Determination of Net Interest Margin in BRIC Countries

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ABSTRACT

This study explores the function Net Interest Margin (hereafter NIM) in almost 50 major banks belong to BRIC countries (Brazil, Russia, India and China) during the period 2004 to 2013 by using of panel data consists of 1,181 observations.

Our exploration is based on the methodology that has been introduced and applied in 1981 by Ho and Saunders [Journal of Financial and Quantitative Analysis XVI (1981) 581–600] and expanded by Angbanzo in 1997 – which we have used in our work. The main goal is to investigate and analyze the effectiveness of the variables those are commonly discussed in BRIC countries' markets. These variables are categorized into two sets: financial (accounting) variables and macroeconomic variables. The former includes Cost Efficiency, Managerial Efficiency, Size of Operation, Credit Risk, Liquidity Ratio and the latter includes Government Debt of GDP, Bank Concentration Ratio and Inflation. For analysis of the named variables, we have applied Random Effects GLS Regression model in STATA software.

The results show that Cost Efficiency Ratio at first place (with negative relation) and then Bank Concentration Ratio (sometimes positive, sometimes negative relation) were the two most dominant variables on NIM in all BRIC countries; whereas Government Debt to GDP was the least effective variable on it.

Keywords: Net Interest Margin, BRIC countries, Random Effects GLS Regression model

ÖZ

Bu çalişma 'BRIC' diye adlandirilan Brezilya, Rusya, Hindistan ve Çin'de faliyet gösteren en büyük 50 bankaya ait verileri kullanarak, bu ülke bankacılık sistemlerindeki faiz marjının hangi faktörler tarafından belirlendiğini ortaya çıkarmak amacıyla yapılmıştr.

Bizim araştırmamız Ho ve Saunders tarafından 1981 yılında yapılan yönteme dayanmaktadır (Journal of Financial and Quantitative Analysis XVI (1981) 581–600). Ayrıca, bu yöntem 1997 yılında Angbanzo tarafından genişletilmiştır.

Çalişmada kullanacağımız de ğişkenleri: Mali değişkenler ve makroekonomik değişkenler olarak iki gruba ayırabiliriz.

Birinci gruba Maliyet Etkinliği, Yönetim Verimlilik, çalışma Boyutu, Kredi Riski, Likidite Oranı dahildir. Ikıncı grupise içborçoranı, Banka Yoğunlaşma Oranı ve Enflasyon değerlerini içerir.

Değişkenlerin analizi için, STATA yazılımında Rastsal etki GLS regresyon modelini uyguladık.

Elde edilen sonuçlar tüm BRIC ülkelerinde NIM üzerinde iki değişkenin baskın olduğunu gösteriyor. Bu değişkenler içerisinde en önemliolan, Maliyet Etkinliği Oranı ve daha sonra Bank Yoğunlaşma Oranı (bazen olumlu, bazen de olumsuz ilişki) yer almaktadır. Bu değerler içerisinde devlet borçlanma oraru etkili değişken olarak görünmüştür.

Anahtar Kelimeler: Net Faiz Marjı, BRIC ülkeler, Rastsal Etki modeli(GLS)

DEDICATION

I dedicate my dissertation work to my lovely family and my friends. A special feeling of gratitude to my loving parents Fatemeh and Mustafa Behravesh Whose words of encouragement and push for tenacity ring in my ears. My dear sisters Mahshid and his wonderful husband Naser, Azar and my brother Masood have always support and courage me.

I also dedicate this dissertation to my best friend who has supported me throughout the process Mr. Shahin Mehdipour Ataee.

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INTRODUCTION

Banking systems are crucial components of the global economy. It has been proven that an effective and proficient banking system can have a substantial effect and positive externalities in the economic growth of any country.

Banks are the main feature in a country for channelizing of funds between lenders and borrowers. In other words, they are financial intermediates for flow "funds of savings" to "investment opportunities" in economy. For this transitional role (channelizing funds from surplus to deficit), banking systems entail receiving of lending interest and should pay borrowing cost. The difference of lending interest and borrowing cost is known as NET INTEREST MARGIN (hereafter NIM) of bank that is formally defined as follows:

Net Interest Margin: The spread between a bank's interest earnings and expenses as a percentage of interest-earning assets.

NIM is the most commonly used function for measuring the efficiency of financial intermediations.

The magnitude of NIM has been a controversial issue in financial market because it is difficult to clarify whether higher level of NIM is better or lower level of it (both

from social welfare and financial perspective). Higher NIM leads to reduction of efficiency in financial systems and distortion in savings and investment schema of the market. As a consequence, this distortion in level of investment and saving slows down the growth of economy. Whereas, this higher NIM on the other hand, may result a degree of consistency for banking sectors that help them to shelter themselves from market risks or other economic shocks (it happens by growth their profitability). Additionally, in the absence of well-operating equity markets, higher NIM resulting to higher internal profit. That can be a good solution for banks to enhance their capital bases.

Conversely, narrower NIMs (lower level NIMs) can lead to relatively competitive banking systems with low level of regulatory taxes (e.g. capital requirements and reserve); Moreover this low level of NIM leads to decrease intermediary's expenditure from social's/customer's perspective and it is necessary to carry out the banks' intermediation role with the lowest cost in order to achieve greater social welfare.

In this context, the main part of our study concentrates on determining of the most effective parameters on NIM; such as cost efficiency, managerial efficiency, size of operation, credit risk, liquidity, Government Debt to GDP, bank concentration and inflation.

Chapter 2

Literatures & Review of Selected Studies on Interest Margin

The study of the bank interest margin can be drawn back to (1945), when Samuelson described how changing the level of the interest rate affected the banking system Samuelson (1945). Main effort to determine of bank margin was done by Ho and Saunders (1981).

The dealership model which is suggested by Ho and Saunders (1981) is the beginning argument for examining the determinants of the interest margin which has been the reference structure for most empirical analyses of the determinants the banks net interest margins. This original study by Ho and Saunders (1981) starting from the idea of banking firms as intermediaries between lenders and borrowers. According them, banks are considered as risk-averse intermediations in economy, accumulating credits and deposits and contributing loans. In their model, financial intermediary perform as passive dealer (similar to specialists on securities exchanges), It has to smooth its actions and operation with the help of the money market and bear the risk of short-term interest rates Kaiguo Zhou (1997) and only have its power to alter prices as a tool to manipulate demand for its products Allen (1988). Moreover, Bank relies only on pure intermediation activities such as deposit taking and lending Santiago Carbo and Francisco Rodrıguez (2007).

Additionally, Ho and Saunders (1981) declare that the degree of market competition and the interest rate risk that the bank is exposed are two basic components of the interest margin.

According their model, the net spread equation is as follows:

$$s = a + b = \frac{\alpha}{\beta} + \frac{1}{2} R \sigma_I^2 Q$$

where a is the margin on deposits, b the margin on loans, $\frac{\alpha}{\beta}$ measures market power, R is the banks' risk aversion, σ^2 is the variance of the interest rate on deposits and loans, and Q measures the size of bank transactions.

They declared that the interest margin has two rudimentary and fundamental elements: the market's competition and the interest rate risk that banks are exposed. Their findings show that pure spread is depending on four elements: the level of managerial risk aversion; the scale of bank transactions; market structure of the bank and the interest rates variance. They found that this spread was positively and significantly related to the variance in the rate on bonds such as predicted by the theoretical models. Furthermore, it is revealed that the smaller banks had an average transaction spread of relatively one-third of one percent more than the larger banks. Although this difference was small, statistically is quite significant. It was concluded that the difference was mainly because of market structure aspects which allowed the smaller banks to gain some additional "producer's" rent or profit Ho and Saunders (1981).

Many empirical tests of dealership model have yielded different results. Lerner (1981) debated the Ho–Saunders model and recommended that the understandings arising from the acknowledgement that a (multi-output) production function exists

require a more comprehensive analysis of bank margins. Lerner (1981) cited the failing of Ho and Saunders model in recognition of the bank as an entity that have production function which is accompanying with intermediation services providing. Expense associated with the inefficiency of production progress through banks can bring distortion on the margin. The extension of the basic dealership model by Maudos and Fernandez de Guevara (2004) responds to this criticism explicitly. Incorporating the role of operating costs and providing a detailed description of the link between riskiness and the margin. This model specifically differentiates between market risk and credit risk, as well as their interaction as separate factors affecting the margin.

Additionally, the dealership model has been extended by a number of other researchers such as Allen (1988), and Angbanzo (1996) and McShane and Sharpe (1985). They view the bank as a dynamic dealer, setting interest rates on loans and deposits to balance the unequal arrival of loan demands and deposit supplies. The ownership structure of the bank is one the variables that could affect the margins significantly which is later examined and analysis by Zuzana Fungacova and Tigran Poghosyan (2011).

Allen (1988) extends the presence of different types of credits and deposits. His study demonstrated the diversification benefits derive from the interdependence of demands across bank services and products. A type of portfolio effect, Control over relative rate spreads across product types, and the ability to control the arrival of transactions demands, enables the financial intermediary to maintain a more active role in handling and managing its portfolio risk exposure Linda Allen (1988).

Angbanzo (1997) prolongs the dealership model and take into account credit risk as well as interest rate risk. The indications declare constancy with the theory that interest margins reveal both interest rate risk premium and default. In addition, their results show that positive relation between core capital and interest rate margin, management quality, non-interest bearing reserves and negatively related to liquidity.

McShane and Sharpe (1985) alter the source of interest rate risk, placing it in the insecurity and uncertainty of the money markets in place of the interest rates on credits and deposits, as in the first study by Ho and Saunders (1981). Saunders and Schumacher (2000) work is a sample of seven OECD countries (six European ones plus the United States). In their model, a bank is viewed as a risk-averse dealer in the credit market, acting in-between demanders and suppliers of funds as intermediary. These studies investigated the determinants of bank margins and found that the interest margin depends on both the degree of market competition and the interest rate risk. In Maudos and Guevara (2004), operating cost was included and a direct estimation of market power applied in an empirical study covering five European countries' banking firms from 1993 to 2000. The results suggested that market power, operational cost, risk aversion, interest rate risk, credit risk, implicit interest payments, opportunity cost and quality of management are all positively related to the net interest margin, which is consistent with the theoretical model developed in Ho and Saunders (1981).

In oppose side, the banking firm's model of micro economy outlooks the banking in a fixed and stable setting where demands and supplies of deposits and loans at the same time clear both markets. Micro-model is firm-theoretical model and is an alternative to dealership dynamic approach. In this model, banks assumed to set the

deposit and loan rate simultaneously Zarruck and Madura (1992). In other words, they noticed the banking firm in a static setting where supply and demand of deposits and loans simultaneously determine both markets by employing the micro-model of the banking firm approach Wong (1997). In Zarruk and Madura (1992), there is an analytical mistake which invalidates their results. Zarruk and Madura model loan defaults by a random variable lying between zero and the total amount of loans granted by a bank. The total amount of loans, on the other hand, is a function of the loan rate. This implies that the support of random loan defaults moves as the bank changes its loan rate. Zarruk and Madura (1992) overlook this moving support factor and thus fail to obtain the correct first-order condition. When this factor is taken into consideration, none of the comparative statics considered by Zarruk and Mudura are determinate Kit Pong Wong (1997)

In our study, determinant variables of NIM, proposed by the dealership model of Ho and Saunders (1981) for BRIC countries are investigating. Recent historical review of the empirical literatures on determinants the bank net interest margin are as follows: Saunders and Schumacher (2000) that investigate OECD (Organization for Economic Cooperation and Development)countries and European banks; Maudos and Fernandez de Guevara (2004) that focused on Latin American countries and Claeys and Vander Vennet (2008)who studied emerging markets in Europe.

Dealership model uses in this study is based on the Angbanzo (1997) work that may provide useful financial management tools for banks in the face of increased uncertainties over the changes of interest rate.

2.1 "BRIC" Countries and Their Banking Structures

Four big economy of the world Brazil, Russia, India and China had formed a political organization among themselves named by "Jim O'Neill" as BRIC countries in 2001. Many studies focus on these 4 big countries because they are new emerging economies in recent decades in the world and will be quite dominant in following years. According the followings findings we can see the significance impact of BRIC countries for the future economy world.

By attention to the economic statistics, it is clear that BRIC countries dramatically are developing. Almost in 2050 their combined economies could affect the richest cooperative economies such as European Union or G7 summit in the world. BRIC countries have more than a 25% of the world's land area and more than 45% of population in the world. From political view, their leaderships trying to alter their political system for practice global capitalism. In 2004 study by "Goldman Sachs" predicted that in BRIC nations, the people with a yearly income over 3,000 $ will be double in number during three years and reach 800 million people within decade. This means an enormous growth in the size of the middle-class in these countries. Also it is forecasted in 2050, the people in BRIC nations who earn over 15,000$ might reach over 200 million people. This indicates that a huge demand will not be limited to basic goods but affect higher-priced goods as well. According to the report, China firstly and then a decade later India will begin to dominate the world economy. Goldman Sachs analysis and statistics also anticipates that China and India, respectively, will become the dominant and principal global suppliers of manufactured goods and services, while Brazil and Russia will become similarly

dominant as producers and suppliers of raw materials. Developed economies have already taken serious note of these facts about BRIC countries economy growth.

Table 1:Gross Domestic Product in 2006

Rank 2050	Country	2050	2045	2040	2035	2030	2025	2020	2015	2010	2006	Percent increase from 2006 to 2050
1	China	70,710	57,310	45,022	34,348	25,610	18,437	12,630	8,133	4,667	2,682	2536%
2	United States	38,514	33,904	29,823	26,097	22,817	20,087	17,978	16,194	14,535	13,245	190%
3	India	37,668	25,278	16,510	10,514	6,683	4,316	2,848	1,900	1,256	909	4043%
4	Brazil	11,366	8,740	6,631	4,963	3,720	2,831	2,194	1,720	2,087	1,064	968%
5	Mexico	9,340	7,204	5,471	4,102	3,068	2,303	1,742	1,327	1,009	851	997%
6	Russia	8,580	7,420	6,320	5,265	4,265	3,341	2,554	1,900	1,371	982	773%

Source: "BRICS AND BEYOND" - Goldman Sachs study of BRIC and N11 nations, November 23, 2007

In this study these four countries were selected because of emphasizing the significant and considerable role and effect of them in the future world economy. Meanwhile due to the availability of relevant accounting data, financial and macroeconomic variables needed in my study, as explain in chapter 3.

2.1.1 Brazil

The financial system in Brazil is the biggest and quite sophisticated between Latin American countries. The first financial institute in Brazil was established in 1808"Banco do Brazil". Up to now lots of changes happened in Brazilian economy and its financial system, especially in recent decades banking sector in Brazil suffered from main and important fluctuations: in 1994 Brazil encountered by serious hyperinflation problem that they could overcome by introduction of new currency, the Real (R$)and creating wide spread networks to earn the gains of float, meanwhile they have also adjusted their market to more constant and stable environment in comparison the previous decades and it is appeared to be rather resistant to the current international financial crisis.

Table 2: main type of bank in Brazil

Type of bank[2]	1997	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
State controled [3]	27	15	15	14	14	13	13	12	10	9	9
Private	190	152	150	150	147	146	143	147	148	148	151
National	118	76	78	82	77	78	77	83	82	77	73
National with foreign capital [4]	23	11	10	10	13	12	10	2	6	11	16
Foreign controlled [5]	33	56	53	49	49	48	49	56	54	54	56
Foreign branches [6]	16	9	9	9	8	8	7	6	6	6	6
Total	217	167	165	164	161	159	156	159	158	157	160

Source:IMF,2012

Another prominent change was the entrance of foreign banks into Brazilian market from 1997. Also, in the past twenty years, there has been a concentration practice in the banking sector of Brazil caused by mergers and acquisitions. The latest large merger was between "Itao and Unibanco". Reduction in prominence of the public banks, both in number and in market share, has also been noted. In 1997, there were 230 operating banks, including national private and state –controlled banks, partially or totally foreign-owned private banks, and international banks branches as well. The

number decreased to 165 in December 2003 and in 2010 almost 157, through this period the number of foreign controlled banks doubled and the amount of state controlled banks has been decreased by two-thirds.
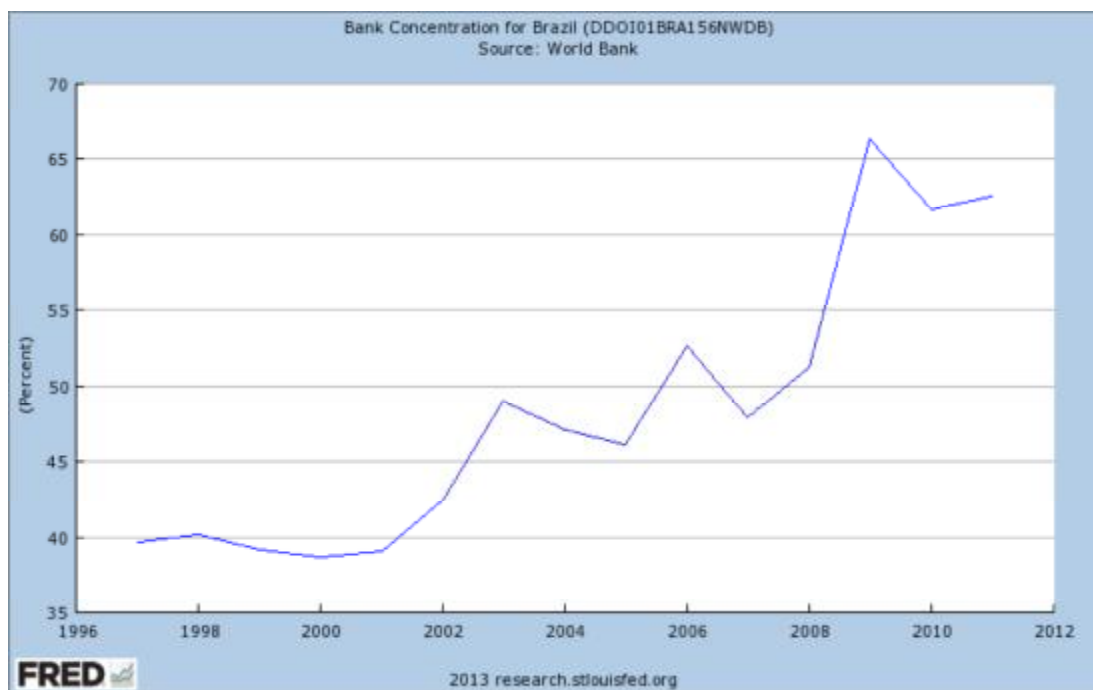
Figure 1 :Bank concentration for Brazil

Moreover, in recent years a reduction in prominence of the public banks, both in number and in market share, can also be attention. By decreasing in state banking and increasing the number of international banks in the country, there were expectation of great benefits for banking customers. Nevertheless, the consolidation process results in Brazil were below expectation and even sometimes negative according the credit/GDP ratio and financial cost of intermediation. According the Correa et al (2010), there was a huge reduction in banking spread from 120% in 1994 to 40% in the early 2000s which is almost sustained till today. However, this financial intermediary cost in terms of absolute rate and spreads, still remains highest in the world. Moreover, deterioration in the credit-to-GDP ratio from 35% in 1994 to 22% in 2002 was observable in Brazil. Six large banks have more than 75% of the

total assets of banking sector in Brazil so; the banking sector is almost concentrated. This trend is the result of ongoing process which is initiated in the 1990s and then later after two major transactions has stabilized more: the acquisition of Banco Real by Santander (2007) and the merger of Itao and Unibanco (2008). After that, only minor acquisitions and merging happened and less significant effect on banking sector concentration and lead to fix each banks' position in the ranking.
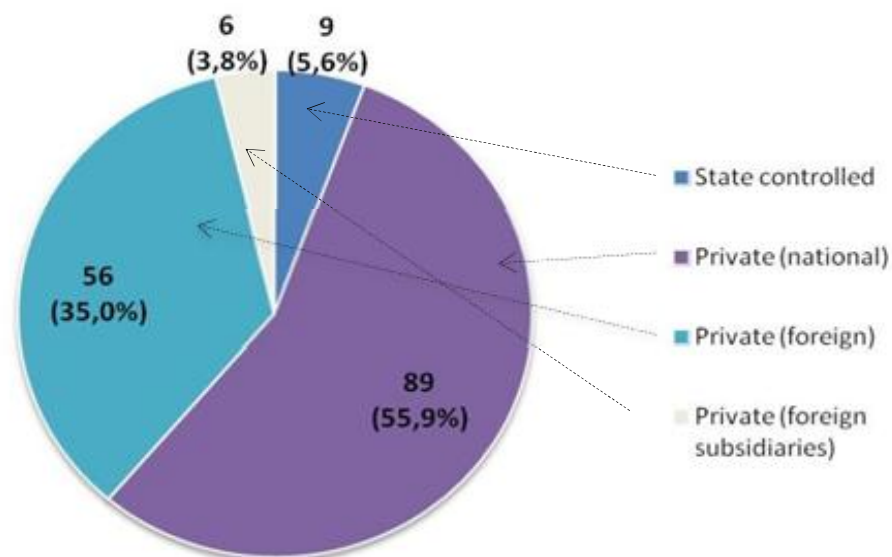
Figure 2: Brazilian banks per capital structure-DEC 2011

One of interesting thing about Brazilian bank is about banking products. The larger banks' interest usually dominated by small or middle size financial institutions. This style cause the smaller banks have to take more risk and search for steadily specific positions. Brazilian banking system in comparison to the other advanced and emerging economies and countries, has high level of liquidity, capitalization and profitability, meanwhile NPLs (non-performing loans) are decreasing and are in the middle level.
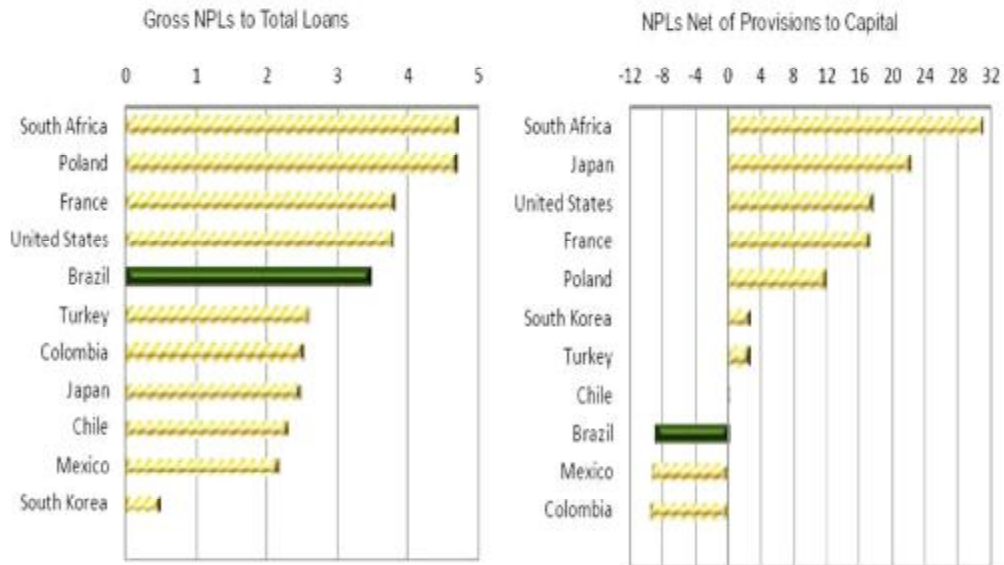
Figure 3: Gross NPLs and net of NPLs of Brazil in comparison other countries

2.1.2 Russia

Russian market is the largest market between Central and Eastern European countries and has been experienced dynamic growing in recent decade. Banks are the main and dominant financial intermediary institutions in Russia and also are strengthened their roles in growth of economy in Russia, but Russian banking sector is still small in comparison with the banking sector in other transition economies even those of recently joint EU member countries. Recently plenty potential in Russian financial market is focus on interest for foreign strategic investors –notwithstanding the global financial crisis. According to analytical overview of developing in banking sector in Russia, there are some main topics: the evolution and renovation of regulatory and legal foundations, reform banking supervision, restructuring in banking sectors and changes in banks' main sources, FDI and the role of foreign banks and government new interaction and assistance.

In August 1998, financial crisis damaged Russia and several other East-Asian countries Financial and banking system. During those days' foreign investors and

security holders began to sale huge amount of their assets and their holding, they extracted their capital from Russian financial market. Simultaneously, the foreign currency earning and reserves in Russia decreased intensely due to decrease in oil prices and international laws, asked for repayment of the Russian bank debts. This caused to escalate the Ruble exchange rate from 6.5% to almost 20 Rubles to a dollar. The crisis affected banking system seriously as well. Many banks had to affiliate with other banks and merge. However, more than half of the banks could endure the majority of the crisis such as "St.peresburg" and "Bank Petovsky". Later banks with debts to foreign banks successfully could overcome their obligations through their agreement with creditor's banks. However, Russian banking reforms and development experienced slow recovery and reformation after the 1998 financial crisis. Russian successfully could overcome the destructive consequences of this adversity. Banking sectors in Russia demonstrate that they can be reliable mediators and partners for foreign investors and investment in Russia. Later higher pace of institutional reforms were occurred in (2003-2005) which lead to great improvements in banking sectors activities and directional practices. Meanwhile, homegrown banking was growing scarcity and then after their accelerated expansion is observable, which is definitely affecting the Russian and global financial market.

After the rapid and vigorous rising oil and raw material prices since 1999s, main improvement in Russian trade, practical macroeconomics reforms policies, relatively successful structural and institutional reformations, provides economic expansion in Russia at the edging of new millennium. Therefore, thorough the decade from 1999 to 2008, the country has experienced an average annual GDP growth rate of relatively 7.1%.

Also the banking–sector assets over GDP almost doubled between 2000 and 2007, exceeding relatively 62% as of end-2007 (Central Bank of Russia, 2008) and also the growth in bank credit extension to the private sector as a share of GDP indicated a similar pattern thorough this period.

Table3: Macroeconomic, monetary and financial indicators for Russia(2002-2008)

	1998	1999	2000	2001	2002	2003
Real GDP growth	-5.3	6.3	10.0	5.1	4.7	7.3
Gross fixed capital formation growth	-12.4	6.3	18.1	10.3	3.0	12.9
CPI inflation (Dec./Dec.)	84.5	36.6	20.1	18.8	15.1	12.0
Exchange rate (Rouble/USD, average)	9.7	24.6	28.1	29.2	31.4	30.7
Unemployment (ILO-type measure, end year, percentage of labour force)	13.2	12.4	9.9	8.7	8.8	8.0
Exports of goods (USD billion)	74.4	75.6	105.0	101.9	107.3	135.9
Imports of goods (USD billion)	58.0	39.5	44.9	53.8	61.0	75.4
Current account (USD billion)	0.2	24.6	46.8	33.9	29.1	35.9
as a per cent of GDP	0.1	12.6	18.0	11.1	8.4	8.3
Budget balance (general government, per cent of GDP)	-5.3	-0.5	3.5	3.1	0.3	1.2[1]
CBR gross foreign exchange reserves (USD billion, end of period)	12.2	12.5	28.0	36.6	47.8	76.9

Source: Central Banking Of Russia, CBR&wiiw

The following Figure shows the changes of concentration ratio of banks during 1996-2012 for Russia, the overall trend shows decreasing during the period of 1996 -2012. In Russia the detail trends are as follows: it seems that during 1997 to 2002 the changes were not considerable except in 1999 to 2000, while in 2003 there was dramatic decrease; high level of bank concentration ratio after 2004 gradually decreased up to 2011. These changes seem to because of highly emerging of new firms and small entities in Russia that would lead to change the market structure in both countries. Decrease in the level of concentration ratio in their banking sector causes that the level of competitiveness increase in Russia. This ratio in Russia is quite more significant in comparison with other countries.

According (Saunders and Schumacher, 2000; Maudos and Fernandez de Guevara, 2004) it should be positive relation between concentration ratio and NIM. By

increasing the concentration ratio in market, competition decrease and banks can widen the spread of interest income and interest expenses (NIM).
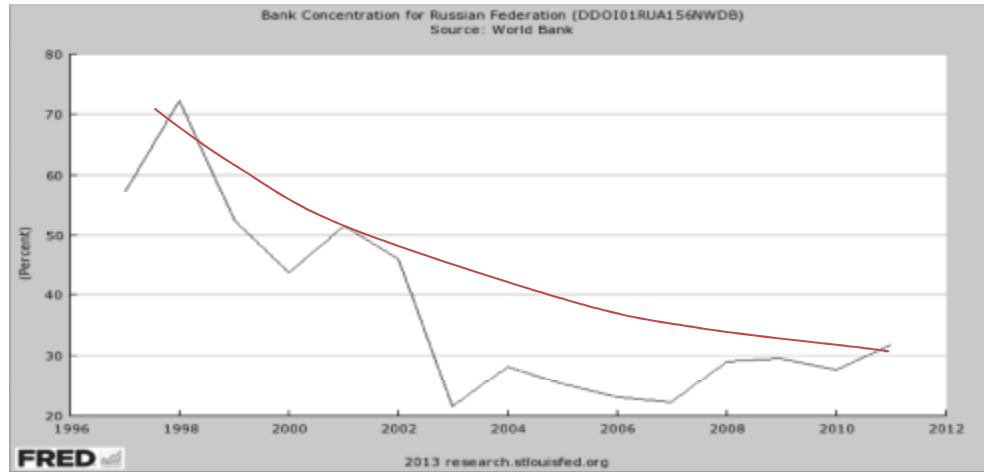
Figure 4:Bank concentration Ratio in Russia
Source :world bank data base

2.1.3 India

Indian banking sector is divided in two major periods: pre-reform and post –reform period. This major shift of pre and post liberalization period was happened after the introduction of financial sector reforms and deregulation in 1992 in India. The nationalization of large Indian commercial banks had a great impact on the commercial banks operation in the country. These fundamental reforms had led to improve the efficiency of Indian banking system. There are many studies in cost, profit and advance (credit) efficiency by using "parametric method" for better understanding the impact of financial reforms on banking performance of Indian commercial banking sectors. In the post- nationalization period, rapid extension of banks in relations of coverage and deposit mobilization happened and also many changes in financial policy occurred. Huge amount of credit was diverted for

prominence sector lending. In this period banking sectors were applied as an instrument to finance government deficit through high Reserve Ratio (CRR) and Statutory Liquidity Ratio (SLR). Accompanied by high CRR and SLR, the operational freedom of the banks was cut with high significance sector lending standards (almost 40% of total lending in 1989-90), non- performing asset (NPA) rose from 14% in 1969 to 35.4% in 1990. Meanwhile for keeping the government borrowing cost to low, the bank loan interest rate was fixed less than interest rate of market. This leads substantial effect on the efficiency and profitability of banks and financial market. Before fundamental reforms and changes in 1992, the public sector has major dominant in financial market of India and there was no main competition. Meanwhile, by expansion in financial policy the number of baking branches defaulting increased, especially in rural areas, which led to reduction of resources for the banking industry. Then after in 1991, Indian economy exposed by a major crisis for imbalance of payment. The resources of foreign exchange almost vanished, inflation was extended by double digits and fiscal deficit was quite high. India decided to manipulate main economic reforms to wash out and overcome the financial crisis, especially in financial sectors. Since then for attain the growth in financial market and private sectors, financial resources were required, and financial system must renovate and change, thus in 1992 the financial sector's reform were established and introduced by Chakravarti Committee Report (Report of the Committee for the Review the Working of the Monetary System) which was started almost in 1985 but the main motion was happened in 1992 by implying the commendation of the Committee of Financial System(CFS) Narasimham (1991). Approximately most of the recommendations of the CFS have been applied in staged manner. Later in 1998 an additional committee, the committee of Banking Sector

Reforms (BSR) was established Narasimham (1998). And almost those commendations of the BSR committee have also been done in phased method. As we can see the recent structure of banking system in India, some main reformations introduce by BSR committee which are applied up to now are: Reduction in the legislative and statutory pre-emption, Interest rate liberalization, increased independence and autonomy and competition and Regulatory Norms.

2.1.4 China

During last decade, Chinese economy has raised about 10% per year, and it is predicted that it's going to become the largest economy in the world thorough the coming future. The globalization of trade in China may be the main reason for this rapid growth, but the banking sector in china has yet to "globalize". In 1970s, banking system in china consisted of only one bank –the people's bank of china (PBC). That was belonged to ministry of finance and had the main role in economy of china. It collected the revenues from enterprises and distributed them to investors' funds approved within the budget, Walter and Howie (2011). The modernization of the banking system in china was started in 1978 by establishment of three major banks ABC(Agricultural Bank of China), CCB (China Construction Bank), BOC (Bank of China) these are specialize respectively in rural banking activities, foreign currency transitions and international activities and servicing the construction industry. From the late 1980s, the government permitted to establish some other domestic banking institutes such as BCOM (Bank of Communications). Nowadays the Chinese banking sector is dominated by four major and very large state-owned banks-the "big four". By 1990 the Big Four were the **Bank of China, Bank of Communications, Central Bank of China and the China Construction Bank.**

They have three-fourth of banking industry assets, and quite few foreign banks. However, the financial and legal system in China banking sector is not well advanced and developed–even in comparison of developing nations. The banking industry was experiencing high level of concentration, and obviously the efficiency of banking system was quite lower than banking section in comparison with other developed countries. Even though, the most researchers on developing economies such as China strictly suggested that for achieving high rate of growth, the major and significant changes in the banking sector and financial infrastructure was required. Also their findings show that the state ownership was companioned with low proficiency, low degree of economic growth and limited access to credit in developing nations. Since the 1990s, foreign investments were allowed to invest in Chinese banks, and then later in 2001, Chinese banking sector was opened for foreign banks entry into the country banking industry. Following entry rose competition in Chinese banking and forced them to increase their efficiency and productivity in order to survive and preserve their market shares. In (2001), China joint WTO and agreed the programs of changing in its banking system to open for foreign competition. In 2003, the CBRC (China Banking Regulatory Commission) started to work as a responsible for banking supervision, regulation, and separating policy from function. In 2006, foreign–owned banks that locally incorporated were allowed to receive the license for currency services to individual customers in China. Rapid growth of economy in China needed more expansion in banking activity during the previous years, and now Chinese banking system are more commercially orientated over the current period, although the government still have significant and considerable influence over the banks activities. And nowadays commercial banks in

china are achieving and maintain robust profitability over recent years, 15-20 per cent per annum of after the aggregate tax returns on equity.
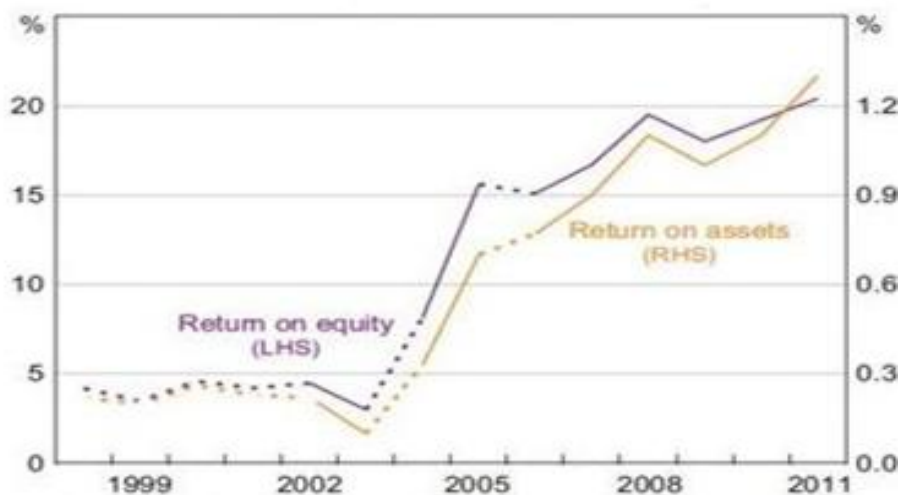

Figure5 :Chinese Banks' Profitability
Source:CBRC:Garcia-Herrerro,Gavila and Santabarabara(2006)

As it's observable in Figure 6, the growth of profit supported by fast expansion in lending of banks through this period.
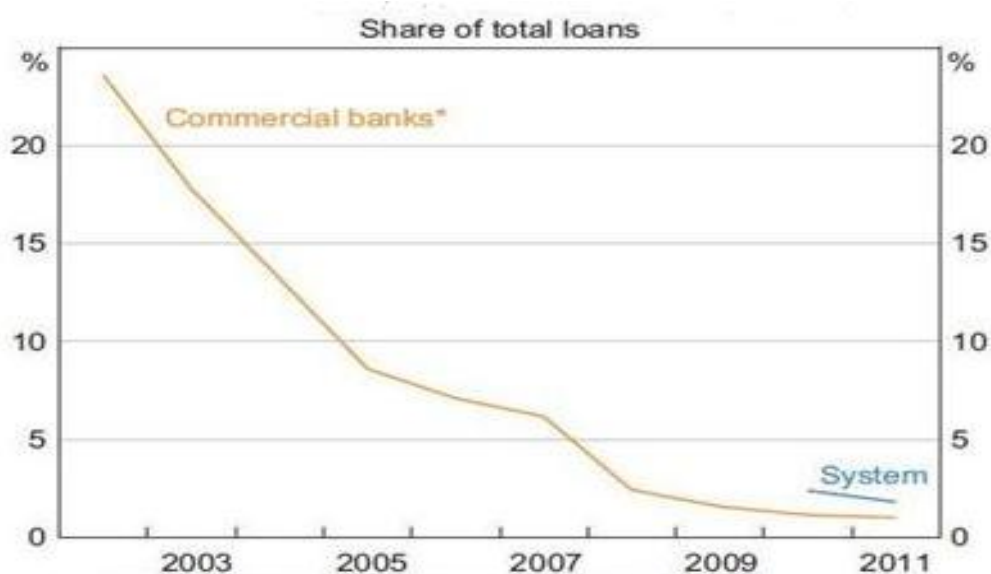

Figure 6:Chinese Banks' Non –performing Loans
Source :CBRC (Central Banking Republic Of China)

Banks had the ability to fund the increased lending through their deposit growth which was supported by strong, robust and forceful economic conditions and high rate of saving in China. During the previous decades banking sectors in China has grew from a mono system to quite more commercially positioned banking system controlled by individual and separated supervisor and central bank. Now banking sector in China includes of five large commercial banks in the world and many various small commercial institutions. But the majority of ownership of main and large banks in China is governed by Chinese government and authorities. Banks in china are funded themselves through domestic deposit and lend them to large or middle size or small businesses, consist of state-owned enterprises. Profitability and capitalization of chinese banks have improved mainly during the past years according measures the performance of asset. The improvement and progress occurred in an environment of robust growth in credit and income in China. Chinese banking sector has become independent and less concentrated nowadays with many deregulations in financial market, through increase the number of commercial banks, create of joint equity banks and establish many local banks by local governments. However, market structure in China is away from competitive market in comparison developed countries as South Korea and other.

2.2 Theoretical Background

Studies indicate that the interest margin in banking sectors is different in every country. According the empirical evidence advocates that interest margin in developed economies is significantly lower in comparison with developing countries. In developing countries there is low degree of market competition and low level of efficiency and also high level of reserve requirements ratios which is observed in Latin America Gelos (2008). According the empirical evidence, the level of interest margin in developing economies is persistently higher than in developed economies. Net interest margin average during 2004-2013 in BRIC countries is observable in Figure 7-10.

Figure 7- Net interest margin average during 2004-2013 in Brazil
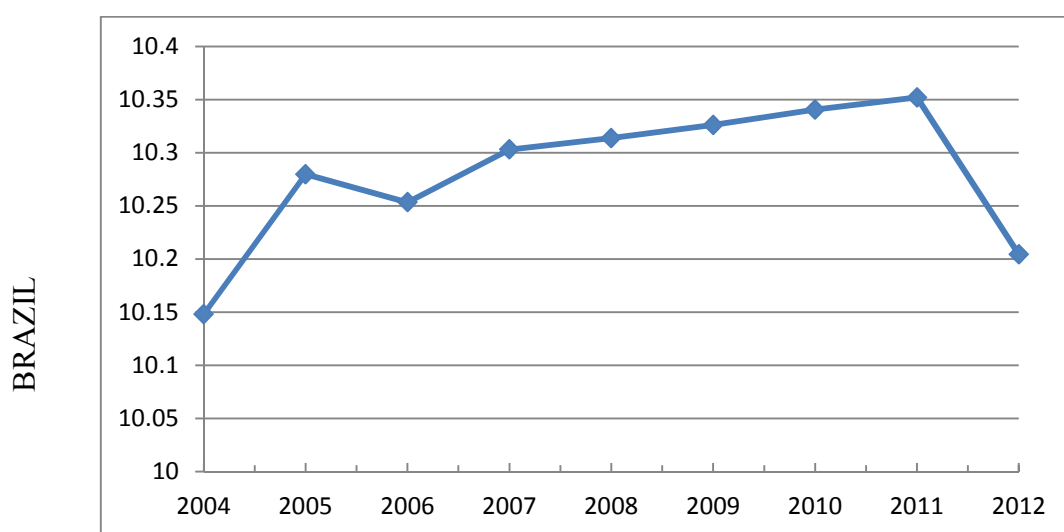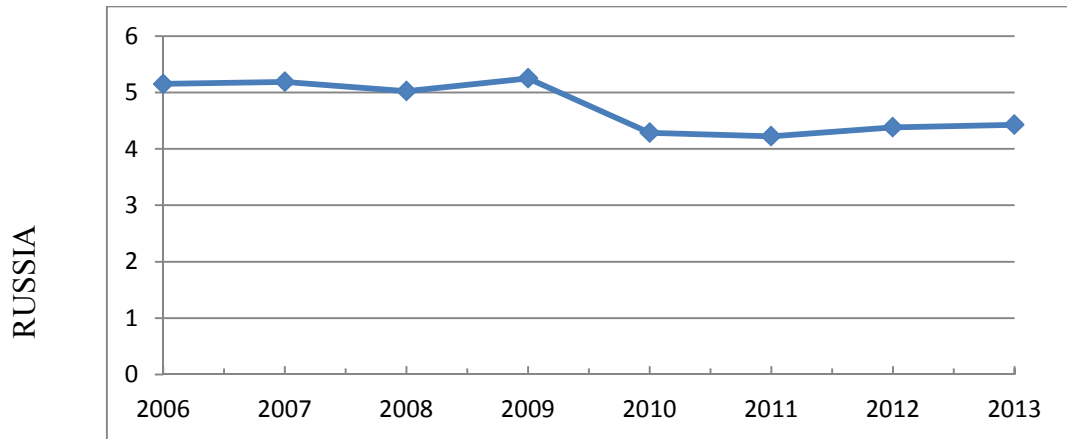
Figure 8- Net interest margin average during 2004-2013 in Russia
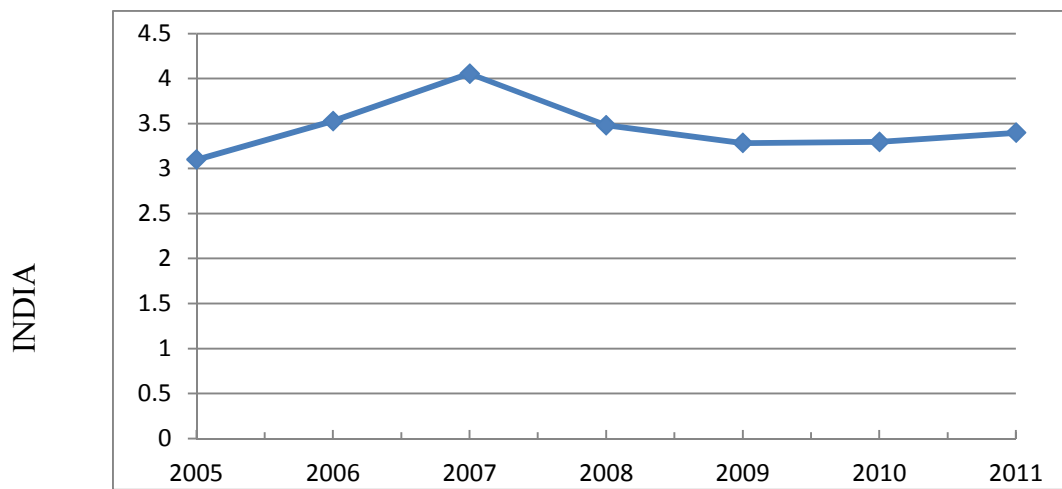

Figure 9- Net interest margin average during 2004-2013 in India
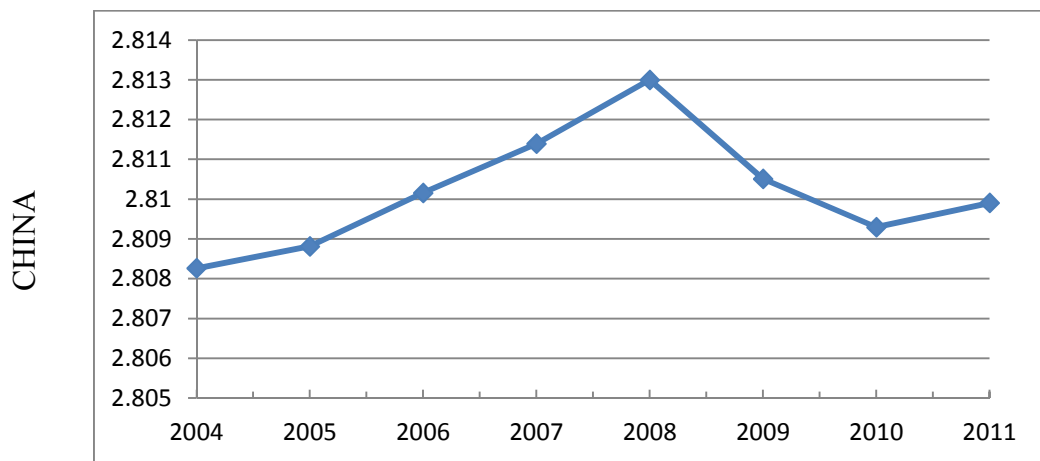
Figure 10- Net interest margin average during 2004-2013 in China

(Barajas et al, 2000) recommend that the financial liberalization has significant effect in improving market competition and lead to enhance banking sector efficiencies that

would result lower interest margin and financial intermediation's cost. Also evidence indicates that margin is usually widening in economic growth periods and improved macroeconomic conditions contribute to extension of lending and reduction in non-performing loans Bikker and Hu, (2002). According to empirical past studies of interest margin in developed countries, it can be found that the margin is related to the degree of market concentration in positive manner in European banking sectors such as France, Germany, Italy, Spain, UK Saunders and Schumacher, (2000). There is also same agreement among the studies on effect of operational costs and risk aversion. Operational cost has substantial impact on banking pricing strategy due to technical regime and specialization of the banks. Credit risk in European countries such as France, Germany, Italy, Spain, UK Maudos and Fernandez de Guevara (2004) and USA Angbanzo (1997) are positively related to net interest margin. But negatively affect in Australia Williams (2007). Liquidity ratio negatively related in emerging economies but positively related in developed countries such as Germany, Switzerland, France, Spain, Italy, UK and USA, Saunders and Schumacher (2000).

Chapter3

DATA AND METHODOLOGY

3.1 Data

The dataset applied in regression analysis consist the panel data over the period of 2004 to 2013 for 4 developing economies in the world: Brazil, Russia, India, and China. The main sources of data are the banks' balance sheet and income statement information, captured from Bank scope Data Base. Macroeconomics data such as inflation and Government Debt to GDP ratio are acquired from IMF (International Financial Statistics and World Economic Outlook) and World Bank database. In other words, the panel data has been used in this study to conduct the empirical analysis on determinants of financial ratios and macroeconomic variable of almost 50 major banks that comes from financial statements to perform comparative analysis. Number of observation is 1,180.

3.2 Methodology

We conduct regression analysis by performing "STATA" software package program to estimate our equation, in accordance with Hausman test [1]which is done in panel data regression analysis. The "Cross Section Random Effects" model has been used because our sample data does not represent whole population. Additionally, due to small number of groups which is 4 and time is only 8 years we have used cross section random effects model. Dependent variable used in this linear least square is Net Interest Margin (NIM). Other variables are considered as independent ones and demonstrated bellow in the models. Furthermore, R-squared in our regression model is tested. This measurement is typically read as the 'percent of variance explained' and is a measure of the overall fit of the model. R-square is very low in four countries which prove the correlations between independent variables are low in regression model. Regression tables are represented in chapter 4.

Additionally, the "Two-tail p-values test" is investigated the hypothesis that each coefficient is different from 0. To reject the null hypothesis [2] the p-value has to be lower than 0.05 (95% probability) or (lower 0.10 and 99% probability), if this is the case then we can say that the variable has a significant influence on dependent variable (NIM).

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[1] *To decide between fixed or random effects we should run Hausman test where the null hypothesis is that the preferred model is random effect vs. the alternative the fixed effects. It basically tests whether the unique errors (ui) are correlated with the regressors; the null hypothesis is they are not. Brandom Bartels (2005).*

[2] *The null hypothesis of the model is that the independent variables don't have any effect on NIM as dependent variable. The rejection of null hypothesis means that the coefficient is significantly different from zero.*

Accounting ratios are classified as dependent and explanatory variables. Dependent variable is Net Interest Margin (Spread between a banks' interest earnings and expenses as a percent of interest-earning assets) expressed as percentages. Variables are considered as independent ones demonstrated below in the models:

$$NIM_{it}= c_1+c_2(cef_{it})+c_3(me_{it})+c_4(lna_{it})+c_5(cr_{it})+c_6(liq_{it})+c_7(inf_{it})+c_8(conr_{it})+c_9(gd_{it})+u_{it}+e_{it}$$

3.3 Independent Variables

Explanatory or independent variables are:

3.3.1 Operation Cost To Total Asset as Cost Efficiency Ratio (cef)

Operation cost is the function of interest expenses plus non-interest expenses. By increasing the interest expenses the operation cost increase and NIM as spread between interest income and interest expenses to decrease. Banks which expose to high level of operational costs tend to allocate these expenses to their customers by changing and increasing the level of interest margin.

3.3.2 Total Earning Asset over Total Asset as Managerial Efficiency Ratio (me)

The high level of management quality of a bank, would lead the higher level of interest margin by them, as in turn, a high level of administration quality implies low–cost and high–yield composition of liabilities and assets. Some studies like (Gischer and Juttner , 2002) indicate that if the management quality increase would tighten the interest margin because of higher efficiency, but most empirical results do

not support their results in developed countries (Claeys and Vander Vennet , 2004) and Angbanzo (1997).

3.3.3 Natural Logarithm Of Total Asset As Size Of Banks (lna)

Theoretical models forecast a positive relation between margins and the size of banks. Larger operations are connected to a higher potential loss and higher credit risk and market risk. In opposite side; higher economies of scale recommend that providing more loans should benefit the banks. So, they would choose the lower margins. Therefore there is no particular expectation regarding the size of operation effect on margins.

3.3.4 Loan Loss Reserve over Gross Loan as Credit Risk Ratio (cr)

Banks tend to increase the margins if they have high ratio of non-performing loans faces, higher credit risk that would reflect in charging of higher margins. An increase in nonperforming Loans would contribute to the increase in interest margins, establishing a positive relationship between nonperforming loans the margin.

3.3.5 Liquids Asset to Total Asset as Liquidity Ratio (liq)

Indicate the liquidity risk that banks face. More liquid asset back up the demanded liabilities, lead to lower liquidity risk of the banks in response to withdrawal of its customer's demand deposit and lower margins as well. In other word, Banks with a high level of funds in liquid assets (liq) have lower level of margins to reflect reduced liquidity risk Angbanzo (1997).

3.3.6 Inflation (inf)

The rising in general prices of services and goods in economy. Most practical studies predict that there is positive relationship between inflation and net interest spread, due to inflation detentions informational asymmetries and macroeconomic instabilities, (Andreas Dietrich and Gabrielle Wanzenried, 2009). Low interest rate encourages people to borrow more money and they spend more, it would lead to increase inflation rate and increase economic growth. As opposite side high interest rate causes customers to have less money to spend. Therefore, less spending lead to low economic growth and lower inflation.

Table 4 - Inflation rate in BRIC countries

Country Code	2004	2005	2006	2007	2008	2009	2010	2011	2012
BRA	8.04	7.21	6.15	5.86	8.33	7.19	8.23	6.97	5.34
RUS	**20.28**		**15.17**	**13.80**	**17.96**	**1.99**	**14.19**	**15.54**	**8.45**
IND	5.93	4.24	6.42	5.76	8.66	6.06	8.86	8.28	8.15
CHN	6.91	3.93	3.79	7.60	7.80	-0.59	6.68	7.80	1.83

Source: IMF, International Financial Statistics and World Economic Outlook

3.3.7 Concentration Ratio (conr)

The ratio that shows the relative size of enterprises and firms in comparison to industry. Low level of concentration ratio would specify high level of competition between the firms in the industry, so for example a ratio of almost 100%, would be indicating a true monopoly. Also this ratio specified that an industry is compromised by a few large firms or many small firms. It is an indicator for determination of competitiveness and contestability in market structure of industry in an economy. (Maudos and Fernandez de Guevara, 2004). Moreover, it is indicated by (Claeys and

Vennet, 2004) that margin have positive correlation to the degree and level of market concentration in European banks.

3.3.8 Government Debt to GDP ratio (gd)

Government debt as a percentage of GDP or Debt to GDP ratio is national debt of a country in percent of the Gross Domestic Product. It is the money that the central government in debt and owed to its creditors. Usually, Government debt as a percentage of GDP is attention and used by investors to measure a country capability to make future repayments on its debt, thus affecting the country borrowing costs and government bond yields. (Gertler and Rogoff, 2006) indicate that increase in government debt equal to one percent of GDP would lead to increase the real interest rate by almost two or three basis points. The Government Debt to GDP ratio is available in Figure 11.1-11.4 for BRIC countries. Brazil recorded a Government Debt to GDP of 65.10 percent of the country's Gross Domestic Product in 2012. Government Debt to GDP in Brazil is stated by the International Monetary Fund. Brazil Government Debt to GDP averaged 68.72 Percent from 2000 until 2012, reaching an all-time high of 79.80 Percent in December of 2002 and a record low of 63.50 Percent in December of 2008.
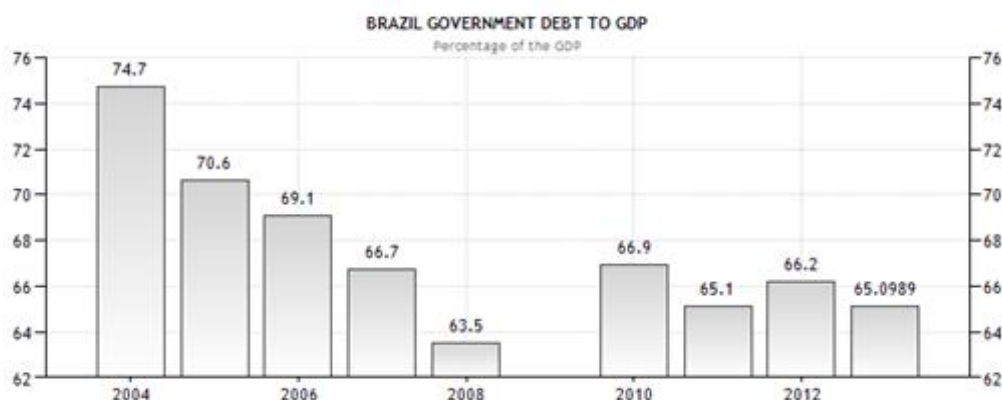
Figure 11.1: GOVERNMENT DEBT TO GDP (BRAZIL)

Figure 11.2: GOVERNMENT DEBT TO GDP (RUSSIA)

Russia recorded a Government Debt to GDP of 8.40 percent of the country's Gross Domestic Product in 2012. Russia Government Debt to GDP averaged 27.14 percent from 2000 until 2012, getting an all-time high of 99.00 percent in December of 1999 and a record low of 7.90 percent in December of 2008.
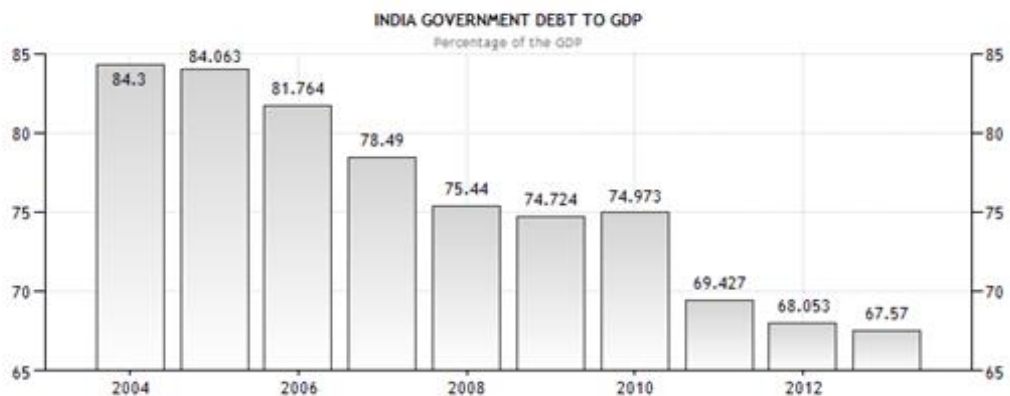
Figure 11.3: GOVERNMENT DEBT TO GDP (INDIA)

India noted a Government Debt to GDP of 67.57 percent of the country's Gross Domestic Product in 2012. Government Debt to GDP in India is testified by the Ministry of Finance, Government of India. India Government Debt to GDP averaged

74.56 Percent from 1991 until 2012, reaching a record high of 84.30 percent in December of 2003 and a record low of 67.57 percent in December of 2011.

China recorded a Government Debt to GDP of 23 percent of the country's Gross Domestic Product in 2012. Government Debt to GDP in China is described by the Ministry of Finance of the People's Republic of China. China Government Debt to GDP averaged 12.41 Percent from 1984 until 2012, getting a record high of 33.50 percent in December of 2010 and a record low of 1.00 percent in December of 1984.
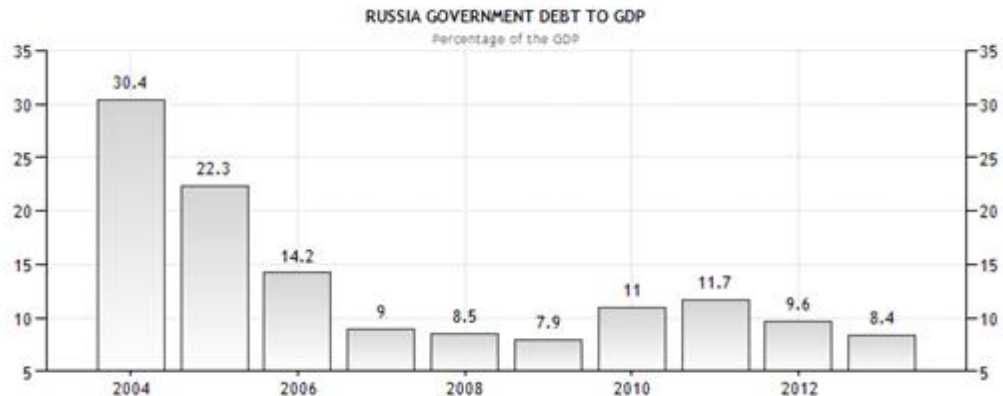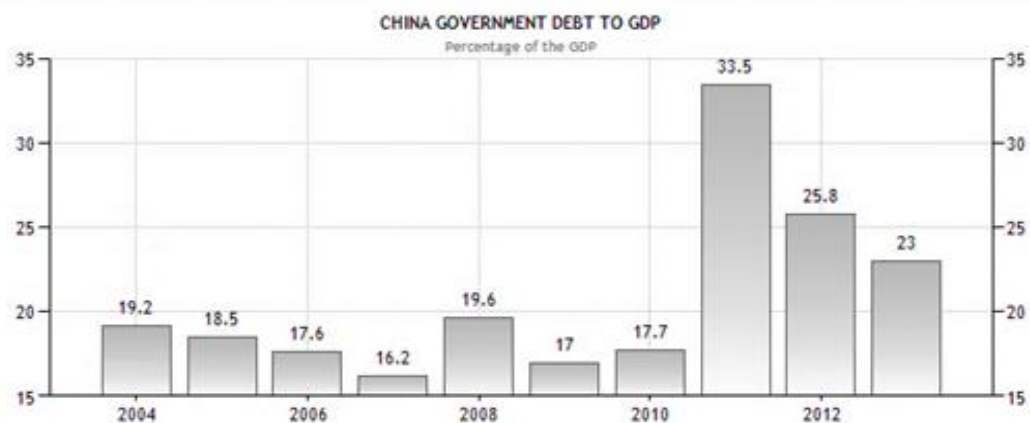

Figure 11.4: GOVERNMENT DEBT TO GDP (CHINA)

Chapter 4

EMPIRICAL ANALYSIS AND RESULTS

In this chapter we will talk about the output of regression analysis which is applied on financial ratios of almost 50 banks of BRIC countries. In order to explain how any changes in independent or explanatory variables may affect the determinants of the dependent variable (NIM) of these banks. Table 5 shows the result of panel regression for Brazil.

Based on this result, the strongest impact of independent variables on NIM in Brazil is cost efficiency (cef) and concentration (conr).The null hypothesis of (cef) and (conr) are rejected at 5% level of significance.

Table 5: regression result of Brazil

NIM	Estimated coefficient	Robust St. error	Z	Economic significance p>IZI
cef	**-.0313**	.0144	-2.17	**0.030****
cr	.488	.3928	1.24	.214
liq	-.0344	.0236	-1.46	0.144
conr	**-.0774**	.0342	-2.26	**0.024****
me	-.0099	.0057	-1.73	0.084
lna	-.0055	.0037	-1.49	0.135
inf	-.00123	.0038	-0.32	0.749
gd	0.0465	.0434	0.284	0.284
Observations				327
NO of banks				48
R-squared				.23

***, ** denote rejection of the null hypothesis at 10% and 5% level of significance

As described in subsection 3.3.1, the effect of cost efficiency ratio is expected to be negative. According the result, (cef) in the Brazil is negatively and significantly (pro=95%) related to dependent variable (NIM). In the line with our expectation, the banks with higher average of operating expenses, suffer from higher interest expenses. So, by growth of interest expenses, NIM (i.e. interest income subtracted by interest expenses) decreases. Also, the high statistical significance of (cef) implies the importance of using this variable in the theoretical description of the interest margin as done in this study.

Bank Concentration Ratio has negative effect also and highly related to NIM in Brazil. As it mentioned in subsection 2.1.1 during a previous decade in Brazil the number of foreign controlled banks doubled and the amount of state controlled banks has been decreased by two-thirds. Entrance of foreign owned banks increase the competitiveness in banking sector. When there is high competition between private banking sectors, banks have to decrease NIM spread which is a benefit for banking customers. These findings are consistent with the theoretical findings (Claeys & Vander Vennet, 2004).

In regard to other variables, credit risk has the expected positive sign that implies high ratio of non-performing loans that can be led to higher credit risk and it reflects in charging of higher margins.

Other explanatory variables are negatively related to banks' net interest margin such as managerial efficiency, liquidity, size and inflation.

Managerial efficiency (me) has a negative relation with NIM, suggesting that banks experiencing managerial efficiency are able to reduce their cost deposits (Gischer and Juttner, 2002).

The negative coefficient of liquidity indicates that banks with a higher level of funds in liquid assets (liq) have lower level of margins to reflect reduced liquidity risk Angbanzo (1997).

Moreover, the regression results of Brazil show that there is negative relation between size (lna) and NIM. It can be said that by increasing the volume of loans for banks, their unit cost decreases and this conclude to make narrower margin (Gischer and Juttner, 2002).

In Russia the null hypothesis of (cef) and (inf) are rejected at level of 10% and (conr) at level of 5%.

Table 6: regression result of Russia				
NIM	Estimated Coefficient	Robust St.error	Z	Economic significance p>IZI
Cef	**-.0222**	.0086	-2.57	**0.010*****
Cr	.0383	.0261	1.46	0.143
Liq	-0.007	.0124	-0.61	0.545
Conr	**0.140**	.0074	1.89	**0.059****
Me	-.00001	.00002	-0.97	0.333
Lna	-.0039	.0028	-1.36	0.174
Inf	**-.0006**	.0001	-4.98	**0.000*****
Gd	-.496	.0473	-1.05	0.294
Observations				324
NO of banks				48
R-squared				.12

***, ** denote rejection of the null hypothesis at 10% and 5% level of significance

According the findings in regression table 6, Cost efficiency ratio (cef) is negatively and highly related to NIM in Russia. This phenomena happens for all BRIC countries. As it mentioned in subsection 3.3.1, growth of interest expenses lead to increase the operation cost and that results to NIM (as spread between interest income and interest expenses) decrease (Lierman & Mullineux, 2005).

The coefficient of Bank Concentration ratio (conr) is positively and significantly related to NIM. As respect to subsection 2.1.2, banking sector in Russia experienced high level of bank concentration in recent decade. High level of concentration leads to decrease the level of competition. This is in line with recent evidence (Maudos & Fernandez de Guevara, 2004), as higher bank concentration ratio is likely to contribute to higher margins.

Another result corresponding to the regression result for Russia is the negative and significant coefficient for inflation variable. It indicates that banks have to increase their deposit rate when there is high level of inflation in economy to avoid of losing their customers. Therefore, interest expenses of banks increase and the growth of interest expenses lead to decrease of NIM spread. Actually from banking perspective increasing the deposit rate especially in long run maturity, would lead to decrease net interest margin. As we can see in Table 4, inflation level is quite high in Russia in compare with other three countries and has significant impact on NIM during this period.

The regression result indicates that liquidity, managerial efficiency and size are negatively related to NIM. The negative relation of liquidity with NIM, suggests that

banks with a high level of funds in liquid assets can lower level of margins to reveal reduced liquidity risk (Angbanzo, 1997)

Whereas, negative relation of managerial efficiency ratio in Russia, indicates that banks experiencing higher managerial efficiency are able to lower deposits expenses and lower NIM (Gischer and Juttner, 2002).

In Table7 null hypothesis of (cef), (cr) and (liq) is rejected at 10% and 5% level of significance in India.

Table 7: regression result of India

NIM	Estimated coefficient	Robust St. Error	Z	Economic significance p>IZI
cef	**-0.381**	.012	-3.15	**0.002*****
cr	**0.596**	.243	2.45	**0.014*****
liq	**0.0794**	.0381	2.08	**0.037****
conr	0.0115	.0135	0.85	0.393
me	-0.0083	.0132	-0.63	0.527
lna	-.0003	.0011	-0.28	0.779
inf	-0.0002	.0006	-0.32	0.748
gd	-0.0501	.0622	-0.81	0.421
Observations				319
NO of banks				49
R-squared				.68

***, ** denote rejection of the null hypothesis at 10% and 5% level of significance

All the explanatory variables are negatively related to banks' interest margins in India except the credit risk (cr), liquidity (liq) and concentration ratio (conr).

Cost efficiency ratio is negatively and highly significant in India which implies that operational costs incurred by banks are affecting margin through higher interest expenses.

Credit risk variable is positively related to NIM in the line with the previous predictions Subsection 3.3.4. The measure of Credit risk has the expected positive relationship with banks' interest margin, which confirms that the risk- averse bank manager tends to apply an extra interest margin. And they tend to increase the margins if they have high ratio of non-performing loans.

In India, the estimated coefficient for liquidity is positive that contradicts with most findings in the literature named in subsection 3.3.5. As (Funga & Tigran Poghosy, 2011) study shows in most emerging economy there is negative correlation but in developed countries there is positive relation between liquidity ratio and NIM. Also, they indicated for determining the effect of liquidity ratio on NIM, the form of ownership in banking sector should be considered. Moreover, the effect of this variable is different among domestic private banks, foreign-owned banks and state-controlled banks.

Another result corresponding to the findings for India is negative coefficient for managerial efficiency and size. This outcome is consistent with our expectation. The negative sign indicates that the higher the quality of management the narrower margin the bank may charge. This outcome is consistent with (Gischer and Juttner ,2002). Additionally, (Gischer and Juttner, 2002) finding indicates that the growth in the volume of loans, the unit cost decrease and this result to narrower margin as well.

In Table 8 null hypothesis of (cef) and (lna) is rejected at 10% and 5% in China.

Table 8: regression result of China

NIM	Estimated coefficient	Robust St.Error	Z	Economic significance p>IZI
cef	**-.0157**	**.0061**	-2.5	**0.011***
cr	0.0411	.0233	1.76	0.078
liq	0.00015	.0033	0.05	0.963
conr	-.001	.007	-0.16	0.876
me	0.0016	.0038	0.43	0.669
lna	**-.0004**	**.0002**	**-1.92**	**0.055****
inf	-0.00009	.0001	-0.89	0.374
gd	0.0026	.0052	0.50	0.616
Observations				211
NO of banks				43
R-squared				.28

***, ** denote rejection of the null hypothesis at 10% and 5% level of significance

(lna), as a proxy of Size is negatively related to NIM and statistically significant in China. It can be said that by increasing the volume of loans for the banks, their unit cost decrease and this result to narrower margin.

The impact of operational cost measured by the ratio of the operating expenses to total assets is also negative and statistically significant, which implies that banks may impose an extra interest expenses when they expose with higher operational cost.

The explanatory variables such as credit risk (cr), liquidity (liq), managerial efficiency (me), are positively related to banks' NIM in China, but statistically they aren't significant. Credit risk (cr) expressed as loan loss reserve over gross loan affects interest margins positively, which suggests that increased credit risk may cause an increase of banks' interest margins subsection 3.3.4. Interestingly, Liquidity ratio (liq) as a proxy of liquids asset to total asset is positively related to NIM which contradict with our expectation. In Some study such as (Maudos & Guevara, 2004),

the sign is expected to be positive. They indicate that, as the greater the volume of liquid reserves, the greater the opportunity costs, so a greater interest margin is needed.

Managerial efficiency (me) is positively related to NIM which is consistent with study presented by Angbanzo (1997); good management implies selecting highly profitable assets and low-cost liabilities, so a positive relationship is to be expected between the quality of management and the interest margin. But it contradicts with (Gischer and Juttner, 2002). They believe that good and higher efficiency of management would tighten the interest margin spread and benefit customers.

Concentration ratio (conr) is negatively related to NIM in China, which is contradicted by our expectation. But according the review of banking structure in subsection 2.1.4, Chinese banking system are more commercially orientated over the current period. They have become independent and less concentrated nowadays with lots of deregulations in financial market. So, high competitiveness in banking sectors is leading to tighten of NIM in China.

Based on STATA output, the general corresponding to the findings for BRIC countries (that imply the insignificant variables) are as follow: Managerial efficiency (me) in Brazil, Russia, and India is negatively related to NIM, in line with (Kim Hawtreya, Angbanzo, 1997). They indicated a high level of administration quality implies low–cost and high–yield composition of liabilities and assets that lead the banking sector decrease the spread of interest margin. Liquidity ratio is negatively related with NIM in Russia and Brazil. More liquid asset which backed up the

demanded liabilities, lead to lower liquidity risk of the banks in response to withdrawal of its customer's demand deposit and lower margins (Gertler, Mark and Kenneth Rogoff ,2005). Banks with a high level of funds in liquid assets (liq) have lower level of margins to reflect reduced liquidity risk Angbanzo (1997). But in China and significantly in India Liquidity ratio is positively correlated to NIM which contradicts with most findings in the previous literatures and studies. As (Zuzana Fungacova, Tigran Poghosy, 2011) study shows, in most emerging economy there is negative correlation but in developed countries there is positive correlation between liquidity ratio and NIM. Also they indicated that the form of ownership in banking sector should be consider for determining the impact of liquidity ratio on NIM. Whereas, Government Debt to GDP ratio is not significant variable in determining NIM in BRIC countries that means our hypothesis regarding the impact of government liabilities affect borrowing cost in economy and negatively affect NIM in banking sector in BRIC countries wouldn't be considered.

Chapter5

Conclusion

In this chapter obtained results will be reviewed in both theoretical and econometrics context. Afterward, some implications and possibilities for further research in this topic will be discussed.

This thesis examined the empirical determinant of banking Interest Margin in BRIC countries based on model developed by Ho and Saunders (1981). Net interest margin (NIM) is employed as Spread between a banks' interest earnings and expenses as a percent of interest-earning assets. Eight major financial, accounting and macro-economy ratios such as cost efficiency, managerial efficiency, size of operation, credit risk, liquidity, Government Debt to GDP, bank concentration and inflation are considered. Based on GLS regression approaches the effect of these variables on NIM in BRIC countries are investigated by employing the collected data from almost 50 major banks in Brazil, Russia, India and China.

From one country to other country, GLS regression represents different results. However, the effects of some variables in BRIC countries are equal, such as cost efficiency ratio (cef) and Credit risk (cr). As it mentioned, NIM is affected highly and negatively from changing of (cef) due to operation cost, it would suggest managers or any other policy makers to observe and control their operation cost with high concern and attention. Furthermore, NIM is affected positively from changes of

credit risk (cr) in BRIC countries due to high ratio of non-performing loans and higher credit risk cause in charging of higher margins in banks. Meanwhile, some other variables have different behavior such as concentration ratio (conr) which is positively related to NIM in Russia and India according the previous studies (Saunders and Schumacher , 2000) ;(Maudos and Fernandez de Guevara , 2004), but negatively related to NIM in China and Brazil. As earlier discussion in subsection 2.3.4, Chinese banking sector has become independent and less concentrated nowadays with many deregulations in financial market. In Brazil as it mentioned in subsection 2.1.1 entrance of foreign owned banks increase the competitiveness in banking sector. So, when there is high competition between private banking sectors, banks have to decrease NIM.

Inflation in all four countries negatively related to NIM. The main reason was banks have to increase their deposit cost when there is high level of inflation in economy to avoid of losing their customers, this concludes to decrease of NIM spread. It suggests that if there is high level of inflation in country, the government or any other regulatory authorities can control the inflation level by manipulating the interest rate. They can increase the interest rate to motivate customers to spend less and save more.

The main finding of this study is that the net interest margin is different in each country. Also, several variables are affecting NIM in banking sectors in BRIC countries. According the obtained results some variables statistically are quite significant in four countries such as Inflation, Bank concentration and Cost efficiency ratio. Furthermore, net interest margin in banking sector of BRIC

countries is affected by not only macro economy variables in the country such as Inflation or market interest rate but also many internal variables, such as managerial efficiency, operational efficiency, credit risk and liquidity ratio are affecting NIM. This result can have important impact for Policy implications of banking supervisions.

Another emerging economy in the world is South Africa, so recently South Africa as new member joint BRIC countries association. Afterwards, they've known BRICS countries. Therefore, studding the impacts of new member in BRIC group as one of the main economy for the future world economy can be strongly suggested.

REFERENCES

Amigos da Terra – Amazônia Brasileira. S-o Paulo (2012), An Introduction to the Brazilian Banking Sector and its Sustainability Practices, The Soundness of the Brazilian Banking System journal

Andreas Dietrich, Gabrielle Wanzenried, Rebel A. Cole (DEC2009). Why are net-interest margins across countries so different? Journal of Banking and Finance

Anthony Saunders1, Lilianan Schumacher (2004). The determinants of bank interest rate margins: an international study, Journal of International Money and Finance, (2000) 813–832.

Bikker, J, Hu, H. (2002.) Cyclical patterns in profits, provisioning and lending of banks and pro cyclicality of the new Basel capital requirements. BNL Quarterly Review 221, 143–175.

Brandom Bartels (2005) Beyond "Fixed Versus Random Effects": A framework for improving substantive and statistical
analysis of panel, time-series cross-sectional, and multilevel data"
http://polmeth.wustl.edu/retrieve.php?id=838

Carbo, S, Rodríguez (2006). Pricing strategies in European banking: Specialization, technology and inter temporal smoothing.

CBRC (China Banking Regulatory Commission) (2010), Annual Report of CBRC.

Claeys, S, & Vander Vennet, R (2004). Determinants of bank interest margins in Central and Eastern Europe: A comparison with the West (mimeo). Ghent University

Claeys, S, Vander Vennet, R. (2008). Determinants of bank interest margins in Central and Eastern Europe: a comparison with the west. Economic Systems 32, 197–216.

Garcia-Herrero A, S Gavila and D Santabarbara (2006),
'China's Banking Reform : An Assessment of its Evolution and Possible Impact', CESifo Economic Studies, 52(2), pp 304–363.

Gelos, G (2008). Banking spreads in Latin America. Economic Inquiry 47, 796–814.

Gertler, Mark and Kenneth Rogoff (eds.) (2005) NBER Macroeconomics Annual 2004, Volume 19. Cambridge and London: MIT Press

Gischer, H, & Juttner, D. J. (2002). Global competition, fee income and interest rate margins of banks. In Financial management association conference.

Joaqu_ın Maudos, Juan Fern_andez de Guevara (2004),Factors explaining the interest margin in the banking sectors of the European Union, Journal of Banking & Finance 28 (2004) 2259–2281

Kim Hawtreya, Hanyu Liangb, Angbanzo, L (1997). Bank interest margins in OECD countries:Commercial bank net interest margins, default risk, interest rate risk and off-balance sheet banking. Journal of Banking and Finance.

Kit Pong Wong (1997), On the determinants of bank interest margins under credit and interest rate risks. Journal of Banking and Finance

Linda Allen (1988), The Determinants of Bank Interest Margins, The Journal of Financial and Quantitative Analysis, Vol. 23, No. 2 (Jun., 1988), pp.231-235

M., Lierman, F., Mullineux, A.W (Eds.), (2005), Competition and Profitability in European Financial Services, Routledge Studies in the European Economy. Routledge, London

Martinez Peria, M., Mody, A (2004). How foreign participation and market concentration impact bank spreads: evidence from Latin America. Journal of Money, Credit and Banking 36, 511–537.

Maudos, J, Fernandez de Guevara, J (2004). Factors explaining the interest margin in the banking sectors of the European Union., Journal of Banking and Finance 28, 2259–2281.

Oscar Torres-Reyna, Data Consultant (2009), Panel Data Analysis Fixed & Random

Effects (using Stata 10.x), (ver. 4.1), http://dss.princeton.edu/- training.

Samuelson, P (1945). The effects of interest rate increases on the banking system. American Economic Review

Santiago Carbo Valverde, Francisco Rodrı´guez Ferna´ndez (2007),The determinants of bank margins in European banking, Journal of Banking & Finance 31 (2007) 2043–2063

Saunders, A, Schumacher, L (2000). The determinants of bank interest margins: an international study. Journal of International Money and Finance 19, 813–832.

Schwaiger, M., Liebeg, D (2008). Determinants of bank interest margins in Central and Eastern Europe. OeNB Financial Stability Report, Austrian National Bank, Vienna.

Thomas S. Y. Ho and Anthony Saunders (November 1981)the determinants of bank interest margins: theory and empirical evidence, journal of financial and quantitative analysis,Volume XVI, No. 4

Williams, B (2007). Factors determining net interest margins in Australia: domestic and foreign banks. Financial Markets, Institutions and Instruments 16, 145–165.

Wong, K. P (1997). On the determinants of bank interest margins under credit and interest rate risks. Journal of Banking and Finance, 21, 251–271.

Zuzana Fungacova´, Tigran Poghosyan (2011), Determinants of bank interest margins in Russia: Does bank ownership matter? journal of Economic Systems, Bank of Finland, Institute for Economies in Transition (BOFIT).