**An International Comparison of Capital Structure and**

**Debt Maturity Choices**

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**I. Introduction**

The choices of corporate finance are determined by the combination of factors that are related with firm's characteristics as well as their institutional environment. All though more importance is given to firm characteristics in most studies, that examine corporate finance choices within the countries, a growing literature is available, that consider that how these choices are affected by institutional differences

This study based on recent literature has two importances. Firstly as these issues are considered within a panel of Industry fixed effects, along with firm level variables, Here in this paper capital structure variation is to be identified across countries, that cannot be explained, if there is cross country difference in firm-level characteristics and in industrial mix, Secondly, the paper consider a number of important institutional characteristics and a large number of countries not previously explored in the literature.

To understand Authors motivation, it is necessary to understand the country level factors, which relate to industry factors in finding the capital structure. A regression that measure firm leverage, has adjusted R- square of 0.19, measured the value of debts recorded in the book is over the market value of the firm. On specific variables of firm and has fixed effect of industry and country. A Regression if estimated with all variables besides the country fixed effect will have adjusted R- square$0.15^{2}$. Though, a Regression having all variables except industry dummies, have a reduced value of 0.17. A Regression of debt maturity, calculated as the book value of long term debt related to the book value of total debt have R-square is 0.25. A Regression of all variable expects of country fixed affects, have a reduced R- square of 0.09. While on other hand a Regression that has all the variables expect industry fixed effects, have R-square of 0.23.

The above experiments show that in the country where firm resides is a necessary determinant that how it is financed, that further suggests that the differences of institutional factors related with country level, have first effect on capital structure choices. For the determination of this possibility, a panel regression consists of large sample of 39 countries that indicate the extent to which differences in tax policy, importance and regulation of financial institutions and legal environment explain cross- country differences in capital structures.

. We also find that public governance and the legal system of the country also affect the capital structure. In case of Government Corruption and weaker Laws there will be higher corporate debt Ratio and will have shorter maturity period. We also conclude that countries with explicit bankruptcy codes or deposit insurance have higher debt Ratio with Longer maturity Period. We also find that capital structure is also influenced by the preference of capital suppliers. In countries that have larger Banking sectors, firms have shorter maturity debts. But this relation with insurance industry is weak. But in those countries that have more fund from pension sources have more equity financing. Finally, we find that in countries having larger government bond Markets, firms have lower debt with short maturity period.

**I.I Literature review:**

Different researchers have worked on the topic at different time spans according to their methodology. Some of the work already been done on this topic is discussed here in this paper, which is mentioned below.

 This is not first time that we are examining the action of legal factors in corporate financing choices. Maksimovic and Demirguc- Kunt (1999) find that firms, in those countries where there are more integrity, have longer period of debt. To find out the cross-sectional changes in the institutional environment, these papers check the choices of capital structure across the countries (Aivazain, Booth, Maksimovic and Demirguc-Kunt (2001), Classens, Nenova and Djanko (1998), Maksimovic and Demirguc-Kunt (1999) Giannetti (2003) and Kabir De Jong and Nguyen (2008). The Regression shows that firms use more debt financing in those countries where tax increase from leverage, which dissimilarity with, Aivazian, Booth, Demirguc-Kunt and Maksimovic (2001), who don not find significant relation between the tax policy and debt Ratios, in earlier study of mostly developing countries. It is explored by Shleifer, Lopez-de-Silanes, La Porta and Vishny (1998), the limit to which contracts can be utilized to diminish the problems that depend on the legal system, which consists of both the content of the laws and the excellence of their enforcement. Lopez-de- Silanes, La Porta, Vishny and Shleifer (1998) conclude significant variation, in both developing and developed, in external investor's legal protection, and this argue that the legal system based on common law provide better protection than civil law. Corruption is the main factor shaping the legal system of the country (Shleifer, Djankov, Lopez-de-Silanes and La Porta (2003)). It is found by Hart, Shleifer, Djankov and McLiesh (2008), the legal structure specifying resolution of default is different in different countries. The Model of Miller (1977), the economy aggregate debt ratio is determined by aggregate preference of the investors. Nguyen and Kabir (2008) and Maksimovic and Dermirguc-Kunt(1999) check the effects of bond/stock, turnover, market size and the total assets of bank on capital structure. Aivazia, Booth, Maksimovic and Demirguc-Kunt (2001) have found no significance relationship between tax policy and debt ratios.

**II. Cross-Country Institutional Factors and Determinants of Capital Structure**

Here in this section it is discussed that how institutional differences between different countries affect and in these countries how firms are financed. Especially institutional variables are considered that reflect (1) In the enforcement of legal contract the ability of creditors (2) Treatment of tax in case of debt or equity financing (3) the significance and guideline of financial institutions that signify major suppliers of capital. We estimate that weaker public enforcement of laws and weaker legal systems should be associated with shorter maturity debt contract and less external equity. We also estimate that in those countries where there is less tax preference for debt will be less levered. At last we check where there is an influence of the suppliers of capital. However most of the literature on this field focus on firm's financial preference, firms capital structures at aggregate level are determined by capital supplier's preference. In relation to debt the preference of capital suppliers to provide more or less equity also affect the capital structure.

Here below in the sub-sections all those variables that affect the debt ratio in sample countries are introduced.

**A. Legal System**

Corporate policy and productivity are shaped by important factors of interest's conflicts between corporate insiders and external investors. Below we will discuss that how these legal factors influence financing choices.

In the countries where the laws and its enforcement is weak , financial instruments that permit insiders less judgment and are contractually simple to understand, are likely to dominate. From this statement it is concluded that the countries having common law utilize more outside equity and longer term debt. To test this statement an indicator variable is taken over here that takes a value of 1, of the country legal system consists of common and 0 otherwise. Besides the content of law the integrity and enforceability of law is also important, which is to be measured by the country corruption level. In case, if the public sector of country is most corrupt, then the expropriation of outsider’s capital will be easier as compare to debt holder, Similarly we can say that the expropriation of short term debt will be most difficult to expropriate, so we can say that in most corrupt countries short term debt will be most frequently used than long term debt.

Finally we find the fulfillment of debt contract. As in USA there is a bankruptcy code specifies and limits the claims and right of creditors and thus the reorganization of ongoing business is facilitate by this facilitate. In other countries due to unavailability of these codes the creditors face difficulties in accessing the collateral.

**B. Tax Code**

Generally the tax system and specially the treatment of tax in relation to the payment of interest and dividend are considered an important factor that affects the capital structure choices since the work of Miller and Modigliani (1963). Three main tax categories have been observed over here.

The first one is classical tax system in this system dividend payment are taxed firstly at corporate level and secondly at personal level, and interest is treated as tax-deductible corporate expenses. This system exists in China, India, Hong Kong, South Africa, Japan UK and USA etc.

Dividend relief tax system is second tax system where dividend is taxed at low rate at personal level. This tax system exists in Austria, Turkey Belgium, Denmark, Portugal, Greece and Thailand and Sweden. In Turkey and Greece there is full dividend relief system, as there the dividend is not taxed at personal level.

The third tax system is dividend imputation tax system, here in this system the interest payment is deducted by the corporation, but the shareholders of domestic level receive a tax credit as for the taxes paid by the corporation. The main purpose of this system is to tax the profit of the corporation only once. Dividend, this type of tax system exists in Australia, France, Canada, Germany, Italy, Ireland, Norway etc.

From the above discussion we expect that in the countries where tax relief or dividend imputation system is used debt will be used less as compare to classical tax system. To examine the effect in each sample country following equation has been used.

$$1-\frac{\left(1-τ\_{c}\right)(1-τ\_{e})}{(1-τ\_{i})}$$

Here in the above equation $τ\_{c}$ represent corporate tax while $τ\_{i}$ represent personal tax $τ\_{e}$ represent the highest effective personal tax rate on equity income coming from dividends.

Both positive and negative values may occur of the tax gain from leverage, in case of dividend relief tax system negative values arise, where the interest income has greater personal tax, than corporate and dividend income has less personal tax and has high corporate tax, on other hand tax gain from leverage is positive.

**C. Suppliers of Capital**

Typically the capital structure problem has been viewed by financial economists from the perspective of firms that face complete and competitive financial markets, where the equity and debt financing are offered at risk-adjusted rates. However the case on other hand is different where the preferences of equity provider influence the financial structure of the corporation. The preference of Pension, banks and insurance companies should be specifically considered, banks have shot-term liabilities and thus can get advantage by holding short term debts, on other hand pension fund prefer holding long term assets, as it have long term liabilities. And insurance companies also hold long term assets. Thus from these statements it is clear those countries that have large banking sectors have more short term financing and pension fund and insurance companies have long term financing. Another alternative is domestic saving that measure the availability of fund to financial intermediaries; on other hand we also check the bond market of every country, by taking government bonds as independent variable. Government bond can affect the availability of debt capital.

**III. Firm Level Characteristics and Capital Structure Choice**

Consistent with existing literature (Wessels and Titman (1988)), Opler and Guedes (1996), Zingales and Rajan (1995)) we add a list of firm level variables that effect maturity structure and Leverage. These variables consist of tangibility of assets, profitability, firm size and market to book Ratio. We do not add variables that examine the operating risk, effective tax rate, research and development expenditure, selling expenses and capital expenditure, due limitation of data in some courtiers of our sample.(Wessels and Titman (1988)).

**IV. Methodology**

This section consists of data collection and data analysis.

**A. Sample Selection**

The primary source of our data is different firms of 50 countries. Only those firms have been selected for data collection process that has been listed on stock exchange of the country in which it is domiciled. The data collected for analysis relate to the period of 1991 to 2006, the final sample is from 39 countries and consists 36,767 firms, table one in the study consist the detail of sample countries.

**B. Country Financing Patterns**

Our calculations for capital are as below:

1. Leverage, calculated as total debt/market value. Where total debt mean market value of total interest bearing short term and long term debts, and market value is the total market value of common stock + preferred stock + total debt.
2. Debt maturity measure as long term debt/total debt.

To know about that how maturity and capital structures differ in different countries we have calculated the above two ratios that shows that in developing countries like Pakistan, South Korea, Brazil, Indonesia and Portugal the leverage ratio is highest, while in developed countries like Australia, US, South Africa, Turkey and Canada is the lowest leverage ratio.

Figure 2 in the paper shows maturity period, from which it is clear that most of developed countries have longer maturity period, like Norway, New Zealand, Sweden Canada and US have highest maturity period. On other hand Thailand, Greece, Taiwan and Turkey and China have lowest maturity period. The median long term debt ratio of developing countries in the sample is 0.36 and for developed countries it is 0.61. In addition to this inflation is also added as one of the indicator, as debt contract are always written in nominal situation and high rate of inflation is ignored. However if there is high variation in inflation rate it mean that there high risk in the future that decrease long term debts. Table 02, presents cross-sectional differences in country level variables, that includes developed economy, common law, bankruptcy, deposit insurance and code to compute the Pearson correlations coefficient for pairs of independent and dependent variables,

The tax system, legal system and suppliers of fund have particular effect on capital structure choice.

1. In developed economies firms have lower debt ratio and have mostly long term debts.
2. In case of common law the leverage is low and is mostly long term debts.
3. In case of low corruption there will lower debt ratio and mostly long term debts.
4. The bankruptcy code lead to high debt ratio and greater long term debts.
5. The countries that have higher tax preference for debt have high debt ratios.
6. The countries where there are more bank deposits and are more domestic saving firms will high leverage and mostly short term debts.
7. Insurance deposits are associated with long term debts
8. The high contribution of pension is linked with lower leverage.

**c. Variables**

The study consists of a list of dependent variables as, long term debts / total debts, Total long term debts / total assets, short term debts / total value of the firm and total debts / total assets, and a number of independent variables given in table 6 of the paper i.e. firm factors tangible assets / total assets, long term total assets, ROA, market to book ratio, and country factors i.e. inflation rate, developed economy, inflation rate volatility, common law, corruption index, bankruptcy, Domestic saving, deposits/ GDP, deposit insurance, Government bonds, insurance penetration, Defined benefit pension, and defined contribution pensions.

**d. Regression Analysis**

This section represents the effect of country-level independent variables on capital structure. Our regression is determined with a GMM (General Method of Moments) approach that shows that residuals are heteroskedastic and are highly correlated across country and firm level observations.

a. **The Determinants of Leverage**

Table 4 shows the result of regression of leverage, in this table column one shows regression for full sample and column two shows sample of developed economies, column three shows developing countries, column four and five the sub-period of 1991,98 and 2006, column six represents OECD countries data related to pension fund equity/bond, column seven shows pension fund asset information.

**Firm Effects**

The coefficient estimated of table 4 represents that leverage is directly related with firm's size and asset tangibility, and inversely related with market to book ratio and profitability. These result that we hold for full as well as for sub-sample is evidence on US firms ( Jarrell, Bradley and Kim (1984), Wessels and Titman (1988) Zingales and Rajan (1995). Aivazian, Booth, Maksimovic and Demirguc-Kunt(2001) Kabir, De Jong and Nguyen (2008).

**Country Effects**

The lower half part of the table 4 represent coefficient estimates for variables related to the country. column 1 for the full sample have adjusted R-square of 0.1798, which is similar to the preliminary result, these result indicate that leverage is unrelated with inflation and its volatility, while positively related with economic development. Better investor protection lead to great use of equity financing, we find that in case of corruption the debt ratio will be high, in case of common low debt ratio will be low. Bankruptcy code related with high debt ratio. We also find that in those countries where tax gain from leverage is positive, have high leverage. We get some help from the idea that capital suppliers effect debt ratio choices, we find that countries having deposit insurance have higher leverage, but the baking size effect not find significantly, more ever we do not find significant relation between insurance size and leverage, but find in the sample OECD countries that countries with greater defined benefit pension fund have high debt ratio, and countries with contribution pension fund have low debt ratios. We also find that in sub-period of 1991-1998 the size of government bond and domestic saving is significant, but not in sub-period of 1999-2006. The sub- sample show that corruption associated with higher debt, However civil versus common law distinction in not too much important in developing countries, in the sample of developed countries taxes are important, while not important in the sample of developing countries. Finally about inflation that is significant only in developing countries.

**b. Determinants of Maturity Structure**

**1. Firm Effects**

Table 5 shows the results of regression related with debt maturity. These regressions are calculated on sub-sample as well as on full sample as discussed earlier. in the table column one is about full while column two is about sub-sample mainly related with developed economies, and column three is sub-sample column of developing economies, column four is for period of 1991-1998, column five is for the period of 1999-2006 and column six is about OECD countries providing pension information.

The firm specific variable’s coefficients are highly related with previous research of (Smith and Barclay (1995), Mauer and Stohs (1996), Opler and Guedes (1996), Maksimovic and Demirguc (1999) in both (full and sub) sample periods. The firms having large size, high profit and larger asset tangibility utilize long term debt. However United State the relationship between debt maturity and Market to book ratio is weak in full sample, while in sub- sample of developed countries it is unrelated. Table A4 consists and give results of regression of country by country debt maturity. The strongest of debt maturity is asset tangibility that is directly related with debt maturity. We also find estimated coefficient for market-to-book ratio, profitability and firm size. The relation between debt maturity and profit ability is positive in 25 out f 39 countries out of which 15 is statistically significant, and debt maturity and firm size are also positively correlated in 33 of 39 countries, out of which 25 are statistically significant.

**2. Country Effects**

Country level coefficient makes it clear that corruption level and debt maturity is negatively related, but the common is negatively related with debt maturity. Investor protection and lower level of corruption lead to higher debt maturity. We find that economic development and debt maturity is positively related with each other. We find that the preference of capital suppliers also effect debt maturity, while the effect of deposits in the banking sectors of the country is negatively related with debt maturity level. We also find that the gross domestic saving is negatively related with maturity level of debts. We also find that where explicit deposit insurance is high the debt maturity will be high. Further finding shows that in those countries where Government bond market is large, the date maturity will be shorter, however no significance relation is found between debt maturity and insurance penetration. Generally the result of all sub-periods and sub-samples are same, however there are several exceptions. We find that in developed countries inflation rate variation is correlated with shorter maturity, but have no relation in developing countries. Further finding suggest that size of insurance is positively related with debt maturity in developing countries, and have no relation in developed countries. The relation between debt maturity and insurance deposit is positive in later time period. The relationship between government bond and maturity is negative however the relationship is significant in later period. In sub-sample of OECD countries defined benefit pension is positively correlated maturity level. While the contribution pension fund is unrelated to maturity level. Finally we find direct relation between maturity level and inflation rate in developing economies in early period and in OECD countries.

**c. Fixed-Effects and Cross-Sectional Estimates**

This section examine the limit up to which time-series variation and cross-sectional in our independent variables drive our result. Our emphasis in capital structure is on cross-sectional variation, however in individual countries also the debt ratio change yearly, that can be explains as yearly variation in our independent variables. To find the limit of our result that will be generated from time series versus cross sectional we consider both country/firm Fama-Macbeth (1973) regression and fixed effect. Specifically table six shows fixed effect leverage in column one and maturity structure regression in column two. In Table six the regression estimates indicate that the relationship between firm characteristics and financial choices are significant are significant in both cross sectional and time series analysis. However the relationship of financial institution variables and inflation is mixed. The results also show that corruption and deposit insurance has also significant impact on the capital structure of the firm, even though in small period of time.

**d. Book Values and Financing Choices**

In this section we have to check the level of short term, long term and total debts affected by country variables. We measure book leverage as total debt / total assets. The result of book leverage regression has been presented in table 7, column one is about total book leverage's regression, column shows long term debt ratio evidences, and column three for short term debt ratio. This table shows that in more developed countries long term debt ratio is high with low corruption, common laws, relatively smaller banking sectors, explicit bankruptcy codes, deposit insurance, smaller Government bonds and lower domestic saving. And the ratio of short term debt is high in developing countries with high corruption, no common laws, high domestic savings, and these results of short and long term debts are consistent with regression in table 5 for debt maturity ratio.

**VI. Analysis and findings**

The above results of the regression shows that firms capital structure is mostly effected by the country where it is situated than by its industry affiliation, that suggests that institutional environment have a very great impact on how firms are financed, specifically we find that country taxation and legal system preference of capital suppliers, corruption level, banks and pension fund has significant impact to change the debt maturity ratios and leverage.

The capital structure is affected by tax as, in case of positive tax gain from leverage, and then more will be debt in capital structure; however the tax affect is not too much positive as the other factors. Legal environment also affect capital structure, the strongest find of the paper is that in case of high corruption there will more short term debts. We also find that there is long term debt in common laws countries. The findings also consists that the countries where there is explicit bankruptcy code used relatively more long term debts and are highly leveraged. We also find that suppliers of capital can affect the firm’s financial structure, it is cleared from the analysis that country with large banking sector has shorter maturity period, however long maturity period is in countries having deposit insurance, we also find that in those countries where there is large level of defined contribution s pension fund equity financing is used, while countries have defined benefit pension fund, firm use long term debt. We find that larger government bond out private debt capital in less developed countries. We have not found the impact of government borrowing on firms’ debt ratio in advanced countries.

Some of our results are significant in sub-samples and in sub-periods, like legal system, level of banking sector and corruption effect is very strong on some sub-sample and sub-periods, but some of our results are very strong for full sample and in all periods.

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