# Financial Sector Reforms and the Efficiency of Banking in Pakistan

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## 1 INTRODUCTION

The banking in Pakistan has been dominated by government owned institutions. It has accommodated the financial needs of the government, public enterprises and private sectors (Khan, 1995; Khan and Khan, 2007). Public sector dominancy, among others, lead to inefficiency in the banking sector (Haque, 1997). The economic efficiency of the banks remained low that led to low savings and investment in the private sector which resulted in low growth (Khan and Khan, 2007). These problems include concentrated ownership of financial assets, high taxes, narrow range of products and have not diversified into consumer and mortgage financing (Haque, 1997 and Limmi, 2002).

A strong regulatory and supervisory system is necessary to cop with the financial crises and promotes the efficient function of financial markets (Caprio and Klingebiel, 1997). Therefore the challenge is to formulate an appropriate regulatory framework that enables the banking system to be more resilient to insolvency. In addition timing, sequencing and speed of restructuring measures are very important for successful restructuring (Khatkhate, 1998 and Alawode and Ikhide, 1997). Moreover, the reforms of the financial system are important to remove market distortions (Eatwell, 1996; Mavrotas and Kelly, 2001; and Khan and Khan, 2007). Financial sector in Pakistan has been under reforms process since early 1990's. The objectives of these reforms has been removing inefficiencies of financial intermediations and maintaining stability and enhancing growth (Faruqi, 2007).

In order to improve the efficiency of financial system the Government of Pakistan initiated macroeconomic and financial sector restructing program. International agencies such as International Monetary Fund (IMF), The World Bank and government of Japan provided technical support as well as banking sector adjustment loan (BSAL) in 1996. The current spell of reforms process has

started in 1997. The main concern of the reforms agenda has been on the recovery of non-performing loans, retrenchment of surplus staff, closure of over-extended branches, privatization of banks, introduction of international accounting standards, strengthening prudential regulation and establishment of banking courts. During 1998 and 1999, the reform process suffered badly.

The Government of Pakistan has decided in 2000 to review the reforms program. Therefore the Government approached the World Bank to get support for revival of the reforms program. As a result the World Bank approved a credit for the Pakistan Banking Sector Restructuring and Privatization Project (PBSRPP). The main focus of PBSRPP has been to improve the efficiency of state owned banks by reducing the cost structure, complete privatization of banks, liberalizing bank branching policy, reduction in taxes, integration of national savings scheme to the financial markets, discontinuance of the mandatory placement of foreign currency deposits by the commercial banks, and strengthening the central bank to play effective role as a regulator of banking sector (Qayyum and Ahmed, 2006).

Following the guidelines provided in the agreement with the donors, the Government of Pakistan and State Bank of Pakistan has taken several steps to restructure financial sector. These include privatization of NCBs**, c**orporate governance, capital strengthening, improving asset quality, consumer financing, legal reforms, prudential regulations, E-banking, credit rating, reduction of corporate taxation and human resource development (SBP, 2005). It was expected that these reforms will bring significant economic benefits through a more effective mobilization of domestic savings and efficient allocation of resources.

There are a few studies are available in Pakistan on banking efficiency. These include Musleh-ud-Din (1996), Akhter (2002), Burki and Niazi (2003) and Qayyum and Ahmed (2006). None of these considered second generation reforms and their impact. Therefore there is a need of comprehensive assessment of the impact of financial sector reforms (especially 2$^{nd}$ phase of reforms i.e. 2002) on banking efficiency. It is to investigate weather efficiency of banking in Pakistan improves or not. For this purpose we used data from 1990 to 2006 for 20 domestic commercial banks.

Next section, after introduction, provides overview of status of banking and reforms in Pakistan, section three elaborates methodology and fourth section provides results. Final section concludes the study.

## 2 OVERVIEW OF FINANCIAL SECTOR

Financial sector in Pakistan consists of regulators, commercial banks, development finance institution and stock market. Earlier the financial sector was supervised and regulated by three organizations such as State Bank of Pakistan, Pakistan Banking Council and the Corporate Law Authority (CLA). The SBP acts as central bank, Pakistan Banking Council (PBC) used to monitors the performance of nationalized commercial banks and Corporate Law Authority regulates the equity market.

At the time of independence Pakistan inherited Habib Bank that was established in 1941 in Bombay (Mumbai) which after creation of Pakistan shifted from Bombay to Karachi. On 1st July 1948 the Government of Pakistan has established a central bank that is State Bank of Pakistan (SBP). The SBP was jointly owned by the Government of Pakistan and private sector. In the following years the government set up fully state owned bank namely National Bank of Pakistan. (Date of establishment of private and foreign banks in Pakistan can be seen in Appendix 1.)

The Government of Pakistan nationalized all banks in 1974 to make credit availability to highly priority sectors of the economy (Haque and Kardar, 1993). This step of nationalization completely wiped out the private sector from the banking business. Nationalization affected the performance and efficiency of the banks. After analysing the performance of nationalized institutions for a decade government has decided to revise the policy decision of nationalization to encourage private sector participation, enhance efficiency and promote competition among banks Consequently the Banks (Nationalization) Act, 1974 was amended in 1991. As a first step twenty three banks were allowed to work. Out of these ten banks belongs to domestic sector and rests were international/foreign banks.

**TABLE: 1 PRIVATE AND FOREIGN SCHEDULED BANKS ESTABLISHED IN 1991**

| | | | |
|---|---|---|---|
| 1 | Metropolitan Bank Limited, | 13 | Bank AI-Habib Limited |
| 2 | Faysal Bank Limited | 14 | Bank of Punjab |
| 3 | Mehran Bank Limited | 15 | Union Bank Limited |
| 4 | Askari Commercial Bank Limited | 16 | Prime Commercial Bank Limited |
| 5 | Republic Bank Limited. | 17 | Capital Bank Limited |
| 6 | Schon Bank Limited, | 18 | Habib Credit & Exchange Bank Limited |
| 7 | Prudential Commercial Bank Limited | 19 | Platinum Commercial Bank Limited |
| 8 | Bank of Khyber | 20 | Trust Bank Limited |
| 9 | Soneri Bank Limited | 21 | Bank AI-Falah Limited |
| 10 | Indus Bank Limited | 22 | Oman International Bank |
| 11 | Bolan Bank Limited, | 23 | Gulf Commercial Bank Limited |
| 12 | Bank of Ceylon | | |

Source: FSA 1990-2000

The process of denationalization/privatization of Nationalized Commercial Banks (NCBs) has also been started. At a first stage two state owned banks that are MCB and ABL were privatized. The process of their privatization took two years to complete. In 1991, 26 percent shares of MCB and ABL were offered to the private sector. Followed by floating of 49 percent more shares of MCB during 1993. Consequently the management and control of MCB has been transferred to the buyer. Under the Employees Stock Ownership Plan (ESOP) 25 percent shares of Allied Bank Limited (ABL) were sold to private sector in August 1993. As a result the management and control of the bank was handed over to Employee Management Group (EMG).

The SBP has also decided to enhance its role as a regulator of banking sector. As a first step, in 1993 the SBP advised banks to set quarterly recovery targets, submit their progress reports and formulate strategies to improve future recovery. Furthermore, in 1997 SBP has revised disclosure standards and banks were directed to submit their annual accounts on new format as per with international accounting practices. The SBP adopted two new systems to monitor and evaluate the performance of each bank. These include CAMELS (i.e. Capital

adequacy, Asset quality, and Management quality, Earnings, Liquidity and Sensitivity to Market Risk Systems and controls) and CAELS (Capital adequacy, asset quality, earnings, liquidity and sensitivity).

Further down to the road of reforms in 1997 the Government of Pakistan amended two important banking laws such the Banking Companies Ordinance (1962) and the State Bank of Pakistan Act (1956). Moreover the Pakistan Banking Council was abolished and the State Bank of Pakistan has been given sole responsibility to regulate banking sector. Further, all appointments and removals of Chief Executives and Board of Nationalized Commercial Banks (NCBs) and Development Financial institutions (DFI) are now required to be made with the approval of the State Bank of Pakistan. Further the Banking Tribunal Ordinance (1984) and Banking Companies (Recovery of Loans) Ordinance (1997) were repealed through promulgation of Banking Companies (Recovery of Loans and Advances, Credit and Finance) Ordinance (1997).

In order to strengthen the SBP's role as independent and efficient regulator the Government has decided to restructure the SBP. Consequently in 2001, the SBP has been divided into three organizations; 1) the SBP as a central bank, 2) SBP-Banking Services Corporation (SBP-BSC), and 3) National Institute of Banking and Finance (NIBAF).

Moreover to regulate capital market and leasing and investments banks a new organization namely the Securities and Exchange Commission of Pakistan (SECP) was created in 2001. The SECP has replaced CLA and become independent regulator. Now there are two regulators of financial sector such as the SBP and the SECP.

## 3 METHODOLOGICAL ISSUES

### 3.1 The Concept of Efficiency

The best practice or frontier function is an efficient transformation of given inputs into maximum attainable output. In other words, it reflects the ability to produce a well specified output at minimum cost [Forsund, 2001; Lovell, 1993; and Schmidt, 1985-86]. To evaluate efficiency of banks relative to the best practice bank, it is necessary to have a quantifiable standard which can only be determined by those productive units which share a common technology.

Formally Farrell (1957) proposed a method to estimate the productive or economic efficiency (EE) of observed units. In this approach he decomposed production efficiency into two elements such as technical efficiency (TE) and allocative efficiency. TE deals with the measurement of firm's success in producing maximal output with a given set of inputs and the AF quantifies the firm's success in choosing an optimum combination of inputs.

In order to explain different concepts of efficiency we assume a bank that uses only two inputs (i.e., $X_1$ and $X_2$) to produce a single output (i.e., Y). The efficient production function can be written as

$$Y = f(X_1, X_2) \quad (1)$$

Under the assumption of constant returns to scale, equation 1 can be expressed into a production frontier that can be written as[1]

$$I = f(X_1/Y, X_2/Y) \quad (2)$$

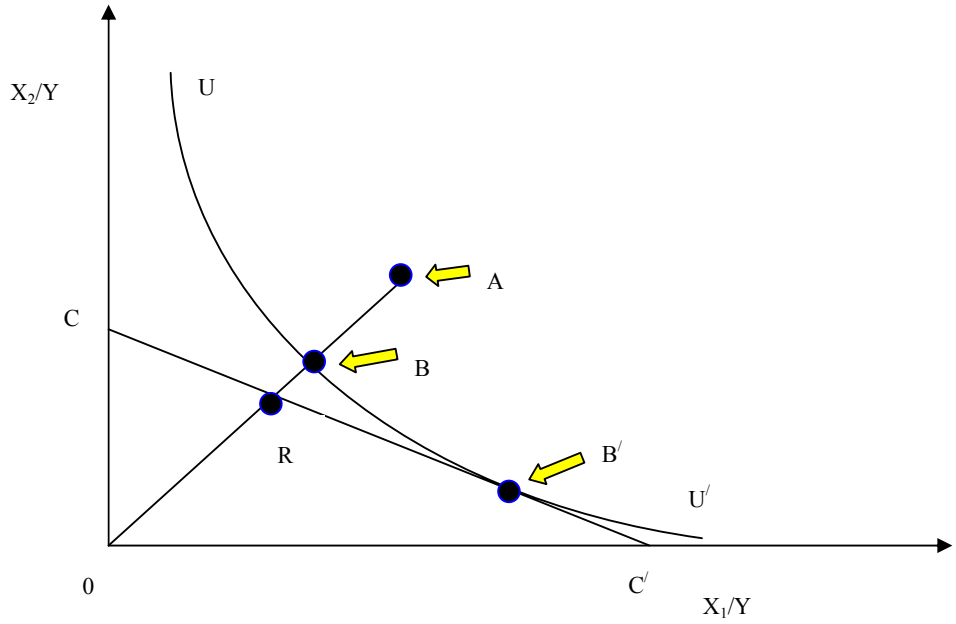
Equation 2 implies that the production frontier can be explained by using the efficient unit isoquant (EUI). This is represented by the curve $UU^{/}$ in Figure 1. The EUI shows technically efficient combinations of inputs used to produce one unit of output. The combination of $X_1$ and $X_2$ actually used by a bank in producing Y is represented by point A which lies above the unit isoquant. We assume another point B that represents a technically efficient bank when a bank can produce same output by using less inputs. Thus the TE of bank A can be defined as the fraction OB/OA. Hence, 1–OB/OA is the technical inefficiency of bank A. This shows the proportion by which the inputs could be reduced, holding the input ratio ($X_1/X_2$) and output level constant. In other words, bank A can produce OA/OB times more output with the same input quantities (Farrell, 1957).

If input prices are considered, then it is possible to examine the optimal combination of inputs which minimize the cost of producing a given level of output. The optimal combination is $B^{/}$ where the price line ($CC^{/}$) is equal to the

[1]The constant returns to scale assumption allow one to represent the technology using unit isoquant. Furthermore, Farrell also discussed the extension of his method so as to accommodate more than two inputs, multiple outputs, and non-constant returns to scale.

slope of unit isoquant ($UU^{/}$). It is evident that Bank B is producing at a higher cost than $B^{/}$, although both points reflect 100 percent technical efficiency. The cost of production at $B^{/}$ is only a fraction OR/OB of that at B. The ratio OR/OB is the allocative efficiency of B. Consequently, the allocative inefficiency of B is 1-(OR/OB), which measures the potential reduction in cost from using optimal input proportions (Schmidt, 1985-86).

**Figure 1: Technical and Allocative Efficiencies from Input Orientation**




The production or economic efficiency (OR/OB) is given by the ratio which is a combination of technical (OB/OA) and allocative (OR/OB) efficiencies of bank A. Accordingly, 1 –(OR/OA) is economic or total inefficiency of that bank, which shows the overall efficiency gain of moving from point A to $B^{/}$ (Schmidt, 1985-86). Therefore, economic efficiency is the product of technical and allocative efficiencies, i.e., EE = (OB/OA) x (OR/OB) = OR/OA (Farrell, 1957).

The estimation of efficiency without resorting to a specific functional form was presented by Farrell and his work is extended by Charnes et al. (1978), Fare, et al. (1985), and Banker, et al. (1984), among others. For this reason these

methodologies have been termed non-parametric[2]. Farrell's methodology however has also been extended to parametric models based on specific functional forms. Moreover, Farrell's original idea had an input-reducing focus and thus is usually termed input-orientated measure. Similarly different concepts of efficiency (i.e., TE, AE, and EE) can be explained by using output oriented technology.

Under the assumption of constant return to scale results of the technical efficiency measures are same for both output-oriented or input-oriented methods. The results, however, differ under increasing or decreasing returns to scale (Fare and Lovell, 1978).

Charnes, et al., (1978) assuming constant returns to scale (CRS) proposed input oriented model. But the CRS assumption is only appropriate when all decision making units (DMU's) are operating at an optimal scale. Imperfect competition, constraints on finance, etc. may cause a DMU to be not operating at optimal scale. Banker, et al., (1984) suggested an extension of the CRS DEA model to account for variable returns to scale (VRS) situation. The use of the CRS specification when not all DMU's are operating at the optimal scale will result in measures of TE which includes *scale efficiencies* (SE). The use of the VRS specification therefore permits the calculation of TE without SE effects.

The technical efficiency can be decomposed into scale efficiency (SE) and pure technical efficiency (PTE) components. This can be done by estimating both a CRS and a VRS DEA using the same data. If there is a difference in the two TE scores for a particular DMU, then this indicates that the DMU has scale inefficiency. The scale inefficiency, therefore, can be calculated from the difference between the VRS TE score and the CRS TE score.

These concepts can be explained by using the Figure 2. By assumeing one-input and one-output we have drawn both CRS and VRS DEA frontiers. Under CRS the input-orientated technical inefficiency of the point P is the distance $PP_c$, while under VRS the technical inefficiency would only be $PP_v$. The difference between these two, $P_cP_v$, is due to scale inefficiency. Therefore it can be expressed

[2] Readers interested in recent advances on non-parametric models are referred to Seiford (1996) and Thrall (1990).

in ratio efficiency measures as:

$$TE_{ICRS} = APC/AP$$

$$TE_I = APV/AP$$

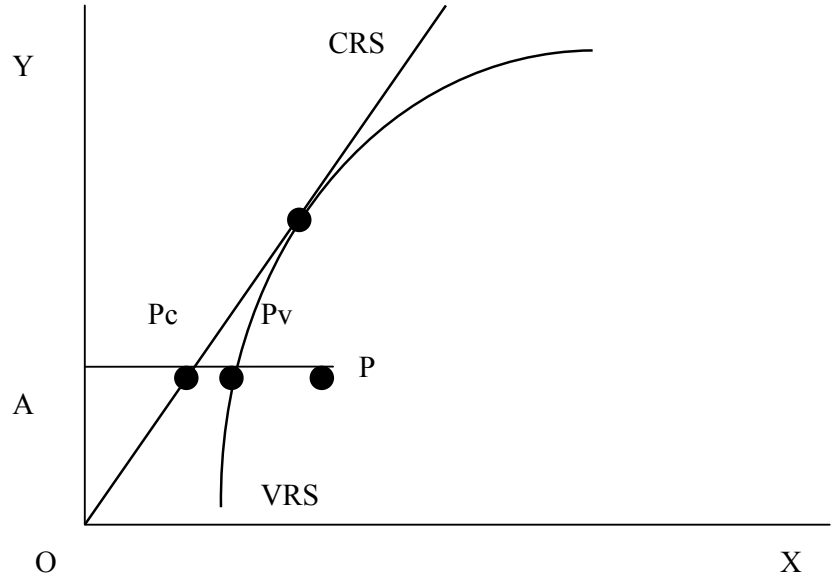
$$SE_1 = AP_C/AP_V$$

Where all of these measures will be bounded by zero and one. We also note that

$$AP_C/AP = (AP_VAP) \times (AP_C/AP_V)$$

Thus the CRS technical efficiency measure is decomposed into pure technical efficiency and scale efficiency.

**Figure 2: Technical Efficiency, Pure Technical Efficiency and Scale**




### 3.2 Methodological Framework

The concept of non parametric frontier was introduced by Farrell (1957) by assuming constant returns to scale (CRS). Later the assumption of CRS was relaxed and the methodology was also extended to parametric one. Now the efficiency estimation techniques can be separated into two broad categories:

1) Econometric methods; and
2) Mathematical programming techniques.

The efficient frontier in econometric methods is obtained by estimating

production or cost / profit functions. These techniques either yield deterministic frontier or stochastic frontier. The deterministic models were initiated by Aigner and Chu (1968) and further extended by Timmer (1970 and 1971), Afriat (1972), Richmond (1974), Schmidt (1976) and Greene (1980). The deterministic frontier can be estimated using standard regression technique (ordinary least squares) and the efficiency measures are computed from the model residuals. The main drawback of the deterministic models is that they do not allow the possible effects of the factors that are not under the control of the producer. Consequently, all deviations from the frontier can be regarded as inefficiency resulting in an over estimation of this component (Meeusen and van den Broeck, 1977).

Aigner, et al., (1977) and Meeusen and van den Broeck (1977) developed the stochastic frontier model independently. The maximum likelihood methods is used to estimate stochastic frontier which incorporates a composed error term having two components – one symmetric, capturing the effects of those factors which are not under the control of the firm and the other is one-sided representing management inefficiency. This approach can be used to analyse the cross-section as well as the panel data [e.g., Pitt and Lee (1981), Battese and Coelli (1988), Battese et al., (1989) and Seale (1990)].

The major advantages of this approach are its ability to incorporate and manage statistical noise and handle outliers, and that hypotheses can be statistically tested (Forstner and Isaksson, 2002). However, this methodology is not free of criticism. These models need specific functional form such as Cobb-Douglas and translog in order to estimate efficiency and the technology is assumed to be valid for all observations. Additionally, such models assume distributional assumptions regarding the composed error term to separate the efficiency from the statistical noise. Consequently, the econometric methodology makes the estimation of efficiency burdensome and has the tendency to produce different efficiency measures (Schmidt and Sickles, 1984).

Farrell's original non-parametric approach where piecewise -linear convex isoquant is constructed so as no observed point lie left or below it known as mathematical programming technique for frontier (Worthington, 2000). Later, this methodology was generalized and extended by Charnes et al. (1978), Färe et al,

(1983), Banker et al (1984) and Byrens et al, (1984). This technique now is widely known as "data envelopment analysis (DEA)".[3] In contrast to econometric method, the DEA does not require any assumption about the functional form and no need to assume any specific distributional form for the error term. Moreover, the DEA analysis is flexible and accommodates variable returns to scale (VRS). However a major disadvantage in this method is its inability to handle noisy data in a satisfactory manner (Worthington, 2000).

Data envelopment analysis (DEA) is used in study to analyze the efficiency of the bank in Pakistan. Both input-oriented (IOM) and output-oriented (OOM) versions of the DEA methodology have been applied to the data for the sake of efficiency score comparison.

The Data Envelopment Analysis (DEA) approach is based on mathematical programming. It uses the observed values of inputs and outputs and attempts to find which of the firms in the sample determine an envelopment surface. Firms lying on the surface are deemed to be efficient and receive a value of unity. Firms that do not fall the frontier are deemed to be inefficient and capture a value of less than unity. Hence, all deviations from the estimated frontier represent inefficiency. Banks under the DEA approach are referred to a decision-making unit (DMUs). Data Envelopment Analysis (DEA) is used to estimate output frontier. Distance functions are estimated under constant return to scale (CRS) and variable return to scale (VRS) assumptions. The overall bank efficiency can be decomposed into scale efficiency and pure technical efficiency. However, the frontier obtained through DEA approach is sensitive to extreme observations and measurement errors (Qayyum and Ahmed, 2006).

An output-oriented model implies that the efficiency is estimated by the output of the firm relative to the best practice level for a given level of inputs. In order to specify the mathematical formulation of the output oriented, let us assume

[3] More detail reviews of the methodology are presented by Seiford and Thrall (1990), Lovell (1993), Ali and Seiford (1993), Lovell (1994), Charnes et. Al (1995) and Seiford (1996).

that we have K decision-making units (DMU)[4] using N inputs to produce M outputs. Inputs are denoted by $x_{jk}$ (j = 1,……..,n) and the outputs are represented by $y_{ik}$ (i=1,…….,m) for each bank k (k=1,…….,K). The efficiency of DMU can be measured as (Coelli, 1998; Worthington, 1999; Shiu, 2002).

$$TE_K = \sum_{i=1}^{m} u_i y_{is} \Big/ \sum_{j=1}^{n} v_j x_{jk}$$

Where $y_{ik}$ is the quantity of the ith output (i.e. Loan & Advances and Investment) produced by the kth DMU firm, $x_{js}$ is the quantity of jth input (i.e. Deposits, Labor and Capital) used by the sth firm, and $u_i$ and $v_j$ are the output and input weights respectively. The DMU maximizes the efficiency ratio, $TE_{k,}$ subject to

$$\sum_{i=1}^{m} u_i y_{is} \Big/ \sum_{j=1}^{n} v_j x_{jk} \le 1 \qquad \text{Where } v_j \ge 1$$

This constraint implies that efficiency measures of a bank cannot exceed one and the input and output weights are positive. The weights are selected in such a way that the firm maximizes its own efficiency. To select optimal weights the following mathematical programming (output-oriented) is specified (Coelli, 1998; Wrothington, 1999; Shiu, 2002)

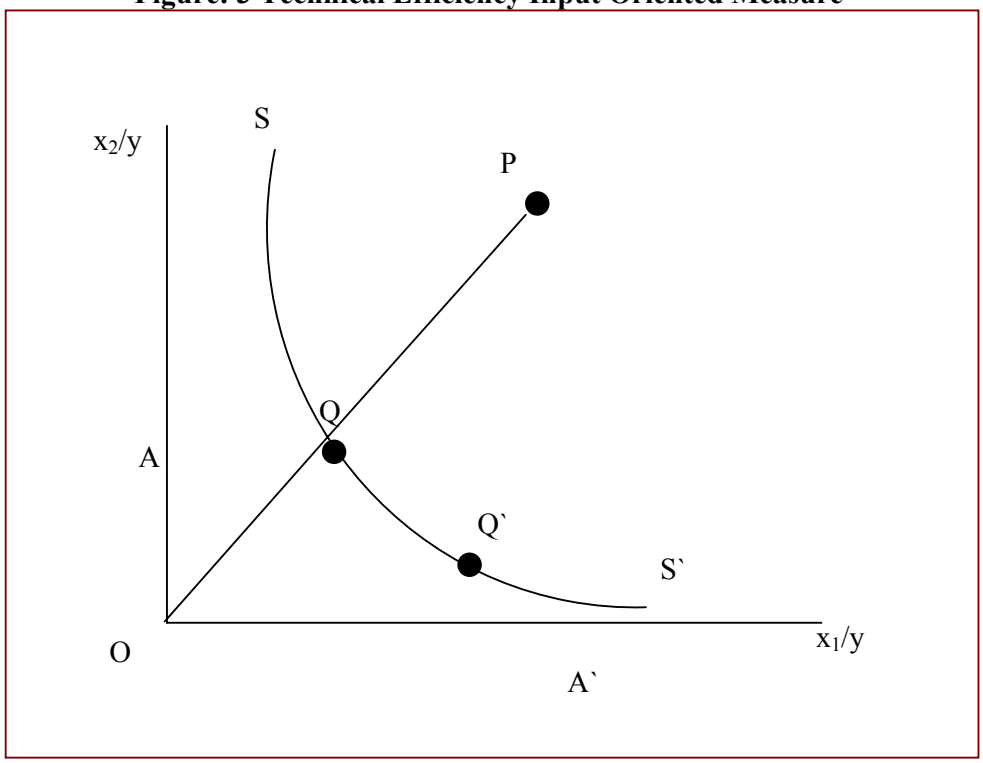
Max $TE_k$

Subject to $\sum_{i=1}^{m} u_i y_{ir} - x_{jr} + w \le 0$ r=1,……,K

$$v_j x_{jr} - \sum_{j=1}^{n} u_j x_{jk} \qquad \text{ui and } v_j \ge 0$$

[4] Hereafter Banks will be represented by DMU.

**Figure: 3 Technical Efficiency Input Oriented Measure**




Input oriented linear programming methods is used in order to obtain the minimize inputs. Therefore the following mathematical programming model is specified (Banker and Thrall, 1992; Coelli, 1998; Worthington, 1999; Shiu, 2002; Topuz et al, 2005).

Min $TE_k$

Subject to $\sum_{i=1}^{m} u_i y_{ir} - y_{iF} + w \geq 0$ r=1… K

$$x_{jr} - \sum_{j=1}^{n} u_j x_{jk} \geq 0$$ ui and $v_j \geq 0$

The above model shows CRS if w = 0 and it changed into variable return to scale (VRS) if w is used unconstrained (Qayyum and Ahmed, 2006).

## 4 EFFICIENCY ANALYSIS

In order to provide baseline for comparison we first estimated efficiency scores of individual banks for the years 1991 that is the first year of the study period. The results are presented in Table 2. As can be seen from the table, the average input oriented technical efficiency (TE), pure technical efficiency (PTE) and scale efficiency (SE) is 64.9, 88.0 and 74.2 percent, respectively. The average output oriented TE, PTE and SE are 64.9, 88.7 and 73.6 percent respectively. In the existing situation of 1991 banks can improve their output by 35% without any additional expenditure or they can reduce their expenditures on inputs without harming their output. It is revealed that whatever the methodology we use to estimate efficiency scores the scale inefficiency dominates the pure technical inefficiency. It is further revealed that approximately 25% of inefficiency in banking sector is due to their scale, implying that there is a room to improve efficiency of banks by reducing number of employees.

The analysis revealed that in 1991 six banks out of twenty are on efficient frontier. These include two public sector banks and four private banks. It is also revealed that four public sector banks (i.e., UBL, ABL, NBP and MCB) are at the top of inefficiency hierarchy. Out of these four banks only one bank (i.e., ABL) which is technically inefficient when VRS is assumed. One thing that clearly emerged from the results presented in the Table, that the scale of bank is the main cause of inefficiency. When we look at the scale inefficiency UBL stands top on the inefficiency table. In case of managerial efficiency, as may be seen from the table, Soneri Bank (a private bank) is on the bottom of the PTE score table.

We also calculated the stage of production technology of each bank which has important policy implications (Farel et. al. 1985 and Qayyum and Ahmed, 2006). Analysis presented in the table reveals that only 20 % (i.e., four) banks are enjoying economies of scale and all these banks belongs to private sector. Moreover, 50 percent banks are facing the problem of diseconomies of scale. Out of these 70% (i.e., seven) banks belongs to public sector and only 30% banks belong to private sector.

**Table: 2**

**INTERMADIATION EFFICIENCY MEASURES OF DOMESTIC BANKS DURING 1991**

| No. | Banks | INPUT ORIENTED | | | OUTPUT ORIENTED | | |
|---|---|---|---|---|---|---|---|
| | | **TE** | **PTE** | **SE** | **TE** | **PTE** | **SE** |
| 1 | ZTBL | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 2 | ABPL | 0.300 | 0.752 | 0.399 | 0.300 | 0.785 | 0.382 |
| 3 | ACBL | 0.532 | 0.542 | 0.981 | 0.532 | 0.537 | 0.991 |
| 4 | BAHL | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 5 | My Bank | 0.308 | 0.601 | 0.512 | 0.308 | 0.398 | 0.773 |
| 6 | FWBL | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 7 | HBL | 0.484 | 1.000 | 0.484 | 0.484 | 1.000 | 0.484 |
| 8 | Al-Falah | 0.555 | 1.000 | 0.555 | 0.555 | 1.000 | 0.555 |
| 9 | MBL | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 10 | MCB | 0.457 | 1.000 | 0.457 | 0.457 | 1.000 | 0.457 |
| 11 | NBP | 0.391 | 1.000 | 0.391 | 0.391 | 1.000 | 0.391 |
| 12 | PCBL | 0.591 | 0.684 | 0.865 | 0.591 | 0.786 | 0.752 |
| 13 | Soneri Bank | 0.476 | 0.480 | 0.992 | 0.476 | 0.555 | 0.858 |
| 14 | Union Bank | 0.379 | 0.576 | 0.658 | 0.379 | 0.707 | 0.536 |
| 15 | UBL | 0.287 | 1.000 | 0.287 | 0.287 | 1.000 | 0.287 |
| 16 | Fysal Bank | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 17 | BOP | 0.522 | 1.000 | 0.522 | 0.522 | 1.000 | 0.522 |
| 18 | BOK | 0.798 | 0.961 | 0.830 | 0.798 | 0.971 | 0.822 |
| 19 | KASB | 0.910 | 1.000 | 0.910 | 0.910 | 1.000 | 0.910 |
| 20 | Saudi Pak | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| | **Mean** | **0.649** | **0.880** | **0.742** | **0.649** | **0.887** | **0.736** |

In this study was also estimated year wise efficiency scores of all banks under study. The results are presented the table 3. The results from the table 3 revealed that the efficiency score of banking improves from 65% in 1991 85% in 1997. The efficiency score jumped at least 20 percentage points. This may be due

to the privatization of main nationalized bank such as MCB and ABL. Both banks were privatized in two phases. At the first phase these banks were partially privatized in 1991 and than completely privatized in 1993. The ABL's TE score in 1991 was 0.30 which jumped to 0.873 in 1997. MCB's TE score moved from 0.45 in 1991 to 1.00 in 1997. During this period the TE score of 13 banks increased, four banks remained at the same level and only three banks' efficiency score declined. Out of these three banks two belonged to public sector. Another reason for this improvement in efficiency may be the induction of new private banks that may have induced healthy competition in the banking industry.

As mentioned elseware in the study, the current phase of financial sector reforms started in the years 1997. Steps taken by the by the authorities during the very first year has already been discussed in section 2. Analysis presented in table 3 revealed that during the 1st phase of reforms period (i.e.1998-01) average input oriented TE, PTE and SE are 78.7, 94.2 and 83.3 percent, respectively. The possible reason for the increasing PTE during the period may be due to strengthen the prudential regulations and international accounting standards for the banks by the SBP.

Comparing the results of pre reform and 1st phase of reforms it can be concluded in input-oriented the Pure Technical Inefficiency (PTI) in pre-reform period was 8.9 percent and in first phase it is 5.8 percent. It means that there is a 3.1 percent increase in PTE. But Scale Inefficiency (SI) in pre-reform period was 14.2 percent and in first phase it is 16.7 percent. It means that the scale inefficiency increased by 2.5 percent in the 1st phase of reforms. On the other hand, in output-oriented the Pure Technical Inefficiency (PTI) in pre-reform period was 8.4 percent and in first phase it is 6.4 percent. It means PTE increased 2 percent.

In pre-reform period SE was 14.7 percent and in first phase of reforms it is 15.8 percent, its means that the SE increased 1.1 percent. Scale Inefficiency is increased in this period it may be due to over employment in banks, unprofitable branches, burden of non-performing loans (NPLs) etc.

Last spell of financial sector reforms started in 2001 with the revival of earlier reform process by the government of Pakistan with the help of international

agencies. Most of the reforms initiated in the 2nd phase are concerned with the reduction in the cost structure of state owned banks, completely privatization of banks, liberalizing the bank branch policy, reducing tax and strengthening the role of SBP. The Average annual efficiency scores for the period from 2002 to 2005 presented in the Table 3 revealed that average input oriented TE, PTE and SE are 87.6, 95.9 and 91.2 percent, and average output oriented TE, PTE and SE are 87.6, 95.5 and 91.7 respectively. The reforms improve the efficiency of banks so the PTE and SE increased.

**Table: 3**
**INTERMADIATION EFFICIENCY MEASURES OF DOMESTIC BANKS**

| | **INPUT ORIENTED** | | | **OUTPUT ORIENTED** | | |
|---|---|---|---|---|---|---|
| **Years** | **TE** | **PTE** | **SE** | **TE** | **PTE** | **SE** |
| **1991** | **0.649** | **0.880** | **0.742** | **0.649** | **0.887** | **0.736** |
| 1992 | 0.718 | 0.886 | 0.818 | 0.718 | 0.888 | 0.817 |
| 1993 | 0.727 | 0.901 | 0.807 | 0.727 | 0.921 | 0.787 |
| 1994 | 0.879 | 0.951 | 0.924 | 0.879 | 0.961 | 0.914 |
| 1995 | 0.802 | 0.899 | 0.883 | 0.802 | 0.902 | 0.882 |
| 1996 | 0.875 | 0.930 | 0.939 | 0.875 | 0.926 | 0.944 |
| 1997 | 0.854 | 0.935 | 0.912 | 0.854 | 0.928 | 0.91 |
| **1991-97** | **0.782** | **0.911** | **0.858** | **0.782** | **0.916** | **0.853** |
| 1998 | 0.812 | 0.929 | 0.868 | 0.812 | 0.923 | 0.875 |
| 1999 | 0.797 | 0.946 | 0.845 | 0.797 | 0.950 | 0.842 |
| 2000 | 0.802 | 0.966 | 0.828 | 0.802 | 0.957 | 0.839 |
| 2001 | 0.739 | 0.929 | 0.794 | 0.739 | 0.914 | 0.815 |
| **1998-01** | **0.787** | **0.942** | **0.833** | **0.787** | **0.936** | **0.842** |
| 2002 | 0.821 | 0.932 | 0.877 | 0.821 | 0.924 | 0.884 |
| 2003 | 0.825 | 0.940 | 0.880 | 0.825 | 0.931 | 0.891 |
| 2004 | 0.924 | 0.989 | 0.934 | 0.924 | 0.986 | 0.937 |
| 2005 | 0.939 | 0.979 | 0.958 | 0.939 | 0.980 | 0.958 |
| **2002-05** | **0.876** | **0.959** | **0.912** | **0.876** | **0.955** | **0.917** |
| **1991-05** | **0.804** | **0.932** | **0.863** | **0.804** | **0.931** | **0.864** |

In the pre reform, 1st phase and 2nd phase of reforms the scale inefficiency is greater than the pure technical inefficiency. It implies that most of the technical inefficiency of commercial banks is due to the scale inefficiency rather than the pure technical inefficiency. The results show that the most of the reforms are related to management side and most of the banks show improvement in the management side (i.e. PTE). However it leads to say that there is a need of proper

reforms to reduce the scale inefficiency.

We also analysed and compared efficiency scores of different banks over the years. The results are presented in Table 4. As can be seen from the table, there are three banks that are highest level of inefficiency in 1991. Moreover, years 1996 and 1997 are seems to be tough for the banking in Pakistan. Most of the banks (i.e., 12) were away from the efficient frontier during the study period. Finally year 2001 is considered to bad for number of banks. As may be seen from the table 4 six banks are at the lowest level of efficiency. However over the years, as is evidenced from the table, most of the banks seem to be improving their efficiency score an intermediary.

Efficiency analysis of the commercial banks for the year 2005 is given in table 4. The results show that there are twelve banks which are on efficient frontier. These include FWBL, MBL, MCB, PCBL, Union Bank, UBL, Fysal Bank, BOP, BOK and Saudi Pak. Only one bank that is FWBL belongs to government sector whereas all other banks are owned by private sector. It is interesting to note that UBL being inefficient bank in 1991 after privatization moved into efficient frontier in 2005. This improvement in the efficiency score is due to improvement in the scale efficiency. Average input oriented TE, PTE and SE is 93.5, 97.9 and 95.6 percent, respectively. The average output oriented TE, PTE and SE are 93.4, 98.0 and 95.5 percent, respectively. The scale inefficiency is greater than the pure technical inefficiency in both measures. It implies that most of the technical inefficiency of commercial banks is due to the scale inefficiency rather than the pure technical inefficiency (Managerial Efficiency).

Now the banks are able to expand their core business activities, they strengthened their capital base, improved asset quality and profitability during the year 2005. These developments clearly reflect the increased competition among banks and improvement in the efficiency of the banking sector.

## 5 CONCLUDING REMARKS

Financial sector in Pakistan has gone through a number of changes during last two decades. These include, i) liberalization of bank opening policy which resulted with the reemergence of private banking sector in the economy, ii) strengthening the role of controlling authorities such as the State Bank of Pakistan and the Security and Exchange Commission of Pakistan.

Financial sector reforms changed the ownership structure of the banking sector during the two decade. Earlier banking sector was dominated by the state owned banks. Now share of public sector banks has declined. There are only four purely state owned banks are operating in Pakistan. Efficiency of all public sector commercial banks such as ABPL, MCB, UBL and HBL that are privatized during the reform process has been improved.

There is overall improvement in the efficiency of commercial banks. It means financial sector reforms improve the efficiency of the banks and after the reform the PTE is increased as compared to SE. Efficiency analysis for the year 2005 revealed that twelve out of twenty banks are on the best practice frontier. Out of these best practice banks only one belong the public sector. It is further concluded that the overall efficiency of the industry improved because of increase in the pure technical efficiency (PTE).

Overall outcome from the study is that financial sector reforms are successful in improving the efficiency of the domestic commercial banks as an intermediary in Pakistan.

This study however concentrated only one aspect of commercial bank that is role as an intermediary. There are number of other dimensions and aspects needs to be explored, these include efficiency of bank as production unit, economic and allocative efficiency of banks. This requires a series of studies in future.

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**APPENDEX: 1 LIST OF SCHEDULED BANKS INCLUDE IN THE STUDY**

| No | Bank Name | Abbreviation | Date of Establishment |
|---|---|---|---|
| 1 | Zari Traquati Bank Limited | ZTBL | |
| 2 | Allied Bank of Pakistan Limited | ABPL | 1942 |
| 3 | Askari Commercial Bank Limited | ACBL | 1991 |
| 4 | Bank Al Habib Limited | BAHL | 1991 |
| 5 | My Bank (Former Bolan Bank) | MB | 1982 |
| 6 | First Women Bank Limited | FWBL | |
| 7 | Habib Bank Limited | HBL | 1947 |
| 8 | Bank Al Falah | BAF | 1991 |
| 9 | Metropolitan Bank Limited | MBL | 1991 |
| 10 | Muslim Commercial Bank | MCB | 1947 |
| 11 | National Bank of Pakistan | NBP | 1947 |
| 12 | Prime Commercial Bank Limited | PCBL | 1991 |
| 13 | Soneri Bank | SB | 1991 |
| 14 | Union Bank | UB | 1991 |
| 15 | United Bank Limited | UBL | 1959 |
| 16 | Fysal Bank | FB | 1987 |
| 17 | Bank of Punjab | BOP | 1989 |
| 18 | Bank of Khyber | BOK | 1991 |
| 19 | Khadim Ali Shah Bukhari | KASB | 1991 |
| 20 | Saudi Pak Bank | SPB | 1981 |

**Table 4: INTERMADIATION EFFICIENCY MEASURES OF DOMESTIC COMMERCIAL BANKS**

| | | 1991 | | | | 1997 | | | | 2000 | | | | 2005 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BANKS | | TE | PTE | SE | | TE | PTE | SE | | TE | PTE | SE | | TE | PTE | SE | |
| ZTBL | 1 | 1.000 | 1.000 | 1.000 | crs | 1.000 | 1.000 | 1.000 | Crs | 1.000 | 1.000 | 1.000 | Crs | 0.860 | 0.911 | 0.944 | irs |
| ABPL | 2 | 0.300 | 0.752 | 0.399 | Drs | 0.873 | 0.875 | 0.998 | Drs | 0.628 | 1.000 | 0.628 | Drs | 0.865 | 0.905 | 0.955 | drs |
| ACBL | 3 | 0.532 | 0.542 | 0.981 | Irs | 0.991 | 0.999 | 0.992 | Drs | 0.736 | 1.000 | 0.736 | Drs | 0.972 | 0.973 | 0.999 | drs |
| BAHL | 4 | 1.000 | 1.000 | 1.000 | Crs | 1.000 | 1.000 | 1.000 | Crs | 1.000 | 1.000 | 1.000 | Crs | 0.970 | 0.971 | 0.999 | irs |
| MY BANK | 5 | 0.308 | 0.601 | 0.512 | Irs | 0.482 | 0.903 | 0.534 | Irs | 0.372 | 0.679 | 0.548 | Irs | 0.831 | 1.000 | 0.831 | irs |
| FWBL | 6 | 1.000 | 1.000 | 1.000 | Crs | 0.657 | 1.000 | 0.657 | Irs | 0.458 | 1.000 | 0.458 | Irs | 1.000 | 1.000 | 1.000 | |
| HBL | 7 | 0.484 | 1.000 | 0.484 | Drs | 0.731 | 1.000 | 0.731 | Drs | 0.607 | 1.000 | 0.607 | Drs | 0.957 | 1.000 | 0.957 | drs |
| AL-FLAH | 8 | 0.555 | 1.000 | 0.555 | Drs | 1.000 | 1.000 | 1.000 | Crs | 0.909 | 1.000 | 0.909 | Drs | 0.678 | 0.773 | 0.877 | drs |
| MBL | 9 | 1.000 | 1.000 | 1.000 | Crs | 0.835 | 0.889 | 0.939 | Irs | 1.000 | 1.000 | 1.000 | Crs | 1.000 | 1.000 | 1.000 | |
| MCB | 10 | 0.457 | 1.000 | 0.457 | Drs | 1.000 | 1.000 | 1.000 | Crs | 0.575 | 0.965 | 0.596 | Drs | 1.000 | 1.000 | 1.000 | |
| NBP | 11 | 0.391 | 1.000 | 0.391 | Drs | 1.000 | 1.000 | 1.000 | Crs | 0.566 | 1.000 | 0.566 | Drs | 0.845 | 1.000 | 0.845 | drs |
| PCBL | 12 | 0.591 | 0.684 | 0.865 | Drs | 0.861 | 0.876 | 0.983 | Irs | 0.800 | 0.819 | 0.977 | Irs | 0.996 | 0.999 | 0.998 | irs |
| SONERI | 13 | 0.476 | 0.480 | 0.992 | Irs | 0.799 | 0.802 | 0.995 | Drs | 1.000 | 1.000 | 1.000 | Crs | 0.870 | 0.882 | 0.986 | irs |
| UNION | 14 | 0.379 | 0.576 | 0.658 | Drs | 0.652 | 0.664 | 0.982 | Drs | 0.827 | 0.879 | 0.940 | Drs | 1.000 | 1.000 | 1.000 | |
| UBL | 15 | 0.287 | 1.000 | 0.287 | Drs | 0.537 | 0.698 | 0.769 | Drs | 0.553 | 1.000 | 0.553 | Drs | 1.000 | 1.000 | 1.000 | |
| FYSAL | 16 | 1.000 | 1.000 | 1.000 | Crs | 1.000 | 1.000 | 1.000 | Crs | 1.000 | 1.000 | 1.000 | Crs | 1.000 | 1.000 | 1.000 | |
| BOP | 17 | 0.522 | 1.000 | 0.522 | Drs | 0.979 | 1.000 | 0.979 | Irs | 1.000 | 1.000 | 1.000 | Crs | 1.000 | 1.000 | 1.000 | |
| BOK | 18 | 0.798 | 0.961 | 0.830 | Drs | 0.933 | 1.000 | 0.933 | Irs | 1.000 | 1.000 | 1.000 | Crs | 1.000 | 1.000 | 1.000 | |
| KASB | 19 | 0.910 | 1.000 | 0.910 | Irs | 0.746 | 1.000 | 0.746 | Irs | 0.928 | 1.000 | 0.928 | Irs | 0.859 | 1.000 | 0.859 | irs |
| SAUDI PAK | 20 | 1.000 | 1.000 | 1.000 | Crs | 1.000 | 1.000 | 1.000 | Crs | 0.885 | 0.934 | 0.947 | Irs | 0.943 | 0.952 | 0.991 | drs |
| MEAN | | 0.649 | 0.880 | 0.742 | | 0.854 | 0.935 | 0.912 | | 0.802 | 0.966 | 0.828 | | 0.936 | 0.970 | 0.964 | |