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The Impacts of Competition-Policy Reforms on the Efficiency of Philippine Commercial Banks

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Abstract

This paper has attempted to examine the impacts of competition policy reforms on the efficiency of the Philippine commercial banking system. It uses the stochastic frontier approach to come up with estimates of profit efficiency and cost inefficiency measures. The results are quite interesting. First, the average measured profit efficiency is 0.85, implying that on the average the commercial banks are using only 85 percent of their resources efficiently compared to the best practice commercial bank in the system producing the same output and facing the same conditions. On the other hand, the average measured cost inefficiency of the commercial banks is 1.39, suggesting that, on average, 39 percent of the commercial bank's costs are wasted relative to the best-practice commercial bank in the system producing the same output and facing the same conditions. Second, some improvements in banks' profit and cost efficiency can be observed after the liberalization of the entry of foreign banks in 1994, but these improvements were halted when the East Asian financial crisis occurred. Some improvements in profit and cost efficiency can again be observed after the passage of the General Banking Law in 2000 that liberalized further the entry of foreign banks. Third, small banks are found to be more profit and cost efficient than large banks. Fourth, foreign banks are generally more profit and cost efficient than domestic banks. However, these differences widen during crisis period and narrow during stable economic conditions. Fifth, profit efficiency of merged banks dropped more sharply than non-merged banks after 1998, but eventually recovered and approximated that of non-merged banks in 2002. Also, merged banks' cost inefficiency dropped sharply in 2000 and since then has remained much lower than that of non-merged banks. Sixth, some factors, such as agency problem, governance and market characteristics appear to be significantly correlated with measured efficiencies of banks.

These results have important policy implications. First, the liberalization of the banking system has generally produced positive results in terms of improving profit and cost efficiencies of banks. Second, improvement in profit and cost efficiencies of domestic banks brought about by greater competition cannot be sustained unless it is accompanied by improvement in prudential regulations and supervision. Third, M&A policy pursued by the Bangko Sentral ng Pilipinas appears to be complementary policy for improving profit and cost efficiencies of banks. Fourth, understanding the nature and extent of the impact of some correlates of measured efficiencies can help authorities in designing appropriate regulatory and supervisory framework for banks.

Key words: banking system; profit efficiency; cost efficiency; competition; merger and acquisition.

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Introduction

Since the early 1980s, the Philippines has introduced significant reforms to improve the efficiency of its financial system and, at the same time, to strengthen the safety and soundness of financial institutions. The banking system must not only be efficient in carrying out its tasks as intermediaries in the financial market, it must also be financially strong to withstand adverse shocks, such as a major policy change and a sharp asset price adjustment, among others. It has been well documented in the literature that the efficient functioning of the financial system, particularly that of the banking system, contributes significantly to economic growth. However, the efficiency of the Philippine financial system, in general, and the banking system, in particular, is often questioned as the public becomes wary over its performance in recent years. It is generally perceived that the cost of accessing banking services has remained high, and that a great majority of enterprises, especially SMEs, still do not have access to affordable banking services. The public is also wary about recent closures of several banks that dissipated hard earned income of many depositors overnight.

This paper tries to examine the impacts of competition policy reforms on the efficiency of the commercial banking industry, which dominates the domestic financial system. Section II discusses the recent competition policy reforms implemented by the government in the banking sector. Section III provides a review of literature particularly on the effects of foreign bank entry into domestic banking system, highlighting recent studies done in the Philippines. Section IV provides an overview of the Philippine commercial banking system in light of the recent policy initiatives of the government. Section V presents the empirical design for efficiency estimation while section VI discusses the empirical results of the estimation and their implications. Section VII gives the tentative conclusions of the paper.

Competition Policy Reforms

Liberalization of the banking system

The liberalization of the Philippine banking system, which was aimed at improving the efficiency of financial intermediation, was done gradually, spanning over 25 years (**Table 1**). It can be divided into three distinct phases: reforms in the 1980s; reforms in mid-1990s; and reforms in 2000s. It was accompanied by measures to strengthen bank supervision and prudential regulations to ensure that increased competition would not lead to bank failures. The elements of the reforms in each phase are briefly discussed below.

*Reforms in the 1980s*². The banking system was restructured in 1980 to foster competitive conditions in the financial markets and increase the availability of medium- and long-term funds to the various sectors of the economy. To achieve these objectives, the numerous types of banks were pared down to five, namely: universal banks or banks with expanded commercial banking functions; ordinary commercial banks; thrift banks; rural banks; and specialized government banks. The functional distinctions among these banks have been reduced so that competition could occur among banks belonging to different categories. Minimum capital requirement varies across these types of banks. The expanded commercial banking system bears the most number of functions, offers the widest variety of banking services, and has the highest minimum capital requirement.

These reforms were accompanied by the lifting of interest rate ceilings so that banks can price their services competitively, and the overhauling of the rediscounting facility to phase out subsidized credit and make the Central Bank a lender of last resort. Towards the end of the decade, the Central Bank lifted the moratorium on the entry of new domestic banks and liberalized bank branching.

² This draws on Lamberte (1993).

Table 1. Competition-Promoting Policies and Deregulation

| | |
|-------------|--|
| Early 1980s | Introduction of universal banking; Lifting of interest rate ceilings |
| 1989 | Measures to promote competition among banks. Abolition of opening new branches in preferentially treated agricultural area. Unification of legal reserve ratios. |
| 1990 | Abolition of moratorium of new entry by domestic banks. Raising the minimum paid-in capital of savings banks. Approved off-site ATMs. Raised minimum paid-in capital of savings banks. |
| 1991 | Raised minimum paid-in capital of expanded commercial banks and ordinary commercial banks. Measure to promote bank mergers and consolidation. |
| | Liberalization of regulation on opening bank branches. Approval of opening branches across the country was given to agricultural bank. Measure to promote bank mergers/ consolidation. The Central Bank's approval was no longer required for installing ATM in areas where bank branch does not exist. |
| | Foreign exchange liberalization |
| 1992 | Measure to promote the opening of branches. Raised the ceiling on the ratio of foreign exchange holding to receipts from exports to 40%. Abolition of foreign exchange regulation as a principle. |
| 1993 | Creation of Bangko Sentral ng Pilipinas. Deregulation of ATM installation criteria. Further relaxation of branching policies. Lifting of prior CB Approval in the establishment of ATMs. Gradual reduction of reserve requirements. Capital ratio, liquidity and profitability and sound management became criteria for approving the opening of bank branches. The New Central Bank Act was enacted. Legal reserves were introduced to common trust funds. |
| 1994 | Liberalization of market entry by foreign banks. Reduction of required equivalent capital for opening branches for savings banks. Revision of minimum paid-in capital for savings banks; Rationalization of the rediscount rate. |
| 1995 | Liberalization of entry-exit rules for rural banks. Increase in the minimum paid-in capital for banks. Passage of Thrift Bank Act of 1995. Easier rules on investment in banks. |
| 1996 | Guidelines on the issuance of expanded commercial banking authority to local branches of foreign banks operating in the country. Further increase in the capital requirement of banks. |
| 1999 | Further encouraged mergers and consolidation. Increased disclosure requirements of banks. |
| 2000 | Passage of the General Banking Law of 2000; Electronic Commerce Act. Greater transparency in granting DOSRI loans. Issued rules and regulations to combat money laundering. Issued guidelines on operations of foreign exchange subsidiaries of banks. |
| 2001 | Issued regulations to implement the General Banking Law of 2000. Amendments to the New Central Bank Act. |
| 2002 | Maintenance of strength and stability. Improvement of banking services and corporate governance. Promote microfinance. |
| 2003 | Approved the increase in the liquidity reserve requirement against peso demand, savings, time deposits and deposit substitute liabilities of Universal Banks (UBs) and Commercial Banks (KBs) Issued guidelines in the establishment of a foreign subsidiary by a bank subsidiary |
| 2004 | To increase the liquidity reserve requirement against peso demand, savings, time deposits and deposit substitute liabilities for UBs and KBs and NBQBs. |

Source: Money & Banking in the Philippines (BSP 2003); Okuda and Saito (2001)

During the second half of the 1980s, the Central Bank introduced measures to strengthen prudential regulations. These include, among others, the improvement in commercial banks' reporting requirements, the issuance of specific guidelines for asset valuation and loan loss provisions aimed at tightening, standardizing and applying criteria uniformly to all banks, and the implementation of several measures to curb insider abuse.

Reforms in mid-1990s. After almost 45 years in existence, the moratorium on foreign banks was finally relaxed through the Foreign Bank Liberalization Act of 1994 (Republic Act No. 7721). The act formally allowed the operations of foreign banks in the domestic banking system provided that they meet the necessary prudential requirements set by the Bangko Sentral ng Pilipinas (BSP). This policy aims at creating a more competitive environment by encouraging greater foreign participation that will stimulate economic growth, attract foreign investments and provide greater variety of financial services. Prior to 1994, only four foreign banks were operating in the Philippines and these were subjected to more restrictive regulations, i.e. they could not (a) operate as universal banks; (b) engage in trust operations; and (c) open new branches.

As specified in Section 2 of RA 7721, a foreign bank may operate in the Philippine banking system through *only* one of the following modes of entry: (a) by acquiring, purchasing or owning up to 60 percent of an existing domestic bank; (b) by investing in up to 60 percent of the voting stock of a new banking subsidiary incorporated in the Philippines; or (c) by establishing a branch with full banking authority. Moreover, Section 4 of the same Act stipulates that each foreign bank authorized to operate in the country may open three additional branches in locations designated by the Monetary Board but should not exceed six branches.

In the wake of the East Asian financial crisis, the BSP implemented the following reforms to improve the capacity of the banking system to face the adverse shocks of the crisis as well as to support the system's institutional structure to deal with problem banks:

1. A further increase in the minimum capital requirements (**Table 2**);
2. Stricter requirements for granting new bank licenses and setting up new branches;
3. Tighter regulations on insider loans and on the restructuring of loans;

4. Redefinition of non-performing loans to align with the international standards and introduction of general loan loss provisioning requirements; and
5. Higher specific provisioning for classified loans and expansion of bank disclosure requirements.

Reforms in the 2000s. The General Banking Law (GBL) passed in 2000 replaced the 52-year old General Banking Act . It mainly aims to create a domestic banking system that can meet the challenges of globalization. One key feature of this law is that it allows a foreign bank to acquire up to 100 percent of the voting stock of *only* one bank, but only within seven years from the effectivity of this law. Another key feature is the provision that encourages existing banks to go into microfinance or the establishment of microfinance-oriented banks. Other key features of this law are aimed at strengthening prudential regulations and supervision of banks, which are:

**Table 2. Minimum Capital Requirements
In million pesos**

| | Existing Requirement | Compliance Period | | |
|---|----------------------|-------------------|--------------|--------------|
| | | 12/ 24/ 1998 | 12/ 31/ 1999 | 12/ 31/ 2000 |
| Expanded Commercial Banks | 3,500 | 4,500 | 4,950 | 4,950 |
| Commercial Banks | 1,625 | 2,000 | 2,400 | 2,400 |
| Thrift Banks | | | | |
| Within Metro Manila | 200 | 250 | 325 | 325 |
| Outside Metro Manila | 40 | 40 | 52 | 64 |
| Rural Banks | | | | |
| Within Metro Manila ^{1/} | 20 | 20 | 26 | 26 |
| Cities of Cebu and Davao ^{1/} | 10 | 10 | 13 | 13 |
| 1st/ 2nd/ 3rd class cities & 1st class municipalities | 5 | 5 | 6.5 | 6.5 |
| 4th/ 5th/ 6th class cities & 2nd/ 3rd/ 4th class municipalities | 3 | 3 | 3.9 | 3.9 |
| 5th/ 6th class municipalities | 2 | 2 | 2.6 | 2.6 |

^{1/} For existing banks only. No new banks are presently allowed.

Source: *Bangk o Sentral ng Pilipinas*

1. A strong legal basis for consolidated supervision of banks;
2. Adoption of a stricter fit and proper rule for individuals elected or adopted as bank directors or officers and inclusion of at least two independent directors on the board of directors;
3. Adoption of a risk-based capital requirement in line with the recommendations of the Basel Committee;
4. Expansion of the coverage of the single borrower's limit and stronger safeguards against connected lending;
5. More flexibility in examining banks onsite in connection with supervisory matters;
6. Defining unsafe and unsound banking practices; and
7. Greater transparency and disclosure requirements for banks.

Indeed, the actual openness of the financial sector is already way above the country's commitments under General Agreement on Trade in Services (GATS), which are already quite high by East Asian standards (**Appendix I**).

Merger/consolidation and acquisition

While the reforms have encouraged the entry of new banks into the domestic banking system, merger/consolidation and acquisition (M&A) have also been promoted as early as the 1980s so that banks can meet the minimum capital requirement and improve both their soundness and competitiveness. In April 2000, the BSP issued Circular No. 237, which consolidates and clarifies all existing rules and obligations on mergers and consolidation of banks and other financial institutions. Again, the primary objective remains the same, that is to foster a healthy competition between and among banks, bring about more and better financial services at lower cost, and promote stability and efficiency in the Philippine banking sector. In aiming for the said objective, it is without doubt that economies of scale and increased productivity are expected by-products of these policy considerations.

The BSP has also encouraged M&A to speed up the rehabilitation or prevent possible bank closures of ailing banks in the wake of the East Asian financial crisis. Thus, it has offered incentives that merging/consolidating banks may avail of, such:

1. Revaluation of bank premises, improvements and bank equipment;
2. Staggered booking of unbooked valuation reserves;
3. Temporary relief from full compliance with the prescribed net worth to risk assets ratio;
4. Amortization of goodwill up to a maximum of 40 years, if warranted;
5. Payment in installments of outstanding penalties on legal reserves and interest on overdrafts with the BSP as of date of merger/consolidation;
6. Higher rediscount ceiling with the BSP;
7. Restructuring/plan of payment of past due obligations of the proponents with the BSP as of date of merger/consolidation;
8. Concurrent officership at a merged/consolidated bank/financial institution and another bank/financial institution.

On the other hand, banks that are not yet ready to merge or consolidate may opt to downgrade or convert to a lower category, which require minimal or no additional capital.

Bank Entry and Competition: A Review of Literature

Previous studies had examined banking concentration and the efficiency of financial intermediation in the Philippines. For example, Lamberte (1993) found that the Herfindahl index explains 78 percent of the total variation of bank spread. Indeed, the interest rate liberalization in the 1980s which was not accompanied by a liberal bank entry policy led to increasing banking concentration, which in turn led to larger intermediation spread for banks.

After the liberalization of the entry of foreign banks into the domestic banking system, attention has been focused on the effect of this policy on the efficiency of financial intermediation, particularly those of domestic banks that had long been protected from competition. This issue is interesting, especially since there are different views on the impact of the entry of foreign banks on the domestic banking system. The

traditional view of the role of foreign banks in developing countries states that foreign banks follow their domestic clients to finance their trade and service their needs in other countries. This view is supported by empirical research studies that obtained a positive relationship between the presence of banks from a given country and the level of trade between that country and the host country. On the other hand, an alternative view, which is anchored on the theory of comparative advantage, argues that foreign banks actively participate in the development of the host country's banking system. However, majority of recent studies acknowledge the combined effects of these two views on foreign bank entry into the domestic banking system. In fact, Philippine legislators took this view in passing the laws liberalizing the entry of foreign banks.

As pointed out by Levine (1996), foreign bank entry may: improve the quality and availability of financial services in the domestic financial market by increasing banks competition, and enabling the application of more modern banking skills and technology. It may also serve to stimulate the development of the underlying bank supervisory and legal framework; and enhance a country's access to international capital. However, there are also arguments against foreign bank entry, particularly in developing markets. One argument rests on the concept of "over competition;" that is, a massive influx of foreign banks could lead to destructive competition or over fragmentation of the financial system. There is greater tendency for domestic banks to cater to the more risky segments of the market since foreign banks tend to select the most lucrative segments in the domestic market (Goldberg et al. 2000). However, the infant-industry argument contends that the banking industry is best left in the hands of domestic residents. In addition, Yoshitomi and Shirai (2000) pointed out that foreign bank participation may weaken financial supervision due to challenges to supervision exacerbated by information asymmetries between home and host country supervisors.

In the Philippines, a number of research studies had examined the impact of the liberalization of foreign bank entry and offer interesting results and policy implications. Using bank-level accounting and general macroeconomic data from 1990 to 1998, Unite and Sullivan (2001) found that: (a) foreign bank entry is associated with decrease in interest rate spreads and bank profits for domestic banks affiliated to a domestic family business group; (b) foreign entry corresponds with improvements in operating efficiencies

as shown by the decline in bank operating expenses, but a deterioration of loan portfolios; (c) there is an inverse relationship between operating expenses and relative size of the banks, that is, relatively faster growing banks seem to be able to become more efficient but group-affiliated banks are not found to be gaining in efficiency; and (d) increases in the share of ownership by foreign investors in domestic banks are found to be associated with an increase in operating expenses and a decrease in non-interest income.

Meanwhile, Montinola and Moreno (2001), using data envelopment analysis (DEA) to examine indicators of efficiency in the Philippines over the period 1992-1999, shows that banking efficiency in the production of deposits of the intermediation of loans declined prior to the liberalization of foreign bank entry. They also found that there is no strong improvement in domestic bank efficiency in deposit or loan production after the said liberalization. In addition, the modest improvements in banking efficiency in 1995 suggest that foreign entry was too restrictive to generate a competitive environment to offset its adverse incentive effects.

Milo (2001) investigated the impact of deregulation of foreign bank entry and branching in the country on domestic banking competition. She found that while the entry of more foreign banks led to the decline in concentration ratios, there has been no significant impact on bank spreads. In addition, her results indicate a positive but modest impact on financial intermediation and dynamic efficiency of commercial banks. Manzano and Neri (2001) found similar results, but argued that the prevailing macroeconomic incentives brought about by certain policies, such as overvalued exchange rate and high interest rate policy, matter in the determining outcomes of liberalization measures.

Based on the survey results of ten local banks, Hapitan (2001) found that there is an increase in the competitive environment, particularly on the wholesale banking side and that there is a substantial loss in the potential revenues of domestic banks. He also found that there is little evidence to support the claim that foreign bank entry has increased the variety of financial services, brought incremental intermediation activities, and adoption of new technologies and processes. He likewise found that core marketing strategies were the most preferred reaction of the local banks because they perceive

foreign banks' entry as a marketing problem rather than a banking problem. Finally, he found that re-engineering was undertaken by local banks as a strategy in itself, and not because of the entry of foreign banks.

In seeking to address some of the issues already examined by these studies, and in covering other issues not examined by the same, the study uses a different analytical technique that can yield more insights regarding the potential impacts of the competition policy reforms on the efficiency of banks.

Table 3 gives a summarized presentation of these various studies.

The Philippine Commercial Banking System

Structure and Performance

Table 4 presents the structure of the banking system from 1990-2003. It reveals clearly how rapidly the commercial banking system has expanded over the years and has consistently kept a command on the entire banking system, accounting for 89 percent and 57 percent of the total resources and number of institutions or offices in the industry, respectively. The improvement in the economy and the liberalization of bank entry and branching in the 1990s paved the way for the increase in the number of commercial banking institutions (**Figure 1**). Interestingly, despite the continuous decline in the number of commercial banks since 1997, the number of bank branches has remained almost the same at more than 4,000. As of December 2003, there were 42 operating commercial banks in the country, of which 19 were foreign banks, up from four before the liberalization (**Table 5**). Because of the rapid rise in the number of commercial banking institutions particularly in the early 1990s, the banking density ratio has improved considerably from more than 30,000 people per bank office in the 1980s to less than 20,000 people per banking office since 1997 (**Figure 2**).

Table 3. Summary of Research Studies on Bank Entry and Competition

| Title | Author (s) | Hypothesis/ Objective | Scope of the study | Methodology | Findings |
|--|-------------------------------------|---|--|--|--|
| The Impact of Liberalization of Foreign Bank Entry on the Philippine Domestic Banking Market | Unite, A. and Sullivan, M. (2001) | To investigate how the relaxation of foreign entry regulations affects domestic banks. | Philippine commercial banks; 1990-1998 | Qualitative analysis; Random effects model | Foreign bank entry is compels domestic banks to be more efficient, to focus operations due to increased risk, and to become less dependent on relationship-based banking practices. |
| The Political Economy of Foreign Bank Entry and Its Impact: Theory and a Case Study | Montinola, G. and Moreno, R. (2001) | To investigate how changes in political and economic factors may influence the timing and scope of financial liberalization by affecting a politicalequilibrium of competing interests. | Philippine commercial banks; 1992-1999 | Data envelopment analysis (DEA) | Declines in banking efficiency reduced resistance to foreign bank entry but the effects of liberalization on efficiency were modest. |
| Deregulation of Bank Entry and Branching: Impact on Competition | Milo, M. (2001) | To examine bank entry and branching in the Philippines and its impact on the sector's structure, conduct and performance. | Philippine commercial banks; 1990-1998 | Qualitative and quantitative analyses | Results indicate that deregulation of bank entry and branching had a positive impact on financial intermediation and dynamic efficiency of commercial banks. |
| Foreign Bank Entry, Bank Spreads and the Macroeconomic Policy Stance | Manzano, G. and Neri, E. (2001) | To offer an alternative explanation on the widening bank spreads in the midst of foreign bank entry. | Philippine commercial banks; 1994-1997 | Qualitative and quantitative analyses | The results show that prevailing macroeconomic incentives matter in determining outcomes of liberalization measures. |
| Reactions to the entry of foreign banks in the Philippines: a critical study of selected local banks | Hapitan, R. (2001) | To examine various reactions to the entry of foreign banks through survey of ten local commercial banks. | Philippine commercial banks; 1995-2000 | Survey; Qualitative analysis | Survey results show increased competition but there was little evidence to support that it resulted to an increased in variety of financial services, brought incremental intermediation activities, or brought in new technologies and processes. |

**Table 4a. Number of Banking Institutions: Head Offices and Branches
By Type of Institution**

| Year | Total | Commercial Banks ¹ | | | | Thrift Bank | | | | | Specialized Government Banks ² | Rural Banks |
|------|-------|-------------------------------|-------|-------|------|-------------|--------------------------|---------------------------|-----------------------------------|---------------|---|-------------|
| | | Total | EKBs | NEKBs | FXBs | Total | Savings & Mortgage Banks | Private Development Banks | Stock Savings & Loan Associations | Micro Finance | | |
| 1990 | 3,637 | 1,863 | 1,237 | 567 | 9 | 653 | 270 | 211 | 172 | - | 76 | 1,045 |
| 1991 | 3,791 | 1,989 | 1,333 | 581 | 9 | 663 | 285 | 202 | 176 | - | 76 | 1,063 |
| 1992 | 4,296 | 2,361 | 1,618 | 627 | 9 | 718 | 316 | 218 | 184 | - | 77 | 1,140 |
| 1993 | 4,656 | 2,604 | 1,869 | 599 | 9 | 780 | 334 | 250 | 196 | - | 77 | 1,195 |
| 1994 | 5,096 | 2,924 | 2,243 | 524 | 9 | 821 | 347 | 265 | 209 | - | 77 | 1,274 |
| 1995 | 5,569 | 3,221 | 2,481 | 546 | 20 | 925 | 367 | 310 | 248 | - | 77 | 1,346 |
| 1996 | 6,332 | 3,647 | 3,143 | 482 | 22 | 1,171 | 426 | 432 | 313 | - | - | 1,514 |
| 1997 | 7,182 | 4,078 | 3,441 | 614 | 23 | 1,389 | 523 | 524 | 342 | - | - | 1,715 |
| 1998 | 7,646 | 4,230 | 3,537 | 670 | 23 | 1,474 | 722 | 444 | 308 | - | - | 1,942 |
| 1999 | 7,689 | 4,326 | 3,596 | 708 | 22 | 1,478 | 753 | 434 | 291 | - | - | 1,885 |
| 2000 | 7,553 | 4,250 | 3,504 | 723 | 23 | 1,391 | 754 | 408 | 229 | - | - | 1,912 |
| 2001 | 7,585 | 4,320 | 3,581 | 648 | 29 | 1,351 | 725 | 404 | 220 | - | - | 1,914 |
| 2002 | 7,454 | 4,265 | - | - | - | 1,278 | 743 | 340 | 193 | 2 | - | 1,911 |
| 2003 | 7,494 | 4,296 | 3,681 | 573 | - | 1,277 | 747 | 336 | 191 | 3 | - | 1,921 |

Notes:

EKBs: expanded commercial banks; NEKBs: non-expanded commercial banks; and FXBs: foreign banks

¹ With Development Bank of the Philippines starting February 1996 and A I-A manah Investment Bank of the Philippines starting January 1997.

² Consolidated with commercial banks since February 1996 for DBP and January 1997 for A I-A manah Investment Bank.

Source: Bangko Sentral ng Pilipinas

Table 4b. Total Resources of the Philippine Banking System
For end-periods indicated, in billion pesos

| Year | Total | Commercial Banks ¹ | | | | Thrift Banks | | | | | Specialized Government Banks ² | Rural Banks |
|-------------------|----------|-------------------------------|----------|--------|--------|--------------|--------------------------|---------------------------|-----------------------------------|---------------|---|-------------|
| | | Total | EKBs | NEKBs | FXBs | Total | Savings & Mortgage Banks | Private Development Banks | Stock Savings & Loan Associations | Micro Finance | | |
| 1990 | 609.70 | 539.70 | 349.13 | 97.46 | 66.61 | 37.60 | 21.90 | 11.30 | 4.40 | - | 18.50 | 13.90 |
| 1991 | 691.10 | 599.10 | 407.70 | 96.91 | 64.20 | 47.50 | 29.90 | 12.30 | 5.30 | - | 28.60 | 15.90 |
| 1992 | 811.90 | 691.10 | 478.47 | 102.72 | 63.71 | 60.20 | 36.70 | 17.00 | 6.50 | - | 42.00 | 18.60 |
| 1993 | 1,019.10 | 864.40 | 591.92 | 104.71 | 75.96 | 74.60 | 44.80 | 22.20 | 7.60 | - | 57.40 | 22.70 |
| 1994 | 1,253.90 | 1,058.80 | 794.75 | 94.99 | 86.52 | 106.70 | 69.30 | 28.50 | 8.90 | - | 60.20 | 28.20 |
| 1995 | 1,595.50 | 1,347.40 | 1,027.58 | 129.33 | 115.47 | 143.30 | 88.40 | 42.40 | 12.50 | - | 68.20 | 36.60 |
| 1996 | 2,109.60 | 1,876.20 | 1,580.08 | 142.47 | 202.98 | 185.10 | 98.90 | 67.20 | 19.00 | - | 0.30 | 48.00 |
| 1997 | 2,776.60 | 2,513.00 | 2,069.07 | 207.77 | 288.35 | 208.40 | 105.80 | 81.20 | 21.40 | - | - | 55.20 |
| 1998 | 2,804.40 | 2,528.00 | 2,028.62 | 216.84 | 310.42 | 216.40 | 132.80 | 64.00 | 19.60 | - | - | 60.00 |
| 1999 | 3,025.80 | 2,740.40 | 2,203.89 | 238.25 | 396.69 | 223.50 | 136.20 | 68.70 | 18.50 | - | - | 61.90 |
| 2000 | 3,326.80 | 3,013.60 | 2,321.53 | 304.29 | 454.76 | 245.80 | 158.10 | 69.00 | 18.70 | - | - | 67.40 |
| 2001 | 3,348.10 | 3,015.30 | 2,328.81 | 319.46 | 367.03 | 259.00 | 173.40 | 66.70 | 18.70 | - | - | 73.80 |
| 2002 ³ | 3,422.82 | 3,077.32 | 2,493.72 | 287.34 | 296.27 | 262.00 | 194.60 | 53.20 | 14.00 | 0.20 | - | 83.50 |
| 2003 ⁴ | 3,455.53 | 3,083.53 | 2,503.10 | 291.91 | 288.51 | 282.60 | 205.90 | 61.50 | 14.90 | 0.30 | - | 89.40 |

Notes:

EKBs: expanded commercial banks; NEKBs: non-expanded commercial banks; and FXBs: foreign banks

¹ With Development Bank of the Philippines starting February 1996 and A I-A manah Investment Bank of the Philippines starting January 1997.

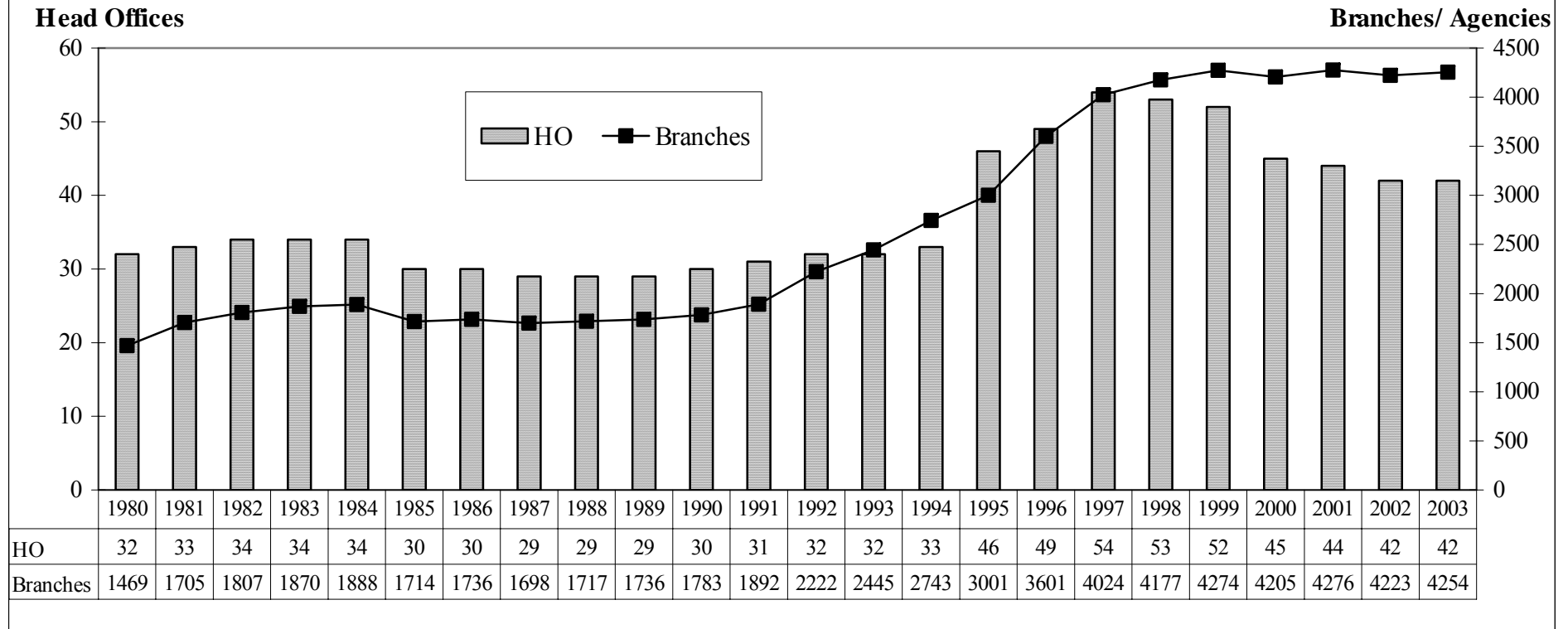
² Consolidated with commercial banks since February 1996 for DBP and January 1997 for A I-A manah Investment Bank.

³ For Commercial banks, data as of November 30, 2002

⁴ For Commercial banks, data as of May 31, 2003

Source: Bangko Sentral ng Pilipinas

Figure 1. Banking Offices of the Commercial Banking System, 1980 - 2003



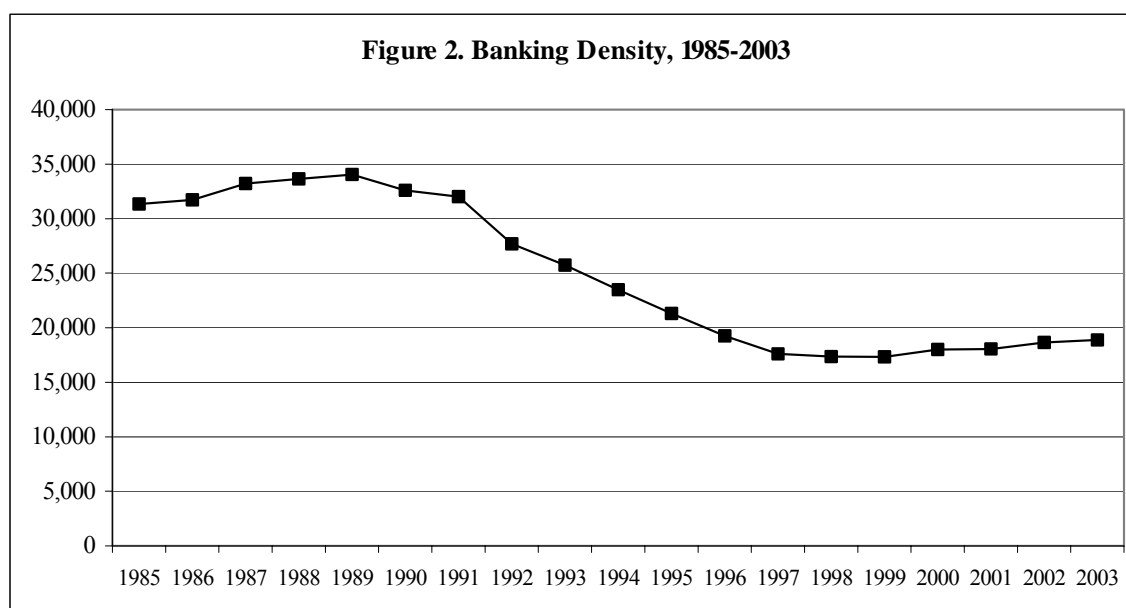
Source of data: *Bangko Sentral ng Pilipinas*

**Table 5. Number of Head Offices By Type
The Commercial Banking System**

| Type of KB | 1980 | 1985 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|--------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------------|-------------|
| TOTAL | 32 | 30 | 30 | 31 | 32 | 32 | 33 | 46 |
| Private Domestic Banks | 27 | 25 | 25 | 26 | 27 | 27 | 28 | 30 |
| Foreign Bank Branches | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 14 |
| Foreign Bank Subsidiaries | | | | | | | | |
| Government Banks | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Foreign Banks | | | | | | | | |
| Share in domestic banking system (%) | 12.50 | 13.33 | 13.33 | 12.90 | 12.50 | 12.50 | 12.12 | 30.43 |
| Share in total assets (%) | | | 11.40 | | | | | 8.70 |
| | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| TOTAL | 49 | 54 | 53 | 52 | 44 | 43 | 44 | 42 |
| Private Domestic Banks | 31 | 33 | 32 | 30 | 23 | 23 | 22 | 20 |
| Foreign Bank Branches | 14 | 14 | 13 | 13 | 14 | 14 | 15 | 14 |
| Foreign Bank Subsidiaries | | 4 | 5 | 6 | 4 | 3 | 4 | 5 |
| Government Banks | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Foreign Banks | | | | | | | | |
| Share in domestic banking system (%) | 28.57 | 33.33 | 33.96 | 36.54 | 40.91 | 39.53 | 43.18 | 45.24 |
| Share in total assets (%) | 12.70 | 17.50 | 15.60 | 16.40 | 15.30 | 16.00 | 14.60 ¹ | 13.5 |

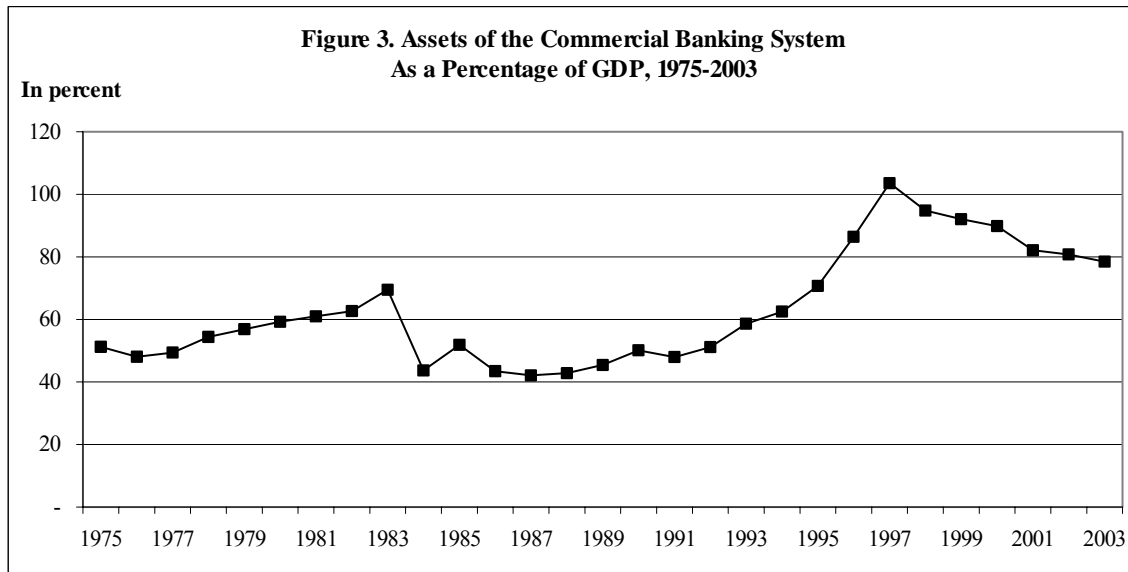
¹ As of September 2002

Source of basic data: Bangko Sentral ng Pilipinas



Sources of data: Bangko Sentral ng Pilipinas and National Statistics Office

As a percent of Gross Domestic Product (GDP), the total assets of the commercial banking system rose sharply in the first half of the 1990s, surpassing 100 percent in 1997 (**Figure 3**). However, this declined consistently since 1998 as most banks restructured their assets to deal with rising non-performing loans in the wake of the East Asian financial crisis and depositors became more cautious in investing their money. By 2003, commercial banks' assets were equivalent to only 78 percent of GDP.



Sources of basic data: Bangko Sentral ng Pilipinas and National Statistical Coordination Board

The profitability of the commercial banking system is presented in **Table 6**. It is observed that both the rate of returns on assets (ROA) and rate of returns on equity (ROE) declined, particularly after the East Asian financial crisis and that these only started to recover in 2000. Focusing on the commercial banks included in this study, which includes data for earlier years, both ratios show similar declining trend even before the onset of the East Asian financial crisis. It could be that the reforms initiated towards the end of the 1980s and early 1990s already resulted in the trimming down of the profits enjoyed by the commercial banks (**Figure 4**).

Bank failures and M&A

The banking system in the Philippines is littered with bank failures. Lamberte (1989) noted that the problems in the financial system, particularly in the 1980s, were systemic and caused by the lack of prudential regulations and past credit and banking policies of the government. The external shocks only heightened these weaknesses. As shown in **Table 7**,

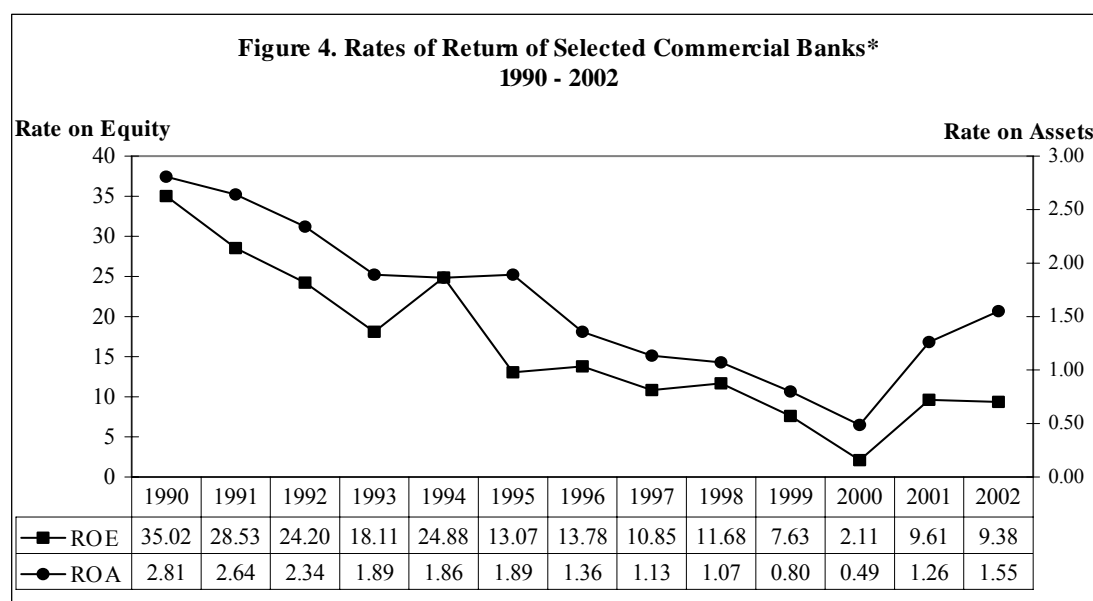
221 banks were closed in 1981 to 1990, comprising of 3 commercial banks, 36 thrift banks and 182 rural banks. More failures occurred in the period 1991-2000 (137 banks) and the

Table 6. Rate of Returns
The Commercial Banking System, 1995-2003
In percent

| | Return on Equity | | | | | Return on Assets | | | | |
|------|------------------|-------|-------|-------|-------|------------------|------|-------|-------|------|
| | All KBs | EKBs | NEKBs | FXBs | SGBs | All KBs | EKBs | NEKBs | FXBs | SGBs |
| 1995 | 15.99 | 17.08 | 13.77 | 13.50 | 14.04 | 2.12 | 2.11 | 2.07 | 2.56 | 1.93 |
| 1996 | 15.92 | 18.51 | 9.10 | 8.81 | 14.26 | 2.18 | 2.36 | 1.32 | 1.83 | 1.89 |
| 1997 | 13.45 | 15.51 | 8.80 | 8.17 | 10.88 | 1.76 | 1.95 | 1.35 | 1.30 | 1.26 |
| 1998 | 6.39 | 7.25 | 3.59 | 5.03 | 4.99 | 0.85 | 0.95 | 0.63 | 0.71 | 0.51 |
| 1999 | 2.88 | 3.39 | 2.39 | -0.43 | 5.59 | 0.40 | 0.48 | 0.46 | -0.06 | 0.51 |
| 2000 | 3.12 | 2.37 | 0.91 | 6.05 | 6.35 | 0.42 | 0.33 | 0.15 | 0.85 | 0.53 |
| 2001 | 3.29 | 1.35 | -0.55 | 9.59 | 9.69 | 0.43 | 0.18 | -0.08 | 1.31 | 0.88 |
| 2002 | 6.15 | 4.80 | 6.90 | 8.93 | 9.20 | 0.81 | 0.63 | 0.96 | 1.32 | 0.91 |
| 2003 | 9.26 | 9.14 | 5.91 | 10.99 | 9.61 | 1.20 | 1.19 | 0.79 | 1.67 | 0.94 |

EKBs: expanded commercial banks; NEKBs: non-expanded commercial banks; FXBs: foreign banks; and SGBs: Specialized government banks

Source: Philippine Deposit Insurance Corporation period 2000-2003 (40 banks).



*Commercial banks with reported data on the given year. These are the commercial banks included in the Stochastic Frontier Analysis (SFA) of the study.

Source of basic data: Individual Financial Statements of Commercial Banks, Securities and Exchange Commission

**Table 7. Number of Closed PDIC Member Banks
1970 - 2003**

| | 1970-1980 | 1983-1987 | 1981-1990 | 1991-2000 | 2001-2003 |
|------------------------------|-----------|------------|------------|------------|-----------|
| Commercial Banks | 3 | 3 | 3 | 2 | - |
| Thrift Banks | 3 | 26 | 36 | 13 | 2 |
| Rural Banks | 42 | 102 | 182 | 122 | 38 |
| Specialized Government Banks | - | - | - | - | - |
| Total | 48 | 131 | 221 | 137 | 40 |

^{1/} Includes Overseas Bank of Manila which was closed in 1968.

Source: Philippine Deposit Insurance Corporation

The current weakness of the commercial banking system can be gauged from its non-performing loans (NPLs) ratios. As a percent of total loans, NPLs rose to double digit levels in the wake of the East Asian financial crisis (**Table 8**).³ As of December 2003, NPLs accounted for 14 percent of total loans of the commercial banking system. Domestic banks, particularly ordinary commercial banks, exhibited very high NPL ratios. This is understandable given that they serve more diverse and larger markets/customers compared to foreign banks, and this indicates a difference in risk exposures and portfolios between local and foreign banks.

As mentioned, the BSP has encouraged M&A to improve the financial strengths of domestic banks and rehabilitate ailing banks. Indeed, several M&As have occurred since 1999, and this is the main reason for the decline in the number of commercial banks in the system (**Table 9**). Interestingly, M&A occurred not only between large and small banks or between strong and ailing banks but also between large and relatively strong banks, more in response to the growing competition in the system and to the need for banks to project themselves in the global market as significant players.

³ These ratios double if real and other properties owned or acquired (ROPOA) were included.

Table 8. Non-Performing Loans of the Commercial Banking System
Levels in million pesos; ratios in percent

| Year | Non-Performing Loans | | | | | Ratios of NPL to Total Loans | | | | |
|------|----------------------|---------|--------|--------|--------|------------------------------|-------|-------|-------|------|
| | Total | EKBs | NEKBs | Govt | FXBs | Total | EKBs | NEKBs | Govt | FXBs |
| 1990 | 19,426 | - | - | - | - | 7.17 | - | - | - | - |
| 1991 | 20,245 | - | - | - | - | 6.61 | - | - | - | - |
| 1992 | 22,494 | - | - | - | - | 6.13 | - | - | - | - |
| 1993 | 23,840 | - | - | - | - | 4.71 | - | - | - | - |
| 1994 | 25,050 | - | - | - | - | 3.93 | - | - | - | - |
| 1995 | 28,008 | - | - | - | - | 3.23 | - | - | - | - |
| 1996 | 34,206 | 21,144 | 3,598 | 5,906 | 3,558 | 2.80 | 2.40 | 3.72 | 4.38 | 3.31 |
| 1997 | 73,602 | 46,582 | 9,845 | 10,232 | 6,943 | 4.68 | 4.19 | 7.15 | 6.15 | 4.42 |
| 1998 | 160,001 | 112,445 | 16,487 | 18,824 | 12,245 | 10.37 | 10.41 | 13.65 | 10.12 | 7.86 |
| 1999 | 195,389 | 141,630 | 22,954 | 25,382 | 5,423 | 12.34 | 13.04 | 16.44 | 12.63 | 3.47 |
| 2000 | 245,813 | 172,396 | 32,414 | 33,523 | 7,480 | 15.10 | 16.82 | 17.58 | 15.07 | 3.81 |
| 2001 | 281,908 | 192,578 | 41,687 | 35,737 | 11,906 | 17.35 | 19.41 | 22.82 | 17.84 | 4.77 |
| 2002 | 245,102 | 180,032 | 26,873 | 30,295 | 7,902 | 14.95 | 17.28 | 17.24 | 15.73 | 3.17 |
| 2003 | 245,508 | 181,368 | 29,237 | 28,560 | 6,343 | 14.05 | 16.21 | 18.47 | 13.29 | 2.49 |

EKBs: expanded commercial banks; NEKBs: non-expanded commercial banks; and FXBs: foreign banks

Source: Bangko Sentral ng Pilipinas

Table 9. Philippine commercial bank mergers, 1998 - 2003

| Date acquired | Acquiring bank | Acquired bank(s) | Surviving bank |
|------------------|--------------------------------|--|--------------------------------|
| September 1999 | Equitable Banking Corp | Philippine Commercial International Bank | Equitable PCI Bank |
| February 2000 | Prudential Bank | Pilipinas Bank | Prudential Bank |
| May 2000 | Global Bank | Philippine Banking Corp. | Global Bank |
| October 2000 | Global Bank | AsianBank Corp. | Global Bank |
| April 2000 | Bank of the Philippine Islands | Far East Bank & Trust Co. | Bank of the Philippine Islands |
| October 2000 | Metropolitan Bank & Trust Co. | Solidbank Corp. | Metropolitan Bank & Trust Co. |
| September 2000 | Bank of Commerce | Panasia Banking Corp. | Bank of Commerce |
| July 2000 | Banco de Oro | Dao Heng Bank | Banco de Oro |
| August 2001 | BPI Family Bank (Thrift Bank) | DBS Bank Philippines | BPI Family Bank (Thrift Bank) |
| December 2001 | Bank of Commerce | Traders Royal Bank | Bank of Commerce |
| 1st quarter 2002 | ABN AMRO Bank, Inc. | TA Bank of the Phils., Inc. | ABN AMRO Bank, Inc. |
| September 2002 | Metropolitan Bank & Trust Co. | Global Bank | Metropolitan Bank & Trust Co. |
| September 2002 | Banco de Oro | First e-Bank | Banco de Oro |
| July 2003 | Banco de Oro | Banco Santander | Banco de Oro |

Source: BusinessWorld Fourth Quarter Banking Report (2003), February 10, 2004

Empirical Design for Efficiency Estimation

Efficiency measurement method

This paper uses a frontier analysis, which is a means to measure the relative performance of firms by objectively providing a numerical efficiency value and ranking these accordingly. The analysis shows how close firms are to the “best-practice” frontier. Compared to the generally used standard financial ratios from accounting statements, frontier efficiency offers a superior measure because it uses statistical techniques that eliminate the effects of differences in input prices and other exogenous market factors affecting the standard performance ratios (Bauer et al. 1998). Such analysis proves to be significant in providing information that is useful in either of the following: (a) in assessing the effects of deregulation, mergers and market structure on efficiency that may be valuable to the policymakers; (b) in dealing with academic research studies on the efficiency of a firm and its comparison to other efficiency approaches; or (c) in improving the performance of a firm by distinguishing the “best practices” and “worst practices” associated with the respective efficiency levels.

By employing data on accounting measures of costs, outputs, inputs, revenues, profits, etc., the frontier efficiency can be estimated given available data. Efficiency can be measured using parametric or non-parametric estimation techniques.⁴ Non-parametric models include data envelopment analysis (DEA) and free disposal hull (FDH). Parametric models, on the other hand, include the stochastic frontier approach (SFA), the thick frontier approach (TFA) and the distribution free approach (DFA).

For this paper, efficiency measures are calculated using the SFA. Under this approach, a commercial bank is considered inefficient if its costs are higher or if its profits are lower compared to those predicted for an efficient commercial bank given the same existing conditions. The SFA, which is also referred to as the econometric frontier approach, specifies the relationship between output and input levels and decomposes the error term into two components: (a) a random error; and (b) an inefficiency component. The random error, which is assumed to follow a symmetric distribution, is the traditional normal error term with

⁴ See Berger and Mester (1997) for a detailed discussion on these estimation approaches.

a zero mean and a constant variance while the inefficiency term is assumed to follow an asymmetric distribution and may be expressed as a half-normal, truncated normal, exponential or two-parameter gamma distribution. Furthermore, this approach distinguishes a functional form for the cost, profit, or production relationship among inputs, outputs and other factors.

The main drawback of this approach lies on the assumed shape of the frontier caused by imposing a functional form. As such, if the functional form is incorrect, the measured efficiency will be misleading. Despite the intense research efforts on efficiency frontier, researchers have not yet arrived at a consensus regarding the most preferred frontier method for determining the best-practice frontier. Focusing on the use of different measurement methods, a related paper by Berger and Mester (1997b) that examined the possible sources of differences in measured efficiency, including differences in efficiency concept, measurement method and a number of bank, market and regulatory characteristics, showed that the choices made concerning measurement technique, functional form and other variables usually make very little difference in terms of either average efficiency or the rankings of individual firms. It is also to be noted that sensitivity analysis using different forms to test for the robustness of the results can be made after using either of the methodologies given.

Cost and alternative profit functions

Although this study estimates both cost and profit efficiencies using the standard cost function and the alternative profit function to gain information about the performance of commercial banks, it uses the alternative profit efficiency as the main measure of performance because it is conceptually superior to cost efficiency for evaluating overall firm performance (Berger and De Young forthcoming). If a firm maximizes profit, then it must pay equal attention to both raising a marginal peso of revenue and reducing a marginal peso of cost. A decision that leads to an increase in cost can be considered a deterioration in bank performance under cost minimization approach, but if such decision can raise revenues faster than cost, then it can be considered an improvement in bank performance under the profit maximization approach (Berger and Mester 2001). The cost efficiency measure can provide additional information as to whether the profit inefficiency comes from the cost side or the revenue side. However, for ease in exposition, which will be made clear later, the study starts with the standard cost function.

The cost function, which relates the variable costs on the prices of variable inputs, quantities of variable outputs, other exogenous factors, random error and efficiency, can be written in logarithmic form as:

$$\ln C = f_c(w, y, z, v) + \ln u_c + \ln \varepsilon_c \quad (1)$$

where C measures the variable costs; f_c denotes a functional form; w is the vector of input prices; y is the vector of outputs; z represents the quantities of any fixed parameters; v is the set of other exogenous variables; u_c is the inefficiency factor; and ε_c is the random error.

The cost inefficiency of a commercial bank b is then defined as the actual cost of commercial bank b divided by the estimated cost needed to produce commercial bank b's output vector if the bank were as efficient as the best-practice bank in the sample facing the same exogenous variables (w,y,z,v), adjusted for random error (Berger and Mester 1997b). This can be expressed as:

$$\text{Cost EFF}^b = \frac{\hat{C}^b}{\hat{C}^{\min}} = \frac{\exp [f_c(w^b, y^b, z^b, v^b)] \times \exp [\ln \hat{u}_c^b]}{\exp [f_c(w^b, y^b, z^b, v^b)] \times \exp [\ln \hat{u}_c^{\min}]} = \frac{\hat{u}_c^b}{\hat{u}_c^{\min}} \quad (2)$$

where \hat{u}_c^{\min} is the minimum \hat{u}_c^b across all commercial banks in the sample. The value of Cost EFF^b can be equal to or greater than one. It is equal to one for the best-practice commercial bank within the given sample. If it is greater than one, then the bank is thought to be wasting a certain proportion of its resources relative to a best practice bank facing the same condition. Thus, a higher value of Cost EFF^b indicates greater inefficiency. For example if Cost EFF^b = 1.30, it means that the bank wastes 30 percent of its costs relative to a best practice bank facing the same conditions. Conversely, the closer the value of Cost EFF^b to one, the more efficient the bank is.

The alternative profit function relates profit to input prices, indicating that output is held constant while output prices vary and may affect profits.⁵ Berger and Mester (1997b), using banking institutions, have pointed out that the alternative profit function may be helpful

⁵ In contrast, the standard profit function relates profit to output prices.

when one or more of the following conditions hold: (a) there are substantial unmeasured differences in the quality of banking services; (b) outputs are not completely variable so that a bank cannot achieve every output scale and product mix; (c) output markets are not perfectly competitive so that banks have some market power over the prices they charge; and (d) output prices are not accurately measured so that they do not provide accurate guides to opportunities to earn revenues and profits in the standard profit function. The authors believe that these conditions exist in the case of the Philippines, hence the use of the alternative profit function.

The alternative profit function is written in logarithmic terms as:

$$\ln (\pi + \theta) = f(w,y,z,v) + \ln \varepsilon_{a_\pi} - \ln u_{a_\pi} \quad (3)$$

where π denotes the variable profits of the commercial bank; θ is a constant added to every commercial bank's profit; y is the vector of outputs that yields different values for the inefficiency, $\ln u_{a_\pi}$, and random error term, $\ln \varepsilon_{a_\pi}$.

The alternative profit efficiency is expressed as the ratio of predicted actual profits to the predicted maximum profits for a best-practice commercial bank and this is represented as follows:

$$\text{Alt } \pi \text{ EFF}^b = \frac{a\pi^b}{a\pi^{\max}} = \frac{\{ \exp [f(w^b, y^b, z^b, v^b)] \times \exp [\ln \hat{u}_{a_\pi}^b] \} - \theta}{\{ \exp [f(w^b, y^b, z^b, v^b)] \times \exp [\ln \hat{u}_{a_\pi}^{\max}] \} - \theta} \quad (4)$$

The value of $\text{Alt } \pi \text{ EFF}^b$ gives the proportion of maximum profits that can be earned. Its value can be equal to or less than one, with one being the profit efficiency of the best practice bank. For example, a bank with $\text{Alt } \pi \text{ EFF}^b=0.85$ means that it is 85 percent profit efficient, or is foregoing 15 percent of its potential profits through excessive costs, deficient revenues, or both.

Functional form

To estimate the cost and alternative profit frontier functions, a transcendental logarithmic functional form is chosen. This functional form is widely used because it allows some flexibility when estimating the frontier function.⁶ Assuming, for the sake of convenience, three inputs, three outputs, and three other exogenous variables, the cost function for bank k can be expressed as:⁷

$$\begin{aligned}
 \ln C_{kt}(y,w,z) = & a_0 + \sum_{i=1}^3 a_i \ln y_{ikt} + \frac{1}{2} \sum_{i=1}^3 \sum_{j=1}^3 a_{ij} \ln y_{ikt} \ln y_{jkt} + \sum_{i=1}^3 b_i \ln w_{ikt} \quad (5) \\
 & + \frac{1}{2} \sum_{i=1}^3 \sum_{j=1}^3 b_{ij} \ln w_{ikt} \ln w_{jkt} + c_0 \ln z_{kt} + \frac{1}{2} c_1 (\ln z_{kt})^2 \\
 & + \sum_{i=1}^3 \sum_{j=1}^3 d_{ij} \ln w_{ikt} \ln y_{jkt} + \sum_{i=1}^3 e_i \ln w_{ikt} \ln z_{kt} \\
 & + \sum_{i=1}^3 f_i \ln y_{ikt} \ln z_{kt} + \ln \varepsilon_c + \ln u_c
 \end{aligned}$$

The ε and u are the inefficiency and random error term, respectively.

Following Berger and Mester (2001), one of the changes in the specification of the alternative profit function is on the dependent variable. For the profit function, $\ln C$ is replaced with $\ln [\pi + |\pi^{\min}| + 1]$, where $|\pi^{\min}|$ indicates the absolute value of the minimum value of the profit over all banks for the same year. Since the minimum profits can be negative, the addition of the value, $\theta = |\pi^{\min}| + 1$, to every bank's dependent variable will allow for the natural log to be taken as a positive number. Aside from this change, there is also a slight change in the above specification for the alternative profit function where the dependent variable is replaced with net profits and the inefficiency term is $-u$.

⁶ Some authors claim that specification bias may result from using a translog function over a sample of banks with different size and product mix but the study of Berger and Mester (1997b) found that both the translog and Fourier-flexible functional forms generate basically the same average level and dispersion of measured efficiency. Also the study shows that both functional forms ranked the individual banks in almost the same order.

⁷ The models estimated below actually use three outputs, two input prices and three other exogenous variables.

Correlates of bank efficiency measures

Three sets of potential correlates of bank efficiency measures that can help explain the variation in measured efficiencies are being examined in this paper. These are: agency cost, governance and market characteristics.

Agency problem will not likely occur in a firm wherein ownership is highly concentrated and owners have greater control of the management of the firm. Philippine commercial banks are characterized by highly concentrated ownership where it is centered around family corporate groups that control a sizeable share of corporate assets. The paper of Unite and Sullivan (2001) showed that in their sample of 16 large domestic Philippine commercial banks, 10 of which are subject to significant group ownership and are effectively controlled by related parties including group companies, affiliated companies and managerial insiders. However, the paper also noted that the average insider ownership dropped from 55.34 percent in 1992 to 43.25 percent in 1998. Thus, it would be worthwhile to examine the relationship between agency cost variables and efficiency measures of Philippine banks.

The correlates of agency costs include FIXASSETS and SUFMARG. FIXASSETS is defined as the ratio of fixed assets to total assets. It measures the extent to which management uses funds for unproductive uses. Thus, higher values of FIXASSETS will likely lower profit efficiency and increase cost inefficiency of the commercial banks. However, it is possible that FIXASSETS can have a positive impact on profit efficiency if such assets are meant to modernize the operations of a bank so that it can provide better services to its customers, and hence attract more businesses that could lead to higher increases in revenues than costs. This will likely be the case in a rapidly growing bank that wants to improve further its competitiveness in response to growing competition. In other words, it would lose its competitiveness if it continues to underinvest in modern non-financial facilities, such as better bank offices that are convenient to customers, and technologies, such as information processing and telecommunications. SUFMARG is the ratio of the difference between financial income and financial cost to operational costs. It measures the proportion of operational costs covered by the financial margin. A higher ratio is associated with more

efficient management. Thus, SUFMARG will likely be negatively correlated with cost inefficiency and positively correlated with profit efficiency.

The correlate for bank governance is represented by a lone variable, DEPLIAB, which is the proportion of deposits to total liabilities. This draws on Jensen's (1989) *free cash flow theory*, which states that an appropriate policy to control agency costs is to limit free cash flows available to constrain the expense preference behaviour of managers. The higher the concentration of ownership, as in the case of Philippine banks, and greater the financial leverage that limits managers' incentives to spend on perks and other wasteful activities. Thus, DEPLIAB will likely be positively correlated with profit efficiency measure. However, a higher level of deposits could also increase bank costs, and thus, worsens the measured cost inefficiency.

The correlates for market characteristics include banking density (POPBANK) and real growth rate of the economy (RGDP). POPBANK refers to the ratio of population to the number of commercial banks operating in the country in a given year. A higher ratio is likely to be associated with a less competitive financial market, while a lower ratio, a more competitive market. It is therefore expected that POPBANK will reduce cost inefficiency (or will improve cost efficiency) and will improve profit efficiency of commercial banks. In other words, competitive pressures could force commercial banks to become more cost and profit efficient.

On the other hand, RGDP, is a proxy for the general state of the economy that can affect bank efficiency measures. An expanding economy improves profit efficiency and lessens cost inefficiency.

Description of the Data

The variable inputs and outputs used in this paper are defined using the intermediation approach suggested by Sealey and Lindley (1977). According to this approach, banks as financial intermediaries use labor, capital, deposits and other borrowed funds to produce

earning assets.⁸ Since this approach takes into account the overall costs of banking, it is then the most suitable approach to tackle concerns regarding the economic viability of banks (Ferrier and Lovell 1990).⁹

For the cost function (profit function), the dependent variable is the total cost (total profit) of each commercial bank. The independent variables include three output quantities, namely, total loans (Y1), securities (Y2) and contingent accounts (Y3), and two input prices, namely, wage rate (W1) and price of physical capital (W2). All variables are expressed in real terms using the consumer price index (CPI) with 1994 as the base year. It can be noted that aside from the including traditionally defined outputs, such as loans and securities, this paper also contingent accounts of commercial banks as output variable, which serves as a proxy for other services offered by banks. Thus, the model captures more comprehensively the other services by banks not incorporated in the other output quantity variables.

Aside from three outputs and two input prices, the model includes three exogenous variables that are intended to capture the effects on efficiency of various facets of the liberalization policy. These are dummy variables for ownership of the bank, liberalization episode and M&A. OWN is a dummy variable for ownership of the bank, which takes the value of unity for domestic banks and zero for foreign banks. LIB is a dummy variable for financial liberalization which takes the value of unity for the period 1995-2002 and zero otherwise. Studies comparing the efficiency of foreign and domestic banks operating within the boundaries of a single country avoid the problem of controlling environmental differences in the model. Meanwhile, MERGER is a dummy variable for mergers and acquisitions, which takes the value of unity for the acquiring and acquired bank in the year of the merger and zero otherwise.

This paper uses balance sheet and income statement data of both domestic and foreign commercial banks for the period 1990 to 2002. These data were obtained from the BSP and Securities and Exchange Commission (SEC). The unbalanced panel data include 44 commercial banks whose assets accounted for 80 percent, on the average, of the total assets

⁸ The production approach is another method, which views banks as producing demand deposits, savings and time deposits, commercial loans, real estate loans and installment loans using capital, labor and materials as inputs (Humphrey 1985).

⁹ Berger, Hanweck and Humphrey (1987) who were concerned about the competitive viability of banks used similar approach.

of the banking system. Lack of data precluded the use of all existing commercial banks in the country in this study. More specifically, some banks had financial statements in some years that lacked details or breakdowns of financial items needed for the analyses, and therefore were weeded out of the sampling frame. Thus, the panel data are unbalanced and consist of only 388 observations. However, it is noteworthy that the time series data on the commercial banks included offer significant benchmark information on the commercial banking system's profile and performance. Other macroeconomic variables were obtained from the various reports of the National Statistical Coordination Board (NSCB).

Table 10 presents the summary of the definitions of the variables used for the alternative profit and cost functions and the correlates of efficiency along with their descriptive statistics.

Coelli's (1994) Frontier Version 4.1 was used to estimate the profit and cost efficiency of the commercial banks. This program estimates the cost and profit models as well as the equations relating efficiency measures with a set of correlates using maximum likelihood estimation (MLE) procedure.

Estimation Results

The estimated cost and alternative profit functions are presented in **Appendix 2**. The discussions below will focus on the efficiency estimates; the effects of foreign bank entry and M&As on the measured efficiencies; and the effects of potential correlates on the measured efficiencies of commercial banks.

Average Efficiency Estimates

The average measured profit efficiency of Philippine commercial banks is 0.85, implying that, on the average, the commercial banks are using only 85 percent of their resources efficiently compared to the best practice commercial bank in the system producing the same output and facing the same conditions. However, it appears that this is higher than the average measured profit efficiency of 66.3 – 66.8 percent found by Berger and De Young (forthcoming) for US banks.

On the other hand, the average measured cost inefficiency of the commercial banks is 1.39. This suggests that, on average, 39 percent of the commercial bank's costs are wasted relative to the best-practice commercial bank in the system producing the same output and facing the same conditions. This is considerably higher than the average measured cost inefficiency of 27 percent reported in Berger and Humphrey (1997) in their survey of 130 financial institution efficiency studies for 21 countries and the average inefficiency of 22 – 24 percent reported in Berger and De Young (forthcoming) and 26 percent reported in Ferrier and Lovell (1990) for US banks.

It is to be noted, however, that cross-country comparisons between the results for US banks and this study are difficult to interpret because it is likely that the regulatory and economic environments faced by these financial institutions significantly differ. Moreover, the level and quality of service associated with deposits and loans between the two countries may vary. The main usage then of the given efficiency values is to provide vital information regarding the competitiveness of banks in each country.

There is a negative correlation between the measured profit efficiency and the cost inefficiency of commercial banks, implying that the most profit efficient banks are also least cost inefficient banks, and vice-versa. However, the correlation is not as strong as expected since the correlation coefficient is only -0.43, which is significant only at the 14 percent level.

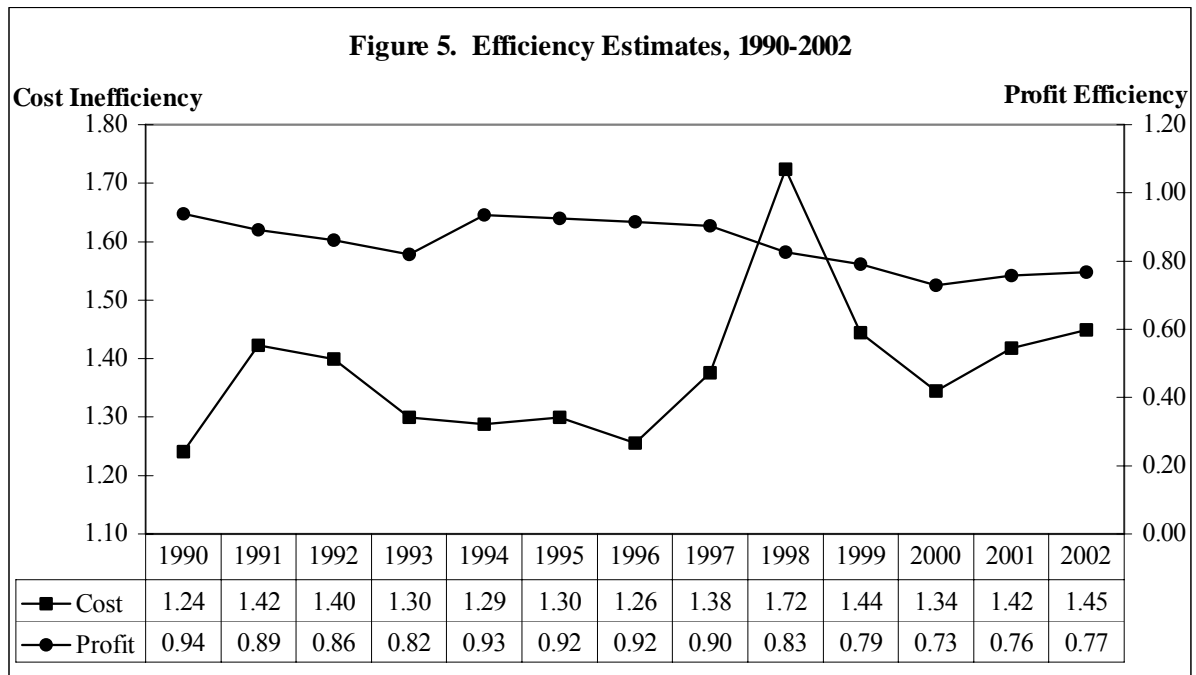
Before proceeding further, it is worthwhile to examine how the measured profit and cost efficiencies are correlated with standard profitability ratios, such as return on assets (ROA) and return on equity (ROE). Results show that measured profit efficiency is positively correlated with ROA ($r=0.65$) and ROE ($r=0.72$), while measured cost inefficiency is inversely correlated with ROA ($r= - 0.79$) and ROE ($r= - 0.76$). These results imply that the findings of the study on efficiency measures are robust and are not simply the consequences of the specifications or methods. Thus, a profit and cost efficient bank is also financially sustainable.

Table 10. Definition of Variables and Their Characteristics

| Symbol | Variable Name and Definition | Mean | Maximum | Minimum | Std. Dev. |
|---|--|-----------|-----------|-----------|-----------|
| A. Cost and Alternative Profit Functions | | | | | |
| Dependent Variables | | | | | |
| Costs | Real Costs, in million pesos, deflated by the Consumer Price Index (CPI) (1994=100) | 30.63 | 202.36 | 0.07 | 38.40 |
| π | Real Profit defined as net income, in million pesos, deflated by the CPI | 58.80 | 138.54 | 0.01 | 17.97 |
| Independent Variables | | | | | |
| Variable Output Quantities | | | | | |
| Y1 | Total loans, in million pesos, deflated by the CPI | 178.12 | 1,377.41 | 0.47 | 239.58 |
| Y2 | Securities: total assets less total loans and fixed capital, in million pesos, deflated by the CPI | 182.49 | 1,400.40 | 0.31 | 256.43 |
| Y3 | Contingent Accounts, in million pesos, deflated by the CPI | 204.48 | 2,096.48 | 0.00 | 285.44 |
| Variable Input Prices | | | | | |
| W1 | Real Wage rate: salaries and benefits divided by assets, in million pesos, deflated by the CPI | 0.000132 | 0.000539 | 0.000014 | 0.000081 |
| W2 | Real Price of physical capital, in percentage: occupancy expenses divided by the book value of fixed assets, deflated by the CPI | 0.004501 | 0.104972 | 0.000041 | 0.009002 |
| Dummy Variables for Policy Reforms | | | | | |
| OWN | Ownership: Domestic=0 Foreign=1 | 0.26 | 1.00 | 0.00 | 0.44 |
| LIB | Liberalization: 1990-1994=0; 1995-2002=1 | 0.74 | 1.00 | 0.00 | 0.44 |
| MERGER | Dummy for merger Acquiring & acquired bank=1; Otherwise=0 | 0.33 | 1.00 | 0.00 | 0.47 |
| B. Correlates | | | | | |
| Correlates of Agency Costs | | | | | |
| FIXASSETS | Proportion of fixed assets to tot assets, in percentage | 2.78 | 34.46 | 0.02 | 2.51 |
| SUFMARG | Sufficiency of financial margin, in percentage | (8.79) | 2,593.92 | (89.14) | 228.71 |
| Governance and Bank Performance | | | | | |
| DEPLIAB | Proportion of deposits to tot liabilities, in percentage | 4.24 | 23.87 | 0.0046 | 2.48 |
| Macro Economic Characteristics | | | | | |
| POPBANK | Banking Density: Population/ number of commercial banks | 21,623.46 | 32,584.00 | 17,313.00 | 5,161.91 |
| RGDP | Real GDP growth rate in % | 3.26 | 5.97 | (0.58) | 2.23 |

Behavior of Efficiency Measures over Time

Figure 5 presents the average measured profit and cost inefficiencies of commercial banks for the period 1990-2002. The average measured profit efficiency declined in the first three years of the 1990s, but recovered from 1994 to 1996, when new foreign banks were allowed to enter, and stayed close to the 1990 level.¹⁰ The East Asian financial crisis might have exacted a heavy toll on commercial banks as can be seen from the declining trend of their average measured profit efficiency during the period 1997-2000. Interestingly, the average profit efficiency started to improve gradually after the passage of the GBL.



The trend in measured cost efficiency during the period 1990-2002 can partly explain the trend in measured profit efficiency. The measured cost inefficiency increased in the early 1990s, but improved considerably during the period 1993-1996. Then it rose dramatically in the wake of the East Asian financial crisis. However, the last

¹⁰ It is to be noted that the Philippine economy was badly affected by the first Gulf War. In fact, GDP contracted by 0.6 percent in 1991. The country was also hit by a debilitating power crisis in 1992-1993.

two years are quite interesting. While measured cost inefficiency deteriorated (increased), measured profit efficiency increased.¹¹ It could be that banks were able to raise their revenues by more than they raised costs in the last two years. This is consistent with the profit maximization hypothesis. Moreover, this result is not quite surprising as pointed out by the existing empirical studies mentioned in the literature above.

The findings above seem to suggest that external shocks affect banks' measured efficiencies. The implication here is that bank regulation and supervision should focus on measures that could limit banks' exposures to uncontrollable factors or external shocks.

Efficiency Measures by Asset Size Class

Banks of different asset size offer different financial services and such difference implies effects of organizational control and distance on efficiency. Thus, in order to further differentiate the performance based on asset size in real terms, the banks were divided into the following three asset size groups: less than PhP100 million; PhP100 – PhP300 million; and PhP300 million and above.¹² The efficiency estimates per asset group are the simple average of individual efficiency measures within each size group.

The results shown in **Figure 6** are quite revealing. Asset size is inversely correlated with measured profit efficiency, but is positively correlated with measured cost inefficiency. This suggests that the most efficient banks both in terms of profit and cost efficiency measures belong to the smallest size class. Small banks usually conduct relationship banking and stay close to their customers. This approach could have compensated whatever technological disadvantages they have with large banks.¹³ This gives small banks competitive advantage over large banks, and this could be the reason

¹¹ Berger and Mester (2001) found that cost productivity in the US banking industry worsened during the period 1991-1997, while profit productivity improved substantially.

¹² The nominal bank assets were deflated by the CPI with 1994 as the base year.

¹³ It is to be noted that some technologies, such as accounting system and other IT-based system, are now available for small banks even for microfinance banks that enable them to efficiently service numerous small accounts.

why despite the generous incentives given by the BSP to banks to merge or consolidate to attain a much larger size, still many small commercial banks in the country have opted to stay out of any merger or consolidation exercises.

The finding above is not unusual. For instance, Berger (2000) found that profit efficiency consistently declines as asset size increases, with the smallest asset size group having the highest efficiency estimate. Also, Ferrier and Lovell (1990) found that small banks are more cost efficient than large banks.

Efficiency Measures: Domestic vs. Foreign Banks

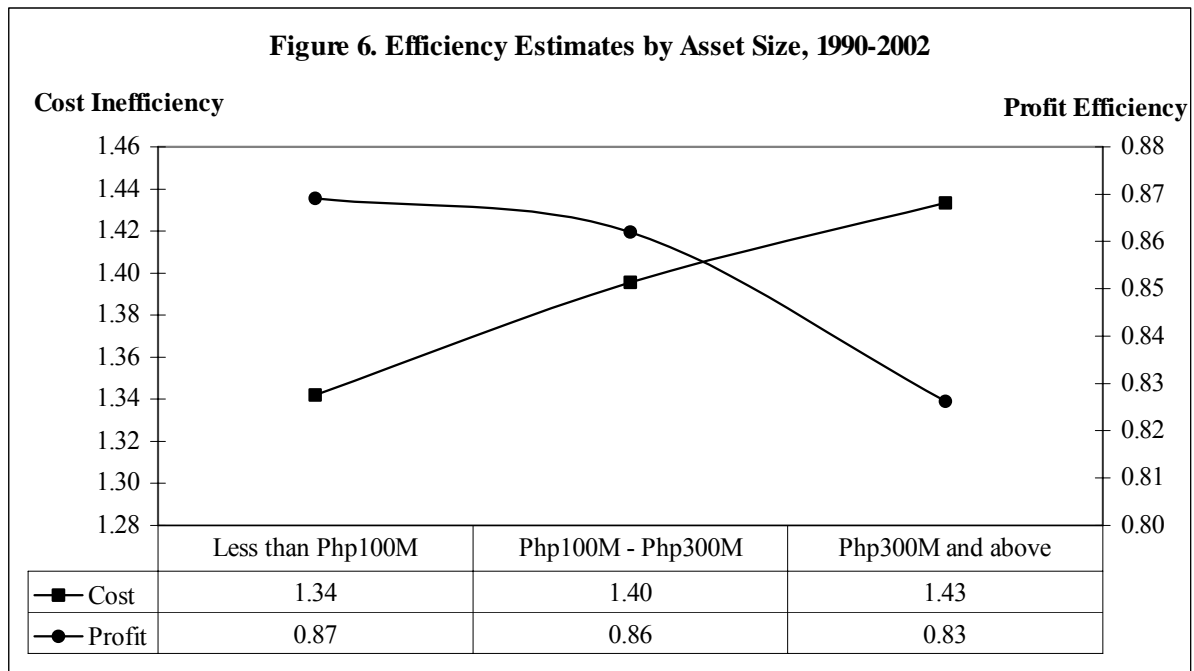
We compare here measured efficiencies of domestic and foreign banks. The efficiency estimates per type of commercial banks are the simple averages of individual bank's efficiency measures within each type of ownership per year. The results shown in **Figure 7** suggest that foreign banks are generally more profit and cost efficient than domestic banks during the period 1990-2002.¹⁴ However, there are other interesting results. More specifically, both groups of banks tended to have similar measured profit efficiencies in the years after the foreign bank entry liberalization in 1994.¹⁵ In the wake of the East Asian financial crisis, however, the measured profit efficiency of domestic banks dropped more sharply than that of foreign banks. This indicates that domestic banks are more vulnerable to external shocks than foreign banks operating in the country.

One explanation for this as stated above in the literature is that domestic banks tend to have the riskier segments of the market since foreign banks tend to select the most lucrative segments or clients in the markets. Moreover, a study conducted by the Asian Development Bank (in Hapitan 2001) explained that domestic branches of foreign banks have their own foreign head and monetary offices that act as their private lenders of last

¹⁴ Considering the positive relationship between profit efficiency and standard profit ratios, this result seems to support the findings of Claessens et al. (1998) using bank level data for 80 countries that foreign banks achieve higher profits than domestic banks in developing countries. Moreover, Hapitan (2001) found that foreign banks in the Philippines are enjoying high returns on their equity and factors like increased in foreign banks' activities through loans and deposits but with limited capital infusion.

¹⁵ Domestic banks are not necessarily technologically backward compared to foreign-owned banks. It is to be noted that 12 of the domestic banks have substantial equity participation from foreign banks.

resort; domestic branches of foreign banks could import competent managers from foreign banks that are more knowledgeable to international regulations and standards; and domestic branches of foreign banks are likely to have a more internationally diversified asset base which lowers the vulnerability of their assets to the boom-bust cycle. These may explain why domestic branches of foreign banks are more resilient to external shocks than local banks.



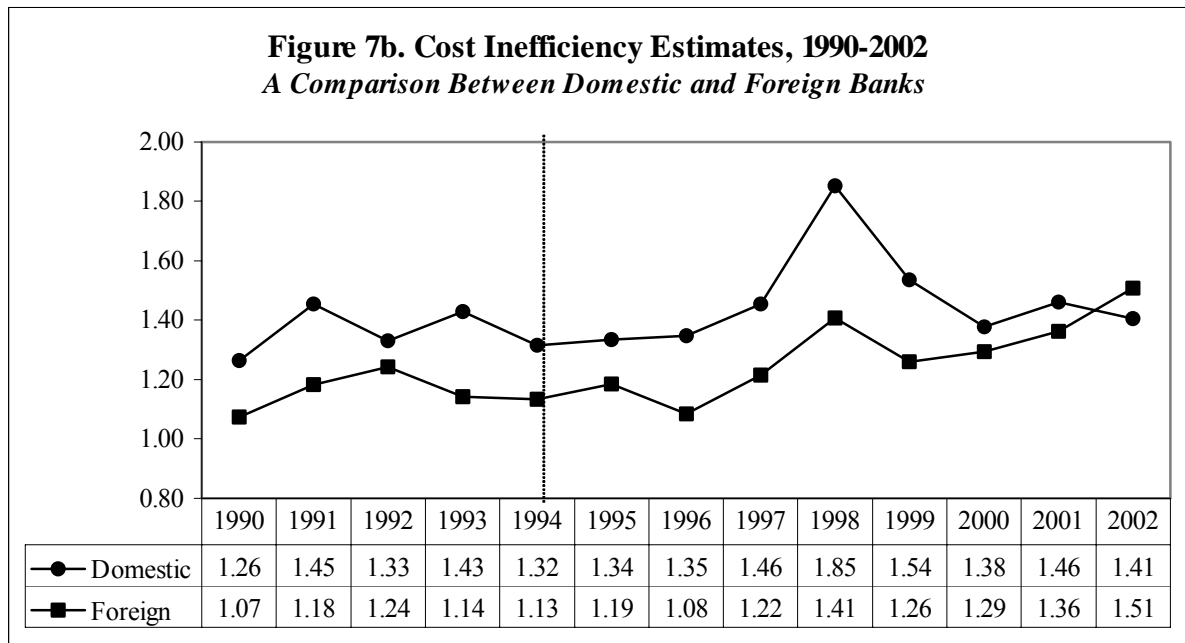
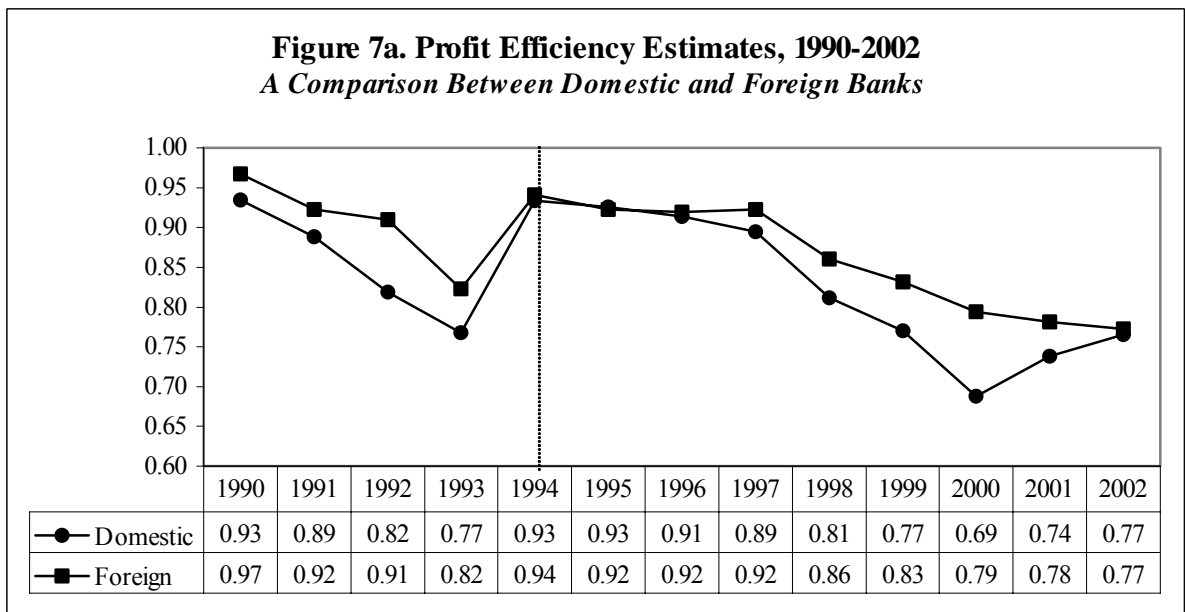
Note:

| Standard Deviation: | Cost | Profit |
|----------------------------|-------------|---------------|
| <i>Less than Php100M</i> | 0.36 | 0.09 |
| <i>Php100M - Php300M</i> | 0.22 | 0.09 |
| <i>Php300M and above</i> | 0.26 | 0.14 |

Another key finding is that, in the last two years, the measured profit efficiency of domestic banks had improved considerably and approached that of foreign banks. It is then to be expected that, as in the years following the 1994 liberalization up until the East Asian financial crisis, domestic banks can be as competitive as foreign banks in the years to come as long as there are no external shocks.

The findings on measured cost inefficiency essentially tell the same story, except for two things. One is that the gap between domestic banks' measured cost inefficiency

and those of foreign banks is quite substantial; that is, domestic banks are significantly more cost inefficient than foreign banks. The other is that said gap had narrowed since 2000, and in fact foreign banks tended to become more cost inefficient than domestic banks in 2002. Domestic banks' improving cost efficiency in recent years could have explained the improvement in their profit efficiency in these years.



There is one important policy implication that can be drawn from the above results, which further refine the results discussed earlier. Domestic banks can be as efficient as foreign banks during normal times, but less efficient during crisis years. This suggests that the regulatory and supervisory framework of the BSP should pay greater attention to the vulnerability of domestic banks to external shocks.

Efficiency Measures: Merged vs. Non-Merged Banks

In this section, the impact of M&As on measured efficiencies of concerned banks are examined and compared with those of non-merged banks. It should be recalled that the M&A cases included in this paper are those that occurred starting in 1999, which include both domestic and foreign banks (see Table 9). **Figure 8** shows that measured profit efficiency of merged banks declined more sharply than non-merged banks up until 2001. In 2002, however, the merged banks' measured profit efficiency recovered and approximated that of non-merged banks. This seems to suggest that any negative impact of M&A on banks' profit efficiency will likely be temporary.

The results on measured cost inefficiency are quite instructive. Merged banks' cost inefficiency dropped sharply in 2000 and remained much lower than that of non-merged banks in subsequent years. Interestingly, while the cost inefficiency of non-merged banks continued to rise in 2002, merged bank's cost inefficiency fell substantially suggesting economies of scale arising for larger merged commercial banks.

Two important points emerging from the results need to be stressed. One, as pointed out by Berger (2000), is that the acquiring banks could have been more cost efficient ex ante and brought the efficiency of the targets up to their own level by restructuring management and spreading its superior management system to much larger resources. The other is that while the merged banks immediately realized improvement in cost efficiency, they suffered deterioration in profit efficiency following the merger, and it took them awhile to reverse the trend. It could be that they were initially having difficulty in managing revenues especially if the acquiring banks have products and

services different from the targets. It could also be that the targets have similar products and services as the acquiring banks but that they need to be upgraded to the level of those of the acquiring banks, hence, the loss of revenues at least temporarily.

Correlates of Efficiency

The results from the maximum likelihood estimation that relate the measures of efficiency to potential correlates are presented in **Table 11**.

Agency Costs

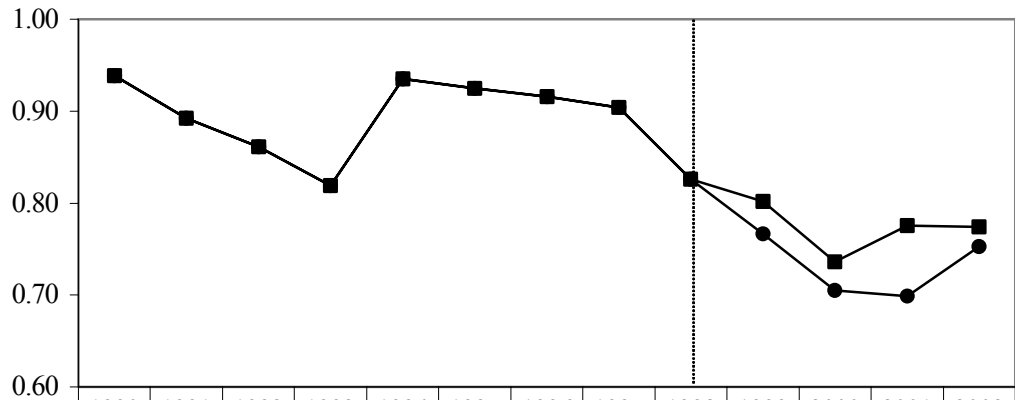
FIXASSETS has a significant positive effect on measured profit efficiency. This does not support the agency cost hypothesis. Given the fact that Philippine banks are tightly controlled and managed by their owners, it could be that investment in fixed assets by banks are meant to improve bank efficiency, rather than to satisfy non-pecuniary needs of bank managers. It is to be noted that fixed assets on the average accounted for only 2.8 percent of the total assets of banks in the sample.

On the other hand, the result with respect to cost inefficiency conforms to *a priori*; that is, an increase in the proportion of fixed assets to total assets could lead to a worsening in cost efficiency.

The coefficient of SUFMARG is statistically significant but inconsistent with *a priori* expectation as far as measured profit efficiency is concerned. In contrast, SUFMARG appears to have a significant negative effect on cost inefficiency, which is consistent with *a priori* expectation.

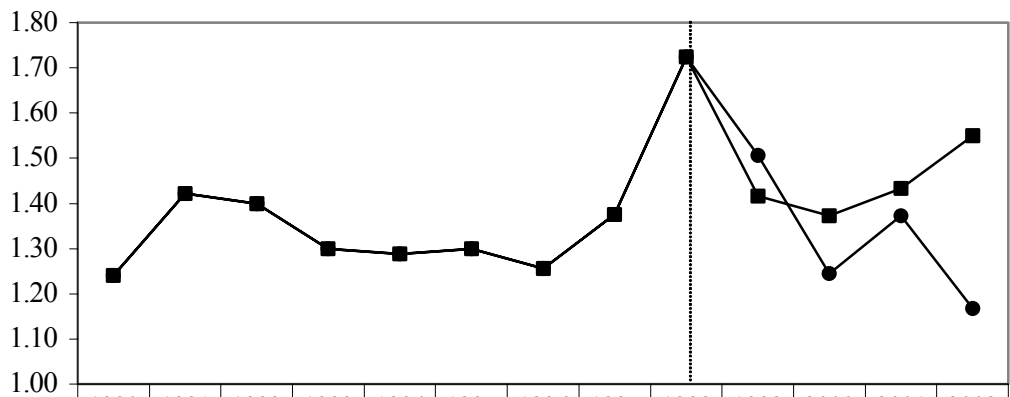
In general, the results of our investigation regarding the existence of agency problem in banks are consistent with our expectations only as far as measured cost inefficiency is concerned, but not as far as measured profit efficiency is concerned.

Figure 8a. Profit Efficiency Estimates, 1999-2002
A Comparison Between Pre and Post Merger Period



| | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| ● Merged | 0.938 | 0.892 | 0.861 | 0.819 | 0.935 | 0.925 | 0.916 | 0.904 | 0.826 | 0.766 | 0.705 | 0.699 | 0.753 |
| ■ Non-merged | 0.938 | 0.892 | 0.861 | 0.819 | 0.935 | 0.925 | 0.916 | 0.904 | 0.826 | 0.802 | 0.736 | 0.776 | 0.774 |

Figure 8b. Cost Inefficiency Estimates, 1999-2002
A Comparison Between Pre and Post Merger Period



| | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|--------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| ● Merged | 1.24 | 1.42 | 1.40 | 1.30 | 1.29 | 1.30 | 1.26 | 1.38 | 1.72 | 1.51 | 1.24 | 1.37 | 1.17 |
| ■ Non-merged | 1.24 | 1.42 | 1.40 | 1.30 | 1.29 | 1.30 | 1.26 | 1.38 | 1.72 | 1.42 | 1.37 | 1.43 | 1.55 |

Table 11. Correlates of Efficiency Measures

| Correlates | Profit | | Cost | |
|--|-------------|---------|-------------|---------|
| | Coefficient | T-Ratio | Coefficient | T-Ratio |
| Agency Costs | | | | |
| FIXASSETS | 0.25 | 6.65* | 0.03 | 5.04* |
| SUFMARG | (0.13) | (9.00)* | (0.04) | (8.54)* |
| Governance and Bank Performance | | | | |
| DEPLIAB | 0.15 | 4.14* | 0.05 | 12.86* |
| Macro Economic Characteristics | | | | |
| POPBANK | (0.00) | (4.08)* | (0.00) | (8.83)* |
| RGDP | 0.02 | 0.35 | (0.02) | (6.79)* |

* Significant at 5 percent level

Governance

The effect of DEPLIAB on measured profit efficiency appears to be consistent with the *free cash flow hypothesis* discussed earlier. Likewise, its effect on cost inefficiency conforms to *a priori* expectation. These results suggest that bank governance has substantial effect and thus, can explain to a greater extent, the differences in the efficiency among commercial banks.

Market Characteristic

POPBANK, which indicates the degree of competition in the domestic market, exerts a significant negative effect on profit efficiency. It means that as POPBANK declines as a result of a more rapid increase in the number of banking offices relative to the country's population, banks are encouraged to improve their profit efficiency. As regards cost inefficiency, result shows that an increasing degree of competition in the market brought about by the establishment of many banking offices (that is, a declining POPBANK) would lead to an increase in cost inefficiency. Increases in the number of

branches, accompanied by greater product diversification, could have raised cost excessively and strained managerial capacity of banks.

Although the coefficient of GRDP conforms to *a priori* expectation, it is not statistically significant. It means that it could not explain the differences in measured profit efficiencies among commercial banks. This is surprising considering that measured profit efficiency, as discussed earlier, tends to be affected by crises. As regards cost inefficiency, the result indicates that GRDP is negatively correlated with measured cost inefficiency; that is, a reduction in GRDP can lead to higher cost inefficiency. This supports earlier results that banks, specifically domestic banks, are vulnerable to external shocks.

The results generally indicate that market conditions can partly explain the differences in the efficiency among commercial banks.

Conclusion

Using stochastic frontier analysis, this paper has examined the performance of the Philippine commercial banking system from 1990 to 2002 with emphasis on evaluating the impacts of competition policy reforms of the government on the commercial banking system. This study particularly focuses on the liberalization of foreign bank entry into the country and the recent M&A of commercial banks which have been encouraged by the BSP.

Small banks are not necessarily less competitive than large banks. On the contrary, small banks appear to be more profit and cost efficient than large banks. Their personal relationship banking approach which requires them to stay close to their clients could have led to better profit and cost efficiency. This perhaps could have offset any technological disadvantage they have with large banks. It is not therefore surprising that there are still many small banks in the domestic banking system that have not opted to merge with other banks to a certain size.

The policy of easing entry of foreign banks is aimed at introducing more competition into the domestic banking system, which can eventually force domestic banks to become more efficient. Indeed, the results show that foreign banks are generally more profit and cost efficient than domestic banks. Interestingly, the gap in profit efficiency between domestic banks and foreign banks declined after the liberalization of bank entry of foreign banks in the mid-1990s and in the 2000s. However, it is to be noted that the efficiency of domestic banks appears to be more sensitive to external shocks than foreign banks. This suggests that BSP's regulatory and supervisory framework must pay greater attention to domestic banks. Liberalization without improvement in prudential regulations will not lead to a sustained improvement in the efficiency of domestic banks.

M&A led to a sharper decline in profit efficiency of merged banks compared to non-merged banks. However, this appears to be temporary. In contrast, cost efficiency of merged banks improved considerably after the merger relative to non-merged banks. Thus, as far as improving the efficiency of banks is concerned, M&A appears to be an appropriate policy.

There are other factors that can have significant impact on the efficiency of banks. These are agency problem, governance issue and general market conditions. The nature of their impact on the efficiency of banks can also help authorities in designing appropriate regulatory and supervisory framework that can improve the efficiency of the domestic banking system.

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Appendix 1. Banking (Acceptance of Deposits and Lending) 1997

| Selected APEC Member Countries | Cross Border Supply | | | Consumption Abroad | | | Commercial Presence | | | | | |
|-----------------------------------|---------------------|---------|-------|--------------------|---------|-------|---------------------|----------|--------|-----------|-------------|-------|
| | Deposits | Lending | Index | Deposits | Lending | Index | Legal Form | # of Sup | Equity | # of Oper | # of Trans. | Index |
| Hong Kong, China | U | U | 0.000 | N | N | 0.000 | LT | DL | | LN | LV | 0.600 |
| Indonesia | N | N | 0.050 | N | N | 0.013 | LL | U | LO1 | LN | | 0.800 |
| Korea, Rep. | U | U | 0.075 | U | U | 0.040 | | DL | LO1 | | LV | 0.200 |
| Malaysia | U | LC | 0.000 | N | | 0.000 | | U | LO1 | U | | 0.400 |
| Philippines | U | U | 0.160 | N | N | 0.040 | DL | DL | LO2 | LN | LV | 0.600 |
| Singapore | U | U | 0.160 | N | N | 0.040 | | U | LO1 | LN | DL | 0.800 |
| Thailand | U | U | 0.000 | U | U | 0.000 | LL | DL | LO1 | LN | | 0.200 |

Note:

| <i>Code</i> | <i>Type of Commitment</i> | <i>Index Value</i> |
|-------------|--|--------------------|
| <i>U</i> | <i>"Unbound" against relevant mode</i> | <i>0.00</i> |
| <i>DL</i> | <i>Discretionary Licensing or Economic Needs Tests</i> | <i>0.25</i> |
| <i>LC</i> | <i>Limited commitments</i> | <i>0.50</i> |
| <i>LO1</i> | <i>Limits on ownership less than 50% (minority)</i> | <i>0.50</i> |
| <i>G</i> | <i>Grandfathering Provisions</i> | <i>0.75</i> |
| <i>LL</i> | <i>Limits on Legal Form</i> | <i>0.75</i> |
| <i>LN</i> | <i>Limits on number of operations (branches)</i> | <i>0.75</i> |
| <i>LO2</i> | <i>Limits on ownership more than 50% (minority)</i> | <i>0.75</i> |
| <i>LT</i> | <i>Limits on types of operations (branches vs. subsidiaries)</i> | <i>0.75</i> |
| <i>LV</i> | <i>Limits on value of transactions or Assets</i> | <i>0.75</i> |
| <i>RE</i> | <i>Reciprocity condition or MFN exemption</i> | <i>0.75</i> |
| <i>N</i> | <i>Full Bindings or "None" Limitations against relevant mode</i> | <i>1.00</i> |

Source: Qian (2003).

Appendix 2. Estimated Cost and Alternative Profit Functions

| Variable Name | Profit | | Cost | |
|---|-------------|---------|-------------|---------|
| | Coefficient | T-ratio | Coefficient | T-ratio |
| Constant | 13.88 | 10.99* | (0.99) | (0.37) |
| Quantity of loans | (0.58) | (1.91)* | 0.78 | 1.85* |
| Quantity of securities | 1.09 | 3.34* | 0.10 | 0.19 |
| Quantity of contingent accounts | (0.01) | (0.05) | (0.12) | (0.66) |
| Wage rate | 1.96 | 6.52* | 0.20 | 0.34 |
| Price of physical capital | 0.28 | 1.43 | (0.79) | (2.51)* |
| Quantity of loans*Quantity of loans | 0.01 | 0.48 | 0.18 | 5.24* |
| Quantity of securities*Quantity of securities | 0.04 | 1.02 | 0.18 | 2.84* |
| Quantity of contingent accounts*Quantity of contingent accounts | (0.02) | (2.79)* | 0.02 | 3.09* |
| Wage rate*Wage rate | 0.20 | 4.59* | 0.03 | 0.35 |
| Price of physical capital*Price of physical capital | (0.01) | (1.03) | (0.04) | (1.92)* |
| Quantity of loans*Quantity of securities | 0.01 | 0.38 | (0.17) | (4.20)* |
| Quantity of loans*Quantity of contingent accounts | 0.02 | 1.47 | (0.02) | (1.48) |
| Quantity of loans*Wage rate | (0.05) | (1.39) | 0.01 | 0.26 |
| Quantity of loans*Price of physical capital | 0.00 | 0.04 | 0.02 | 0.70 |
| Quantity of securities*Wage rate | 0.12 | 3.59* | (0.04) | (0.66) |
| Quantity of securities*Price of physical capital | 0.02 | 0.81 | (0.02) | (0.77) |
| Quantity of securities*Quantity of contingent accounts | (0.00) | (0.32) | (0.02) | (1.01) |
| Quantity of contingent accounts* Wage rate | 0.01 | 0.71 | (0.01) | (0.34) |
| Quantity of contingent accounts* Price of physical capital | (0.02) | (1.68)* | (0.02) | (1.71)* |
| Wage rate*Price of physical capital | 0.05 | 1.75* | (0.09) | (2.25)* |
| Quantity of loans*Liberalization | 0.04 | 0.83 | 0.11 | 1.46 |
| Quantity of securities*Liberalization | (0.01) | (0.20) | (0.09) | (1.05) |
| Quantity of contingent accounts*Liberalization | (0.01) | (0.60) | (0.03) | (0.75) |
| Wage rate*Liberalization | 0.18 | 2.66* | (0.01) | (0.12) |
| Price of physical capital*Liberalization | 0.01 | 0.44 | (0.11) | (2.52)* |
| Liberalization*Liberalization | 1.38 | 2.34* | (0.77) | (0.84) |
| Quantity of loans*Mergers | 0.02 | 0.57 | (0.08) | (1.28) |
| Quantity of securities*Mergers | 0.06 | 1.41 | (0.00) | (0.06) |
| Quantity of contingent accounts*Mergers | (0.04) | (1.27) | 0.05 | 1.23 |
| Wage rate*Mergers | (0.15) | (2.87)* | (0.09) | (1.48) |
| Price of physical capital*Mergers | 0.03 | 1.25 | (0.03) | (0.84) |
| Mergers*Mergers | (1.44) | (3.12)* | (0.82) | (1.64)* |
| Quantity of loans*Ownership | (0.01) | (0.28) | (0.13) | (2.07)* |
| Quantity of securities*Ownership | 0.08 | 1.83* | (0.06) | (0.86) |
| Quantity of contingent accounts*Ownership | 0.01 | 0.40 | 0.12 | 2.94* |
| Wage rate*Ownership | (0.21) | (3.70)* | (0.14) | (2.11)* |
| Price of physical capital*Ownership | 0.01 | 0.33 | (0.04) | (0.71) |
| Ownership*Ownership | (2.13) | (4.62)* | (1.12) | (2.10)* |

* Significant at 5 percent level