CHAPTER II

REVIEW OF LITERATURE

This chapter explains the theory related to the influence of macroeconomic toward bank efficiency. The macroeconomic factors that was used in this research was inflation rate, exchange rate, and interest rate. Beside that, this chapter discusses the role of bank in economy, and the difference between conventional bank and sharia bank.

This research used four variables. These variables consisted of interest rate, exchange rate, inflation rate, and bank efficiency. The independent variables of this research consisted of interest rate, exchange rate, and inflation rate. The dependent variable of this research was the bank efficiency.

2.1. Bank

Financial service industry plays a very imperative role in today dynamic environment, and banks take a very important part in the financial intermediation (Akhtar, 2002). The various studies that are done for the evolution of efficiency in the financial service industries and especially in banking sector are different to the methodology, variables and sample size (Ahmad and Gill, 2007a). Various economists empirically examined deeply and positively association between financial growth and economic development in their research (Levine et al., 1999; Khan and Senhandji, 2000).

Until the last two decades, the people go to a bank only to save their money which is not used. Previously, a bank is known as a place for money changer or deposit and borrow money, but nowadays a bank also acts as financial intermediary with more various services inside.

Besides the main function of bank to collect and distribute funds from and to society, nowadays bank does not only do savings and loans activities but also it other roles of activities to remain competitive and responsive to public interest needs. Based on Rose (2002), banking principal now days roles has the following:

- The Intermediation Role, transforming received savings from household into credit (loans) for business firms and others in order to make investment (building equipment).

- The Payment Role, carrying out payments for goods and services on behalf of their customers (such as by issuing a clearing checks, wiring funds, and providing a conduit for electronic payments).

- The Guarantor Role, standing behind their customer to pay-off customer debts when they are unable to pay (issuing Letter of Credit).

- The Risk Management Role, assisting customers in preparing finance for the risk of loss on property and persons.

- The Savings / Investment Advisor Role, aiding customers in fulfilling their long-term goals for a better life by building, managing, and protecting savings.

- The Safekeeping / Certification of Value Role, safe guarding a customer's valuables and appraising and certifying their true market value.

- The Agency Role, acting on behalf of customers to manage and protect their property or issue and redeem their securities (usually provided through the bank's trust department).

- The Policy Role, serving as a conduit for government policy in attempting to regulate the growth of the economy and pursue social goals.

Conventional bank is a financial institution that provides services, such as accepting deposits, giving business loans and auto loans, mortgage lending, and basic investment products like savings accounts and certificates of deposit. The traditional commercial bank is a brick and mortar institution with tellers, safe deposit boxes, vaults and ATMs. However, some commercial banks do not have any physical branches and require consumers to complete all transactions by phone or Internet. In exchange, they generally pay higher interest rates on investments and deposits, and charge lower fees. Based on Booklet of Indonesia Banking (2011), the business of conventional bank are:

- Collect fund from public in the form of savings in the form of giro, time deposits, certificates of deposit, savings, and / or other forms same like that.

- Give credit to people who need.

- Issue debt.

- Buy, sell or guarantee over own risk and to the interests of customers.

- Move money for its own sake and for the benefit of customers.

- Place funds, borrow funds from, or lend funds to other banks, either by using the mail, telecommunications or by means of a show of money orders, checks or other means.

- Receive payments of bills over the Securities and perform calculations with or between third parties.

- Provide a place for storing goods and securities.

- Perform activities of entrusting to the interests of other parties based on a contract.

- Do the deployment of funds from one customers to another customers in the form of the securities which is not listed in the stock exchange.

Sharia bank is the bank having its business activities based on sharia principle and according to its kind, consists of sharia commercial banks and sharia people funding bank. The sharia principle is a principle of law observance in banking activities based on a fatwa which was issued by an agency that has the authority to determine fatwa in the field of sharia (Booklet of Indonesia Banking, 2011).

Sharia bank normally perform the same functions like conventional banks, but sharia banks does not receive and pay any interest. Sharia bank

is based on profit and loss sharing principal and based on profit sharing agreement between the provider of the funds and the borrower of the funds, but does not receive and lend profit in advance. Sharia bank takes fee, commission in transaction but does not accept or give any predetermined interest. Profit is distributed normally on the basis of risk (Hassan et al., 2009).

Sharia bank is operating in many countries of the world. Initially, it was established to fulfill the Muslim's need of halal income. But nowadays, it is spreading even in non Muslim word sharia banking is considered as fast growing banking system (Sufian and Noor, 2009). The first bank was established in 1963 in Egypt. And the total number of Islamic financial institution all over the world is round about 300, and the total assets of sharia banks all over the world are about $250 billion (Sufian and Noor, 2009). Based on the Booklet of Indonesia Banking (2011), the business of sharia bank consists of:

- Raising funds in the form of savings accounts, savings, or other forms based on wadi'ah.

- Raising funds in the form of investment in the form of deposits, savings, or other forms based on mudharabah agreement or other agreement that do not have conflict with the sharia principle.

- Distributing finance share of the revenue based on mudharabah, greetings agreement, or other agreement that does not have conflict with the sharia principle.

- Distributing finance share of the revenue based on murabahah, greetings agreement, istishna agreement, or other agreement that does not have conflict with the sharia principle.

- Distributing finance based on qardh agreement or other agreement that does not have conflict with the sharia principle.

- Distributing rental financing goods, which is movable or immovable to the borrowers based on ijarah agreement and or rent.

- Does buy-out debt agreement based on hawalah or other agreement that does not have conflict with the sharia principle.

- Conduct the business of debit card / financing cards based on sharia principle.

- Buy, sell, own or guarantee over the risk of third party valuable letter published on the basis of the transaction real based on sharia principle, such as bonds agreement, musyarakah, mudharabah, murabahah, kafalah, or hawalah based on then sharia principle.

- Purchase securities based on sharia principle issued by the government / the central bank.

On an operational system of sharia bank, the owner of funds saving the money in the bank and does not have a profit motive, but in order to have advantages for the results. Then, the funds of the customers was distributed to those in need (e.g. business capital), in accordance to the agreement of share of the profits. The operational system includes:

1. Components of Collecting Fund

   Sharia bank does not do single approach to provide collecting funds product for customer. Thus basically, it can be seen from the sources of funds of sharia bank that consist of the following:

   a. Capital

      Capital is a fund handed over by supervisors. Capital fund can be used to buy the building, the ground, fixtures and forth that does not directly produce fixed assets. Capital can also be used for productive things, which is distributed for financing.

   b. Deposit (Wadi'ah)

      In this principle, the bank received fund from customer and take full responsibility over any of those fund. Customer has the funds to be taken any time, in accordance with the applicable provisions.

   c. Investment (Mudharabah)

      The agreement which has the principle of investment is mudharabah. It has the goal of cooperation between the owner of funds (shahibul maal) and the fund management (mudharib) or the bank.

2. Components of Allocating Finance

   a. Financing transaction is devoted to have goods are carried with the principle of buying and selling. The principle of

buying and selling this one is evolved into the shape of financing murabahah, financing greetings and istishna.

b. Financing transaction is devoted to get services done based on the principle of lease (ijarah).

c. The principle of a revenue share for the products of sharia bank is presently served by with patterns of musyarakah and mudharabah.

Conventional bank and Sharia bank have similarities in same cases. The difference between conventional bank and sharia bank can be seen in table 2.1:

Table 2.1: Comparison Between Conventional and Sharia Bank

Aspect	Sharia Bank	Conventional Bank
Organization Structure	Collection and allocating of funds should be in accordance to fatwa sharia Supervisory Board	Don't have board like Sharia bank
Businesses and venture which was financed	-Doing investment in permissible course -Relationship with customer in the form of partner -Based on sharing profit principle -Have orientation on profit and happiness in the world and here after.	-Investment in permissible and non permissible course -Relationship with customer only creditor-debitor relationship -Using riba
Work environment	Islamic	Non Islamic

Source : Machmud Amir, Rukmana, 2011, *Bank Sharia*

2.2.Bank Performance Measurement

The health of a bank is the interests of all parties concerned, either the owner, bank managers (management, bank users and the community). The bank can be used by the parties to evaluate the performance of the bank in applying the principle of prudence, adherence to the applicable provisions and risk management. There are many kinds of measurement of bank performance, which is CAMELS and RGEC. Based on Kasmir (2002), one of the instrument for measuring the health of banks are with the analysis of CAMEL. The elements of judgment in analysis of CAMEL is as follows:

1. Capital Adequacy

    The assessment based on capital which is owned by one bank .Thus assessment used CAR method (capital adequacy ratio) by comparing capital to assets according to the risk (ATMR)

2. Assets Quality

    The assessment based on the quality of assets which is owned by the bank. There are two kinds of ratio that can be measured as follows:

    - The ratio of productive assets against productive assets

    - The removal of the ratio of qualifying productive assets against classified productive assets

3. Management Efficiency

 The assessment based on capital management, the management of assets, liquidity and management of public management.

4. Earning Ability

 The assessment based on the earning ratios of a bank that could be seen in ability of a bank in creating profit. The assessment in this elements is based on the following:

 o Return on Assets (ROA)

 o BOPO

5. Liquidity Sufficiency

 Which is to assess bank liquidity .Bank liquidity assessment is based on two kind of ratios, which is :

- Net liabilities ratio of number of Call Money against current assets and current assets include Cash, checking account on Bank Indonesia BI, Certificate of Bank Indonesia (SBI) and money market Securities (SBPU)

- The ratio between the credit and the funds accepted by the Bank

 According to bank Indonesia regulation number 13/1/PBI/2011 about the assessment system of healthy public bank, the assessment of the level of healthy bank is measured by using RGEC method (risk profile, good corporate governance, earnings, and capital).

1. Risk Profile

   An assessment of risk profile is an assessment of quality of the application of operational in bank risk management, which is:

   a. Credit Risk

      Credit risks risk is the inability of a debtor or counterparty making payments back from a bank. The biggest risk is in banking system of Indonesia and can become the main cause of bank failure.

   b. Market Risk

      The market risk is the loss in the position of the balance and accounts administrative including derivatives transactions due to changes in the overall market conditions .This risk can be sourced from trading-book and banking book bank .The risk of market trading book is the risk of the loss of investment value due to the activity of trading with the aim to gain advantage. Different to the market traded risk, generally have the structure of bank funds which are the short term because of credit given futures more time of savings fund customers.

   c. Liquidity Risk

      Liquidity risk is the inability of a bank to meet its obligations are due from the source of funding and cash flow or liquid assets of high quality that can be encumbered , without disrupting the activity and financial condition of the bank.

2. Good Corporate Governance

   An assessment on GCG is an assessment of the implementation of the principle on GCG bank management. Bank had oblige to implement the principles of GCG in any business activities or the level of organization at all levels including at the time for preparation of vision, the mission, strategic plan, the implementation of policies and measures of internal control. The scope of application of the principles according to bank Indonesia GCG least must be manifested in:

   - The performance of duties and responsibilities to the board of commissioners.

   - The performance of duties and responsibilities to the directors.

   - Complete and enforcement duties committee

   - The handling of the conflict in interest

   - The application of the function in compliance

   - The application of the internal audit function

   - The application of the external audit function

   - The application of risk management into internal management

   - Providing of funds to associated parties

   - Transparency of financial condition and non bank financial, the implementation of internal reporting and GCG report

- Strategic bank plan

3. Earnings

   An assessment on rentability factors include assessment about component, such as the achievement on ROA, ROE, NIM, the level of efficiency bank, the growth of operational profit, diversification income, the implementation accounting principle into recognition income and cost, and operational profit prospect.

4. Capital

   An assessment of the capital is the judgments against components-components:

   - Sufficiency, composition, and projection forward trend capital and ability to capital of bank in asset for cover problem

   - The ability of maintaining the necessity of bank capital derived from profit capital bank plan to support business growth access to capital source, and financial performance of shareholders to increase capital bank

   The performance of firms, such as banks, is often described in terms of the firm's efficiency. The measured efficiency of a production unit is commonly interpreted as the difference between its observed input and output levels and the corresponding optimal values. An output-oriented measure of efficiency compares observed output with the maximum output possible for given input levels. Alternatively, an input-oriented efficiency

measure compares the observed level of inputs with the minimum input that could produce the observed level of output. These are measures of technical efficiency and, as such, ignore the behavioral goals of the firm.

Measures of allocative efficiency compare the observed mix of inputs or outputs with the optimal mix that would minimize cost, maximize profit or obtain any other behavioral goal. Allocative efficiency can be combined with technical efficiency to measure overall efficiency. In addition, measures of technical efficiency can be used to construct measures of scale efficiency, which involve a comparison of observed and optimal scale, or size, of the firm. One can also measure scope efficiency, which involves a comparison of the cost of producing the observed mix of outputs in a single firm with the costs that would prevail if each output was produced in a separate firm.

Actually banks provide links from surplus unit to deficit unit of the economy. In the last fifty years, financial sectors, especially, banking sector has been expanded a lot in both developed and underdeveloped countries (Hassan, 2004). Efficiency of the banks and different controversial issues, like competition and economies of scales are linked together. Competition between different banks and banking systems forces these banks to operate efficiently. Lacking of different banking systems and relatively small number of banks, in economy, might encourage monopoly by restricting their output or colluding between different banks. Efficiency of the banks normally depends on different banking systems and number of banks in the

market, along with their ability to achieve economies of scales (Qayyum and Khan, 2006). Different banking systems force banks to operate efficiently.

Efficiency of commercial banks is one of core issues for the economists all over the world due to its strong association with economic growth of the country (Zaidi, 2005). Economic growth would be achieved by utilizing the existing resources of the banks in an appropriate and efficient way (Saeed, 2005). Efficiency of commercial banks has an importance for evaluation of its performance. Banking efficiency provides signal for the economic development of a country (Sathye, 2005). Efficiency of commercial banks is actually the relationship of different combinations of outputs and inputs of the banks to achieve optimum level. The optimum level can be achieved under the objective of inputs minimization, while producing the same level of outputs and outputs maximization with same level of inputs.

2.3. Bank Efficiency Measurement

There are many kinds measurement for bank efficiency, like DEA for non parametric measurement and SFA for parametric measurement. SFA is a parametric technique that uses standard production function methodology. The approach explicitly recognizes that production function represents technically maximum feasible output level for a given level of output. The Stochastic Frontier Analysis (SFA) technique may be used in modelling functional relationships where we have theoretical bounds:

- Estimation of cost functions and the study of cost efficiency

- Estimation of revenue functions and revenue efficiency

- This technique is also used in the estimation of multi-output and multi-input distance functions

- Potential for applications in other disciplines

But in this research we will using DEA for measurement of bank efficiency.

DEA is a linear programming model used for evaluating the efficiency of particular Decision Making Units (DMU's) in this case the banks regarding to construct frontier develop by DEA over the data. It was first developed by Charnes et al. (1978) on the sample of nonprofit organization and later it was extended to the banking sector by Sherman and Gold (1985).

In micro-economic theory, production is usually described as a process of combining inputs to create outputs to achieve a desired goal, normally profit maximization. The term "efficiency" is applied when a production unit obtains its goal of producing the maximum amount of output (s) possible, using a minimum amount of input (s) available given the constraint of technological conditions (Fare et al 1985) . More formally, Charnes et al (1981; p.669) state efficiency in the following two orientations:

"(1) Output orientation

A Decision Making Unit (DMU) is not efficient if it is possible to augment any output without increasing any input and without decreasing any other output;

(2) Input orientation

A DMU is not efficient if it is possible to decrease any input without augmenting any other input and without decreasing any output. A DMU will be characterized as efficient if and only if, either (1) or (2) obtains."

The term "DMU" used here refers to a firm or a production unit.

Measuring bank efficiency requires the identification of inputs and output of the banking sector. However, despite the increasing interest in studying the banking industry, there is no agreement among the researchers on what constitutes bank inputs and outputs. Attempts to define these concepts were made earlier by Sealy and Lindley (1977), Colwell and Davis (1992), and later by Berger and Humphrey (1997). There are two main approaches to the definition of the inputs and outputs of the banking sector, which reflect different perspectives of the banking activity: the production and intermediation approaches.

The production approach emphasizes operational activity and thus banks are primarily viewed as providers of services of customers. The input set of this approach includes only the physical variables (e.g. labor, materials, space or information system) or their associated costs since only

physical inputs are needed to perform transactions, process financial documents or provide advice to customers. Interest expenses are excluded from this approach on the ground that only the operational process is of interest. The output of this approach represents the services provided to customers and is best measured by the number and type of transactions dealt with, documents processed or specialized services provided over a given time period. When detailed transaction flow data is not available, data on the stock of deposit and loan accounts are often used instead as a proxy for the level of services provided.

Under the intermediation approach, financial institutions are viewed as primarily intermediating funds between savers and investors. Bank produce intermediation services through the collection of deposits and other liabilities and their application in interest-earning assets, such as loans, securities, and other investments. This approach includes both operating and interest expenses as inputs, whereas loans and other major assets of financial institutions count as outputs. However, there is a longstanding controversy whether deposits should count as inputs or outputs. Different trend in the debate on the identification of banking output led to the establishment of the asset, user cost, and value-added approaches, which can be seen as variants of the intermediation approach. All these approaches are focused on the intermediation activity of banks (Berger and Humphrey, 1977).

On the foundation of Coelli (1996), under input oriented model, suppose there are N DMU's producing L outputs by utilizing P inputs. Suppose Xi and Yi are representing the vectors of i-th bank. For this, X is the input matrix for P*N and Y is output matrix for L*N. DEA measures the maximum ratio observed weighted of outputs to observed weighted inputs subject to constraint. The ratios of all other banks are less or equal to 1 representing DEA in ratio form. It is actually the ratio of output and input $\acute{\omega}y/\acute{\upsilon}X$, in the equation $\acute{\omega}$ and $\acute{\upsilon}$ is the output and input weights. But for the optimal weights we used the linear programming technique, that is :

$$\max{}^{\acute{\omega},\acute{\upsilon}}(\acute{\omega}y/\acute{\upsilon}X,)$$

$$st . \quad \acute{\omega}y/\acute{\upsilon}X, \leq 1, j= 1,2,3,\ldots\ldots.,N \qquad\qquad (1)$$

$$\acute{\omega},\acute{\upsilon} \qquad\qquad \geq 0$$

This equation is used for the purpose to find the value of output and input weights of particular i-th DMU. This means that to maximize the efficiency of a particular DMU under certain constraint, the value of efficiency for the particular DMU is not greater than 1 and the weights must be greater or equal to 0. Despite its strength, it has a limitation that it gives infinite solution for the problem. To solve this problem Coelli et al. (1998) suggested another restriction that

$$\acute{\upsilon}X_{i} = 1$$

$$\max_{0,u} \quad (\acute{u}y_i)$$

$$\text{st } \upsilon X_i = 1$$

$$\acute{u}y_j - \upsilon X_j \leq 0, \text{ j} = 1,2,3......, N \qquad (2)$$

$$\acute{u}, \upsilon \geq 0$$

Where the notation for $\acute{\omega}, \acute{\upsilon}$ is changed to $\acute{u}$ and u respectively and shows transformation. This is named as the multiplier form of linear programming as suggested by Coelli et al. (1998).

Coelli (1996) suggested the duality in the linear programming based on Farrel (1957). The duality form for this problem is as follows :

$$\min_{\theta,\lambda} \theta,$$

$$\text{st } -y_i + Y\lambda \geq 0$$

$$\theta x_i - X\lambda \geq 0 \qquad (3)$$

$$\lambda \geq 0$$

Where θ is Scalar and λ is vector for constants. This form had fewer constraints than pervious one where the value of θ is efficiency score and it is necessary for to satisfy the condition of $\theta \leq 1$. The value of θ indicates score of efficiency for individual banks multiplier form has more hurdles and constraints than this form.

Banker et al. (1984) proposed a variable to scale model. The former is suitable in the case where all DMU's are operating on optimal scale, which means that banks have obtained the economies of scale. But normally DMU's in this case, the banks are not normally operating on

optimal scale due to imperfect market, constrain regarding generating finances, government policies (Casu and Molyneux, 2003).

VRS is the extended part of CRS Dual model, which is modified and its mathematical form is as follows :

$$min_{\theta,\lambda}\ \theta,$$
$$st\ -y_i +\ Y\lambda \geq 0$$
$$\theta x_i - X\lambda \geq 0 \qquad\qquad (4)$$
$$\acute{N}\lambda = 1$$
$$\lambda \geq 0$$

N shows the categorization of matrix having ones. It represents in the form of N*1 VRS tight the envelope more than CRS. This new constrain ensures that inefficient firms is only benchmarked with the firm of similar size.

Further, we are interested in scale efficiency. If TE under CRS is equal to TE under VRS than it means that there is no scale inefficiency and overall technical inefficiency is due to a pure technical inefficiency. Therefore :

$$Scale\ effeciency = \frac{TE\ under\ CRS}{TE\ under\ VRS}$$

If the value of scale efficiency is one (1), it means that overall technical inefficiency is due to a pure technical inefficiency. In other to know if banks are operating at IRS or DRS, the mathematical formula proposed by Coelli (1996) was used.

$$\min_{\theta,\lambda} \theta,$$

$$st \ -y_i + Y\lambda \geq 0$$

$$\theta x_i - X\lambda \geq 0$$

$$\acute{N}\lambda \leq 1$$

$$\lambda \geq 0$$

If the value of TE under CRS and TE VRS are equal, it means that bank is operating at constant return to scale. If both values are not same then compare the value from VRS with a value $\acute{N}\lambda$ TE if both are unequal then banks are operating at IRS, and if both are equal than bank are operating at DRS (Fare et al., 1985b).

Constant returns to scale (CRS) means that the proportionate increase in inputs would result in proportionate increase in outputs. While variable return to scale (VRS) means it is not necessary that output would be increased in proportionate percentage. Further, under VRS banks are operating either on increasing return to scale (IRS) or decreasing return to scale (DRS). IRS means proportionate increase inputs will result higher proportionate increase in outputs. On the other hand DRS means proportionate increase in outputs (Sufian and Noor, 2009). If a firm has at IRS, it would achieve cost efficiency or income efficiency. Banks that are operating at DRS should be conscious when increasing their operations (Sufian and Noor, 2009; Evanoff and Iszraelvich, 1991).

According our literature, various models of efficiency are measured by different researchers in their studies, Ataullah et al. (2004) found technical efficiency under loan and income based approach. In the same

way, we measured the efficiency of Islamic and conventional banks in Indonesia under loan base and income base approaches.

This specification technical efficiency is calculated under both constant return to scale and variable return to scale. In this study, investment, loans, and zakat are regarded as output. Total loan were used as output in previous study (Hassan et al., 2009; Sufian, 2006; Yudhistira, 2003; Ayadi et al., (1998); Sathye, 2003) while loans and advances are taken as output by Sathye (2001). Investment are taken as output by researchers in their studies (Haung and Wang, 2002), while loan plus advances and investment are taken as output by others (Akhtar,2002). While the inputs for this study is bills payable, fixed assets, deposits plus borrowing from other financial institutions. Pasiouras (2006) used fixed assets, customer deposits plus short term funding and number of employees as inputs. In the same way, Ahmad and Gill (2007a), and Ahmad and Ahmad (2007) used number of employees, operating fixed asset, bills payable, and borrowing from financial institutions as input for this specification.

2.4. Bank Efficiency

Much research effort has been expended on identifying and analyzing the efficiency of financial institution in varying forms over the last few decades. The main areas of research have been scale efficiency, scope efficiency as well as the X-efficiency, which attempts to capture the efficiency of a bank (given its inputs and outputs) relative to other banks.

X-efficiency studies of the banking sector typically find that there are large cost inefficiencies. A common finding is that, on average, there are cost inefficiencies in the order of 20 percent. That is, on average, banks are only 80 percent as cost efficient as the "best practice bank" (Berger and Humphrey, 1997).

According to Bashir (2001), the evaluation of efficiency and its determinants are essentially important due to the fast growing environment in today's economic structure. This globalization has indeed put sharia banks in strong competition with conventional banks in financial markets. This is added to the situation where some countries had made complete transformation of their banking system, with the addition to the Islamic elements to this system. Hence, there is a need to determine which among the many potential determinants of efficiency that would emerge to be most important.

Efficiency of banks might result in high profits, good customer service or use for risk diversion (Berger et al., 1993a,b). Efficiency of banks might be influenceed by different factors like size, interest expense, total profits, etc. (Hassan et al., 2009)

There has been general literature in the banking sector that examined the efficiency of conventional commercial banks in the developed countries, especially U.S and European banking sector, over recent years. The work, especially on empirical side, Sharia bank has not been much investigated (Sufian, 2006). Sharia banks are based on equity

base relationship instead of loan base relationship between provider of fund and borrower of fund. Equity base relationship is encouraged by Islamic banking between equity provider and entrepreneur (Roy, 1991).

Several studies that have been seen to measure the performance of sharia banks have commonly investigated the association between profitability and banking characteristics using financial ratios (Samad, 1999; Bashir, 1999; Hassan and Bashir, 2003; Bashir, 2001; Sarker, 1999)

Sarker (1999) used a banking efficiency model to investigate sharia banks efficiency in Bangladesh. He argued that, sharia banks could stay alive still within a conventional banking design in which profit and loss modes of financing were less dominated. He further claimed that due to difference in sharia banking system and conventional banking system, sharia banks have different products and different risk characteristic, so different rules and regulation should be implemented over sharia banks.

The other group of researchers conducted their studies on the efficiency of sharia banking sector by considering the frontier approach instead of financial ratios (Yudistira, 2003; Brown and Skully, 2005; Hassan, 2005; Shamsher et al., 2007; Badar et al., 2007a; Sufian, 2006).

Batchelor and Wadud (2004) found the efficiency of sharia banks in Malaysia by applying DEA model and using technical and scale efficiency, their result revealed that full fledged sharia banks are generally inefficient due to scale inefficiency and not due to pure technical inefficiency. Technical efficiency means the ability of firm (bank in this

case) to produce more output with a given level of input, this is called technical efficiency by output side. Technical efficiency input side means to reduce the same level of output with less input (Farrell, 1957). More theoretically, if a firm produces one unit of output with the same level of input or it can produce the same level of output by marginally decreasing in input, and can be called technically efficient firm.

Income efficiency shows how particular firms obtain their financial and non financial revenues while utilizing the same level of financial and non financial expenditure. It is actually the earning side of the banks (Ahamad and Gill, 2007b). In the same way Pasiouras (2006) took the revenue side of the banks for the income efficiency and found how much a particular bank increases its revenue while utilizing the same level of financial and non financial expenses. Atuallah et al. (2004) found technical and scale efficiency of Pakistan and Indian commercial banks under two models, loan base model and income base model.

There are two widely accepted concepts used in banking literature about the functions of banks; production approach and intermediation approach (Sealey and Lindley, 1977). In production approach banks are considered as firms that use factors of production (that is land, labor, and capital) to produce a deposits and loans account. Outputs are measured by the number of accounts and numbers of transactions done in each type of product mean, in terms of physical accounts, deposits are taken as output under this approach (Colwell and Davis, 1992; Rizvi, 2001). While on the

other hand, intermediation approach treated bank as intermediatory of financial services rather than producer of loans and deposits, which takes funds from surplus unit and provides it to deficit unit of the economy. Deposits are taken as input under this approach (Colwell and Davis, 1992; Rizvi, 2001; Akhtar, 2001).

Using financial ratios is a good indicator for measuring the performance of banks, but it loses, advantages and influenceiveness when a DMU's operates in different environmental structures and practices like different capital structures and accounting practices (Ikhaid, 2000). Further, financial ratios deal for short term performances of the company and that's why it misleads the analysts (Oberholver and Westuizen, 2004). For measurement, the efficiency of banks various models and techniques are available. Among these available models and techniques the parametric and non parametric models are frequently used. Parametric model takes the residual value and also a need to develop in functional form. While non parametric model has minimum constrain on its structure form. DEA has an advantage over regression analysis because single regression analysis captures the average performance of banks and it is also influenceed by high values. In contrast the DEA analyzes the efficiency of various DMU's on yearly bases, and constructs a separate frontier on the yearly basis. It might be possible that the bank efficiency varies over the years that a particular DMU in this case the bank may be efficient in one year while inefficient in other year (Sufian, 2006).

Apart from industry and bank specific features or characteristics discussed above, significant empirical studies also exist suggesting that ultimately, the macroeconomic environment within which such banks operate, also has significant influence on performance. As key financial actors channeling financial resources to various sectors of the economy, operational activities of banking institutions have been shown to be influenced by prevailing macroeconomic dynamics and other external factors. Reviewed empirical evidences suggests that macroeconomic performance and trend conditions associated with key economic indicators have significant influence on bank performance. For instance, in an earlier study focusing on the relationship, Afanasieff, Lhacer and Nakane (2002) concluded that inflationary conditions have negative influence on net interest margins; this conclusion supported earlier finding s by Saunders and Schumacher (2000) in a related analysis. Additionally, in a recent study verifying similar relationship among Tumisian deposit banks, Ayadi and Boujelbene (2012) also showed that inflationary conditions have negative influence on profitability among banks studied. Schwaiger and Liebig (2008) further made a strong case for the role of macroeconomic conditions by showing that banks perform better in periods of significant growth characterized by relatively high investment and consumption growth, and growth in credit supply. This condition suggest that favorable macroeconomic conditions, tends to have positive influence on bank performance. Bikker and Hu (2002) in earlier study also established that

bank profits correlates positively with movements in the business cycles. A study by Allen and Saunders (2004), further provided empirical evidence in support of the importance of macroeconomic factors or conditions in determining bank profitability. These reviewed studies to a greater extent support the general view of positive association between economic performance and bank profitability. However, in a study focusing on a similar relationship among Sub-Saharan African economies, Al-Haschimi (2007) who employed net interest margin as a measure of performance, concluded that macroeconomic factors, have much less influence on bank performance than other studies have suggested. Again, Sufian and Razali (2008) whose study focused on bank profitability in the Philippines also indicated that not all macroeconomic variables are significant in bank performance; the study found that specific variables/conditions such as money supply and stock market capitalizations have insignificant influence on bank performance.

2.5. The Influence of Macroeconomics Factors Toward Bank Efficiency

The banking industry is very sensitive to macroeconomic conditions. Thus, the operation of the bank should closely related to economic movements. Therefore, business cycles and monetary policy might influence the efficiency of a bank. Loans are one of the bank's major outputs. There is a linkage between loan and business cycles and monetary policy movements. Problem loans might occur more frequently in worse economic conditions. Berger and DeYoung (1997) interpreted several

reason that cost inefficient bank might tend to have problem loans. One potential reason that they cite is local economic downturns.

Since loans are one of the bank major outputs, problems loans might lead to bank X-efficiency reduction. Berger and DeYoung (1997) employed Granger causality techniques to test the relation between loan quality and a bank's cost efficiency. They found intertemporal relationships between loan quality and cost efficiency in both directions. They indicated that high levels of problem loans caused banks to increase costs in monitoring, working out, and/or selling off those problem loans. Thus, those non-performing loans tended to decrease the cost efficiency of banks. DeYoung (1998) also found similar results. He found that cost efficiency is positively related examiners ratings of the management quality. His results also showed that banks management ratings were strongly related to their asset quality rating. Berger, Bonime, Covitz, and Hancock (2000) also indicated that bank performance was sensitive to regional/macroeconomic shocks. They show that even the greater geographic diversification and the greater use of financial engineering techniques employed to manage risk in recent years still could not reduce the banking industry's sensitivity to regional/macroeconomic shocks. They also explained that bank profitability would increase during economic boom periods because all regions likely had the unexpected favorable economic conditions. During favorable macroeconomic conditions a shifting toward higher-return investments with higher-risk taking might

occur (Berger and Mester (1999), Berger, Bonime, Covitz, and Hancock (2000)). Thus, if this was the case, the profitability of banks should increase. However, this does not mean that banks can reduce the cost efficiently. The cost efficiency in the banking industry may reduce during the boom economy. However, during downturns in the economy, the banking industry might need to operate more efficiently in order to survive. Thus, the influence of economic conditions on efficiency is still a question mark.

2.5.1. The Influence of Inflation Toward Bank Efficiency

To measure the relationship between economic conditions and bank profitability, the annual inflation rate is used. Inflation is an important determinant of banking performance. In general, high inflation rates are associated with high loan interest rates and high income. Perry (1992), however, asserts that the influence of inflation on banking performance depends on whether inflation is anticipated or unanticipated. If inflation is fully anticipated and interest rates are adjusted accordingly, a positive influence on profitability will be exerted. Alternatively, unexpected raises in inflation causes cash flow difficulties for borrowers which can lead to premature termination of loan arrangements and precipitate loan losses. Indeed if the banks are sluggish in adjusting their interest rates, there is possibility that banks cost may increase faster than bank revenue. Hoggarth et al. (1998) also conclude that high and variable inflation may cause difficulties in planning and negotiating loans.

To findings of the relationship between inflation and profitability are mixed. Empirical studies of Guru et al. (2002) for Malaysia and Jiang et al. (2003) for Hong Kong show that high inflation rates lead to higher bank profitability. The study of Abreu and Mendes (2001) nevertheless report a negative coefficient of inflation for European countries. In addition, Demirguc-Kunt and Huizinga (1999) notice that banks in developing countries tend to be less profitable in inflationary environments particularly when they have a high capital ratio. In these countries bank cost actually increase faster than bank revenue.

Yong Tan (2012) in his research found that inflation rate have positively influence to bank performance. The empirical findings suggest that higher cost efficiency, lower volume of non traditional activity higher banking sector and stock market development tend to increase profitability of Chinese banks. There are mixed findings about the influence of risk on Chinese banking profitability in terms of ROA and NIM; in particular, small bank size seems to increase the NIM of Chinese banks, while the higher NIM can also be explained by the higher liquidity of Chinese banks. Higher labor productivity leads to higher ROA of Chinese banks. The positive relationship found between inflation and profitability in Chinese banking sector reflects that fact that the inflation in China can be fully anticipated and the interest rates are adjusted accordingly. This further implies that revenues increased faster than costs. This result is in line with

Pasiouras and Kosmidou (2007) for the European banks, Fadzlan and Kahazanah (2009) and Garcie-Herrero et al. (2009) for Chinese banks.

H1:Inflation rate has positive influence toward bank efficiency.

2.5.2. The Influence of Interest Rate Toward Bank Efficiency

Interest rates play an important role in bank operations. The major business of commercial banks is taking deposits and making loans. When interest rate increases, the cost of a bank's liabilities also increases. However, the interest rate of the bank's loans will also increase. In the past, interest rate ceilings kept deposit costs low creating less volatility in the spread between a bank's deposits and liabilities. Interest rate deregulation caused higher bank funding costs and lower bank profits in the early 1980s, because the cost of raising funds for commercial banks was closely related to interest rates in the money and capital market (The 1980 Depository Institution Deregulation and Monetary Control Act [DIDMCA] phased out interest rate ceilings [Regulation Q], 1986). This increased the volatility of raising funds for banks. Lam and Chen (1985) expected that banks of different sizes (small and big banks) might react differently to changes in capital regulation because of the phase out of the interest rate ceiling. Brown (1983) found the deregulation of interest rates gave more freedom to the small community bank. However, community-oriented small banks might also be at risk to interest deregulation because of their traditionally high concentration of low-cost deposits. Brown shows that high-performance banks maintain the profitability by controlling non-interest

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expenses to compensate for decreased margins and when comparing the non-interest expenses, Brown shows that smaller banks are more efficient than the larger banks.

Humphrey and Pulley (1997) showed the large banks bore the brunt of interest rate deregulation between 1977-1981 and 1981-1984. Large banks tend minimize the negative influence on profits from the deregulation-induced rise in funding costs by adjusting their use of labor and capital inputs and deposit and loan output prices. However, between 1981-1984 and 1985-1988, the situation was reversed for the large banks. According to the evidence of Humphrey and Pulley, smaller banks with assets between $100 and $500 million had done less adjustment to the deregulation. Thus, those smaller banks less relied on the improved business environment in order to stabilize profitability and larger banks relied more on the business environment to improve their profitability. The results also imply that the volatility of larger banks profits is higher than that smaller banks after the deregulation of the interest rate ceiling.

Several studies have been conducted to investigate the influence of interest rate changes on the demand for Islamic deposits. Overall, the findings show that a negative relationship exists between the two variables. Haron and Ahmad (2000) analyzed the relationship between total Islamic deposits and conventional rate of return on deposits for the period 1984 to 1999 in Malaysia banks. They found a negative relationship between the interest rates of fixed deposits of conventional banks and the volume of

interest free investment deposits of sharia banks. The finding is consistent with the theory that during rising interest rates, returns on sharia bank deposit are relatively lower which cause customers to switch to the conventional bank. The study by Rahmatina (2007) also found that sharia bank depositors in Indonesia behaved in accordance with the dictates of the profit motive; responding positively to changes in the real rate of return and negatively to rising interest rates although it was not significant in the short run.

Another study by Obiyathulla (2014) examined the relationship between changes in the interest rate of conventional bank deposits and the rate of return on sharia bank deposits for the period 1984 to 2003. Dividing the overall period into two segments (rising and falling interest rates), the study found strong positive correlations between the two rates for both segments. The results showed both rates moved closely in the same direction regardless of rising or falling interest rates. Obiyatullah argued that the result supported the theory that falling interest rates had a favorable influence on sharia banks but it also indicated that sharia banks were forced to raise deposit rates when interest rates rose in order to remain competitive which would imply a potential squeeze on the banks earnings.

H2: Interest rate has negative influence toward Bank Efficiency.

2.5.3. The Influence of Exchange Rate Toward Bank Efficiency

Exchange rate models since the 1970s have emphasized that nominal exchange rates are asset prices and are influenced by expectations

about the future. The "asset market approach to exchange rates" refers to models in which the exchange rate is driven by a present discounted sum of expected future fundamentals. Obstfeld and Rogoff (1996,529) say that "one very important and quite robust insight is that *the nominal exchange rate must be viewed as an asset price*. Like other assets, the exchange rate depends on expectations of future variables" (italics in the original). Frenkel and Mussa's (1985) survey explains the asset market approach:

These facts suggest that exchange rates should be viewed as prices of durable assets determined in organized markets (like stock and commodity exchanges) in which current prices reflect the market's expectations concerning present and future economic conditions relevant for determining the appropriate values of these durable assets, and in which price changes are largely unpredictable and reflect primarily new information that alters expectations concerning these present and future economic conditions. (726)

Yourougou (1990) explained that the interest rate and exchange rates have a significant influence on these hares of financial institutions including banks. Moreover, Kessel (1956), Bach and Ando (1957), French et al (1983) explained the sensitivity of banks interest rate, given the composition of their balance sheets. The first empirical studies have drawn attention to the risk of exchange rate on bank stock returns were generated by Grammatikos and al (1986) and Chamberlain et al (1997). The results of these studies have shown that U.S banks were exposed to the risk of

exchange rate. Furthermore, by employing the same three-factor model to return the generating process of Korean Banks, Hahm (2004) concluded on the risk of interest rate risk and exchange rate in that Korean bank stock return were sensitive to those factors. His work shows that Korean commercial banks have been very involved with the risk of interest rate and currency risk. The result also shows that the efficiency of Korean banks is significantly associated with the degree of interest rate and credit policy.

Mouna and Anis (2011) in their research found that the exchange rate have positive relationship with bank performance. In their research said the fluctuation of the exchange rate leads to an increase of bank stock return volatility. While the influence of long term interest rate volatility on the bank stock volatility is very important, when the long term interest rate becomes more volatile, this will lead to an increase in the bank stock return volatility.

Rexord Abaidoo (2014) in he research about macroeconomic condition and other factors influence operational efficiency among commercial banks found that GDP growth and exchange rate volatility have positively influence aggregate operational efficiency among commercial bank; with a percentage increase in the variables significantly augmenting aggregate operational efficiency.

H3: Exchange rate has positive influence toward bank efficiency.