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Determinants of banks' capital structure in Asia

— A comparison amongst developed and developing countries —

Authors: Hoa Nguyen

Zainab Kayani

Supervisor: Jens Forssbaeck, Prof.

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Authors:	Hoa Nguyen and Zainab Kayani
Supervisor:	Jens Forssbaeck
Key words:	Bank, capital structure, determinants, Asia, developed countries, developing countries, difference.
Purpose:	The thesis purpose is to examine the determinants of banks' capital structure with a more concentration on Asian countries. Moreover, it is of our interest to exploit the potential difference between the leverage ratios as well as influence of such factors on corresponding leverage ratios of banks in two classified groups of developed and developing countries.
Methodology:	Significances of variables are tested by estimating the multiple regression models on panel data with assistance of Eviews 7.
Theoretical perspective:	Modigliani-Miller irrelevance theorem, static trade-off theory, agency theory, pecking order theory, market timing theory.
Empirical foundation:	The data are from 61 banks from 10 Asian countries (5 developed and 5 developing countries) from 2000 to 2012. Thomson Reuters' Datastream, World Bank, Central Intelligence Agency World Factbook and KPMG databases are the primary data sources.
Conclusions:	Our paper highlights the importance of firm-specific determinants as compared to macroeconomic factors on capital structure decision of banks. We also refer that the stage of economic development of a country should be taken into account when drafting policies monitoring banks' operation.

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1. Introduction

1.1. Background

The recent 2007/08 financial crisis is considered as the worst one since the Great Depression in 1930s. Originated from the US subprime mortgage meltdown, its consequences were so severe: the stock markets around the world fell as emergency, many large financial institutions have collapsed or been bought out, governments of even the most advanced economies had to implement various rescue packages to save their financial systems. Investment banks – as direct participants in mortgage-backed securities transactions - were most heavily affected by the crisis. The industry saw the buyouts of Bear Stearns by JPMorgan, Merrill Lynch by Bank of America, the collapse of Lehman Brothers, all of which are amongst the US biggest investment banks. However, it is not only the investment banks but the whole banking system and entire economy suffered. Banks facing massive losses lack confidence in lending and also under legislative pressure would hold more reserves, firms face difficulties when having to finance their operation with more restricted and expensive loans, leading to job cuts, to name a few.

With its crucial role in affecting the entire economy, banking sector is more regulated than any other industries, where supervision under Basel Accords is most frequently mentioned. Issued by the Basel Committee on Banking Supervision, the Basel Accords are voluntary regulatory standards on bank capital adequacy, stress testing and market liquidity risk. As reform measures against the deficiencies in financial regulations revealed from the 2007/08 crisis, Basel III was installed in January 2013. Its aims are to improve the banking sector's ability to absorb shocks arising from financial and economic stress, improve risk management and governance and strengthen banks' transparency and disclosures.

“The world is flat”! In this era of globalization, there are always knock-on effects, that is why the 2007/08 financial crisis is also referred to as the 2007/08 Global Crisis. Many Asian countries have also seen falls in stock market, depreciation of currency values, slowdown in economic growth, increasing unemployment, etc. Interestingly, as found by Mohanty and Tumer (2010), not sharing the same ailing situation with many US and European banks, most of Asian banks responded to the crisis quite well. As per Gochoco-Bautista (2008), no banks or financial

institutions were in threat of nationalization or recapitalization. Mentioned in Stevens, Ekberg and Kim (2012, Exhibit 1), return on equity and revenue of Asian banks during and after the crisis from 2007 to 2009 are all well above the industry growth. Asian banking sector has been better immunized from the financial crisis, as can be said.

1.2 Problem discussion

Bank leverage ratio and the probability of crisis are closely related. As per finding by Mooij et al (2013), excessive bank leverage has fueled the banking crisis. It signifies the importance of studying about capital structure and its determinants so that regulatory authorities can impose a closer supervision on banks, ensuring financial stability in the banking sector.

Ever since the emergence of Modigliani and Miller (1958) irrelevance theorem, capital structure has been the focus of empirical researches in the field of corporate finance. What determines capital structure of firms is still an intriguing question for economists and researchers. Despite the fact that this is a very well-researched field, previous researches have mostly focused on non-financial firms, not many on that of financial institutions in general and banks specifically. This paper is expected to be an additional contribution to the study field on determinants of banks' capital structure, with more focus on Asian economies.

1.2.1. Difference in the capital structure of non-financial firms and banks

Banks and non-financial firms have significant variations in operational systems which result in their different capital structures. Banks are found to have significantly high leverage ratios as opposed to all companies operating in non-financial fields. There are many reasons for this disparity.

A very distinct characteristic as compared to firms is that banks need to follow certain rules and regulations as a hedge against fluctuations in their financial positions. Specifically, minimum capital requirement is imposed on banks as to how they should handle their assets in relation to their capital mix. Moreover, capital requirement is closely related to deposit insurance. As per McCoy (2008), deposit insurance can significantly reduce the incidence of bank runs, protecting benefits of depositors on one hand. On the other hand, if not implemented properly, deposit insurance can give banks incentives to take unnecessary risks. Making deposits

safer provides banks a very cheap source of financing, encouraging them to borrow more and maybe engage in more risky investments. In light of this, banks are required to hold a minimum capital to alleviate the moral hazard of this insurance, reducing their flexibility in capital mix. While there is no such restriction on non-financial firms, they can optimize their capital structure in the way that they prefer.

As highlighted by Raheman, Zulfiqar and Mustafa (2007), another major difference in the capital structure of banks and non-financial firms comes from preference of debts. For firms, profitability and bankruptcy costs influence their preference of debts. Provided with tax shield, firms prefer debts, especially profitable firms which have a lower risk of bankruptcy hence they can more comfortably add on debts into their capital mix. On the other hand, a firm with lower profit will have to face higher risk of bankruptcy if highly leveraged so it will choose to depend less on debts. Banks have less choice but must rely on debts, most of which come from deposits as one of the major and cheapest sources of funds to ensure their smooth ongoing operation. Irrespective of the preference of debt or equity, banks have to rely on debts for their financial needs. Furthermore, agency theory also explains the higher leverage of banks' compared to nonfinancial firms. Flannery (1994) states that banks usually invest in assets that are more complicated to understand for the outsiders and have various opportunities for assets substitution. This will increase the cost of issuing equity due to information asymmetry problems, making banks prefer debt over equity. He also mentions that short-term debts can help discipline the banks' managers through the risk of liquidity and mismatched maturities. Banks, therefore, will prefer debt to discipline manager and mitigate agency cost.

The difference is also originated from investment opportunities and liquidity. A firm with high investment opportunities, by investing in profitable projects and using retained earnings instead of debts to fulfill its financial needs, can lower its leverage. On the contrary, despite the investment opportunities available, a bank still has to rely on high level of debt to fund its ongoing and main business of lending. Firms can also alter their capital structure preferences depending upon their duration of financial requirements. They can determine the minimum cost of capital in accordance to their financial needs, which corresponds to either short-term or long-term capital and prefer either debt or equity accordingly. Banks are different. They have to cater to borrowers' needs of loans whenever needed, be it short-term or long-term. Accordingly, they

must comprise their capital mix from debts, both short-term and long-term to balance their liquidity position. Also according to Diamond & Rajan (2001), banks have a volatile capital structure as opposed to the non-financial firms that have a more stable capital mix. Banks have volatility in their capital structure to ensure their liquidity, enabling them to channel loans that are less liquid while raising more deposits that have higher liquidity levels.

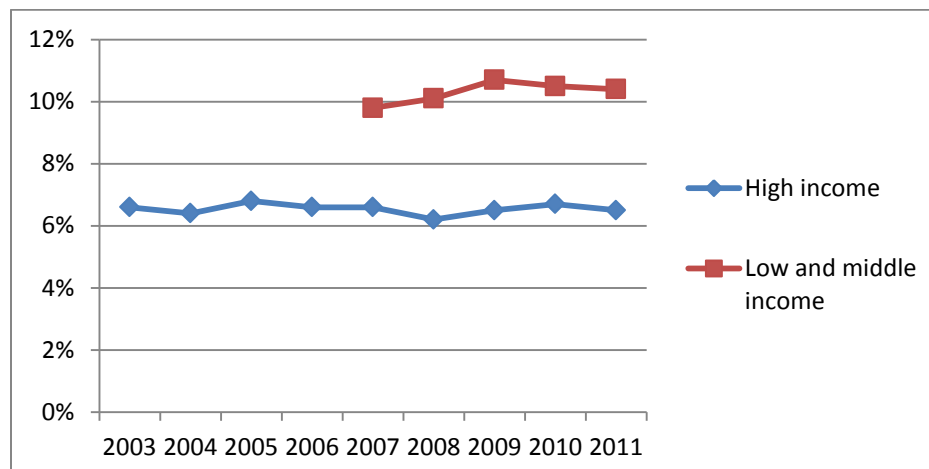
These are good reasons to believe that banks' capital structure should not be determined by the same factors as those of non-financial firms; or if the significance of these determinants holds, their sign and magnitude may change. Holding these beliefs, we decided to study the specific determinants of banks' capital structure in more depth, hoping to contribute some more findings to the research field of bank capital structure.

1.2.2. Difference in determinants of banks' capital structure between developed and developing countries

After narrowing down our concentration on banking sector specifically, we came up with a range of conflicting beliefs as to the difference in capital structure of the banks in different economies. On the global basis, there is a big gap between banks' capital ratios in developed and developing countries. As per the data from World Bank from 2003 to 2011, capital ratio of banks in high income economies is on average lower than that of low and middle income countries, implying an inverse conclusion of leverage ratio accordingly.

Figure 1: Comparison between banks' capital ratio in low and middle income and high income from 2003 to 2011

Source: World Bank



Banking organizations compete in the same industry and thus are subject to more or less the same business-level forces. The variation in their capital mix may be due to country-specific factors like differing inflation, GDP growth, economic structure, government systems, etc. These macroeconomic factors might affect the capital structure of banks in a different way depending upon the stage of economic development of a country. Rajan et al (1995) mentioned a research by Goldsmith stating that “a rough parallelism can be observed between economic and financial development” and “there are even indications in the few countries for which data are available that periods of more rapid economic growth have been accompanied, though not without exception, by an above-average rate of financial development.” This suggests that different economic stages might have difference financial structures. Brown and Oktivia (2010) also state that macroeconomic factors potentially reflect the environment in which banks operate, contemplating the fact that banks’ capital requirement is impacted by the pro-cyclicality of these indicators. Hence banks are more prone to the prevailing systematic factors and these may influence the decision of the banks’ capital mix. This encouraged us to study the potential difference of leverage ratios and significance of determinants – both internal and external factors on banks’ capital structure decision amongst two groups, i.e. developed and developing economies.

1.3. Purpose of the paper

Above all, we would like to find the answers to three main research questions:

- Are banks’ capital structures different between developed and developing countries?
- What are the determinants of banks’ capital structure?
- Are the determinants of banks’ capital structures different between developed and developing countries?

Our aim is to seek for statistical evidence as well as a proper explanation for such result from an economic viewpoint.

1.4. Delimitation

Related studies that have been done are mainly dedicated to developed economies, leaving unfilled gap for developing ones, specifically those located in Asia. As per the data by

World Bank, up to 2011, the Asian economy comprised nearly 4.3 people billion living in 52 different states, accounting for more than 60% of the world population¹. In terms of economic growth, Asia is the world's fastest growing region. As a very limited number of researches on determinants of banks' capital structure have been conducted on such an important economic region, we would like to focus our paper precisely on Asia. Due to information scarcity, choice of countries and choice of banks to be included in the sample depend on data availability. Moreover, for easier access of data, we only included publicly traded banks into the examined sample.

The thesis covers the 13 first years of the 21st century, i.e. from 2000 to the most recent year 2012. Including both economic boom in 2000 and crisis in 2007-2008, we expect that the period can, to some extent, reflect a proper economic cycle. Although the economic boom started from 1995, we only included year 2000 due to data limitation from 1999 backwards.

1.5. Disposition

The thesis starts with Chapter 2 of Theoretical framework and previous researches, introducing the reader to the previous related theories and studies regarding determinants of capital structure, on both firms in general and banks specifically. It is recapped with related hypotheses and findings, which are the foundation for our empirical study in later chapters. The variable choices and definitions are presented under Chapter 3. Later, we describe the data with a presentation of how the sample is selected and the methodology used in conducting the tests. Results are presented in the following chapter 5 of Empirical findings with more detailed analysis and explanation. Finally, conclusions are drawn from the results, believing our paper would be of interest for further studies and of some contribution to decisions of banks' managers and policymakers.

2. Theoretical framework and previous researches

2.1. Capital structure theories

The Modigliani-Miller irrelevance theorem ("M&M theorem") (1958) is the keystone for the later theories contributing to today's corporate finance in general and for studies on capital

¹ Refer to Appendix I: List of countries by population 2011

structure determinants specifically. This theorem, referred to as irrelevance proposition, suggests that a firm's financing decision has no effect on its value. In other words, value of the firm depends on the income generated by its assets, not by how the assets are financed or how the income is divided. It is the conclusion held in "a perfect world", where four main assumptions are required: no corporate taxes, no bankruptcy costs, no information asymmetry and no agency costs. The theorem is considered flawed when being applied to reality – "an imperfect world". Subsequent theories have been developed, taking into account the market imperfections by relaxing those restrictive assumptions. These theories include the extended M&M theorem (1963) which considers corporate taxes in light of benefits brought by tax shields, static trade-off theory which weigh such tax shield benefits against the bankruptcy costs, agency theory which relaxes the assumption of no agency costs and pecking order theory and market timing theory which study impacts of information asymmetry problems on capital structure decisions.

Bank is considered as a very special firm - the only financial institution licensed as a receiver of deposits. Being a firm, all capital structure related theories applicable to firms should also be applicable to a bank. Being a special firm, there should be some special application of these theories to a bank.

2.1.1. M&M irrelevance theorem

(i) M&M theorem – no taxes case (1958)

The theorem has two propositions relevant to capital structure topic. As concluded from Proposition I, the value of the leveraged firm is equal to the value of the unleveraged firm. It implies that a firm's capital structure is irrelevant; and its weighted average cost of capital ("WACC") is the same no matter what mixture of debt and equity used to finance the firm is.

Proposition II refers that the cost of equity rises as the firm increases its use of debt financing, depicting the risk of equity depends on two things: the riskiness of the firm's operations (business risk) and the degree of financial leverage (financial risk).

(ii) M&M theorem - with corporate taxes (1963)

In 1963, M&M theorem was further extended when relaxing the assumption of no corporate taxes. With respect to taxes, interest payments on debts are deductible expenses and thus reduce taxes payable, improving the firm's net income position. Following that, the value of the leveraged firm is equal to the value of the unleveraged firm plus the present value of the interest tax shield. It implies that debt financing is highly advantageous and in the extreme, a firm's optimal capital structure is 100% debt since its WACC decreases with the increase of debt financing. This may refer the important role of corporate taxes in capital structure decisions of all profit-generating entities, among which banks are not exception.

2.1.2. Agency theory

The theory captures the effect of agency costs, i.e. costs due to conflicts of interest among agents. There have been a number of researches on the models in which capital structure is driven by agency costs. Jensen and Meckling (1976) study on earlier work of Fama and Miller (1972) was the pioneer research on this topic. They proposed that these costs arise due to conflict of interest between managers and shareholders, who both desire for self-benefit maximization. Managers have a very little claim on the profit of the company yet they are fully responsible for all the profit engineering activities. Hence they have a lesser incentive to utilize the resources fully for generating profit but transfer these resources to their own benefits. As pointed out by Jensen (1986), debts can be used as a correction tool to mitigate the agency costs of managerial discretion. The reason is that when requiring the firm to pay out cash on a regular basis, debts can help decrease the amount of "free" cash accessible by managers to spend on their personal benefits.

Additional conflicts of interest are between shareholder and debt holder, whose costs are called agency costs of debt. Myer (1977) argues that a firm could incur deadweight costs when a company has a profitable investment opportunity which must be financed by equity, provided an outstanding default-risky debt. In this case, if the residual benefits to shareholders are lower than the project's costs after being transferred to debt holders, managers will not adopt the project even if it is profitable. It is so-called the underinvestment problem, arising when managers, acting in the interest of shareholders, may take actions that appropriate wealth from debt holders

to shareholders. This implies that leverage has a negative relation with the growth opportunities of the firms.

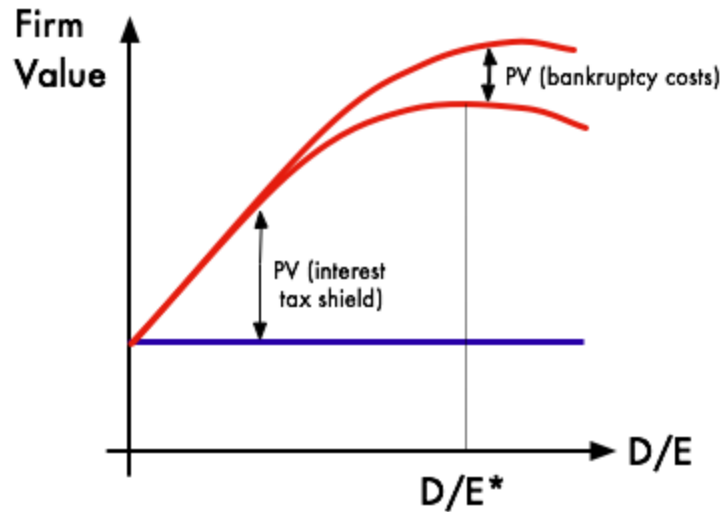
Grossman and Hart (1982) introduces the term “bankruptcy cost to the managers”, including loss of job, loss of position and fear of takeover. It motivates managers to work harder towards efficient allocation of resources and investing in higher profitable activities, reducing the conflict with the equity holders. This alleviates the divergences between managers and equity holders, one more time asserting the benefit of debt financing. From that, they concluded that leverage is positively related with the value of the firm.

The agency theory is also well applicable to bank capital structure, for which we would exploit later in our further analysis.

2.1.3. Static trade-off theory

Static trade-off theory negates the assumption of no bankruptcy costs, the increased costs of debt financing that result from the higher probability of bankruptcy. These bankruptcy costs include both direct costs (such as legal and administration costs) and indirect costs – difficulties that a company has to suffer when under financial distress like loss of reputation, loss of bargaining power, etc. Bankruptcy costs can significantly affect a company’s cost of capital, hence are important in determining and making changes to its capital structure.

M&M theorem (1963) refers that the optimal capital structure is 100% debt as interest on debt is a deductible expense, creating a tax shield for the firm. To argue this, Kraus and Litzenberger (1973) develops the theory of optimal leverage ratio in which the trade-off between costs and benefits of taxes when decision of debt financing is considered. Borrowing saves the firm money on its corporate taxes, but the more it borrows, the more likely it will go bankrupt. At the relatively low debt levels, the probability of bankruptcy and financial distress is low; hence the benefits of tax shield from debt may outweigh the costs. Nonetheless, at the very high debt level, tax advantage of debts may be offset by the bankruptcy costs. This is the main idea of static trade-off theory of capital structure, saying that firms borrow up to the point where marginal benefits of tax shield should be higher than marginal bankruptcy costs.



Besides, there are more costs and benefits involved with the use of debt and equity such as agency costs as mentioned earlier. Incorporating agency costs into the static trade-off theory, capital structure is determined by balancing the trade-off between tax benefits against bankruptcy costs, and between benefits of debt when mitigating agency costs of managerial discretion against agency costs of debt arising from asset substitution effect.

Regarding its application to capital structure determinants, trade-off theory suggests a positive correlation between firm's profitability and size and its leverage ratio. Believing a profitable and large firm would be in less danger of bankruptcy, it is supposed to rely more on debt financing to take advantage of tax benefits. Moreover, profitable firms face higher agency costs of managerial discretion, hence likely would be interested in debt contracts as a mitigation tool.

Being businesses with distinctly high leverage ratios, banks are supposed to have higher probability of bankruptcy. Other than that, banks are closely regulated on their minimum capital requirement, lowering the chance of insolvency. Hence, the trade-off between costs and benefits of debt financing is still highlighted to banks yet somehow different from its application to non-financial firms.

2.1.4. Pecking order theory

The pecking order theory addresses asymmetric information which can create a hierarchy of costs for the companies that use external financing. Accordingly, new investments are preferably financed first by retained earnings, followed by debts and then lastly equities given the increasing cost of capital respectively. From that, pecking order theory suggests a negative impact of profitability on leverage. It implies that a less profitable firm with a weak internal cash flow when having profitable investment opportunities would be more likely to use external fund given its limited retentions.

It further suggests that firms do not have leverage targets. They use debts only when retained earnings are insufficient and only raise external equity capital only as the last resort. Another model based on the idea of managerial optimism by Heaton (2002) shows that pecking order preferences can vary depending upon the optimism levels of the managers. Yueh-hsiang et al. (2005) also suggests that the sensitivity of the net debt issues relative to financing deficits for optimistic managers is larger than those for less optimistic ones. Baker and Wurgler (2002) suggests that managers could minimize the cost of capital by timing the market (issuing equity when share prices increase) implying that market conditions influence the pecking order.

Economists often refer moral hazard as a special case of information asymmetry – “any situation in which one person makes the decision about how much risk to take, while someone else bears the cost if things go badly”, as defined by Krugman (2009). In banking sector, moral hazard problem is closely related to deposit insurance. McCoy (2008) mentions two types of deposit insurance, namely implicit and explicit ones. Most governments are reluctant to allow bank insolvency without some compensation to depositors. Thus they extend depositors some kind of financial safety net, signaling implicit guarantees by bailing out failed banks and thereby sending a message that other bailouts would be available in case of future bankruptcy. The explicit deposit insurance, as suggested by its name, is a more formal commitment to guarantee deposits, usually through legislation. Deposits being insured would not require much risk premium, hence reduce borrowing costs for banks. To mitigate the moral hazard of such insurance, banks are required to hold a minimum amount of capital, limiting their capital mix flexibility. This implies a quite apparent relation between asset risks and banks’ capital structure.

2.1.5. Market timing theory

Market timing theory also closely studies the information asymmetry. It refers to the practice that firms issues equities when the shares are believed to be overvalued and inversely, implement repurchase when shares are undervalued. There are two versions as follows.

The first is the dynamic version by Myers and Majluf (1984), assuming rational economic agents (i.e. managers and investors). Korajczyk et al. (1991) finds that with the existence of adverse selection costs, firms tend to issue equities following a positive information release so that information asymmetry between investors and managers is reduced, resulting in increasing stock price. Hence, firm could create its own timing opportunity. The extent of adverse selection varies across firms (as per Lucas and McDonald (1990), Korajczyk, Lucas and McDonald (1992)) and across time (as per Choe, Masulis and Nanda (1993)) and negatively related to market-to-book ("M/B") ratio.

The second version by Baker and Wurgler (2002) assumes irrational economic agents, leading to a time-varying mispricing of the firm's stock. It is the case when managers believe that they can time the market, so issue equities when they believe shares are at high price and repurchase when believing shares are at low price. Accordingly, variation in M/B ratio comes from managers' perception of misevaluation. Hence, both versions of market timing theory are expected to explain the potential relation between M/B and capital structure.

Managers' belief that they can time the market was evidenced in the survey by Graham and Harvey (2001). However, two market timing versions of dynamic asymmetric information and mispricing cannot be distinguished. Above all, after taking into account results of various researches, Baker and Wurgler (2002) concludes that there is no optimal capital structure, but capital structure only evolves as the cumulative outcome of past attempts to time the equity market.

With our sample of all publicly-traded banks, the market timing theory is expected to help explain any changes in banks' preference of equity financing and thus their capital structures as well.

2.2. Capital structure theories as basis for previous researches

2.2.1. Previous researches on determinants of capital structure

Numerous works have been conducted, trying to explain choice and determinants of capital structure, which has been quite a focused field in corporate finance since the founding work of Modigliani and Miller (1958). Many of the earlier empirical researches also have focused on testing the validity of the trade-off theory, the pecking order theory and the agency cost theory.

A very well-known research conducted by Rajan and Zingales (1995) suggests that there exists a negative relation between growth opportunities and the level of leverage. This is also supported by the theoretical predictions of Jensen and Mekling (1976) focusing on agency theory, and the work of Myers (1977), who argued that because of information asymmetries, those companies that have a higher leverage would entail a higher tendency of giving up investment opportunities with a positive net present value. Alternatively, Myers (1977) also concludes that those specific companies with a higher growth ratio will tend to have lower leverage. These papers also suggest that profitability also has a negative relationship with the leverage of the company.

Booth et al. (2001) evaluates the determinants capital structure theory across countries with diverse institutional structures. They collected data from 10 developing and the G7 countries between 1980 and 1991, and concluded that there is a constant relationship between profitability, asset tangibility, growth options and leverage for each country.

Another research conducted by Chen (2004) on Chinese listed companies using panel data accomplishes that the capital structure choices of these companies depend upon a “New Pecking Order” model (retained earnings, equity, long-term debt) because of distinctive legal restrictions. These companies rely heavily on short-term financing, and managers prefer equity financing to debt financing.

Mainly the empirical researches on capital structure focus on the determinants of corporate debt ratios such as Rajan and Zingales (1995), Graham (1996) and studies of issuing firms’ debt versus equity financing choice namely Marsh (1982), Jalilv and Harris (1984),

Bayless and Chaplinsky (1990), etc. These studies have concluded that firm characteristics including size, market-to-book ratio of assets, stock returns, asset tangibility, profitability and the marginal tax rate play a significant role in determining corporate financing choices, especially profitability and market-to-book ratio. These are so-called standard determinants of capital structure.

So far developed countries have been the focus of researches like study by Rajan and Zingales (1995) on G-7 countries, Sheridan Titman and Roberto Wessels (1998) on USA, Bevan and Danbolt (2000 and 2002) on UK, Alberto de Miguel and Julio Pindado (2001) on Spanish firms, Al-Sakran (2001) on Saudi Arabia, Antoniou et al. (2002) on UK, Germany, and France, Hall et al. (2004) on European small and medium enterprises, F Bancel and UR Mittoo (2004) on European countries, etc. Fewer studies examine developing countries, namely Booth et al. (2001) study on ten developing countries², Pandey (2001) on Malaysia, Omet and Mashharawe (2001) on Jordan, Chen (2004) on China. Among these, some have used cross-country comparisons based on data from Asia like Deesomsak et al. (2004) on Asia Pacific region.

2.2.2. Previous researches on determinants of banks' capital structure

Most of the previous researches on determinants of capital structure examined non-financial firms; meanwhile there were just some studies on banks to date.

A well-cited paper by Gropp and Heider (2007) studies the 200 largest publicly-traded commercial banks and bank holding companies in the US and 15 EU developed countries³ during the period from 1991 to 2004. Using results from empirical researches on capital structure determinants of non-financial firms, it tries to explain the fact that leverage is much higher in banks compared to firms. The standard determinants of capital structure for firms are found to be still applicable in explaining banks' capital mix decision. Interestingly, statutory capital requirement, which is believed to have great influence, is not supported as an explanation for the variation in bank capital. Also Gropp and Heider did not find a significant effect of deposit

² 10 developing countries are Brazil, Mexico, India, South Korea, Jordan, Malaysia, Pakistan, Thailand, Turkey and Zimbabwe

³ 15 EU countries are Austria, Belgium, Germany, Denmark, Spain, Finland, France, United Kingdom, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, and Sweden.

insurance coverage on banks' capital structure. Among some examined macroeconomic factors, Gross Domestic Product ("GDP") growth is not statistically significant.

Following this, Octavia and Brown (2010) examines determinants of bank capital structure in developing countries and made a brief comparison with the result from Gropp and Heider's paper. The sample includes 56 publicly commercial banks from 10 developing countries⁴ between 1996 and 2005. The result that standard determinants are significant in explaining variation in bank capital still holds, for both banks' book and market capital. The impact of minimum capital requirement cannot be confirmed due to the mixed outcome when analyzing book and market leverage. The influence of macroeconomic factors is inclusive due to conflicting results when examining book and market leverage.

Brewer III, Kaufman and Wall (2008) also conducted studies on 78 largest private banks headquartered in 12 industrial countries⁵ in the period 1992-2005. They tried to explain why bank capital ratios vary across these developed countries and concluded that the differences may be in part explained by public policy and regulatory regimes of each country. Most of bank specific variables, above all, still have the most explanatory power.

Studies by Adrian and Shin (2008 and 2009) and Greenlaw, Hatzius, Kashyap, and Shin (2008) conclude that the biggest banks do not handle their capital structure based on regulatory constraints but more focused on internal value at risk. According to them the financial intermediaries try to maximize earning while maintaining more or less a constant risk exposure. So they conclude that leverage for banks is high in high growth period due to lower perceived risk and vice versa.

Besides, there were some other papers also trying to explain the relationship between banks' capital ratio and standard determinants in specific countries separately such as Wong, Choi and Fong (2005) on banks in Hong Kong, Williams (2011) on banks in Nigeria, Romdhane (2012) on banks in Tunisia, Çağlayan and Şak (2010) on banks in Turkey, Amidu (2007) on banks in Ghana, etc but not very comprehensive. They failed to explain the possible reasons for sign and magnitude of the relationship between the examined factors and the capital ratio.

⁴ 10 developing countries include Brazil, India, Jordan, Korea, Malaysia, Mexico, Pakistan, Thailand, Turkey and Zimbabwe.

⁵ 12 industrial countries are US, Australia, Ireland, UK, Italy, Canada, Japan, Switzerland, Sweden, France, Netherlands and Germany.

3. Variable choices and definitions

3.1. Leverage ratio as dependent variable

As defined by Ronald, Merle and Edgar (1996), capital structure is the ratio of long-term debts over equity. This definition has been used consistently in previous researches on capital structure decision of firms in general.

However, the nature of debts in banks is very different from other non-financial firms. For firms, the majority of debts are the loans borrowed from banks, most of which are long-term loans. The main source of banks' debts, on the other hand, is from deposits, which are more of short-term nature (transaction accounts). Hence, it would be inadequate if we just follow the aforesaid definition of capital structure used to analyze non-bank firms. Considering this, the dependent variable of leverage ratio in our paper is referred to as Total Debts over Total Assets consistently. The leverage ratios of our interest include both book and market leverage, where we take into account the book and market value of equity respectively, assuming book value of debt constant.

3.2. Independent variables

Regarding regressants, we start from related theories and previous empirical researches to determine which variables potentially have explanatory power on capital structure of banks. Both internal and external factors which are likely to affect banks' capital decisions are taken into account. We followed Gropp and Heider (2007) in our definition of most variables, which is originally referred from Frank and Goyal (2004). There are some minor changes in calculation method but the nature of variables is unchanged.⁶

3.2.1. Bank-level determinants

The internal factors are selected based on past empirical studies on determinants of capital ratio of firms in general and of banks specifically, including collateral, dividend, size, asset risk, M/B and profit.

⁶ Refer to Appendix III: Definition of variables

(i) Collateral

From the perspective of trade-off theory and agency theory, tangible assets as collateral help reduce the financial distress costs and agency costs of debt, hence increase the leverage capacity for firms. Such anticipation of positive relationship between collateral and leverage ratio has been confirmed consistently in studies by Rajan and Zingales (1995), Titman and Wessels (1988), Aggarwal and Jamdee (2003) and Frank and Goyal (2005), etc. The opposite conclusion of inverse relationship between collateral and capital structure was made by Pandey (2001), Correa et al. (2007), Mazur (2007), Mitton (2008), Ullah and Nishat (2008).

Gropp and Heider (2007) and Octavia and Brown (2010) (Herein after also referred to as “two previous papers on banks’ capital structure” interchangeably) have opposite conclusion on this, where Gropp and Heider only a negative relation between collateral and leverage whilst Octavia and Brown concluded a statistical insignificance.

(ii) Dividend

A dividend-paying company which is large and mature can rely on its reputation to raise external capital, hence would reduce borrowing. Frank and Goyal (2005) finds this negative relation between dividend and leverage.

According to Gropp and Heider (2007), banks face a higher cost of issuing equity due to asymmetric information. Those banks that indulge in paying dividends are expected to face lower cost of issuing equity as they are well known to the outsiders, preferring equity financing. They also concluded a negative relationship between dividend and leverage ratio, while Octavia and Brown (2010) could not conclude due to mixed results when examining book and market leverage.

(iii) Size

In accordance to trade-off theory, large firms with lower bankruptcy costs and more stable cash flow would have higher capacity for debt financing. This positive relationship between size and leverage is also concluded from researches by Titman and Wessels (1988), Booth et al. (2001), Aggarwal and Jamdee (2003) and Frank and Goyal (2005).

The contradictory conclusion of inverse relationship comes from information asymmetry problem. Rajan and Zingales (1995) argues that large firms are usually required to disclose more information to the public, increasing its transparency, reducing information asymmetry costs hence would favor equity financing. Chen (2004) further explains this by referring to large companies' reputation and attraction to equity market.

Two previous papers on banks' capital structure had the same conclusion as the first argument of a positive relation.

(iv) Asset risk

Increasing asset risk increases the default probability, hence would reduce the firm's preference in borrowing as suggested by trade-off theory. Such negative correlation between risk and leverage was also concluded in Titman and Wessels (1988), Harris and Raviv (1991), Pandey (2001) and Ullah and Nishat (2008), emphasizing that risky firms will use less debt.

Besides, given its very unique characteristics, banking industry is specifically controlled by the statutory minimum capital requirement set by Basel Committee on Banking Supervision internationally and by the local Central Bank in respective countries. The relation between asset risk and banks' capital structure is expected to be significant, for which two previous papers on banks' capital structure also had the same conclusion of a negative relation.

(v) M/B

From the viewpoint of pecking order theory, a firm with high M/B ratio has high financial capacity from its operation, thus would rely more on its internal capital not debt. According to market timing theory, believing its share price is high, the firm's management would issue shares if in need of capital. These arguments support an inverse relationship between M/B and leverage, which has also been concluded in Rajan and Zingales (1995), Aggarwal and Jamdee (2003) and Frank and Goyal (2005). On the other hand, if based on trade-off theory for argument, high M/B implies a profitable firm which can rely more on debts without too much concern on its solvency. Therefore we also have reasons to expect a positive correlation.

Gropp and Heider (2007) indicates a negative correlation while and Octavia and Brown (2010) has mixed conclusion in terms of signs of effects when examining book and market leverage.

(vi) Profit

Implied from M&M theorem (1963) when taking corporate taxes into account, firms would prefer debt given tax shield benefits. Further with static trade-off theory, provided lesser chance of bankruptcy, a profitable firm would carry on more debt compared to a less profit-generating one. Additionally, agency theory suggests that a profitable firm would increase debt to mitigate the agency costs of managerial discretion. All of these refer a positive association between profitability and leverage.

Alternatively, pecking order theory emphasizes that a profit firm will prioritize to use its retained earnings first, not debts. This implies a negative relationship, which is consistent with many previous studies like Rajan and Zingales (1995), Booth et al (2001), Aggarwal and Jamdee (2003) and Frank and Goyal (2005). Besides, Chen (2004) further justifies the negative relationship as a mitigation tool for the underinvestment problem and mispricing of new projects. This is also result of two previous papers on banks' capital structure.

3.2.2. Country-level determinants

We would also include macroeconomic variables which are believed to have effects on banks' capital ratio, including Gross Domestic Product ("GDP") growth, inflation, stock market risk, term structure spread and tax rate.

(i) GDP growth

During economic downturn, due to bad performance and increase in bankruptcy costs, firms would hesitate to borrow. Reversely, companies would borrow more in good economic condition given more investment opportunities. This argument of positive association between GDP growth and leverage is supported by trade-off theory and matches with findings in previous researches by Booth et al. (2001), Deesomsak et al. (2004), de Jong et al. (2008), Mitton (2008), Bas et al. (2009), Nuño et al (2013), etc.

Gropp and Heider (2007) also concludes a positive relation, while Octavia and Brown (2010) finds GDP growth statistically insignificant in determining bank leverage.

(ii) Inflation

Inflation would add up an inflation premium to the nominal interest rate, making firms more hesitant in borrowing, thus lower leverage. This argument is also confirmed by findings of Booth et al. (2001) and Beck et al. (2008).

On the contrary, as suggested by the trade-off theory, the tax advantage of debts will increase with the level of inflation. As per market timing theory, as equity becomes undervalued in the era of inflation, managers would not issue equity but opt to go for bank loans. These two theories emphasize the positive relationship between inflation and leverage, which is consistent with conclusion by Taggart (1986), Per (2005) and Frank and Goyal (2008).

Its relation with banks' capital structure is inconclusive as per Gropp and Heider (2007), where the test is significant when examining book leverage but insignificant for market leverage.

(iii) Stock market risk

Stock market risk is the potential loss due to fluctuations in the stock market of a country, depicting the volatility of an economy's stock index. This is an important measure of the financial risk prevailing in the country. High risks make bank have to increase its reserves to comply with regulations on statutory capital requirements, which results in lower leverage. On the contrary, we can also expect a positive relation. When the market experiences high volatility, investors would not be confident in investing money. In this case, they may prefer keeping their money as deposits, increasing the banks' leverage ratios.

Among previous studies on bank capital structure, Octavia and Brown (2010) rejects its statistical significance, meanwhile Gropp and Heider (2007) concludes an inverse relation.

(iv) Term structure spread

Interest rates play a vital role in the banking system, directly affecting the deposits and loans of individual banks. A higher term structure spread depicts a higher risk premium banks require when lending to customers. This suggests a negative relation between term spread and

firms' leverage. Regarding the debt ratio of banks, Gropp and Heider (2007) finds a positive relation indeed.

(v) Tax rate

Corporate tax also potentially has a significant impact on the capital ratios of banks. With higher levels of taxes, banks will opt to have more debts in their capital structure given the tax shield benefits following M&M theorem (1963). This positive relationship was also confirmed in Per's paper (2005).

In summary, the effects of all variables as concluded from previous papers and anticipated applying capital structure theories are summarized under Table 1.

Table 1: Expected effects of explanatory variables on leverage ratio

The effects may vary across different studies and among implications of different theories.

+/-: The test is statistically significant and has positive or negative relation with leverage ratios.

+ (-)/ Not significant: The test is statistically significant and has positive or negative relation with leverage ratios in one study but not significant in another study.

Undecided: The significance tests have contradictory results when examining book leverage and market leverage, hence significance of the variable is inconclusive.

Blank: Not yet examined in previous papers/ Not relevant with the theory.

Variable		Expected effects						
		Per previous studies on firms	Per previous studies on banks	Per theories				
				M&M theorem	Agency theory	Static trade-off theory	Pecking order theory	Market timing theory
Bank-level factors	Collateral	+/-	-/ Not significant		+	+		
	Dividend	-	-/ Undecided				-	
	Size	+/-	+			+		
	Asset risk	-	-			-		
	M/B	-	-/ Undecided			+	-	-
	Profit	-	-	+	+	+	-	
Country-level factors	GDP growth	+	+/ Not significant			+		
	Inflation	+/-	Undecided			+		+
	Market risk		-/ Not significant					
	Term structure spread		Undecided					
	Tax		+	+				

4. Data and methodology

4.1. Data and sample selection

4.1.1. Data and descriptive statistics

Our data come from four main sources. Regarding bank-level factors, all data from banks' balance sheet and income statements as well as their stock price and dividend payout are all available in Thomson Reuters's Datastream. The country-level determinants are, on the other hand, obtained from various sources including Thomson Reuters's Datastream, World Bank, the Central Intelligence Agency ("CIA") World Factbook and KPMG databases. For more details with regards to data sources, please refer to Appendix IV.⁷

The descriptive statistics for primary variables are as follows.

Table 2: Descriptive statistics – Developed countries

Size is Book value of bank assets, measured in USD. Collateral and Profit are ratios of Size. More details about definition of variables and data sources are under Appendix III and IV.

	Size	Collateral	Asset risk	M/B	Profit	GDP growth	Inflation	Market risk	Term structure spread	Tax
Mean	24,230,580	0.283293	0.001936	1.054721	0.001719	0.030014	0.012179	0.011629	0.025424	0.278206
Median	17,931,989	0.281734	0.000997	0.991580	0.002712	0.036000	0.011300	0.010964	0.021167	0.275000
Maximum	161,000,000	0.972019	0.048934	4.481954	0.136360	0.108000	0.056800	0.027558	0.072000	0.420000
Minimum	69,677	-0.704827	0.000000	0.920481	-0.442017	-0.052	-0.0134	0.004314	0.002000	0.000000
Std. Dev.	26,032,501	0.158187	0.003854	0.316682	0.029621	0.029321	0.016681	0.004894	0.014719	0.133399
Obs.	349	327	349	349	349	348	377	357	323	377

⁷ Appendix IV: Sources of data

Table 3: Descriptive statistics – Developing countries

Size is Book value of bank assets, measured in USD. Collateral and Profit are ratios of Size. More details about definition of variables and data sources are under Appendix III and IV.

	Size	Collateral	Asset risk	M/B	Profit	GDP growth	Inflation	Market risk	Term structure spread	Tax
Mean	10,784,124	0.253265	0.001660	0.972341	0.010578	0.047099	0.044143	0.013388	0.039015	0.336687
Median	3,803,704	0.250081	0.001187	0.983232	0.011205	0.052000	0.037700	0.012426	0.042000	0.350000
Maximum	68,959,094	0.903930	0.014633	1.304470	0.078780	0.104000	0.197688	0.031679	0.072100	0.430000
Minimum	40,204	-0.236273	0.000000	0.000000	-0.092909	-0.064	-0.008504	0.003688	0.000000	0.230000
Std. Dev.	14,687,991	0.173354	0.001857	0.151093	0.016376	0.029899	0.042987	0.004875	0.018500	0.033134
Obs.	382	325	373	380	380	384	410	416	336	386

Having a closer look at mean values of the variables, it is observable that there are some variations in the two samples of banks in developed and developing countries as per table 4.

Table 4: Comparing mean values of primary variables

Size is Book value of bank assets, measured in USD. Collateral and Profit are ratios of Size. More details about definition of variables and data sources are under Appendix III and IV.

	Developed countries	Developing countries
Size	24,230,580	10,784,124
Collateral	0.283293	0.253265
Asset risk	0.001936	0.001660
M/B	1.054721	0.972341
Profit	0.001719	0.010578
GDP growth	0.030014	0.047099
Inflation	0.012179	0.044143
Market risk	0.011629	0.013388
Term structure spread	0.025424	0.039015
Tax	0.278206	0.336687

As per Table 2 and Table 3, difference in size of banks is most apparent, where the largest bank is more than 2300 and 1700 times as large as the smallest banks in developed and developing groups respectively. Comparing between two groups in Table 4, size of banks in developing countries is only 44% compared to banks in developed countries on average. M/B

ratios are both around 1 implying close relation between book value and market value of bank assets, however banks in developed countries are more highly valued with the ratio greater than 1. Regarding profitability, banks in developing countries outperform with more than six times higher. Despite these differences, collateral ratio and asset risk of banks in two groups are relatively similar.

In terms of macroeconomic factors, developing countries are more volatile markets with higher inflation rate and higher market risk. This is in line with the distinction in term structure spread, in which they have higher spread to compensate for the market instability. They also impose higher corporate tax rates on average. The positive side is that they have a better GDP growth as compared to advanced economies.

4.1.2. Sample selection

We followed the classification of World Bank in categorizing countries based on their Gross National Income (“GNI) per capita. Following that, all Asian countries with GNI per capita of \$12,476 or more are classified as developed countries and the rest are developing ones. Among the total of 52 countries and territories, there are seven countries which lie on both continents including Armenia, Azerbaijan, Cyprus, Georgia, Kazakhstan, Russia and Turkey. For economic and political purposes, they are not considered or arguably to be considered as Asian countries, hence we excluded these seven to avoid confusion. Besides, Hong Kong and Macau as regions of the People's Republic of China are also not included. In summary, the list of Asia countries under our examination comprises of 12 developed and 31 developing countries.⁸

Due to data scarcity and time limitation, we could not examine the whole population of all banks in all Asian countries, but would only focus on a smaller sample. The sample includes data of 61 listed banks from ten Asian countries (consisting of five developing and five developed countries) from 2000 to 2012. Data in the sample, by definition, are panel data.

⁸ Refer to Appendix II: List and category of Asian countries

Table 5: Number of banks across countries

Category	Country	Banks
Developing countries	Pakistan	7
	India	6
	Thailand	7
	Sri Lanka	6
	Lebanon	6
	Total	32
Developed countries	Japan	9
	Israel	6
	Taiwan	6
	South Korea	4
	Bahrain	4
	Total	29

Given the inconsistency and insufficiency of data, the selection process which is supposed to be on random basis, is determined by the availability of data.

4.2. Methodology

4.2.1. Model specification

The purpose of the paper is to determine which factors are statistically significant in explaining capital structure decision of banks, then compare if such influences are different among banks in two groups of economic stages. There are eleven determinants to be tested, including six bank-specific factors (size (Size), profits (Prof), M/B ratio (MTB), collateral (Coll), dividend (Div) and asset risk (AssRisk)) and five country-level variables (GDP growth rate (GDP), inflation rate (Infl), Term structure spread (Spread), tax rate (Tax) and market risk (MktRisk)). All bank-specific factors are lagged by one year to account for possible time-lagged temporal effects, whilst the dummy dividend and macroeconomic factors are contemporaneous. These variables are tested against bank leverage (Lev), including both book leverage and market leverage. The null and alternative hypotheses are:

H_0 : The independent variables have no explanatory power on bank leverage ($\beta_i = 0$)

H_a : The independent variables have significant explanatory power on bank leverage ($\beta_i \neq 0$)

The hypotheses are tested by estimating the following regression equation:

$$\text{Lev}_{i,t} = \alpha + \beta_1 \ln(\text{Size}_{i,t-1}) + \beta_2 \text{Profit}_{i,t-1} + \beta_3 \text{MTB}_{i,t-1} + \beta_4 \text{Coll}_{i,t-1} + \beta_5 \text{Div}_{it} + \beta_6 \ln(\text{AssRisk}_{i,t-1}) + \beta_7 \text{GDP}_{it} + \beta_8 \text{Infl}_{it} + \beta_9 \text{Spread}_{it} + \beta_{10} \text{Tax}_{it} + \beta_{11} \ln(\text{MktRisk}_{it}) + \varepsilon_{it}$$

4.2.2. Procedure

The relationships of explanatory variables with bank capital structure would be taken into account by the quantitative approach. For the available data, we would run the multivariable regression model with the assistance of Eviews 7 to see the significance, sign and magnitude of each variable on leverage ratio, both book and market value.

To begin with, multicollinearity problem is checked to see if explanatory variables are highly correlated with one another. Our aim is to detect near multicollinearity (i.e. correlation which is higher than 0.8) via the correlation matrix. Detecting multicollinearity and solve it if any is important for some reasons. Firstly, highly correlated variables make it more difficult to observe individual contribution of each to the overall fit of the regression. As a consequence, the regression may “look good” with high R^2 but individual variables are not significant. Secondly, the regression would be more sensitive to every small change in the specification, i.e. adding or removing a regressor would lead to large change in coefficient values or significances of other variables. Lastly, presence of near multicollinearity would lead to inappropriate conclusions for the test, reducing precision of the desired inference. The correlation matrixes are as follows.

Table 6: Correlation matrix – Developed countries

Correlation	Book leverage	Market leverage	Collateral	Dividend	Ln (Size)	Ln (Asset risk)	M/B	Profit	GDP growth	Inflation	Ln (Market risk)	Term structure spread	Tax
Book leverage	1.000000												
Market leverage	0.483301	1.000000											
Collateral	-0.286762	-0.131061	1.000000										
Dividend	0.079609	0.183082	0.036188	1.000000									
Ln (Size)	0.466463	0.317288	-0.119972	0.406447	1.000000								
Ln (Asset risk)	-0.416109	-0.781477	0.013208	-0.186296	-0.350076	1.000000							
M/B	-0.067869	-0.86771	0.031842	-0.187077	-0.112149	0.566234	1.000000						
Profit	-0.193275	-0.01237	0.010002	0.069011	-0.104656	0.069478	-0.070601	1.000000					
GDP growth	-0.185003	-0.223346	-0.136742	-0.233808	-0.261742	0.262799	0.106407	0.193885	1.000000				
Inflation	-0.188958	-0.165813	-0.22455	-0.338576	-0.270062	0.306052	0.056259	0.199200	0.341109	1.000000			
Ln (Market risk)	0.147717	0.022117	-0.283221	-0.275849	-0.07652	0.177482	0.059006	-0.102745	0.053920	0.455932	1.000000		
Term structure spread	-0.525643	-0.401162	0.058030	-0.067429	-0.306366	0.429694	0.111957	0.088175	0.139590	0.245625	-0.035958	1.000000	
Tax	0.536290	0.472188	0.080408	0.305119	0.545903	-0.639942	-0.167332	-0.191631	-0.470784	-0.551653	-0.104547	-0.675858	1.000000

Table 7: Correlation matrix – Developing countries

Correlation	Book leverage	Market leverage	Collateral	Dividend	Ln (Size)	Ln (Asset risk)	M/B	Profit	GDP growth	Inflation	Ln (Market risk)	Term structure spread	Tax
Book leverage	1.000000												
Market leverage	0.488830	1.000000											
Collateral	0.240102	0.394329	1.000000										
Dividend	-0.365145	-0.050646	0.095019	1.000000									
Ln (Size)	0.381372	-0.055005	0.143437	-0.057495	1.000000								
Ln (Asset risk)	-0.139884	-0.584462	-0.51183	-0.073712	-0.074479	1.000000							
M/B	0.457839	-0.547659	-0.15294	-0.292516	0.419906	0.429041	1.000000						
Profit	-0.58106	-0.304543	-0.089809	0.383128	-0.241632	0.074068	-0.23977	1.000000					
GDP growth	-0.012839	-0.076681	0.010736	0.148834	0.081040	0.067452	0.053742	0.107622	1.000000				
Inflation	0.219576	-0.085764	0.156728	0.112893	0.238795	0.021858	0.301435	0.005707	0.178982	1.000000			
Ln (Market risk)	0.151320	-0.13623	-0.100993	-0.01336	0.131317	0.308922	0.282326	-0.126536	-0.193761	0.188959	1.000000		
Term structure spread	0.300855	-0.00326	0.191923	-0.091091	0.609337	-0.078073	0.291039	-0.196002	0.189371	0.113399	0.222444	1.000000	
Tax	0.035200	0.211936	0.213935	0.249738	-0.389317	0.006108	-0.177857	0.129037	0.132262	0.159389	0.007884	-0.250721	1.000000

As can be seen, multicollinearity problem is not observed amongst independent variables of the two examined samples per the above correlation matrixes.

After checking the validity of variables, we would run the regression on dependent variables - book leverage and market leverage - separately. For panel data, the simplest way is to estimate a pooled regression on all data together. The biggest problem of pooling the data is that

it implicitly assumes the average values of all variables and the relationships between them are constant over time and cross sectionally. Therefore, we would not go for this option. In financial research, there are two classes of estimator approaches: fixed effects model and random effects models to choose when dealing with panel data. Fixed effect model removes the particular effect of time-invariant features to examine net effect of the explanatory variables and also takes into account the distinctiveness of these features by not correlating them with other individual characteristics. This is why fixed effects model assumes correlation between error term and variables. On the other hand, the rationale behind the random effects model is that the variations across the entities are assumed to be random and uncorrelated with the explanatory variables. This model also allows for the time-invariant variables to be included. To examine the suitability of either one of these two models, we performed the Correlated Random Effects – Hausman Test and the Redundant Fixed Effects Tests on both data sets for developed and developing countries with the help of Eviews 7.

The Correlated Random Effects – Hausman Test compares the fixed and random effects estimates of coefficients, in which the two hypotheses are:

H_0 : The random effects are uncorrelated with the explanatory variables (i.e. Random effects model is preferred)

H_a : The random effects are correlated with the explanatory variables (i.e. Fixed effects model should be applied)

The Redundant Fixed Effects Tests test for applicability of fixed effects model. We choose the unrestricted specification as a two-way fixed effects estimator and Eviews will test the joint significance of all the effects as well as the joint significance of cross-section effects and the period effects separately. The hypotheses under the fixed effects testing are as follows:

H_0 : The fixed effects are redundant

H_a : The fixed effects are not redundant

Of note, given our data are unbalanced, tests of random-fixed or random-random effects on two dimensions of data are not applicable. The results are as follows.

Table 8: Tests for random vs fixed effects model – Developed countries

Regressant	Period dimension	Cross section dimension	Test applied	Test result
Book leverage	Random	None	Hausman Test	Reject H_0
	None	Random		Reject H_0
	Fixed	None	Redundant Fixed Effects Tests	Reject H_0
	None	Fixed		Reject H_0
	Fixed	Fixed		Reject H_0
Market leverage	Random	None	Hausman Test	Reject H_0
	None	Random		Reject H_0
	Fixed	None	Redundant Fixed Effects Tests	Reject H_0
	None	Fixed		Reject H_0
	Fixed	Fixed		Reject H_0

Table 9: Tests for random vs fixed effects model – Developing countries

Regressant	Period dimension	Cross section dimension	Test applied	Test result
Book leverage	Random	None	Hausman Test	Reject H_0
	None	Random		Reject H_0
	Fixed	None	Redundant Fixed Effects Tests	Not reject H_0
	None	Fixed		Reject H_0
	Fixed	Fixed		Reject H_0
Market leverage	Random	None	Hausman Test	Reject H_0
	None	Random		Reject H_0
	Fixed	None	Redundant Fixed Effects Tests	Not reject H_0
	None	Fixed		Reject H_0
	Fixed	Fixed		Reject H_0

As can be seen, the random effects model is not supported by any of these tests. With regards to tests for fixed effects, when fixed effects dummies are significant in both dimensions and in each dimension separately, the model using fixed effects in just one dimension is not valid. Therefore, our employed sample is better suited to apply the fixed effects model both in cross-sectional and period dimensions. Per Brooks (2008), fixed effects model is applicable

where the variables in the data sample successfully constitute the entire population. Moreover, cross-sectional and period fixed effect model will allow for latent firm specific and time-specific heterogeneity.

Heteroscedasticity is expected to exist in the estimation process. There are several options to correct standard error estimates, among which heteroscedasticity-robust is most relevantly available in Eviews. Given we are estimating the two-dimension fixed effects model, the coef covariance method White diagonal is applicable. White diagonal does not actually take away the heteroscedasticity. It leaves the residuals (or parameter estimates) unaffected and just makes inference insensitive to the presence of heteroscedasticity. The results of the final regression after taking into account the heteroscedasticity problem would be analyzed and see if they can be explained by any of the above mentioned theories.

4.3. Limitations

For BLUE estimator, it is important that data should be collected on a random basis. However, data is not easily obtained and especially, data for developing countries is much more limited and incomprehensive. Due to that reason, apart from data which is mostly collected from Thomson Reuters's Datastream, we had to supplement the missing figures from various sources such as World Bank, CIA Factbook and KPMG databases. We tried to consolidate and compare data from different sources yet some data are not consistently the same amongst these sources. Hence, we temporarily assume accuracy and consistency in data from these sources and use the collections of data which are most reasonable. When calculating term structure spread specifically, we could not find the prime lending rates and government bond rate of the same terms for all investigated countries, hence had to accept the closest data which are available.

Moreover, difference in accounting policies and local currencies in different countries also threatens the consistency in data, but it is unavoidable. Regarding currency difference, we tried to transform most of the data into ratio. For such data which should be in absolute value, despite the exchange rate impact, we converted all figures into US dollar to ensure uniformity.

Another limitation of the paper is the survivorship bias, i.e. we ignored banks which no longer existed until the end date of the examined period. The reason again refers to the availability of data, where Thomson Reuter's Datastream only publishes data of existing

businesses. Therefore, there may be some reasons behind disappearance of such banks (such as bankruptcy, merger and acquisition) that affects the determinants of their capital structure but we may overlook upon exclusion of these banks from the examined sample.

5. Empirical findings

5.1. Comparing leverage ratios amongst banks in developed and developing countries

Estimating the regression on both book leverage and market leverage of banks in the two groups, we obtained the respective leverage ratios as follows.

Table 10: Comparison between leverage ratios amongst banks in developed and developing countries

The mean values of leverage ratios (both book and market values) are tested if they are statistically different from each other using t-test.

H₀: The mean values of bank leverage ratios in developed and developing countries are the same.

H_a: The mean values of bank leverage ratios in developed and developing countries are different.

	Book leverage		t-test for difference		Market leverage		t-test for difference	
	Developed countries	Developing countries	Test statistic	p value	Developed countries	Developing countries	Test statistic	p value
Mean	0.9311	0.9196	2.917	0.0036	0.9126	0.9315	-2.589	0.0099
Median	0.9419	0.9301			0.9510	0.9536		
Max	1.1554	1.1055			0.9919	1.0000		
Min	0.5723	0.6992			0.2103	0.5591		
Std. Dev.	0.0512	0.0547			0.1189	0.0691		
Obs.	349	380			349	373		

From the available data, it can be concluded that the mean values of banks' leverage ratios in developed and developing countries are statistically different at 1% confidence level. So far we have been of the opinion that countries in each category share more or less the same macroeconomic conditions given their similar economic characteristics. For instance, as per conclusion from World Bank, GDP growth rates in developing countries are on average higher than those in advanced countries. Developed ones usually have high GDP levels but low GDP growth rates given their productivity has been optimized to the maximum level. This is also

consistent with the result from our sample of Asian countries as shown in Table 4 earlier. On the other hand, developing countries have more potential with higher GDP growth rates but are negated by their comparatively fast population growth rates simultaneously. This explains GDP per capita growth rates in these countries to be relatively low or even negative. Since the bank-level factors are specific to each bank, we believe that the leverage ratios in these two groups, if different, should be explained by the country-level determinants. So can the result of significant difference in the banks' leverage ratios signify that country-level factors do have explanatory power on their capital structure decisions? Or is this also caused by the differing significance and magnitude of banks' specific characteristics? To answer these, we would further delve deeper into the sign, significance and magnitude of each dependent variable on bank leverage ratios in the next sections.

5.2. Comparing sign, significance and magnitude of determinants

As per Table 11, the F-test on the combined significance of all the independent variables generates statistical significance at 1% confidence level. However the adjusted R^2 is much higher when we estimate the regression on market leverage.

In general, the results are quite in line with those of previous researches, where most of bank-level factors are significant in explaining capital structure decision of banks, meanwhile macroeconomic factors are less influential. When examining the dependent variable as book leverage and market leverage respectively, the statistical significances of variables as well as signs and magnitudes of the correlation are pretty consistent. For banks in developed countries, collateral, size, asset risk, M/B, market risk and term structure spread are statistically significant in explaining both book and market leverage, while dividend and GDP growth rate only have explanatory power on market leverage. Regarding banks in emerging countries, the results are totally consistent when dividend, size, asset risk, M/B, profit and tax are all statistically significant at 1% in explaining leverage, both book and market values. Another very noteworthy point is that the impacts of individual variables on banks' leverage ratios in developed and developing countries share no similarity at all.

Table 11: Comparison of factors' effects on bank capital structures in developed and developing countries

The coefficients obtained from the significance tests against leverage ratios are tested if are statistically different from each other using t test.

H_0 : The impacts of independent variables on leverage ratios of banks in developed and developing countries are the same.

H_a : The impacts of independent variables on leverage ratios of banks in developed and developing countries are different.

*, ** denote statistical significance at the 1% and the 5% confidence level respectively.

Variables		Book leverage				Market leverage			
		Coefficients and standard errors		t-test for difference of coefficients		Coefficients and standard errors		t-test for difference of coefficients	
		Developed countries	Developing countries	Test statistic	p value	Developed countries	Developing countries	Test statistic	p value
Firm-level determinants	Collateral	-0.063*	0.025	-63.911	0.000000	-0.048*	0.025	-57.545	0.000000
	<i>se</i>	0.014	0.017			0.012	0.017		
	Dividend	-0.006	-0.027*	40.673	0.000000	-0.008*	-0.025*	34.449	0.000000
	<i>se</i>	0.005	0.007			0.005	0.007		
	Size	0.009*	0.006*	17.216	0.000000	0.007*	0.005**	8.614	0.000000
	<i>se</i>	0.002	0.002			0.002	0.002		
	Asset risk	-0.013*	-0.006*	-26.501	0.000000	-0.041*	-0.007*	-140.625	0.000000
	<i>se</i>	0.004	0.001			0.004	0.001		
Country-level determinants	M/B	0.022**	0.332*	-97.783	0.000000	-0.275*	-0.528*	83.588	0.000000
	<i>se</i>	0.010	0.050			0.009	0.048		
	Profit	-0.170	-1.217*	87.986	0.000000	0.090	-1.136*	110.733	0.000000
	<i>se</i>	0.121	0.149			0.108	0.142		
	GDP growth	-0.013	0.019	-4.113	0.000046	-0.127*	-0.004	-16.656	0.000000
	<i>se</i>	0.079	0.101			0.070	0.096		
	Inflation	-0.156	0.043	-17.917	0.000000	-0.225	0.036	-26.075	0.000000
	<i>se</i>	0.170	0.063			0.152	0.060		
Country-level determinants	Market risk	0.016**	0.010	9.282	0.000000	0.029*	0.011	28.889	0.000000
	<i>se</i>	0.006	0.009			0.005	0.009		
	Term structure spread	-1.093*	0.031	-56.150	0.000000	-1.356*	0.023	-75.506	0.000000
	<i>se</i>	0.269	0.183			0.240	0.175		
	Tax	0.036	0.537*	-69.625	0.000000	0.022	0.529*	-74.358	0.000000
	<i>se</i>	0.039	0.109			0.035	0.104		
Constant		0.783*	0.337*	76.120	0.000000	0.996*	1.210*	-39.045	0.000000
	<i>se</i>	0.049	0.081			0.043	0.077		
Number of observations		269	256			269	256		
	F-statistic	7.867	27.639			88.934	37.169		
Prob (F-statistic)		0.000	0.000			0.000	0.000		
	R ²	64.34%	60.47%			95.33%	90.28%		
Adjusted R ²		56.16%	58.69%			94.25%	87.86%		

5.2.1. Bank-level determinants

(i) Collateral

The difference in impact of collateral on capital structure decision is pretty apparent between banks in two groups of countries. Collateral can only explain leverage ratios of banks in advanced countries, and it is an inverse relation.

General firms with high tangibility can reduce financial distress costs and agency costs of debts, hence would have more capacity to increase borrowing following trade-off theory and agency theory. This is not applicable to banks since the Liability account of banks is mostly contributed by deposits from individuals and corporations, which are not likely to increase with the rising level of tangible assets as collateral of banks. It may explain the separation of collateral and leverage of banks in developing countries, especially where banks are more of the nature of pure commercial banks accepting deposits and lending.

The situation in advanced economies is a little bit different, where banks have more operational functions like investments and insurance besides making loans. Besides cash and due from banks, land and building and other tangible assets, banks here have more securities, treasury bills, other bills, bonds, CDs, etc as collateral. These evidence the reduced interest of banks in attracting deposit, which is in line with conclusion of Gropp and Heider (2007) of upward trend in non-deposit liabilities and downward trend in deposits of banks in US and EU. We are of the opinion that it explains the negative relation between collateral and leverage of banks in developed countries.

(ii) Dividend

Except for book leverage of banks in developed countries, statistical results show that dividend can explain change of capital structure at 1% confidence level, where the sign of effect is consistently negative. Information asymmetry may help explain in this regards. For listed banks, dividend-paying status can act as a good signal to investors about future growth of the banks, reducing the information asymmetry problem, thus lower the cost of issuing equity. M&M theorem (1963) and pecking order theory suggest preference of debts over equities, but static trade-off theory opposes to extreme usage of debts. As long as the problem of higher costs

of equity is addressed, a bank would be more willing to rely more on equity financing, reducing its leverage ratio. Together with the increasing number of shareholders when banks foster equity financing, paying dividends is costly. Debt holders may see it as an appropriation of their wealth to equity holders when managers substitute retained earnings with higher dividend payments, reducing their interests when lending to banks. This may be an explanation for the inverse relation between dividend and leverage as found.

(iii) Size

Statistics shows that there is insufficient evidence to reject the explanatory power and the positive impact of size on leverage ratios of banks in all examined countries. This result is the same as conclusion from Gropp and Heider (2007) and Octavia and Brown (2010). Similar to the case of non-financial firms, this can be explained by the trade-off theory. Usually considered as good banks, large banks can more easily attract deposits from individuals and corporations. “Too big to fail”, large banks are supposed to have lower bankruptcy costs hence have tendency to rely more on debts as very cheap source of financing. The lower costs of debts for banks come directly from the lower risk premium brought by deposit insurance and more indirectly from the benefits of tax shield.

The magnitude of bank size on its capital mix decision is statistically, but slightly, different between two country groups, in which it is more important in determining the capital structure decision of banks in developed countries.

(iv) Asset risk

Asset risk is consistently statistically significant and negatively related to leverage, both book and market values of banks in all countries, regardless of economic development stage. This finding is the same as the two previous papers on determinants of banks' capital structure. It is supported by agency theory and static trade-off theory, where leverage ratios are reduced for risky banks given agency costs from asset substitution effects are greater than benefits of debts as a mitigation tool against managerial discretion. Additionally, costs of bankruptcy outweigh benefits of tax shields.

Risky banks are also under pressure of reducing debt ratio as imposed by regulatory minimum capital requirements. The higher the risk level is, the more risk-weighted assets are, resulting in higher capital ratio to be required and lower leverage ratio simultaneously. So reducing debt financing is not only a preference but a must for banks when in high risk level, complying with regulations in banking sector.

The absolute values of coefficients are much higher for banks in advanced economies, indicating that asset risks are more important in capital structure decision of these banks. This may result from the fact that banks in developed countries are more closely and strictly regulated by their national Central Banks besides the international standards by Basel Accords. According to a report released on October 2012 by World Bank and International Finance Corporation, Augusto Lopez-Claros - Director of Global Indicators and Analysis, World Bank Group stated that “Over the years, governments (in developing countries) have made important strides to improve their business regulatory environment and to narrow the gap with global best practices”, however they still have many things to do to improve the national regulation systems. As such, banks in emerging countries are less influenced by regulations on their capital ratios in relation to volatility in asset risks as opposed to those in more economically developed countries.

(v) M/B

M/B ratio proves its importance in explaining capital structure decision of banks in all countries, but its signs of correlation with book leverage and market leverage are conflicting. It is positively related to book leverage, but inversely to market leverage. Octavia and Brown (2010) has exactly the same results when examining developing countries, while banks in advanced nations per Gropp and Heider (2007) show only negative relation between M/B and market leverage and no statistical significance with book leverage.

M/B different from 1 implies a different valuation of bank value by the market and the bank itself. Octavia and Brown (2010) explains the positive relation between M/B and book leverage based on pecking order theory. The more M/B different from 1, the more serious the information asymmetry between outsiders and bank insiders is, which results in higher costs of equity. Banks would prefer debts, making the book leverage higher.

Regarding the negative correlation between M/B and market leverage, we think that market timing theory can help explain. High M/B implies that a bank is more highly valued by the market than its real value as indicated by the book figure. According to market timing theory, when shares are believed to be overvalued, banks would issue equities to take advantage of this mispricing. This action would reduce the reliance on debts, increase the market value of bank assets, hence lower the market leverage accordingly.

Comparing the coefficients, it can be seen that magnitude of M/B on determining leverage ratios of banks in less developed countries are statistically and much higher than those in advanced nations. One possible reason is due to the higher level of information transparency in developed economies, making dispersion of market value from book value immaterial. The leverage ratios of banks here are thereby less influenced by M/B as compared to those in developing countries, where chance of misevaluation is supposed to be higher.

Another note is that relative to book leverage, the absolute values of coefficients are much higher in the regression with market leverage – same with findings of Octavia and Brown (2010). They explained that this could reflect the spurious correlation resulted from having market values on both side of the equation. The other argument for which we are of more agreement is that growth opportunities reflected by M/B plays a vital role in a forward-looking measure that market leverage essentially reflects.

(vi) Profit

It is found that profit is only statistically significant (at 1% confidence level) in explaining leverage ratios for banks in less developed countries. The sign of correlation is negative and the very high coefficients shows its ultimate importance in determining the debt ratio of these banks, but interestingly not for those in advanced countries. The negative relation between profit and leverage ratio can be explained quite directly by the pecking order theory. A profitable bank is more likely to utilize its retention before taking debts - the considered-to-be more expensive financing source. Moreover, high profit may act as a positive signal to investors, encouraging them to invest in the banks. From that, a profitable bank would have an easier access to equity financing at lower costs hence may lower the leverage ratio.

Our concern is why is there little evidence showing that profit impacts capital structure decision of banks in Asian developed countries? The related paper by Gropp and Heider (2007) examining banks in Western developed countries also concludes statistical significance and negative impact of profit on bank leverage in these countries. Is this non-relatedness due to the heavy reliance of a bank on debts for its ongoing operation of meeting the loan demand? If based on this argument, we believe that it should be more proper to explain for banks in developing countries – which are more of the nature of commercial banking, not for those in developed countries with more diversified channels of operation. Given this, we have to question the reliability of this result, for which the limited data in the sample may cause. Further studies in this regards are expected in the future.

5.2.2. Country-level determinants

(i) GDP Growth

GDP growth is statistically insignificant in all tests except for the test against market leverage of banks in developed countries. It is significant at 1% confidence level, showing a negative relation with the market leverage of the developed countries. GDP growth rate signifies a flourishing economics scenario, with new and profitable investment opportunities available in the economy. Individuals and corporations having alternative means of investment will withdraw their deposits from banks, making the debt account of banks reduced. At the same time, banks have to cater the increasing loan demand and also want to raise capital for their own investments. This may lead banks to increase their reliance in equity financing, which further decreases the leverage ratios.

According to Ozcan (2012) large banks are more responsive towards economic cycles while smaller banks display an inconsequential relationship. As mentioned when analyzing Table 4, banks in developed countries are much bigger in size as compared to the banks in developing countries. It can help explain the difference in the significance of GDP growth between two groups of countries, where GDP shows no impact on the banks' leverage in developing countries. Octavia and Brown (2010) examining determinants of banks' capital structure in emerging countries also suggests that GDP depicts an insignificant impact on bank leverage.

(ii) Inflation

The test on influence of inflation on bank leverage has shown statistical insignificance for all the countries included in the model. This is the same as the findings of Santoni (1986) and Gropp and Heider (2007).

Inflation impacts the discount rates on both borrowing and lending. As explained by Ali (2011), in response to the inflationary pressure the national central banks would adjust discount rates and tighten the monetary policy to avoid unnecessary fluctuations in the credit market of an economy, trying to neutralize the impact of inflation on the interest rates. This limits the impact of inflation on the amounts of banks' deposits and loans, minimizing any changes on capital structure.

(iii) Stock market risk

The empirical findings for market risk illustrate that it has a significant impact at 5% and 1% confidence level for the book and market leverage, respectively, of banks only in economically developed countries. The data also shows that market risk has a positive relation with the bank leverage, which is opposite to previous finding by Gropp and Heider (2007). One possible explanation is that increasing market risk induces higher uncertainty for the investors. They would be more hesitant in all channels of investment, prefer keeping money in banks until the market volatility is reduced. As mentioned by Angora et al (2009), banks operate in a highly competitive environment. This would result in attracting more deposits for the banks especially in the scenario of the rising market instability.

For banks in developing countries, there is insufficient evidence that market risk has explanatory power on their leverage ratios. Our finding is consistent with that of Octavia and Brown (2010). They explained this as a result of including both cross sectional and period fixed effects in the model.

(iv) Term structure spread

Term structure spread is statistically significant at 1% confidence level for bank leverage in only developed countries, showing a negative impact. This is, however, opposite of the positive relation as found by Gropp and Heider (2007).

Higher term structure implies the higher risk premium as compared to the risk free rate, resulting in higher costs of debts for banks. The preference on debts would reduce accordingly, which may account for the lower leverage ratio of banks.

In our opinion, the finding that term structure spread does not explain capital structure of banks in developing countries may be explained by the difference in the businesses as mentioned earlier. Banks in emerging countries are of more nature of commercial banking with ultimate function of accepting deposits and lending. Hence, they have to rely heavily on deposits as the main source of financing irrespective of the changing costs resulted from changes in term structure spread.

(v) Tax rate

Tax rate has shown to be statistically significant at 1% confidence level for both market and book leverage of banks in developing countries only, depicting a positive impact. This is in line with the findings of numerous studies, including Keen et al (2012) and Wieshi Gu Et al (2012). It can be explained referring to M&M theorem (1963) where the corporate financial notion of tax shield is highlighted. When taxes are involved, it is cheaper for the banks to switch to higher leverage ratios, utilizing tax benefits of debts.

The non-significant impact of tax rate on bank leverage in developed countries as compared to significant influence for that in developing countries can be explained by trade-off theory. As can be seen in our Table 4, the mean value of tax rates in developing countries is higher than advanced economies. This may imply the more important role of taxes in determining capital structure of banks in emerging countries, as the benefits of tax shields with higher tax rates are supposed to be higher than agency costs of debts.

6. Conclusion

The serious consequences of previous financial crises highlight the importance of supervision, especially in the banking sector. In order for a proper legislation system to be implemented, it is vital to have a thorough understanding about the operation of banks in general and determinants of their capital structure specifically. As raised by Berger et al. (2008), “Without understanding bank’s observed capital levels and capital cushions, it is hard to predict how they will respond to economic or supervisory changes”. This motivated us to conduct our paper in this field, examining determinants of bank leverage, at both bank and country levels with a closer look at Asian region.

As per our findings, the difference in banks’ leverage ratios between countries is proven to be statistically significant. It is believed that the disparity in the capital structures of banks depends upon the economic growth stage of the countries where they operate.

Regarding the determinants, we find that factors which have been proved to affect the capital structure in previous papers also have explanatory power in our tests against bank leverage ratios. All the variables included in our model can more or less explain changes in the capital mix of all the examined banks, except for inflation. Examining the bank-specific determinants, there are only some differences in terms of these factors’ significances. Collateral is observed to be significant in determining the capital mix of banks of developed countries only, whereas profit is a factor of significant importance for merely that of banks in developing countries. The results depict that the macroeconomic factors show more variations in influencing capital structures of banks in different countries. Tax is the only indicator that explains the capital ratios of banks in emerging countries, while the remaining factors are insignificant. Country-level determinants have shown to be more impactful on the capital structure of banks in advanced countries with the statistical significances of GDP, market risk and term structure spread. Drawing conclusion from the behavior of the macroeconomic factors, this strengthens the above mentioned observation of the existing difference between the capital structures of banks in developed and developing countries.

Mooij, Keen and Orihara (2013) shows that there exists a positive link between bank leverage and financial crisis. Thereby, the determinants of banks’ capital structure should be

taken into account carefully when drafting policies to mitigate their financial instability by imposing statutory capital requirements. According to Claessens et al. (2010), regulatory shortcomings have fueled up the global crisis. It concludes that regulatory authorities should provide incentives to the banks to negate the impact of the macroeconomic shocks. It implies that certain policies should focus not only on the bank specific factors but also the macroeconomic indicators. Together with our findings, it is recommendable that while establishing policies on banking sector, the authorities should also consider the economic development stage of different countries for a more properly applicable supervision system. We expect that this would contribute somehow to decision-making of bank managers as well as policymakers not only in Asia but worldwide also. Moreover, it is our hope that the paper will raise interest for further researches in the future as well.

APPENDIX I: List of countries by population 2011

Source: World Bank database

	Rank	Economy	(thousands)
CHN	1	China	1 344 130
IND	2	India	1 241 492
USA	3	United States	311 592
IDN	4	Indonesia	242 326
BRA	5	Brazil	196 655
PAK	6	Pakistan	176 745
NGA	7	Nigeria	162 471
BGD	8	Bangladesh	150 494
RUS	9	Russian Federation	142 960
JPN	10	Japan	127 817
MEX	11	Mexico	114 793
PHL	12	Philippines	94 852
VNM	13	Vietnam	87 840
ETH	14	Ethiopia	84 734
EGY	15	Egypt, Arab Rep.	82 537
DEU	16	Germany	81 798
IRN	17	Iran, Islamic Rep.	74 799
TUR	18	Turkey	73 640
THA	19	Thailand	69 519
ZAR	20	Congo, Dem. Rep.	67 758
FRA	21	France	65 434
GBR	22	United Kingdom	62 744
ITA	23	Italy	60 724
ZAF	24	South Africa	50 587
KOR	25	Korea, Rep.	49 779
MMR	26	Myanmar	48 337
COL	27	Colombia	46 927
TZA	28	Tanzania	46 218
ESP	29	Spain	46 175
UKR	30	Ukraine	45 706
KEN	31	Kenya	41 610
ARG	32	Argentina	40 765
POL	33	Poland	38 534
DZA	34	Algeria	35 980
AFG	35	Afghanistan	35 320
UGA	36	Uganda	34 509

	Rank	Economy	(thousands)
CRI	118	Costa Rica	4 727
IRL	119	Ireland	4 576
CAF	120	Central African Republic	4 487
GEO	121	Georgia	4 486
NZL	122	New Zealand	4 405
HRV	123	Croatia	4 403
LBN	124	Lebanon	4 259
COG	125	Congo, Rep.	4 140
LBR	126	Liberia	4 129
WBG	127	West Bank and Gaza	3 927
BIH	128	Bosnia and Herzegovina	3 752
PRI	129	Puerto Rico	3 707
PAN	130	Panama	3 571
MDA	131	Moldova	3 559
MRT	132	Mauritania	3 542
URY	133	Uruguay	3 369
ALB	134	Albania	3 216
ARM	135	Armenia	3 100
LTU	136	Lithuania	3 030
OMN	137	Oman	2 846
KWT	138	Kuwait	2 818
MNG	139	Mongolia	2 800
JAM	140	Jamaica	2 707
NAM	141	Namibia	2 324
LSO	142	Lesotho	2 194
MKD	143	Macedonia, FYR	2 064
LVA	144	Latvia	2 058
SVN	145	Slovenia	2 053
BWA	146	Botswana	2 031
QAT	147	Qatar	1 870
KSV	148	Kosovo	1 803
GMB	149	Gambia, The	1 776
GNB	150	Guinea-Bissau	1 547
GAB	151	Gabon	1 534
TTO	152	Trinidad and Tobago	1 346
EST	153	Estonia	1 340
BHR	154	Bahrain	1 324

CAN	37	Canada	34 484
SDN	38	Sudan	34 318
IRQ	39	Iraq	32 962
MAR	40	Morocco	32 273
NPL	41	Nepal	30 486
PER	42	Peru	29 400
UZB	43	Uzbekistan	29 341
VEN	44	Venezuela, RB	29 278
MYS	45	Malaysia	28 859
SAU	46	Saudi Arabia	28 083
GHA	47	Ghana	24 966
YEM	48	Yemen, Rep.	24 800
PRK	49	Korea, Dem. Rep.	24 451
MOZ	50	Mozambique	23 930
AUS	51	Australia	22 324
ROM	52	Romania	21 385
MDG	53	Madagascar	21 315
LKA	54	Sri Lanka	20 869
SYR	55	Syrian Arab Republic	20 820
CIV	56	Côte d'Ivoire	20 153
CMR	57	Cameroon	20 030
AGO	58	Angola	19 618
CHL	59	Chile	17 270
BFA	60	Burkina Faso	16 968
NLD	61	Netherlands	16 693
KAZ	62	Kazakhstan	16 559
NER	63	Niger	16 069
MLI	64	Mali	15 840
MWI	65	Malawi	15 381
GTM	66	Guatemala	14 757
ECU	67	Ecuador	14 666
KHM	68	Cambodia	14 305
ZMB	69	Zambia	13 475
SEN	70	Senegal	12 768
ZWE	71	Zimbabwe	12 754
TCD	72	Chad	11 525
GRC	73	Greece	11 300
CUB	74	Cuba	11 254
BEL	75	Belgium	11 021
RWA	76	Rwanda	10 943
TUN	77	Tunisia	10 674

MUS	155	Mauritius	1 286
TMP	156	Timor-Leste	1 176
CYP	157	Cyprus	1 117
SWZ	158	Swaziland	1 068
DJI	159	Djibouti	906
FJI	160	Fiji	868
GUY	161	Guyana	756
COM	162	Comoros	754
BTN	163	Bhutan	738
GNQ	164	Equatorial Guinea	720
MNE	165	Montenegro	632
MAC	166	Macao SAR, China	556
SLB	167	Solomon Islands	552
SUR	168	Suriname	529
LUX	169	Luxembourg	518
CPV	170	Cape Verde	501
MLT	171	Malta	416
BRN	172	Brunei Darussalam	406
BLZ	173	Belize	357
BHS	174	Bahamas, The	347
MDV	175	Maldives	320
ISL	176	Iceland	319
BRB	177	Barbados	274
PYF	178	French Polynesia	274
NCL	179	New Caledonia	254
VUT	180	Vanuatu	246
WSM	181	Samoa	184
GUM	182	Guam	182
LCA	183	St. Lucia	176
STP	184	São Tomé and Príncipe	169
CHI	185	Channel Islands	154
CUW	186	Curaçao	146
FSM	187	Micronesia, Fed. Sts.	112
VIR	188	Virgin Islands (US)	110
VCT	189	St. Vincent and the Grenadines	109
ABW	190	Aruba	108
GRD	191	Grenada	105
TON	192	Tonga	105
KIR	193	Kiribati	101
ATG	194	Antigua and Barbuda	90
ADO	195	Andorra	86

PRT	78	Portugal	10 557
CZE	79	Czech Republic	10 496
SSD	80	South Sudan	10 314
GIN	81	Guinea	10 222
HTI	82	Haiti	10 124
BOL	83	Bolivia	10 088
DOM	84	Dominican Republic	10 056
HUN	85	Hungary	9 972
SOM	86	Somalia	9 557
BLR	87	Belarus	9 473
SWE	88	Sweden	9 449
AZE	89	Azerbaijan	9 173
BEN	90	Benin	9 100
BDI	91	Burundi	8 575
AUT	92	Austria	8 424
CHE	93	Switzerland	7 912
ARE	94	United Arab Emirates	7 891
ISR	95	Israel	7 766
HND	96	Honduras	7 755
BGR	97	Bulgaria	7 348
SRB	98	Serbia	7 259
HKG	99	Hong Kong SAR, China	7 072
PNG	100	Papua New Guinea	7 014
TJK	101	Tajikistan	6 977
PRY	102	Paraguay	6 568
LBY	103	Libya	6 423
LAO	104	Lao PDR	6 288
SLV	105	El Salvador	6 227
JOR	106	Jordan	6 181
TGO	107	Togo	6 155
SLE	108	Sierra Leone	5 997
NIC	109	Nicaragua	5 870
DNK	110	Denmark	5 571
KGZ	111	Kyrgyz Republic	5 515
ERI	112	Eritrea	5 415
SVK	113	Slovak Republic	5 398
FIN	114	Finland	5 388
SGP	115	Singapore	5 184
TKM	116	Turkmenistan	5 105
NOR	117	Norway	4 953

SYC	196	Seychelles	86
IMY	197	Isle of Man	83
ASM	198	American Samoa	70
DMA	199	Dominica	68
BMU	200	Bermuda	65
MNP	201	Northern Mariana Islands	61
GRL	202	Greenland	57
CYM	203	Cayman Islands	57
MHL	204	Marshall Islands	55
KNA	205	St. Kitts and Nevis	53
FRO	206	Faeroe Islands	49
TCA	207	Turks and Caicos Islands	39
SXM	208	Sint Maarten (Dutch part)	37
LIE	209	Liechtenstein	36
MCO	210	Monaco	35
SMR	211	San Marino	32
MAF	212	St. Martin (French part)	31
PLW	213	Palau	21
TUV	214	Tuvalu	10
WLD		World	6 974 243

Notes: a. Excludes Abkhazia and South Ossetia.
b. Excludes Transnistria.

LIC	Low income	816 818
MIC	Middle income	5 022 403
LMC	Lower middle income	2 532 742
UMC	Upper middle income	2 489 661
LMY	Low & middle income	5 839 221
EAP	East Asia & Pacific	1 974 219
ECA	Europe & Central Asia	408 141
LAC	Latin America & Caribbean	589 015
MNA	Middle East & North Africa	336 540
SAS	South Asia	1 656 465
SSA	Sub-Saharan Africa	874 841
HIC	High income	1 135 022
EMU	Euro area	332 931

APPENDIX II: List and category of Asian countries

Source: World Bank

No.	Name	Rank	Note
1	Afghanistan	3	
2	Armenia	2	*
3	Azerbaijan	2+	*
4	Bahrain	1	
5	Bangladesh	3	
6	Bhutan	2	
7	Brunei	1	
8	Burma (Myanmar)	3	
9	Cambodia	3	
10	China (PRC)	2+	
11	Cyprus	1	*
12	East Timor	2	
13	Georgia	2	*
14	Hong Kong	1	**
15	India	2	
16	Indonesia	2	
17	Iran	2+	
18	Iraq	2	
19	Israel	1	
20	Japan	1	
21	Jordan	2+	
22	Kazakhstan	2+	*
23	Kuwait	1	
24	Kyrgyzstan	2	
25	Laos	2	
26	Lebanon	2+	
27	Macau	1	**
28	Malaysia	2+	
29	Maldives	2+	
30	Mongolia	2	
31	Nepal	3	
32	North Korea	2	
33	Oman	1	
34	Pakistan	2	
35	Palestine	2	

No.	Name	Rank	Note
36	Philippines	2	
37	Qatar	1	
38	Russia	2+	*
39	Saudi Arabia	1	
40	Singapore	1	
41	Sri Lanka	2	
42	South Korea	1	
43	Syria	2	
44	Taiwan (ROC)	1	
45	Tajikistan	3	
46	Thailand	2+	
47	Turkey	2+	*
48	Turkmenistan	2+	
49	United Arab Emirates	1	
50	Uzbekistan	2	
51	Vietnam	2	
52	Yemen	2	

Note:

- 1 Developed country: GNI per capita is above \$12,476
 - 2+ Upper-middle income country: GNI per capita is \$4,036 and \$12,475
 - 2 Lower-middle income country: GNI per capita is \$1,026 to \$4,035
 - 3 Developing country: GNI per capita is below \$1,025
- Low-income and middle-income economies are sometimes referred to as developing economies
- * Countries which lie in two continents
 - ** Territory/ Region only, not a country

APPENDIX III: Definition of variables

Book leverage = $1 - (\text{book value of equity} / \text{book value of assets})$

Market leverage = $1 - (\text{market value of equity} (= \text{number of shares} * \text{end of year stock price}) / \text{market value of bank} (= \text{market value of equity} + \text{book value of liabilities}))$

Size = book value of assets

Profits = Net profits/Book value of assets¹⁰

Market-to-book ratio = market value of assets/Book value of assets

Collateral = $(\text{Total assets} - \text{Loans}) / \text{Book value of assets}$ ¹¹

Dividend dummy = one if the bank pays a dividend in a given year

Asset risk = annualised standard deviation of daily stock price returns * (market value of equity/market value of bank).

GDP growth = annual percentage change of gross domestic product

Stock market risk = annualised standard deviation of daily national stock market index return

Term structure spread = xx year interest rate – yy month interest rate on government bonds¹²

Inflation = annual percentage change in average consumer price index

¹⁰ Profits = (pre-tax profit + interest expenses)/book value of assets as in Gropp and Heider's paper

¹¹ Collateral = (total securities + treasury bills + other bills + bonds + CDs + cash and due from banks + land and buildings + other tangible assets)/book value of assets as in Gropp and Heider's paper

¹² Term structure spread = 10 year interest rate – 3 month interest rate on government bonds as in Gropp and Heider's paper

APPENDIX IV: Sources of data

	Variable	Data source
Bank-level factors	Collateral	Thomson Reuters' Datastream
	Dividend	Thomson Reuters' Datastream
	Size	Thomson Reuters' Datastream
	Asset risk	Thomson Reuters' Datastream
	M/B	Thomson Reuters' Datastream
	Profit	Thomson Reuters' Datastream
Country-level factors	GDP growth	World Bank and CIA World Factbook database
	Inflation	World Bank and CIA World Factbook database
	Market risk	Thomson Reuters' Datastream
	Term structure spread	World Bank and Thomson Reuters' Datastream
	Tax	World Bank and KPMG databases

LIST OF REFERENCES

Aggarwal, Raj, and Sutthisit Jamdee, 2003, *Determinants of capital structure: evidence from the G-7 countries*, in Presentation at Financial Management Association meeting (Denver, Colorado)

Ali, Irfan., 2011, *Determinants of Capital Structure: Empirical Evidence from Pakistan*, N.p.

Al-Sakran, Sulaiman A., 2001, *Leverage Determinants in the Absence of Corporate Tax System: The Case of Non-financial Publicly Traded Corporations in Saudi Arabia.*, Emerald. N.p., 2001. Web. 19 May 2013

Angora, Alain, Distinguin, Isabelle and Rugemintwari, Clovis, 2009, *Excess capital of European banks: Does bank heterogeneity matter?*, University of Limoges, LAPE, 5 rue Félix Eboué BP3127, 87031 Limoges, France

Amidu, Mohammed, 2011, *Determinants of capital structure of banks in Ghana: an empirical approach*, Department of Accounting, University of Ghana Business School, Legon, Accra, Ghana, pp 67-79

Antoniou, Antonios, and Yilmaz Guney., 2002 , *The Determinants of Debt Maturity Structure: Evidence from France, Germany and the UK.*, N.p.

Bank for International Settlements website, available at <http://www.bis.org/bcbs/> , accessed on 28 April 2013

Baker, Malcolm, and Jeffrey Wurgler, 2002, *Market timing and capital structure*, Journal of Finance 57, pp 1-32

Bancel, Franck, and Usha R. Mittoo., 2004, *Cross-Country Determinants of Capital Structure Choice: A Survey of European Firms.*, Jstor. N.p.

Bas, Tugba, and Gulnur Muradoglu., 2009, *Determinants of Capital Structure in Developing Countries.*, N.p.

BAYLESS, MARK, and SUSAN CHAPLINSKY., 1990, *Is There a Window of Opportunity for Seasoned Equity Issuance.*, N.p.

Beck, Thorsten., 2008, *Financing Patterns around the World: Are Small Firms Different*, Science Direct. N.p.

Berlin Mitchell, 2011, *Can we explain banks' capital structure?*, Business Review Q2. 2011

Bevan, Alan A., and Jo Danbolt., 2000-2002, *Capital Structure and Its Determinants in the UK - a Decompositional Analysis*, N.p.

Booth, Lawrance. "Capital Structures in Developing Countries." N.p., 2001. Web.

Brewer, E., Kaufman, G. and Wall, L., 2008, *Bank capital ratios across countries: Why do they vary?*, Journal of Financial Services Research 34 , pp 177–201

Ça ğlayan, Ebru and Şak, Nazan, 2010, *The Determinants of Capital Structure: Evidence from the Turkish Banks*, Journal of Money, Investment and Banking ISSN 1450-288X Issue 15 (2010)

Chen, Jean J. Chen., 2004, *Determinants of Capital Structure of Chinese-listed Companies*, ScienceDirect.com. N.p.

Claessens, Stijn, and Giovanni Dell'Ariccia., 2010, *Lessons and Policy Implications from the Global Financial Crisis*, Imf.org. IMF

Correa, Carlos A., Basso, Leonardo F. C. and Nakamura, Wilson T., 2007, *What Determines the Capital Structure of the Largest Brazilian Firms? an Empirical Analysis Using Panel Data*, Journal of International Finance and Economics, Vol. 5, No. 1

Deesomsak, Rataporn., *The Determinants of Capital Structure: Evidence from the Asia Pacific Region*, ScienceDirect.com. N.p

De Jong, Abe., 2008, *Capital Structure around the World: The Roles of Firm- and Country-specific Determinants*, ScienceDirect.com. N.p.

Diamond, D. and Rajan, R., 2000, *A theory of bank capital*, Journal of Finance 55 , pp 2431–2465

Flannery, M., 1994, *Debt maturity and the deadweight cost of leverage: Optimally financing banking firms*, American Economic Review 84, pp 320–331

Frank, M. and Goyal, V., 2005, *Capital structure decisions: Which factors are reliably important?*, Financial Management forthcoming

Frank, M. and Goyal, V., 2007, *Corporate leverage adjustment: How much do managers really matter?*, unpublished working paper, University of Minnesota

Frank, M. and Goyal, V., 2008, *Trade-off and pecking order theories of debt*, in: E. Eckbo (ed.), Hand-book of Corporate Finance: Empirical Corporate Finance ,Vol.2, Elsevier, Amsterdam, pp 135–202

Gochoco-Bautista, Maria Socorro, 2008, *The impact of the global financial crisis on Asia and on Philippines*, Institute of Development Studies, Sussex

Graham, John R., 1996, Proxies for the Corporate Marginal Tax Rate, ScienceDirect.com. N.p.

Graham, John R., and Campbell Harvey, 2001, *The Theory and Practice of Corporate Finance: Evidence from the Field*, Journal of Financial Economics 60, pp 187-243

Greenlaw, D., Hatzius, J., Kashyap, A. and Shin, H., 2008, *Leveraged losses: Lessons from the mortgage market meltdown*, US Monetary Policy Forum Report No. 2

Gropp, Reint, and Florian Heider, 2007, *The determinants of bank capital structures*, Review of Finance, 2007

Grossman, Sanford J. and Hart, Oliver D., 1982, *The Economics of Information and Uncertainty*, National Bureau of Economic Research, pp 107-140

Hall, Graham, and Nicos Micheals., 2004, *Determinants of the Capital Structures of European SMEs*, N.p.

Harris, Milton, and Artur Raviv, 1991, *The theory of capital structure*, Journal of Finance 46, pp 297-355.

Heaton, J. B., 2002, *Managerial Optimism and Corporate Finance*, Willey Blackwell. N.p.

Jensen, Michael C., 1986, *Agency costs of free cash flow, corporate finance and takeovers*, American Economic Review 76, 323-339

Jensen, Michael C., and William Meckling, 1976, *Theory of the firm: managerial behavior, agency costs and capital structure*, Journal of Financial Economics 3, 305-360

Keen, Michael, and Masanori Orihara, 2012, *Taxation, Bank Leverage, and Financial Crises*, Fiscal Affairs Department, IMF working paper

Kraus, Alan and Litzenberger, Robert H (1973), *A State-Preference Model of Optimal Financial Leverage*, Journal of Finance, pp 911-922

Krugman, Paul, 2009, *The Return of Depression Economics and the Crisis of 2008*, p. 62, published by W. W. Norton & Company

Marsh, Pual, 1982, *The Choice Between Equity and Debt: An Empirical Study*, Blackwell Willey. N.p.

Mazur, Kinga, 2007, *The Determinants of Capital Structure Choice: Evidence from Polish Companies*, International Advances in Economic Research, Springer, vol. 13(4), pp 495-514

Miguel, Alberto De, and Julio Pindado., 2001, *Determinants of Capital Structure: New Evidence from Spanish Panel Data*, ScienceDirect.com. N.p.

McCoy, Patricia, A., 2006, *The moral hazard implications of deposit insurance: Theory and evidence*, Seminar on Current Development in Monetary and Financial Law, Washington DC, October 23-27, 2006

Melicher, Ronald W., Welshans, Merle T. and Norton, Edgar A., *Finance – Introduction to institutions, investments and management*, ninth edition, published by South-Western College Publishing in 1997, pp 586-611

- Milton, Todd, 2008, *Why Have Debt Ratios Increased for Firms in Emerging Markets?*, European Financial Management, Volume 14, Issue 1, pp 127–151, January 2008
- Modigliani, F. and Miller, M., 1958, *The cost of capital, corporation finance and the theory of investment*, American Economic Review 48, pp 261–297
- Mohanty, MS and Tumer, Philip, 2010, *Banks and financial intermediation in emerging Asia: reform and new risks*, BIS Working Paper No. 313
- Mooij, Ruud De, and Michael Keen., 2013, *Taxation, Bank Leverage, and Financial Crises*, Fiscal Affairs Department, IMF working paper
- Myers, S.C., 1977, *Determinants of corporate borrowing*, Journal of Financial Economics 5, 147-175
- Myers, S. and Majluf, N., 1984, *Corporate financing and investment decisions when firms have information that investors do not have*, Journal of Financial Economics 13 , pp 187–221
- Myers, S. and Rajan, R., 1998, *The paradox of liquidity*, Quarterly Journal of Economics 113, 733–771
- Octavia, Monica and Brown, Rayna, 2010, *Determinants of bank capital structure in developing countries: Regulatory capital requirement versus the standard determinants of capital structure*, Journal of emerging market Vol. 15. 2010, pp 50-62
- Omet, Ghassan, and Fadi Mashharawe., 2001, *The Capital Structure Choice in Tax Contrasting Environments: Evidence*, N.p.
- Ozcan, Sebnem Kalemli., 2012, *Leverage Across Firms, Banks and Countries*, N.p.
- Pandey, M.I., 2001, *Capital Structure and the Firm Characteristics: Evidence from an Emerging Market*, IIMA Working Paper No. 2001-10-04
- Rajan, R. and Zingales, L., 1995, *What do we know about capital structure? Some evidence from international data*, Journal of Finance 50, pp 1421–1460

- Romdhane, Mohamed, 2012, *The Determinants of Banks' Capital Ratio in Developing Countries: Empirical Evidence from Tunisia*, Research Journal of Finance and Accounting Vol 3, No 1. 2012
- Ronald W. Melitcher, Merle T. Welshans and Edgar A. Norton, 1996, *Finance – Introduction to institutions, investments, and management*, Ninth edition, Published by South – Western College
- Santoni, G. J., 1986, *The Effects of Inflation on Commercial Banks*, N.p.
- Soubbotina, Tatyana P., 2004, *Beyond Economic Growth - An Introduction to Sustainable Development*, Second Edition, The International Bank for Reconstruction and Development/THE WORLD BANK
- Stevens, Anthony, Ekberg, Jason and Kim, Taekyung, 2012, *Crouching tigers – The rise of Asian regional banks*, published by Oliver Wyman Company
- Taggart, Robert A., 1986, *The Growth of the "Junk" Bond Market and Its Role in Financing Takeovers*, National Bureau of Economic Resear. N.p
- Titman, S. and Wessels, 1988, *The determinants of capital structure choice*, Journal of Finance 43, pp 1–19
- Ullah, Wali, and Mohammed Nishat., 2008, *Capital Structure Choice in an Emerging Market: Evidence from Listed Firms in Pakistan*, N.p.
- Yueh-hsiang, Lina., 2005, *Managerial Optimism and Corporate Investment: Some Empirical Evidence from Taiwan*, ScienceDirect.com. N.p.
- Weishi Gu, Grace, and Ruud De Mooij., 2012, *Taxation and Leverage in International Banking*, Fiscal Affairs Department, IMF working paper
- Williams, Harley Tega, 2011, *Determinants of capital adequacy in the Banking Sub-Sector of the Nigeria Economy: Efficacy of Camels. (A Model Specification with Co-Integration Analysis)*, International Journal of Academic Research in Business and Social Sciences October 2011, Vol. 1, No. 3

Wong, Jim, Choi, Ka-fai and Fong, Tom, 2005, *Determinants of capital level of banks in Hong Kong*, Hong Kong Monetary Authority quarterly bulletin September 2005