 2010-2013. The criteria used in the selection of firms are as follows:

Table 1

Step	Search Criteria	Number of search results
1	All firms listed on MSE	181
2	All firms that are active on MSE	72
3	All non-financial firms	65
4	All firms with data available in the period 2010, 2011, 2012 and 2013.	23
5	Total firms	23

After the application of the search criteria, there are data available from 23 firms for testing the hypothesis. Financial firms (i.e. banks, insurance companies) are excluded from the study as their balance sheets have a strikingly different structure from those of non-financial firms. The sample set includes data from 23 listed Mongolian firms, covering four year period. The sample includes total of 92 firm year observations. All data are collected using the Mongolian currency Tugrug. One euro is equal to around 2,000 Mongolian Tugrug.

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4. RESULTS

The sample consists of 23 firms listed on the Mongolian stock exchange in the period 2010 to 2013. The data on the firm-specific variables profitability, liquidity, asset tangibility and size are from the period 2010 to 2012. The dependent variable leverage is from 2011-2013. The independent variables are lagged one period behind the dependent variable in order to avoid potential reverse causality between independent and dependent variables. Descriptive statistics is carried out for the independent and the dependent variables.

4.1 Descriptive statistics:

Table 2

	Leverage	Profitability	Liquidity	Asset tangibility	Size
Mean	0.47	0.05	3.22	0.59	22.62
Median	0.45	0.03	1.92	0.62	22.75
Standard Deviation	0.39	0.29	3.08	0.30	1.67
Minimum	0.03	-1.00	0.04	0.08	20.21
Maximum	1.32	0.65	9.20	1.28	25.57
Number of Observations	69	69	69	69	69

This table shows the descriptive statistics for firm-specific variables. Leverage is the ratio of total debt to total assets. Profitability is the ratio of Earnings before interest and tax (EBIT) to total assets. Asset tangibility is measured as total fixed asset to total asset. Liquidity is calculated as current assets scaled to current liabilities. Natural logarithm of total assets is used as a proxy for size.

Table 2 above presents the descriptive statistics for firm specific variables. The mean of leverage is 47 percent in our sample while the median is 45 percent. Leverage in this sample of Mongolian firms is relatively low compared to the leverage of US firms and UK firms. In US firms the mean leverage was around 58 percent, while in UK firms the mean leverage was around 54 percent (Rajan and Zingales, 1995). According to the authors Bas, Muradoglu and Phylaktis (2009) who studied the determinants of capital structure in developing countries, the reason behind developing countries leverage being lower than developed countries is due to limited availability of funds in emerging markets to fund firms. In their study Bas, Muradoglu and Phylaktis (2009) found leverage of listed firms to have the mean of 44.23 percent. As the leverage ratio in their study is very close to the leverage of Mongolian listed firms, it could actually be the case that the emerging markets do not have sufficient fund to finance firms in the case of Mongolia. Other authors have argued that firms make use of more debt due to lack of developed stock markets. Therefore high leverage ratio would indicate less developed stock market.

The mean of profitability in the sample is 5 percent. This result is very close to the results found by Chen (2004) who found that the mean profitability in Chinese firms is 5.1 percent. However compared to the mean profitability of firms in developed countries such as UK (11.6 percent), the profitability of Mongolian firms are much lower. This pattern is contradicting to the statement made in the study of Bas, Muradoglu and Phylaktis (2009) who said that since funding options are limited in developing countries, firms prefer to keep their profits in the company as an internal funding source. Hence suggesting that firms in developing countries will have higher profitability ratio.

However, on average 59 percent of the Mongolian listed firms' assets are fixed assets which can be used as collateral when borrowing. Therefore firms with high asset tangibility should have higher borrowing capacity. Compared to this result the assets tangibility in Chinese firms is 49 percent (Chen, 2004). The asset tangibility of Thai firms is 43 percent (Deesomsak, Paudyal and Pescetto, 2004). However the asset tangibility of listed companies in the UK is 35.6 percent while asset tangibility in the US is 39.5 percent (Antoniou, 2008). The motive behind having higher asset tangibility in Mongolian firms is that as the stock market is underdeveloped and illiquid, equity financing is not easily available, hence making use of higher tangibility as collateral when borrowing.

The mean liquidity in the sample is 3.22. The maximum is 9.20 and the minimum is 0.04 in the sample of Mongolian firms. Compared to the sample of De Jong, Kabir and Nguyen (2008) the liquidity ratio of Mongolian firms is very close to the ratio of Austrian firms with liquidity ratio of 3.20. Compared to transitional economies such as China which has liquidity of 1.85, Mongolian firms are more liquid.

Natural logarithm of total assets is used to proxy for the variable size. The mean in this sample is 22.62, in contrast the mean of size in Chinese listed firms is 8.81 (Chen, 2004).

At last, the descriptive statistics of the independent and dependent variables in the sample do not seem to be so far off than the previous studies on the determinants of capital structure.

4.2 Bivariate analysis

Table 3

Correlation	Leverage	Profitability	Liquidity	Asset tangibility	Size
Leverage	1.00				
Profitability	-0.57**	1.00			
Liquidity	-0.54**	0.40	1.00		
Asset tangibility	0.10	-0.26	-0.02	1.00	
Size	0.22	0.34	0.18	0.00	1.00

Correlation coefficient of the firm specific determinants and the dependent variable leverage are presented by making use of Pearson correlation. For the definition of the variables refer to table 2. **indicate level of significance at 1 percent.

Table 3 above presents the correlation between the dependent (Leverage) and predictor variables (firm-specific determinants). In accordance with the pecking order theory profitability and liquidity is inversely related to leverage. In line with the pecking order theory Mongolian firms which are profitable and are more liquid make use of less debt and more internal financing.

Asset tangibility is positively related to Leverage as postulated by the pecking order theory. However, the correlation coefficient is surprising, as it was stated before banks in Mongolia use fixed assets as collateral when lending. Fixed asset plays a big role in the capital structure decisions of Mongolia firms. Hence suggesting that firms with higher asset tangibility will have higher leverage but from the correlation coefficient there is not a strong support for this.

The variable size is positively related to leverage in contrast to what we expected. According to the pecking order theory size is regarded as a proxy for information asymmetry between firm insiders and capital markets. Hence, larger the firm, the more information is provided to the outsiders, and adverse selection costs when issuing new equity is diminished. Therefore suggesting larger firms will make use of more equity and less debt, expect inverse relationship.

4.3 Ordinary least square regression

Table 4

Variables	Expected Relationship	Model 1	Model 2
Constant			
Unstandardized coefficients		0.66	-1.85
Standard error		0.16	0.77
T-value		4.08	-2.39
P-Value		0.00*	0.03**
Profitability			
Unstandardized coefficients	-	-0.56	-0.79
Standard error		0.26	0.22
T-value		-2.20	-3.59
P-Value		0.04**	0.00*
Liquidity			
Unstandardized coefficients	-	-0.05	-0.05
Standard error		0.02	0.02
T-value		-1.95	-2.56
P-Value		0.07***	0.02**
Asset Tangibility			
Unstandardized coefficients	+	-0.02	-0.08
Standard error		0.23	0.18
T-value		-0.10	-0.43
P-Value		0.92	0.68
Size			
Unstandardized coefficients	-		0.11
Standard error			0.77
T-value			3.29
P-Value			0.00*
R^2		0.35	0.57
Number of observations		276	345

Model 1 shows the regression analysis of leverage on firm specific variables before accounting for size, proxy natural logarithm of total assets. Model 2 shows regression of leverage on firm specific variables by using size proxy of natural logarithm of total assets. We estimate regressions by using the OLS estimators with fixed effects corrected with white standard errors. Column 1 shows the expected relationship by the theory. Column 2 shows the unstandardized coefficients and column 3 the standard error. Column 4 and 5 shows the regression of leverage. For the definition of the firm specific variables refer to table 2. The reported R^2 is the adjusted R^2.* indicates level of significance at 1%, ** level of significance at 5%, and * level of significance at 10%.**

Table 4 presents the result of leverage for the overall sample before and after accounting for size proxy. The top three variables in Table 4 are coefficient estimates of our firm specific variables. Looking at the firm specific variable profitability it can be observed that in both model 1 and model 2 a significant negative relationship with leverage is in place. This relationship is as expected by pecking order theory, as profitable firms make use of less debt due to the problem of information asymmetric and hardly make use of equity as their equity will be undervalued.

For the firm specific variable liquidity a significant negative relationship with leverage is observed both in Model 1 and Model 2. The negative relationship is in line with the pecking order theory, as more liquid firms will tend to use less debt in their capital structure. Liquid firms are in possession of more internal funds, which can be used as a source of finance. Therefore more liquid firms are far less leveraged than less liquid firms.

However one of the most important variables for Mongolian firms is asset tangibility. As the equity market is well underdeveloped and in order to get access to conventional debt financing, a firm needs to have high level of asset tangibility, due to the fact banks mainly use collateralized lending. Hence a positive relationship is expected, higher asset tangibility would

indicate higher levels of debt financing. Nonetheless contradicting results are found. It is found that there is an insignificant negative relationship between asset tangibility and leverage. The finding is also contradicting to the pecking order theory, as tangibility increases, collateral increases and firms should be able to find more debt (Titman and Wessels, 1988). However some studies such as the one done by Booth, Aivazian, Demirguc-Kunt & Maksimovic (2001) have found this inverse relation and explain it with the maturity matching principle. This suggests that influence of tangibility will differ between long term and total debt ratios as firms match the maturity of debt to the tangibility of their assets. Hence based on the maturity matching principle, long term debt is financed by long term assets, while short term debt is negatively related with asset tangibility. Therefore in our sample leverage is negatively related to asset tangibility because Mongolian firms in our sample deploy higher levels of short term debt.

The control variable size is found to have a significant positive relationship with leverage. The positive relationship is contradicting to the pecking order theory which suggests that as the size of firms increase they suffer less from the problem of information asymmetric and the adverse selection costs when issuing new equity is diminished, meaning firms will borrow less and use more equity. However it is found that as the size of Mongolian firms increase they tend to borrow more. Therefore in this variable Mongolian firm do not follow the pecking order theory but follow the static trade off theory, which suggest as firm size increase they will borrow more.

The adjusted R^2 can be used to test the explanatory power of the model and to check whether the independent and the dependent variables are linearly related. The adjusted R^2 for Model 1 without using size as a control variable is 0.35. This is very low compared to other studies on determinants of capital structure in countries with similar structure as Mongolian firms. For example the study done by Delcoure (2007) found adjusted R^2 for firms in Poland to be 0.69 and in Czech Republic to be 0.61. However after using natural logarithm of total assets to control for possible spurious relationship between the dependent and the independent variables and to control for any non-linearity in the data and the resulting problem of heteriskedasticity, the adjusted R2 improves to 0.57. This result is closer to the finding of other authors on determinants of capital structure in developing countries and transitional economies. Hence Model 2 after accounting for size proxy is a better model to explain the capital structure of Mongolian firms. The model 2 as a whole is explains about 57 percent variability in leverage. This is much better than the initial model 1 without accounting for size proxy which only explains 35 percent of the variability in leverage. Hence based on the R^2 it can be said that the variables are moderately linearly related.

Consequently, it can be confirmed that the results are robust for size proxies. Larger firms have higher leverage. Asset tangibility is not related to leverage; this is explained by the maturity matching principle. As profitability and liquidity increases, leverage decreases. The variables are significant and as expected by the pecking order theory. Therefore, there is a moderate support for existence of pecking order theory in Mongolian firms when they finance their investments. Table 5 below summaries the findings compared to the predictions by pecking order theory.

Table 5
Summary of determinants of capital structure, theoretical predicted signs and the results of the study.

Proxy	Definitions	Predicted signs by pecking order theory	Results of this study
Profitability	Earnings Before Interest and Tax (EBIT) divided by total assets.	-	-
Liquidity	Current asset divided by current liabilities.	-	-
Asset Tangibility	Total fixed asset divided by total assets.	+	-
Size	Natural logarithm of total assets.	-	+

"+" means that leverage increases with the variable and "-" means that leverage decreases with the variable.

5. CONCLUSION

Capital structure theories have been mainly constructed and investigated in the context of developed countries. A large number of studies have been done to investigate to what extent firm-specific variables influence capital structures of firms in developed countries. The research on developing countries such as Mongolia is very limited to non-existent. This paper is an attempt to add to the existing pool of literature by analyzing the capital structure decisions in Mongolian firms. Specifically focusing on whether pecking order theory can explain the capital structure decisions of Mongolian firms, as few studies found transition economies do not follow the pecking order theory.

To answer the postulated research question at hand literature review and OLS-regression analysis is carried out. The findings show that the impact of several firm specific factors arising from pecking order theory like profitability and liquidity is significant and consistent with the prediction of the conventional pecking order theory. Another variable which is the asset tangibility is found to have a negative relationship with leverage in Mongolian listed firms, however this result is not significant. This result is contradicting to the predictions by the pecking order theory which suggests a positive relationship. This negative relationship is surprising since the capitals market in Mongolia is very underdeveloped and in order to get the conventional bank loans a firm needs to have high level of collateral. Nevertheless, maturity matching principle explains this behavior suggesting that short term debt has a negative relationship with leverage. As majority of Mongolian firms deploy short term debt a negative relationship between asset tangibility and leverage is not surprising. On the other hand the variable size is found to have a positive relationship with leverage, which follows the static trade off theory. Therefore it can be concluded that 3 out of the 4 variables tested indeed do follow the pecking other theory.

One important observation made from this study is that most listed companies in Mongolia do not deploy long- term debt to finance their investments, since the debt market is not well developed and they rather depend much more on short term bank loans as source of financing.

Nevertheless, the whole OLS regression model only explains 57 percent of the variability in leverage. Therefore it is important to study further what other factors influence the capital structure decisions in Mongolian firms. In the study done by De Jong, Kabir and Nguyen (2008) they concluded after analyzing the impact of country-specific factors on leverage, countries with better legal environment, more stable and healthier economic conditions, firms are not more likely to take more debt but the effects of firm specific variables on leverage are reinforced.

Hence based on the statement above a further study on determinants of capital structure should be done including country specific variables. This should be interesting also due to the fact that the government of Mongolia has recently enforced new legislation to improve the capital markets, to create better legal environment and better legal protection for creditors.

Overall, the following statement can be made: Mongolian listed firms initially make use of retained earnings and when external financing is needed they prefer to make use of short term debt over long term debt, but equity is preferred over long term debt.

The main downfall of this study is the number of firms that were tested. Financial statements of only 23 firms were used, which may make it hard to make a generalized conclusion about all the firms. One of the factors of the new legislation is that listed firms are strictly obliged to publish financial statements of every year. Hence, future studies will be able to make better conclusion based on larger samples.

6. REFERENCES

Bas, T., Muradoglu, G.,M., & Phylaktis, K., (2009). Determinants of Capital Structure in Developing Countries. Cass Business School, London ECY1Y 8TZ, UK

Bhaird, M. C. (2013). Demand for debt and equity before and after the financial crisis. *Research in International Business and Finance*, *28*, 105-117.

Booth, L., Aivazian, V., Demirguc-Kunt, A., Maksimovic, V., (2001). Capital structure in developing countries. *Journal of Finance* 56(1), 87–130.

Bontempi, M. E. (2002). The dynamic specification of the modified pecking order theory: Its relevance to Italy. *Empirical Economics*, *27*(1), 1-22.

Chen, J. J. (2004). Determinants of capital structure of Chinese listed companies. *Journal of Business Research, 57*(12), 1341-1351.

De Jong, A., Kabir, R., &Nguyen, T.T. (2008). Capital Structure around the world: The roles of firm-and country-specific determinants. *Journal of Banking & Finance, 32*(9), 1957-1969.

Deesomsak, R., Paudyal, K., & Pecetto, G. (2004). The determinants of capital structure: evidence from the Asia Pacific region. *Journal of Multinational Financial Management*, *14(4)*, 387-405.

Delcoure, N. (2007). The determinants of capital structure in transitional economies. *International Review of Economics & Finance*, *16(3)*, 400-415.

Drobetz, W., Gounopoulos, D., Merikas, A., & Schroder, H. (2013). Capital structure decisions of globally-listed shipping companies. *Transportation Research Part E*, *52*, 49-76.

Fama, E.F., & French K.R. (2002). Testing trade off and pecking order predictions about dividends and debt. *Review of Financial Studies*, 15(1), 1–33

Helwege, J., & Liang, N. (1996) Is there a pecking order? Evidence from a panel of IPO firms. *Journal of Financial Economics*, 40(3), 429-458.

Hillier, D., Clacher, I., Ross, S., Westerfield, R., & Jordan, B. (2011). *Fundamentals of corporate finance: European ed.*. Maidenhead: McGraw-Hill Education.

Huang, G., & Song, F. M. (2006). The determinants of capital structure: evidence from China. *China Economic Review, 17*(1), 14-36.

Ianchovichina, E., & Gooptu, S. (2007). Growth diagnostics for a resource-rich transition economy: The case of Mongolia. The *World Bank Policy Research Working Paper*, 4396.

Ilyas, J. (2008). The Determinants of Capital Structure: Analysis of Non-Financial Firms Listed in Karachi Stock Exchange in Pakistan. *Journal of Managerial Sciences*, *2(2)*, 279-307.

Jensen, C. M., & Meckling, H. W. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3, 305-360.

Milyutin, A. (2012). Financial Sector Assessment Program development module: capital markets - technical note. Washington, DC: World Bank.

Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American economic review,* 48, 261-297.

Myers, S. C. (1984). The capital structure puzzle. *The journal of finance.* 39(3), 574-592.

Oztekin, O., & Flannery, M. J. (2012). Institutional determinants of capital structure adjustment speeds. *Journal of Financial Economics*, 103(1), 88-112.

Rajan, G. R., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The Journal of Finance*, 50(5), 1421– 1460.

Salami, A. K., & Iddirisu, M. (2011). An assessment of the static trade-off theory of the capital structure. Using Ghana stock market data. *Journal of Management Policy and Practice*, *12(6)*, 81-89.

Seifert, B. & H. Gonene (2008). The international evidence on the pecking order hypothesis. *Journal of Multinational Financial Management,* 18(3), 244-260.

Shyam-Sunder L. & Myers SC. (1999) Testing static trade-off against pecking order models of capital structure. *Journal of Financial Economics*, 51(2), 219– 244

The Global Economy, (2014). Compare countries, compare economies, compare indicators. Retrieved 29th May, 2014, from: *TheGlobalEconomy.com*

Titman, S., & Wessels, R., (1988). The determinants of capital structure choice. Journal of Finance 43(1), 1-19

Tongkong, S. (2012). Key factors influencing capital structure decision and its speed of adjustment of Thai listed real estate companies. *Procedia - Social and Behavioral Sciences*, *40*, 716-720.

Wald, J.K. (1999). How firm characteristics affect capital structure: An international comparison. *Journal of Financial Research*, 22(2), 161–87.

World Bank. (2006). Mongolia: Promoting Investment and Job Creation: An investment Climate Assessment and Trade Integration Study, East Asia and Pacific Region, The World Bank.