THE EFFECT OF FINANCIAL SYSTEM ON CAPITAL STRUCTURE DURING 2008 GLOBAL FINANCIAL CRISIS PERIOD

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Abstract

This paper analyses the impact of financial systems on the capital structures of firms operating in developing countries during the 2008 global financial crisis. Traditionally, financial systems are classified according to their orientation as bank-oriented and market-oriented. The bank-oriented financial systems are characterized with an efficient banking sector and a relatively less-developed stock market. On the other hand, stock market is much more effective than the banking sector in a market-oriented system. It is reasonable to expect that the financial system orientation of a country is an important macroeconomic determinant of the external financing mix choices of firms operating in this country. Since both banking sectors and stock markets are affected from the 2008 global financial crisis, the effect of financial system orientation of a country on the capital structure may show interesting patterns during the crisis period. Our findings indicate that leverage ratios are higher for firms operating in countries with market oriented and developed financial systems during the 2008 global financial crisis. Besides, it is found out that there is an indirect effect of financial system development level on capital structure through the firm-specific factors. Generally accepted determinants of capital structure are effective only in countries with a relatively developed financial system while they are not helpful to explain capital structure decisions of firms in financially undeveloped countries during the 2008 global financial crisis.

Key Words: developing countries, financial system orientation, determinants of capital structure, dynamic panel data analysis.

2008 KÜRESEL MALİ KRİZ DÖNEMİNDE FİNANSAL SİSTEMİN SERMAYE YAPISINA ETKİSİ

Özet

Bu makale, 2008 küresel mali krizi sırasında finansal sistem yöneliminin gelişmekte olan ülkelerde faaliyet gösteren firmaların sermaye yapıları üzerindeki etkisini analiz etmektedir. Geleneksel olarak, finansal sistemler banka-ağırlıklı ve sermaye piyasası-ağırlıklı olarak sınıflandırılmaktadır. Banka ağırlıklı finansal sistemler, etkin bir bankacılık sektörü ve nispeten daha az gelişmiş bir borsa ile karakterize edilebilir. Diğer taraftan, sermaye piyasası-ağırlıklı bir sistemde borsa bankacılık sektöründen çok daha etkilidir. Bir ülkenin finansal sistem yöneliminin, bu ülkede faaliyet gösteren firmaların dışsal finansman seçimlerinin önemli bir makroekonomik belirleyicisi olmasını beklenebilir. Hem bankacılık sektörleri hem de borsalar 2008 küresel mali krizinden etkilendiğinden, bir ülkenin finansal sistem yöneliminin sermaye yapısı üzerindeki etkisi kriz döneminde ilginç desenler gösterebilir. Bu çalışma sonucunda, 2008 küresel mali krizi sırasında sermaye piyasası-ağırlıklı ve gelişmiş finansal sistemlere sahip ülkelerde faaliyet gösteren firmalar için kaldıraç oranlarının daha yüksek olduğu bulgulanmıştır. Ayrıca, finansal sistem gelişme düzeyinin, firmaya özgü faktörler aracılığıyla firmaların sermaye yapıları üzerinde dolaylı bir etkisinin olduğu bulunmuştur. Literatürde genellikle sermaye yapısının belirleyicileri olarak kabul edilen bu faktörler yalnızca göreceli olarak gelişmiş finansal sisteme sahip ülkelerde etkilidirler. Ancak 2008 küresel finansal krizi sırasında finansal olarak gelişmemiş ülkelerdeki firmaların sermaye yapısı kararlarını açıklayamamaktadır.

Anahtar Kelimeler: gelişmekte olan ülkeler, finansal sistem yönelimi, sermaye yapısının belirleyicileri, dinamik panel veri analizi.

Introduction

Recent empirical research is focused on investigating the existence of country-level determinants of capital structure (Booth et al., 2001; Giannetti, 2003; Bancel and Mitto, 2004; De Jong et al., 2008; Antoniou et al., 2008; Kayo and Kimura, 2011; Alves and Ferreira, 2011; Fan et al., 2012; Venanzi et al., 2014; Belkhir et al., 2016; Haq et al., 2017; Venanzi, 2017;

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Venanzi and Naccarato, 2017). One of the candidates of these determinants is the financial system orientation. The question of whether financial system orientation is a capital structure determinant becomes a more interesting one when it is asked within the context of only developing countries.

It has shown that the indebtedness of firms in developed countries decreased during the 2008 global financial crisis (Veronesi and Zingales, 2010; Proença et al., 2014; Ivashina and Scharfstein, 2010). However, the number of studies related to the effect of the financial crisis on the leverage ratios in developing countries is limited (Danso and Adomako, 2014). Besides, both banking sectors and stock markets are effected from the crisis. Those the effect of financial system orientation on capital structure in developing countries may show an interesting pattern during the crisis period. It is hoped that this study will contribute to the capital structure literature by investigating whether financial system of a country affected the capital structure choices of firms operating in developing countries during the 2008 global financial crisis. In addition, a set of firm and country level factors are also analyzed in terms of their effect on capital structure.

Traditionally, financial systems can be classified as bank-oriented and market-oriented. But, empirical findings revealed that this classification is not entirely satisfactory (Beck and Levine, 2002). The impact of financial development level of a country on its economic development is much greater than the impact of its financial orientation. Yet, another view argues that the legal protection of investor rights has the greatest impact over the economic development (La Porta, 1997; 1998). Hence, instead of bank or capital market-based classification, factors such as financial development and investor rights protection levels should be considered.

International finance research provides some supporting evidence that financial system orientation is a determinant of capital structure (Booth et al., 2001; Giannetti, 2003; De Jong et al.,2008; Antoniou et al., 2008; Kayo and Kimura, 2011; Fan et al., 2012; Venanzi et al., 2014; Venanzi et al., 2017). However, these studies generally employ merged data sets from both developing and developed countries. The datasets usually consist a considerably large amount of developed country firms and a relatively small amount of developing country firms. Even though the results of these studies are generalized to every country irrespective of their development status, their explanatory power about the capital structure determinants in developing countries must be limited. Thus, investigation of the capital structure and financial system orientation relationship within the context of only developing countries is important for a better understanding of capital structure determinants in these countries. Our aim is to understand whether in developing countries, the financial system of a country affects the capital structure decisions of firms in that country. Besides, we try to investigate whether the well-known firm specific determinants of capital structure are meaningful for firms in developing countries. Our sample period is seven years between 2006 and 2012. These years are selected in order to cover the 2008 global financial crisis period.

Our results reveal the existence of country-specific institutional determinants of capital structure in developing countries during the crisis. Firms in financially developed civil law countries with a market oriented financial system have higher leverage ratios. Besides, macro-economic factors affect capital structures and there are considerable similarities between the capital structure determinants in bank and market oriented financial system countries. A strong relationship exists between financial development level and the firm-specific determinants of capital structure. Firm-specific factors that are identified in the literature as capital structure determinants are valid in countries with a developed financial system. However, they are insufficient to explain capital structure decisions of firms in financially undeveloped countries. Moreover, legal system orientation does not have a vital effect on firm's capital structures.

The rest of the paper is organized as follows. The next section contains a review of international empirical capital structure literature. The sample data set and estimation method is explained in detail in sections 3 and 4, respectively. Empirical results are presented in section 5 and analyzed in section 6. Lastly, section 7 concludes the paper.

1. Background and Literature Review

The comparative advantages of different financial systems in economic growth is widely discussed in the previous literature (Levine, 2002). These efforts revealed new dimensions of financial systems debate. One of the insightful approaches is the "financial services view" which emerges from the idea that the purpose of all financial service providers is to ameliorate market imperfections and to ensure the smooth functioning of the financial markets. Banks and capital markets has complementary functions in terms of providing financial services (Levine, 1999; Beck and Levine, 2002). Financial services provided by banking sector and capital markets are not equivalents of each other. Equity financing has advantages like smoothing agency problems and portfolio diversification. On the other hand, banks eliminate the moral hazard problem with effective monitoring and they have long term relationship with their customers to overcome information asymmetries. Consequently, debt and equity financing are not perfect substitutes to each other. Therefore, the development level of capital market is important even in countries with highly developed banking sectors (Demirgüç-Kunt and Maksimovic, 1996). Indeed, there is a correlation between development levels of the banking sectors and capital markets in most countries.

Another approach is the "law and finance view" (La Porta et al., 1997; 1998). In the traditional finance literature, value of an asset is equal to the present value of future cash flows it will provide. However, in a world with agency problems (where managers do not make their decisions with the aim of maximizing shareholder's wealth) real value of an asset for investors depends on the rights it provided. For instance, shareholders receive dividends regularly because they have the right of voting against the managers. Similarly, a firm carries out the debt service because its creditors may ask for the bankruptcy in case the debt and interest has not been paid on time. For the rights of the investors to be able to have influence on the behavior of managers, laws and institutions must protect these rights. Therefore, investors will want to invest in securities issued by firms only if laws and enforcement mechanisms protect their rights. In other words, there is a relationship between capital structure and investor protection laws.

Investors need the protection of their investments with laws and regulations that enable them to get back the amount they invest in firms. In addition, when laws and regulations do not protect rights of small investors from the abuses of management and large shareholders, it would be very costly (difficult) for firms to raise necessary funds from capital markets. Thus, financial systems can be classified according to the existence of laws and regulations that enables the smooth functioning of the financial markets. According to this view, differences in the level of protection of investor rights and the functioning of the legal system create differences in capital structures across countries. In addition, the legal system of a country affects the development of its capital market. A relationship between the investor protection laws and capital structure has been detected in the literature (Cheng and Shiu, 2007). That leverage ratios are lower in countries where shareholder rights are well protected, while they are higher in countries where creditor rights are well protected.

Thus, a classification based on the country-specific differences in the investor protection laws and the implementation of these laws is more valid to distinguish financial systems than the bank oriented vs. market oriented classification (La Porta et al., 2000). In the light of these

discussions Levine (2002) compared the effects of financial systems on the economic growth and concluded that the bank oriented vs. market oriented classification is not enough to explain the country-specific variability of long-run growth rates.

To sum up, the efficient allocation of resources in a financial system is much more important than its orientation. Also, laws and enforcement mechanisms of a country play a leading role in the financial system development.

The relationship between economic development and capital structure determinants is also researched in the literature (e.g., Booth et al., 2001; Demirgüç-Kunt and Levine, 2004). In general capital markets are more effective and active in developed countries. On the other hand, capital structures of firms in developing countries are not similar to the firms in developed countries (Booth et al., 2001; Ayyagari et al., 2012). In these countries, the rights of the minority shareholders could not be protected from the majority because of the concentrated ownership structure. For firms in developing countries, the most frequently used external financing option is the bank loans. On the other hand, capital markets are preferred by large firms which require long-term funding. Thus, the contributions of banking sector and capital market development to economic growth are complementary.

Rajan and Zingales (1995) found out that determinants of capital structure are similar across seven major industrialized countries. Following the seminal works of La Porta et al. (1997;1998;2000), researchers begin to analyse firm-level data from countries with various legal and financial systems and economic development levels. These efforts, which give quite fruitful results, showed that country-specific institutional and macroeconomic factors are useful to explain country-specific variability in capital structures.

In countries with strict banking regulations and high protection of creditor rights, it is easier to borrow because of the reduced need for collateral. On the other hand, the protection of investor rights allows the development of the capital market and reduce leverage ratios. Protection of creditor rights has been found to increase the leverage ratios (Utrero-González, 2007). Besides, bank concentration and the protection of creditor rights function as a solution to asymmetric information problem and enable firms to have long term debt. Similarly, protection of investor rights increases public offerings. The positive impact of bank concentration on leverage ratios increase in countries with poor protection of creditor rights (Gonzalez and González, 2008).

There is a positive relationship between the financial and institutional development levels of a country and the amount of external finance used by the firms operating in that country. Credits given to the private sector increase the amount of debt financing while protection of investor rights increase both debt and equity financing. Small firms prefer not to use external financing and if they have to use it, they prefer methods like leasing (Beck et al., 2008).

De Jong et al. (2008), found that country-specific determinants of capital structure change the impact and direction of firm-specific determinants. Thus, country-specific determinants have both direct and indirect effects on the capital structures. Direct effects result from the country-specific factors' directly affecting leverage choices of the firms. Indirect effects result from the country-specific factors' impact on the direction and magnitude of the relationship between firm-specific factors and capital structure.

Alves and Ferreira (2011) found out that even though institutional factors such as creditor rights protection and legal system orientation have direct effects on the capital structure, firm-specific determinants of leverage do not have a country-specific variability.

Venanzi and Naccarato (2017) focus on the important effect of institutional framework of a country on the capital structures of firms operating in this country. They also mention a

relationship between ownership concentration of firms and the financial system orientation. A more developed banking system causes more leveraged firms. On the other hand, a negative relationship exists between stock market development and leverage.

In sum, country-specific variables are important determinants of capital structure. Since country-specific determinants in developed countries are similar in many aspects to each other while differing from those in developing countries, traditional capital structure theories, which are developed from the characteristics of US firms, are valid only in developed countries. In order to understand capital structure decisions of firms, both direct and indirect effects of country-specific factors should be taken into account.

Therefore, our aim in this study is to understand whether in developing countries, the financial system of a country affects the capital structure decisions of firms operate in that country. Besides, we try to reveal whether the well-known determinants of capital structure are meaningful for firms in developing countries. Our sample period is seven years between 2006 and 2012. These years are selected in order to cover the 2008 global financial crisis period.

The closest work to that reported here is the paper of Antoniou et al. (2008) who investigate the impact of financial systems on the determinants of capital structure in G5 countries. Their sample is divided into two groups as capital market oriented (i.e.US and UK) and bank-oriented (i.e. France, Germany and Japan) economies. The financial services which are provided by these two systems differ each other in many respects. They assumed that the financial system of a country has a direct impact on the external finance resources available in this economy. Financial and legal systems affect the environment in which firms carry out their activities. Each combination of financial and legal systems has its own traditions and unique features which cause either plenty of or limited external financing options for firms. They conclude that firm-specific determinants of leverage are more or less same in all of the G5 countries but the sign and the magnitude of the impact varies from country to country. Hence, both firm and country-specific variables affect capital structure decisions. Financial system is also a determinant of leverage. Lastly, traditional determinants of capital structure are mostly valid for capital market oriented financial system countries.

Similarly, Bancel and Mitto (2004), found out that leverage ratios and determinants of capital structure in US and EU are very similar but the importance of each determinant varies across countries. They have reached the conclusion that capital structure choice may be a function of many institutional variables which vary from country to country.

According to Fan et al. (2012), country-specific factor's impact on capital structure is much more important than the impact of sector-specific factors. These results support the previous studies which show the impact of institutional factors (i.e. the implementation of legal system, investor right protection and bankruptcy laws) on capital markets (La Porta et al., 1997; 1998). Debt maturities become shorter in bank-market oriented countries. In countries with a developed government securities market, both debt maturities become shorter and leverage ratios decrease.

In the light of all these findings, it is clear that an investigation of international determinants of capital structure and the relationship between capital structure and financial system during the 2008 global financial crisis using a sample data set of only developing countries would be an important addition to the literature.

2. Sample

We select our sample among the developing country firms covered by Datastream. World Bank's country classification is used for grouping of countries based on their development

status. The sample consists of firms from thirteen upper middle-income countries with the highest number of firms in dataset for the sample period. Two lower middle-income countries, Indonesia and India are also included in the sample for their relative importance as developing economies.

Following the previous literature, a small T large N panel data set is used in this study. Our sample period covers the years 2006 to 2012 in order to cover the 2008 global financial crisis years. All financial firms and firms with less than five consecutive annual observations for dependent variable are excluded. The final sample consists of annual observations for 6466 public and non-financial firms, including dead firms, from 15 developing countries. The number of firms and descriptive statistics of leverage ratio for each country are given in Table 1.

Table 1: Descriptive Statistics of Leverage Ratio for Each Country.

Countries	Firms	Observations	Mean	Median	St Dev.	Skewness	Kurtosis	First Quarter	Third Quarter
Argentina	72	493	0.262	0.200	0.265	1.836	10.117	0.030	0.420
Brazil	248	1694	0.345	0.360	0.914	-1.804	73.475	0.140	0.530
Bulgaria	189	1252	0.189	0.075	0.714	4.339	172.674	0.000	0.350
China	1717	11357	0.321	0.310	0.535	-5.307	586.067	0.110	0.490
India	1960	13313	0.426	0.430	0.615	4.518	187.995	0.170	0.610
Indonesia	292	1969	0.396	0.330	0.735	6.972	150.026	0.100	0.530
Malaysia	702	4789	0.254	0.210	0.318	10.660	367.623	0.050	0.400
Mexico	113	726	0.334	0.300	0.358	10.462	189.553	0.150	0.480
Peru	90	601	0.247	0.235	0.214	0.607	2.713	0.040	0.400
Philippines	133	913	0.221	0.150	0.321	-4.803	100.245	0.000	0.400
Romania	87	572	0.167	0.080	0.254	0.942	32.432	0.000	0.300
S. Africa	215	1462	0.238	0.210	0.807	-24.475	771.786	0.060	0.380
Serbia	75	494	0.303	0.250	0.269	0.892	3.101	0.080	0.460
Thailand	344	2392	0.279	0.250	0.563	-31.264	1321.13	0.030	0.480
Turkey	229	1562	0.284	0.230	0.383	-2.085	77.533	0.050	0.460

The approach used by Čihák et al. (2013) is employed for classifying countries according to their financial systems. Two aggregate indicators of financial system based on measures of the relative size of banks and markets are used. The ratio of private bond credits by deposit money banks to gross domestic product of a country is used to measure the size (development) of banking sector of that country. Similarly, ratio of security market capitalization to gross domestic product is accepted as an indicator of domestic stock market size (development). Each ratio is calculated for each year from 2000 to 2011 for each country. Their median values are used to obtain the financial structure ratio. It is simply the former ratio divided by the later. The financial structure ratio is a relative indicator of the financial structure of a country. The greater

the ratio, more bank oriented financial system. For classification purposes, countries with a financial structure ratio smaller than one is accepted as market-oriented financial structure countries while countries with a financial structure ratio larger than one is accepted as bank-oriented financial structure countries. Table 2 gives the median values of private bond credits to deposit money banks to gross domestic product and market capitalization to gross domestic product ratios and the estimated financial structure ratios for each country. As can be seen from the last column of the Table 1, financial system ratios of Mexico, Philippines, South Africa, Peru, Malaysia, Indonesia, India, Brazil and Argentina are below one. Thus, capital markets have a greater weight than banking sector in the financial systems of these countries. For the purpose of this study, the financial systems of these nine countries are accepted as market oriented. On the other hand, financial systems of Thailand, Turkey, China, Bulgaria, Serbia and Romania are bank-oriented with financial structure ratios above one.

Table 2: Financial System Ratio

Countries	Population (Million)*	GDP (Per Capita)*	Private Credits (%GDP)	Market Capitalizations (%GDP)	Financial System Ratio
Philippines	95.80	4379.67	29.79	74.86	0.40
South Africa	51.07	11281.20	67.66	164.00	0.41
Peru	30.47	10596.20	23.99	55.11	0.44
Malaysia	29.46	16793.70	106.40	202.18	0.53
India	1227.19	3842.59	47.15	73.55	0.64
Brazil	198.36	11747.40	55.65	80.02	0.70
Thailand	67.89	9502.93	101.91	94.42	1.08
China	1354.04	9055.33	121.49	81.82	1.48
Bulgaria	7.28	14102.80	63.68	32.03	1.99
Serbia	7.26	10721.60	50.27	22.12	2.27
Mexico	177.06	15363.30	18.26	53.12	0.34
Indonesia	244.47	4923.49	25.37	46.44	0.55
Argentina	41.03	17917.40	13.51	13.79	0.98
Turkey	74.89	14811.70	43.17	31.56	1.37
Romania	21.34	12722.10	37.14	14.99	2.48

*Data from the World Bank database for the year 2011.

The financial system classification method mentioned above has a serious drawback: it does not take into account the financial development levels of countries. This method identifies a financial system orientation for each country even though neither its banking sector nor their capital market is developed by international standards. It is clear that, we should make a distinction between the financial systems of financially underdeveloped countries (i.e. with both small capital markets and small banking sectors) and those of financially developed countries (i.e. with large capital markets and large banking sectors). Consequently, sample countries are classified using another method where financial system of a country is accepted as underdeveloped if it has below sample median values of both private bond credits by deposit money banks to gross domestic product and market capitalization to gross domestic product ratios. This classification method is especially useful for our sample since it contains some developing countries with underdeveloped financial systems (UFSs). UFS countries have more

in common with each other than with developed financial system countries (Demirgüç-Kunt and Levine, 1999). Besides, developed financial system countries have considerable similarities with each other regardless of their financial system orientation. median private bond credits by deposit money banks to gross domestic product ratio of sample countries is 55.11 while their median Market Capitalization to Gross Domestic Product ratio is 47.15. Since Mexico, Argentina, Turkey, Romania and Indonesia have below median values for both capital market and banking sector development, their financial system is considered underdeveloped. Consequently, we classified sample countries into four sub-groups as developed and bank-oriented, developed and market-oriented, underdeveloped and bank-oriented, underdeveloped and market-oriented.

La porta et al. (1998) emphasize the role of legal system and its enforcement in creditor rights and their protection. If the legal codes of a country are protective of the investor rights and they are enforced efficiently (in a well-functioning legal system), financial structure of this country will help its growth. Traditionally, the legal rights provided to investors (both stockholders and creditors) in the civil law countries is less than the common law countries. However, the smooth (effective) functioning of law enforcement mechanism depends on the economies development of the country. Countries with few investor rights protection laws, use legal mechanisms such as compulsory dividend payments or concentrated ownership to eliminate the possible negative effects of legal loopholes. La Porta et al. (1997) argue that firms adapt themselves to the legal system of the country they operate in. Nonetheless, both banking sector and capital markets are less developed in countries with few investor rights protection. Country legal systems can be classified as Anglo-Saxon (Common) Law and Roman-Germanic (Civil) Law. Civil Law tradition is divided into three sub-groups as French, German, and Scandinavian law.

For the purpose of this study, sample countries are grouped into two sets as Civil Law and Common Law countries according to their legal system origin. Legal systems of India, South Africa, Malaysia and Thailand come from Common Law traditions while legal systems of the remaining sample countries come from Civil Law. Table 3 gives the classifications of sample countries according to their financial systems, financial development levels and legal systems.

Leverage ratio calculation method is very important in terms of correct understanding of the borrowing preferences of companies. Welch (2011) showed that leverage should be calculated using financial debt, but the leverage ratio to be obtained by proportioning the financial debt to the total assets will not reflect the firm's real choice of debt financing. This is because companies have obligations outside the financial (interest-bearing) debt. When leverage is calculated as the ratio of financial debt to total assets, the denominator consists of equity capital, financial debt and non-financial debt. In this case, the leverage ratio will also be low for companies that have a high non-financial liability as well as firms that prefer equity financing. For this reason, the leverage ratio in this study is measured as the proportion of total debt to total capital of the firm where total debt is defined as the book value short-term and long-term interest-bearing debt, and total capital represents the total investment in the company. It is the sum of common equity, preferred stock, minority interest, long-term debt, non-equity reserves and deferred tax liability in untaxed reserves. Firm and country-specific independent variables are similar to the variables used by the previous literature. Descriptions, and sources of all variables are given at Appendix A.

Table3: Country Classifications

Country	Financial System	Legal System
Argentina	Underdeveloped (Market-oriented)	Civil Law
Brazil	Market-oriented	Civil Law
Bulgaria	Bank-oriented	Civil Law
China	Bank-oriented	Civil Law
Indonesia	Underdeveloped (Market-oriented)	Civil Law
Philippines	Market-oriented	Civil Law
S.Africa	Market-oriented	Common Law
India	Market-oriented	Common Law
Malaysia	Market-oriented	Common Law
Mexico	Underdeveloped (Market-oriented)	Civil Law
Peru	Market-oriented	Civil Law
Romania	Underdeveloped (Bank-oriented)	Civil Law
Serbia	Bank-oriented	Civil Law
Thailand	Bank-oriented	Common Law
Turkey	Underdeveloped (Bank-oriented)	Civil Law

To gain a basic idea about how capital structure differs across countries we graph the mean leverage ratios of sample countries for the sample period. As can be seen in Figure 1, India and Indonesia have relatively high leverage ratios comparing to the rest of the sample. Adversely, Romania has a rather low level of leverage.

For all countries, the mean leverage ratio is 0.28 while the median is 0.24. India, Indonesia, Mexico and China have relatively high leverage with ratios over 0.30 while Romania has the lowest leverage ratio between the sample countries with 0.17. Market-oriented economies have on average higher leverage ratios than bank-oriented economies. Average leverage ratio for market-oriented economies in the sample is 0.30 while for bank-oriented economies this ratio becomes 0.25. In other words, firms prefer more debt financing in market-oriented countries. This is an interesting result. It is generally assumed that a developed stock market stimulates equity financing while credit market development increases debt financing. This assumption may be true for developed economies. But this study reveals that for developing economies, stock market development increases leverage ratios. Actually, the effect of stock market development on corporate debt-equity ratios depends on the initial level of stock market development (Demirgüç-Kunt and Maksimovic, 1996).

Figure1: Mean leverage ratios for the sample period
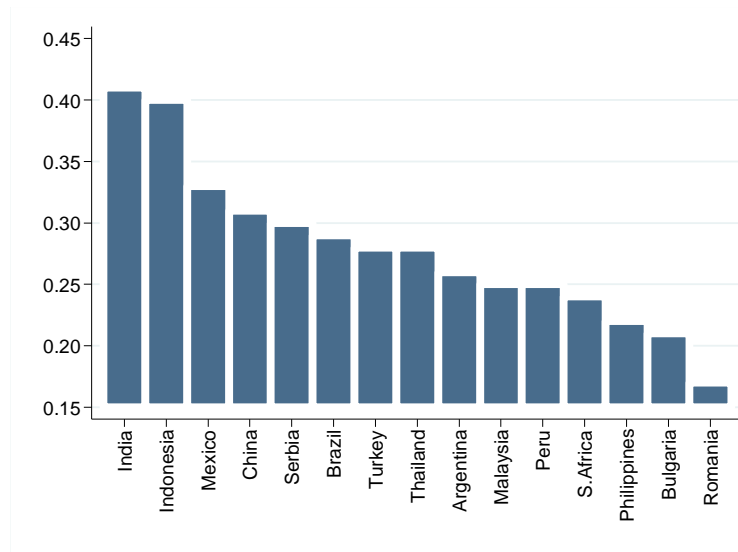
The leverage ratios for sample countries with underdeveloped financial systems are within the range of 0.40 to 0.17. Average leverage ratios for financially underdeveloped and financially developed countries are estimated as 0.29 and 0.28, respectively. To sum up, lowest average leverage ratio is observed as 0.23 in underdeveloped and bank oriented financial structures sub group while the highest average leverage ratio is observed as 0.33 in underdeveloped and market-oriented financial structures sub group. Average leverage ratio for financially developed and market-oriented economies is observed as 0.29 while this ratio is 0.27 for financially developed and bank-oriented economies. When only financially developed countries are taken into account, leverage ratio is higher on average in market-oriented economies. This difference is greater in financially underdeveloped countries.

Since the sample is only consisting of developing countries these results are in accordance with the previous research. Ayyagari et al. (2012) emphasize that the capital market development and banking sector development have complementary effects on economic development in developing countries. A positive relationship between capital market development level and leverage ratios in developing countries are also found in the literature (Demirgüç-Kunt and Maksimovic, 1996).

3. Model and Methodology

We adopt a dynamic system GMM method in order to investigate the existence of a relationship between financial orientation of a country and capital structure decisions of firms operate in that country. The following panel data model is employed to investigate the relationship between capital structure and a number of firm and country-specific factors;

$$y_{it} = \delta y_{i,t-1} + x'_{k,it}\beta + u_{it} \qquad (1)$$

$$u_{it} = \mu_i + \lambda_t + \varepsilon_{it}$$

Here, sub-index i represent ith firm, while sub-index t is used to represent tth year. y_{it} is the leverage ratio of firm i in year t. $x'_{k,it}$ represent the matrix of independent variables in the model. Constant term and dummy variables are also included in the matrix $x'_{k,it}$. Random error term, u_{it}, is a two way error component model which consists of μ_i, unobserved individual firm effect, and λ_t, time-specific effects. The third component of error term ε_{it} is assumed to

be $IDD\sim(0,\sigma_{\varepsilon}^{2})$. Time dummies are included in the model in order to reduce the effect of cross-sectional dependency across individuals in the idiosyncratic disturbances. Windmeijer (2005) finite-sample correction to the standard errors in two-step estimation is made in order to prevent standard errors to be severely downward biased (Roodman, 2009).

The panel data model given at equation (1) is employed to analyze the relationship between capital structure of firms and financial systems of countries they operate in. Control variables are classified into three groups as firm-specific, macro-economic and institutional.

Bank Based Financial System (BOFS), Underdeveloped Financial System (UFS) and Civil Law (CL) dummy variables are used to assess the leverage variability caused by a country's financial system, financial development and legal system, respectively. BOFS dummy variable for a given country takes a value of 1 if the financial system orientation of that particular country is bank based and 0 if it is market based. UFS dummy variable for a given country takes a value of 1 if the financial system of that particular country is underdeveloped and 0 otherwise. CL dummy variable for a given country takes a value of 1 if the legal system orientation of that particular country is Civil Law and 0 if it is Common Law. Besides, time dummy variables are included in all models as a partial solution to possible cross-sectional dependency problem.

 A forward selection approach is employed where control variables are added to the model one at a time. Hence, the relationships between right hand side variables and possible multicollinearity problems such as change in significance levels or signs of the model variables with the inclusion of a new variable are investigated. In this approach, variables added to the model according to the significance levels of their pairwise correlation with the dependent variable.

4. Results

For the analysis step, three models are estimated. Firstly, we investigate the existence of country-specific variability in capital structures using country dummies. Secondly, macroeconomic variables are included. Lastly, the model is extended with the addition of financial orientation, financial development level and the legal system dummies. BOFS dummy variable for a given firm takes a value of one if the financial system of the country it operates is bank-oriented and zero if it is market-oriented. UFS dummy variable for a given firm takes a value of one if the financial system of the country it operates is developed and zero otherwise. CL dummy variable for a given firm takes a value of one if the legal system of the country it operates is civil law oriented and zero if it is common law oriented. Time dummies are included as a partial solution to cross-sectional dependency problem of the data set (Roodman, 2009). Firm-specific determinants of capital structure are also included in all models as control variables. The results are given on Table 4.

Significant coefficients of country dummies imply the existence of country-specific determinants of leverage. Among three institutional dummy variables only UFS dummy has highly significant and negative coefficient. When CL and inflation variables are excluded from the model, the coefficient estimate of BOFS dummy also becomes highly significant and negative. On the other hand, CL variable has significant coefficient estimates only when BOFS and inflation variables are excluded from the model. This may indicate strong multicollinearity problems. The correlation coefficient between CL dummy variable and BOFS is 0.62. These variables may explain the same portion of the variability in leverage.

Leverage ratio is found to have positive and significant relationships with all macroeconomic variables. However, GDP growth variable loses its significance when institutional dummies are included in the model.

Table 4: GMM Estimation: Determinants of Capital Structure

This table shows the results of the GMM estimation. Three models are estimated. Model 1 investigates the existence of country-specific variability in capital structures using country dummies. Model 2 includes macroeconomic variables in order to evaluate their determinative effects on leverage. Lastly, Model 3 is obtained with the addition of financial orientation, financial development level and the legal system dummies. P-values of the model coefficients are presented in parentheses. P-values of the autocorrelation, over identification and model specification tests are also given at the table.

Variables	Model 1	Model 2	Model 3
Lag Leverage	0.260	0.232	0.232
	(0.000)	(0.003)	(0.003)
Profitability	-0.051	-0.052	-0.054
	(0.016)	(0.019)	(0.018)
Asset Tangibility	0.200	0.202	0.204
	(0.000)	(0.000)	(0.000)
Firm Size	0.017	0.015	0.017
	(0.000)	(0.000)	(0.000)
Growth Opportunity	0.001	0.001	0.001
	(0.123)	(0.116)	(0.118)
Non-debt Tax Shield	-0.028	-0.032	-0.032
	(0.044)	(0.019)	(0.023)
Income Volatility	0.000	-	-
	(0.848)		
GDP Growth	-	0.001	0.000
		(0.083)	(0.627)
Nominal Interest Rate	-	0.001	0.001
		(0.084)	(0.055)
Current Account Deficit	-	0.002	0.001
		(0.000)	(0.039)
Inflation	-	0.009	0.008
		(0.000)	(0.000)
BOFS	-	-	0.005
			(0.533)
UFS	-	-	-0.057
			(0.000)
CL	-	-	-0.007
			(0.435)
Constant	-0.048	-0.076	-0.090
	(0.151)	(0.002)	(0.000)
Time Dummies	yes	yes	yes
Country Dummies	yes	-	-
AR(1) (p-value)	0.008	0.008	0.008
AR(2) (p-value)	0.501	0.538	0.538
Hansen Test (p-value)	0.305	0.218	0.215
Wald Test (F-value)	50.63	56.75	55.42
Wald Test (p-value)	0	0	0
Number of Obs.	30483	30573	30573
Number of Firms	6333	6335	6335
Number of IV	46	35	38
Sample Period	2006-2012	2006-2012	2006-2012

Coefficient estimates of firm-specific variables indicate that leverage ratio is negatively related to profitability and positively related to asset tangibility and firm size. Growth opportunity and

income volatility variables are not identified as firm-specific determinants of leverage. Magnitudes, signs and significances of the coefficients estimated for firm-specific variables do not change to a large extent with the addition of country-specific factors.

5. Analysis

A statistically significant and negative relationship is found between leverage and UFS dummy at 1% significance level. This finding indicates the importance of financial development level of countries on firm's capital structure decisions. The average leverage ratio of firms in financially developed countries is higher than the average leverage ratio of firms in financially underdeveloped countries. Banking sector and capital markets are not substitutes of each other. On the contrary, they are complementary institutions in satisfying external financing needs of countries. When a country's banking sector and capital market are both developed, agency costs and information asymmetry problems will decrease for firms in this country. Then, firms may find external financing at a lower cost. Due to pecking-order theory firms will prefer debt financing to equity financing. Thus, leverage ratios will be higher in financially developed countries. However, if only banking sector or only capital market is developed, there still be agency costs and information asymmetry problems for firms in need of external financing. These problems increase the cost of debt and prevent firms from borrowing largely. No statistically significant relationship between leverage and BOFS dummy is found. We can conclude that financial system orientation has no effect on capital structure decisions. But financial institution's joint development increases firm debt in economically developing countries. Similarly, there is no sufficient evidence that the legal orientation of a country has an effect on the capital structure decisions of firms operating in this country.

Unlike some of the previous research, which found no relationship between inflation rate and leverage (Alves and Ferreira, 2011; Booth et al., 2001; Fan et al., 2012), a strong and positive relationship between inflation and leverage is found in this study. Trade-off theory predicts a positive relationship between debt and expected inflation. Firms usually borrow at nominal interest rates. If today's inflation, which is the best indicator of the expected inflation, is high, firms will prefer long-term debt (Fan et al., 2012). All macroeconomic variables in the model has a significant positive relationship except GDP growth. Leverage ratios are higher in countries with high inflation rates, high current account deficits and high nominal interest rates. However, the financial significance of macroeconomic variables is very low. These may cause correlation relationships between institutional and macroeconomic factors.

When we look at firm specific variables we can say that leverage ratio has negative relations with profitability and non-debt tax shield and positive relations with asset tangibility and firm size. Contrary to the expectations, no significant relation between leverage ratio and growth opportunity is found. Trade-off theory implies a positive relationship between leverage and profitability. Since the bankruptcy probability is lower for profitable firms, they can have larger amounts of debt and higher tax benefits from leverage. This negative relationship can be considered as an important evidence against the validity of trade-off theory (Fama and French, 2002; Chen and Zhao, 2005). However, static trade-off theory is about the balance between the present value of expected costs of financial distress and the present value of expected debt tax shields. These two parameters depend on the expected profitability (Xu, 2012). Thus, unless past profitability is an indicator of future expected profitability, the validity of static trade off theory cannot be tested by investigating the relationship between realized (past) profitability and current leverage ratio. On the other hand, pecking order theory focuses on the asymmetric information problem in the market and makes a different prediction for the leverage-profitability relationship. Since firms prefer internal finance to external finance when they need funding for a new investment, a negative relationship between profitability and leverage ratio

should be expected (Myers and Majluf, 1984). The found negative relationship between leverage and profitability supports the pecking order theory.

The liquidation value of fixed assets does not deviate much from their going-concern values since creditors accept them as collateral in case of a bankruptcy. According to the trade-off theory, fixed assets alleviate indebtedness by decreasing financial distress costs. Similarly, agency theory argues that as the amount of fixed assets increase, agency cost of debt decreases and firms can borrow money at a lower cost. Thus, a positive relation between the ratio of fixed assets to total assets and leverage is expected by trade-off and agency theories. On the other hand, according to pecking order theory, fixed assets makes it cheaper to raise funds with stock issues by lessening the asymmetric information problem. Therefore, pecking order theory implies a negative relation between asset tangibility and leverage ratio. A positive relation between asset tangibility and leverage is generally found in the literature (Harris and Raviv, 1991; Rajan and Zingales, 1995; Booth et al., 2001; Gonzalez and González, 2008; De Jong et al., 2008; Antoniou et al., 2008; Fan et al., 2012). Similarly, the positive relation found in this study can be explained with the trade-off and pecking order theories.

Firm size, which is another capital structure determinant in the literature, is accepted as a proxy of bankruptcy risk (Rajan and Zingales, 1995; De Jong et al., 2008; Gonzalez and González, 2008; Frank and Goyal, 2009; Cheng and Shiu, 2007). According to the trade-off theory, since large firms can diversify more, their risk premium is lower. These firms usually operate for long years and are well-known in the loan market. Thus, the cost of debt is low for them. Large firms are very unlikely to go bankrupt, so they borrow in large amounts and benefit from the tax advantage of interest. In sum, trade-off theory suggests a positive relationship between leverage and firm size.

On the other hand, pecking order theory implies a negative relation between leverage and firm size. Since asymmetric information problem is lower for large firms, investors demand their stocks. Their cost of debt is also lower for the same reason. Besides, they can easily reach loan markets. As a result, there is an uncertainty about the expectation of this theory for the sign of the relation between leverage and firm size. Empirical results support a positive relationship (Harris and Raviv, 1991; Rajan and Zingales,1995; Utrero-González, 2007; Booth, et al., 2001; Gonzalez and González, 2008; De Jong et al., 2008; Alves and Ferreira, 2012; Antoniou et al., 2008). Our results are in accordance with the mainstream findings of the empirical literature and the expectations of the trade-off theory.

Even though a negative and significant relationship between growth opportunity and leverage ratio is frequently reported in the literature, no evidence of a significant relationship is observed. This may be due to the large amount of missing observations in the sample data set for the market value variable.

Conclusion

International capital structure literature investigates the existence of any difference between developing and developed countries in terms of determinants of capital structure. One of the candidates of these differences is the financial system orientation. Literature provides some evidence on the validity of financial system orientation as a substantial country-specific capital structure determinant. However, these studies investigate determinants of capital structure using large sample data sets which contains data from both developing and developed countries. Besides, both banking sectors and stock markets are effected from the 2008 global financial crisis. Those the effect of financial system orientation on capital structure in developing countries may show an interesting pattern during the crisis period. This paper investigates whether in developing countries, the financial system of a country affects the capital structure

decisions of firms in that country during the 2008 global financial crisis. A following question is whether the well-known determinants of capital structure are valid for firms in developing countries.

We investigated capital structure and financial system orientation relationship with system-GMM method using a dataset consists of 6466 public firms from 15 countries for 2006-2012 period. The results imply the existence of a relationship between financial system orientation and capital structure of firms in developing countries. Ceteris paribus, firms in countries with Civil Law traditions and with developed and market oriented financial systems have higher leverage ratios. On the other hand, a relationship exists between financial development level and the firm-specific capital structure determinants. The firm-specific determinants that are identified in the literature are valid in countries with a developed financial system while they are insufficient to explain capital structure decisions of firms in financially undeveloped countries. Lastly, legal system orientation does not have a vital effect on capital structure determinants in developing countries.

References

Alves, P. F. P., & Ferreira, M. A. (2011). Capital structure and law around the world. *Journal of Multinational Financial Management*, *21*(3), 119-150.

Antoniou, A., Guney, Y., & Paudyal, K. (2008). The determinants of capital structure: capital market-oriented versus bank-oriented institutions. *Journal of financial and quantitative analysis*, *43*(1), 59-92.

Ayyagari, M., Demirguc-Kunt, A., & Maksimovic, V. (2012). Financing of firms in developing countries: Lessons from research. The World Bank.

Bancel, F., & Mittoo, U. R. (2004). Cross-country determinants of capital structure choice: a survey of European firms. Financial Management, 103-132.

Beck, T., & Levine, R. (2002). Industry growth and capital allocation: does having a market-or bank-based system matter?. Journal of financial economics, 64(2), 147-180.

Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2008). Financing patterns around the world: Are small firms different?. Journal of Financial Economics, 89(3), 467-487.

Belkhir, M., Maghyereh, A., & Awartani, B. (2016). Institutions and corporate capital structure in the MENA region. Emerging Markets Review, 26, 99-129.

Booth, L., Aivazian, V., Demirguc-Kunt, A., & Maksimovic, V. (2001). Capital structures in developing countries. The journal of finance, 56(1), 87-130.

Chen, L., & Zhao, X. S. (2005). Profitability, mean reversion of leverage ratios, and capital structure choices.

Cheng, S. R., & Shiu, C. Y. (2007). Investor protection and capital structure: International evidence. Journal of Multinational Financial Management, 17(1), 30-44.

Čihák, M., Demirgüč-Kunt, A., Feyen, E., & Levine, R. (2013). Financial development in 205 economies, 1960 to 2010 (No. w18946). National Bureau of Economic Research.

Danso, A., & Adomako, S. (2014). The financing behaviour of firms and financial crisis. *Managerial Finance*, *40*(12), 1159-1174.

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), 1954-1969.

Beck, T., Demirgüç-Kunt, A., & Levine, R. (1999). *A new database on financial development and structure*. The World Bank.

Demirgüç-Kunt, A., & Levine, R. (Eds.). (2004). Financial structure and economic growth: A cross-country comparison of banks, markets, and development. MIT press.

Demirgüç-Kunt, A., & Maksimovic, V. (1996). Stock market development and financing choices of firms. The World Bank Economic Review, 10(2), 341-369.

Fama, E. F., & French, K. R. (2002). Testing trade-off and pecking order predictions about dividends and debt. The review of financial studies, 15(1), 1-33.

Fan, J. P., Titman, S., & Twite, G. (2012). An international comparison of capital structure and debt maturity choices. Journal of Financial and quantitative Analysis, 47(1), 23-56.

Frank, M. Z., & Goyal, V. K. (2009). Capital structure decisions: which factors are reliably important?. Financial management, 38(1), 1-37.

Giannetti, M. (2003). Do better institutions mitigate agency problems? Evidence from corporate finance choices. Journal of Financial and Quantitative Analysis, 38(1), 185-212.

González, V. M., & González, F. (2008). Influence of bank concentration and institutions on capital structure: New international evidence. Journal of Corporate Finance, 14(4), 363-375.

Haq, M., Hu, D., Faff, R., & Pathan, S. (2017). New evidence on national culture and bank capital structure. Pacific-Basin Finance Journal.

Harris, M., & Raviv, A. (1991). The theory of capital structure. the Journal of Finance, 46(1), 297-355.

Ivashina, V., & Scharfstein, D. (2010). Bank lending during the financial crisis of 2008. *Journal of Financial economics*, *97*(3), 319-338.

Kayo, E. K., & Kimura, H. (2011). Hierarchical determinants of capital structure. Journal of Banking & Finance, 35(2), 358-371.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1997). Legal determinants of external finance. The journal of finance, 52(3), 1131-1150.

La Porta, R. Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1998). Law and finance. Journal of political economy, 106(6), 1113-1155.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (2000). Agency problems and dividend policies around the world. The journal of finance, 55(1), 1-33.

Levine, R. (1999). Law, finance, and economic growth. *Journal of financial Intermediation*, *8*(1-2), 8-35.

Levine, R. (2002). Bank-based or market-based financial systems: which is better? (No. w9138). National Bureau of Economic Research.

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. Journal of financial economics, 13(2), 187-221.

Proença, P., Laureano, R. M., & Laureano, L. M. (2014). Determinants of capital structure and the 2008 financial crisis: evidence from Portuguese SMEs. *Procedia-Social and Behavioral Sciences*, *150*, 182-191.

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

Roodman, D. (2009). How to do xtabond2: An introduction to difference and system GMM in Stata. The STATA Journal, 9(1), 86-136.

Utrero-González, N. (2007). Banking regulation, institutional framework and capital structure: International evidence from industry data. The Quarterly Review of Economics and Finance, 47(4), 481-506.

Venanzi, D. (2017). How Country Affects the Capital Structure Choice: Literature Review and Criticism. International Journal of Economics and Finance, 9(4), 1.

Venanzi, D., Naccarato, A., & Abate, G. (2014, December). Does the country effect matter in the capital structure decisions of European firms?. In *A previous version of this paper was presented to the EFMA 2014 Annual Meeting*.

Venanzi, D., & Naccarato, A. (2017). The Capital Structure Choice of European Firms: The Role of Financial System and Institutional Setting. International Business Research, 10(12), 22.

Veronesi, P., & Zingales, L. (2010). Paulson's gift. *Journal of Financial Economics*, *97*(3), 339-368.

Welch, I. (2011). Two common problems in capital structure research: The financial-debt-to-asset ratio and issuing activity versus leverage changes. International Review of Finance, 11(1), 1-17.

Windmeijer, F. (2005). A finite sample correction for the variance of linear efficient two-step GMM estimators. Journal of econometrics, 126(1), 25-51.

Xu, J. (2012). Profitability and capital structure: Evidence from import penetration. Journal of Financial Economics, 106(2), 427-446.

Appendix

Table A1. Variable Descriptions and Sources

Variable	Descriptions	Item	Source
Dependent Variable			
Leverage	The ratio of total debt to book value of total investment. Total debt is the sum of long term debt, short term debt and the current portion of long term debt. Total investment is the sum of total capital, short term debt and current portion of long term debt.[(Long Term Debt + Short Term Debt & Current Portion of Long Term Debt) / (Total Capital + Short Term Debt & Current Portion of Long Term Debt) * 100]	WC08221 Total Debt % Total Capital & Short Term Debt (Key item)	Datastream Worldscope
Independent Variables			
Firm-specific Variables			
Profitability	(Net Income – Bottom Line + ((Interest Expense on Debt - Interest Capitalized) * (1-Tax Rate))) / Average of Last Year's and Current Year's (Total Capital + Short Term Debt & Current Portion of Long Term Debt) * 100	WC08376 Return On Invested Capital (Key item)	Datastream Worldscope
Tangibility	The ratio of total fixed assets to total assets. Total fixed assets represent gross Property, Plant and Equipment less accumulated reserves for depreciation, depletion and amortization. Total assets represent the sum of total current assets, long term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment and other assets.	WC02501Property, Plant And Equipment - Net (Key item)/WC02999Total Assets (WS) (Key item)	Datastream Worldscope
Firm Size	Natural logarithm or net sales and revenues. Net sales or revenues represent gross sales and other operating revenue less discounts, returns and allowances.	WC01001 Net Sales Or Revenues (Key item)	Datastream Worldscope
Non-debt Tax Shield	Ratio of depreciation, depletion and amortization to total assets.	WC01151Depreciation, Depletion And Amortization (Key item)/WC02999Total Assets (WS) (Key item)	Datastream Worldscope
Growth Opportunities	Ratio of market value to book value. Market value is estimated as total assets minus book value of equity plus market value of equity. Book value of equity represents common shareholders' investment in a company. Market value of equity is the share price multiplied by the number of	[(WC02999 Total Assets (WS) (Key item) - WC03501	Datastream Worldscope

	ordinary shares in issue. The amount in issue is updated whenever new tranches of stock are issued or after a capital change. Book value is equal to total assets.	Common Equity (Key item)+MV Market Value)/(WC 02999 Total Assets (WS) (Key item)]	
Income Volatility	First difference of annual net income available to commons.Net income available to commons represents the net income the company uses to calculate its earnings per share.	WC01751 Net Income Available To Common (Key item)	Datastream Worldscope
Country-specific Variables			
Nominal Interest Rate		Lending Interest Rate %	World Bank World Development Indicators (For Turkey, Central Bank Of Turkey)
Inflation		Inflation, average consumer prices	IMF World Economic Outlook
Current Account Balance		Current account balance (% of GDP)	World Bank World Development Indicators
GDP Growth		GDP growth (annual %)	World Bank World Development Indicators
Dummy Variables			
BOFS	Bank Oriented Financial System Dummy		
UFS	Under-developed Financial System Dummy		
CL	Civil Law Dummy		