

Manlagñit, Ma. Chelo V.; Lamberte, Mario B.

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Evaluating the Impacts of Competition Policy Reforms on the Efficiency of Philippine Commercial Banks

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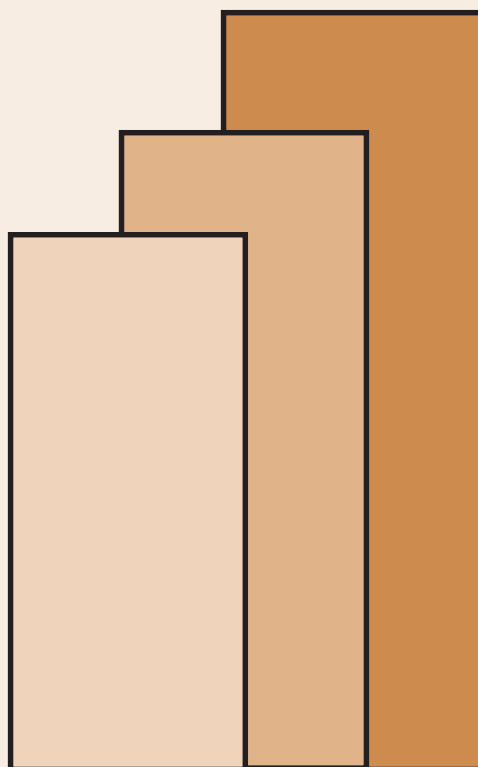
Ma. Chelo V. Manlagñit and Mario B. Lamberte

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The Research Information Staff, Philippine Institute for Development Studies
3rd Floor, NEDA sa Makati Building, 106 Amorsolo Street, Legaspi Village, Makati City, Philippines
Tel Nos: 8924059 and 8935705; Fax No: 8939589; E-mail: publications@pidsnet.pids.gov.ph
Or visit our website at <http://www.pids.gov.ph>

Evaluating the Impacts of Competition Policy Reforms on the Efficiency of Philippine Commercial Banks

*Ma. Chelo V. Manlagñit¹
Mario B. Lamberte*

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.

¹ Respectively, Research Associate and President, Philippine Institute for Development Studies. The authors are grateful to Jose Maria Ruiz for his excellent research assistance.

I. Introduction

The Philippines has introduced significant reforms into the financial system since the early 1980s to improve the efficiency of the 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 but it must also be financially strong to withstand adverse shocks, such as a major policy change, 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 being 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 system, which is the dominant system in the domestic financial system. The remaining sections are structured as follows. Section II discusses the recent competition policy reforms of 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 conclusion of the paper.

II. Competition Policy Reforms

A. Liberalization of the banking system

The liberalization of the Philippine banking system aimed at improving the efficiency of financial intermediation was done gradually, spanning over 25 years (**Table 1**). This can be divided into three distinct phases: reforms in the 1980s; reforms in mid-1990s; and reforms in 2000s. The liberalization was accompanied by measures to strengthen bank supervision and prudential

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)

regulations to ensure that increased competition would not lead to bank failures. The elements of the reforms in each phase are briefly discussed below.

1. Reforms in the 1980s²

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 them 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.

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 and specific guidelines for asset valuation and loan loss provisions aimed at tightening, standardizing and applying criteria uniformly to all banks, and several measures to curb insider abuse.

2. 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) which formally allowed the operations of foreign banks in the domestic banking system provided that they met 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 which were

² This draws on Lamberte (1993).

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:

- (a) A further increase in the minimum capital requirements (**Table 2**);
- (b) Stricter requirements for granting new bank licenses and setting up new branches;
- (c) Tighter regulations on insider loans and on restructuring of loans;
- (d) Redefinition of non-performing loans to align with the international standards and introduction of general loan loss provisioning requirements; and
- (e) Higher specific provisioning for classified loans and expansion of bank disclosure requirements.

3. Reforms in 2000s

The General Banking Law (GBL) passed in 2000 replaced the 52-year old General Banking Act of the country. 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. These include, among others, the following:

- (a) A strong legal basis for consolidated supervision of banks;

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: *Bangko Sentral ng Pilipinas*

- (b) Adoption of a stricter fit and proper rule for individuals elected or adopted as bank directors or officers and inclusion of at least to independent directors on the board of directors;
- (c) Adoption of a risk-based capital requirement in line with the recommendations of the Basel Committee;
- (d) Expansion of the coverage of the single borrower's limit and stronger safeguards against connected lending;
- (e) More flexibility in examining banks onsite in connection with supervisory matters;
- (f) Defining unsafe and unsound banking practices; and
- (g) Greater transparency and disclosure requirements for banks.

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

B. 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 1981 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, which 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.

Moreover, M&A has been encouraged by the BSP to speed up rehabilitation or prevent possible bank closures especially of the ailing banks in the wake of the East Asian financial crisis. Thus, it has offered incentives that merging/consolidating banks may avail of, such as: Some of these incentives are the following:

- (a) Revaluation of bank premises, improvements and bank equipment;
- (b) Staggered booking of unbooked valuation reserves;
- (c) Temporary relief from full compliance with the prescribed net worth to risk assets ratio;
- (d) Amortization of goodwill up to a maximum of 40 years, if warranted;
- (e) Payment in installments of outstanding penalties on legal reserves and interest on overdrafts with the BSP as of date of merger/consolidation;
- (f) Higher rediscount ceiling with the BSP;
- (g) Restructuring/plan of payment of past due obligations of the proponents with the BSP as of date of merger/consolidation;
- (h) Concurrent officership at a merged/consolidated bank/financial institution and another bank/financial institution.

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

III. Bank Entry and Competition: A Review of Literature

Previous studies had examined banking concentration and efficiency of the 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: (a) 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; (b) serve to stimulate the development of the underlying bank supervisory and legal framework; and (c) 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). Aside from this, the infant-industry argument, which contends that the banking industry is best left in the hands of domestic

residents, is also one of the reasons against liberalization. In addition, Yoshitomi and Shirai (2000) pointed another argument that states 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 they offer interesting results that offer policy implications. Using bank-level accounting data 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) used data envelopment analysis (DEA) to examine indicators of efficiency in the Philippines over the period 1992-1999. The DEA analysis shows that banking efficiency in the production of deposits of the intermediation of loans declined prior to the liberalization of foreign bank entry and 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, the results indicate a positive but modest impact on financial intermediation and dynamic efficiency of commercial banks. Manzano and Neri (2001) found similar results, but they 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: (a) there is an increase in the competitive environment particularly in the wholesale banking side; (b) there is a substantial loss in potential revenues of domestic banks; (c) there is little evidence to support that foreign bank entry has increased the variety of financial services, brought incremental intermediation activities and adoption of new technologies and processes; (d) 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; and (e) re-engineering was undertaken by local banks as a strategy in itself, and not because of the entry of foreign banks.

Although this paper aims to address some of the issues already examined by existing studies, however, it covers more issues and 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.

IV. The Philippine Commercial Banking System

A. Structure and Performance

Table 4, which presents the structure of the banking system from 1990-2003, reveals clearly how rapid commercial banking system has expanded over the years. It consistently keeps a command on the entire banking system both in terms of resources and number of institutions or offices, with their relative shares of 89 percent and 57 percent, respectively. The improvement of 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 4 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 postive 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 Al-Amanah Investment Bank of the Philippines starting January 1997.*

² *Consolidated with commercial banks since February 1996 for DBP and January 1997 for Al-Amanah 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 Al-Amanah Investment Bank of the Philippines starting January 1997.

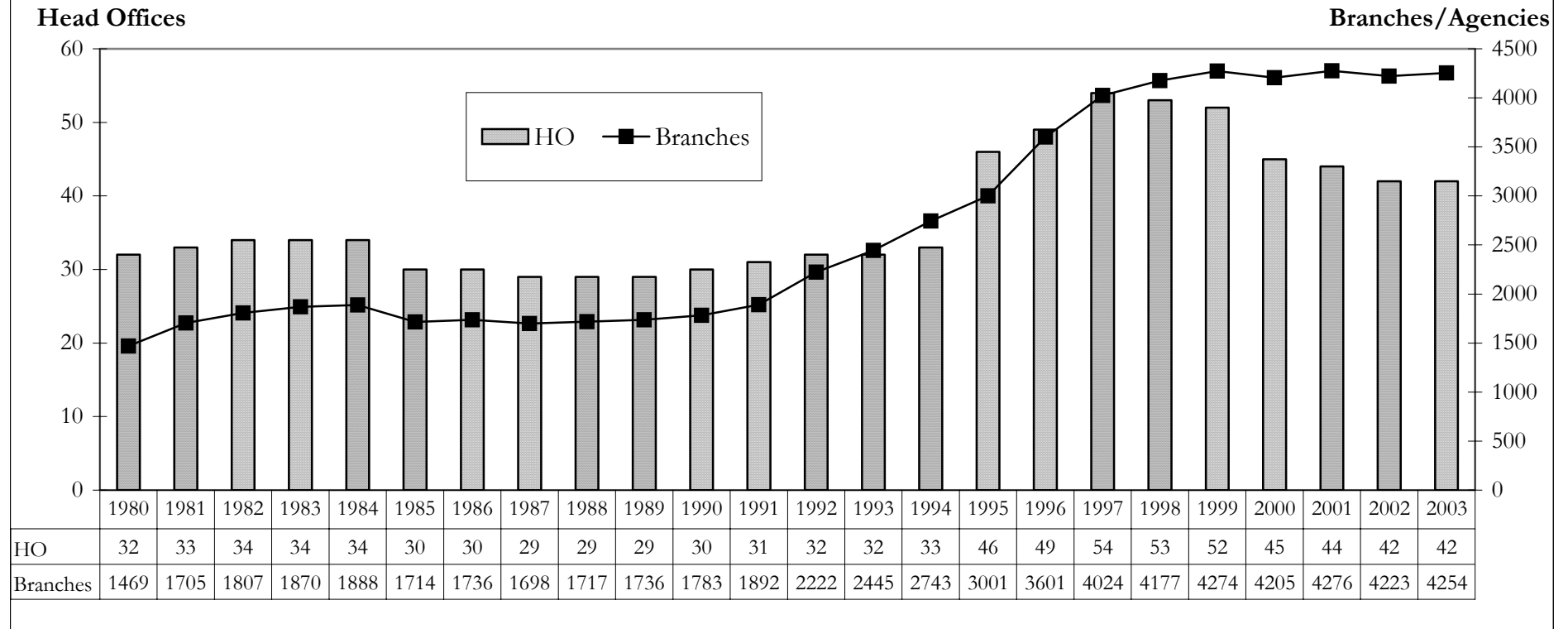
² Consolidated with commercial banks since February 1996 for DBP and January 1997 for Al-Amanah Investment Bank.

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



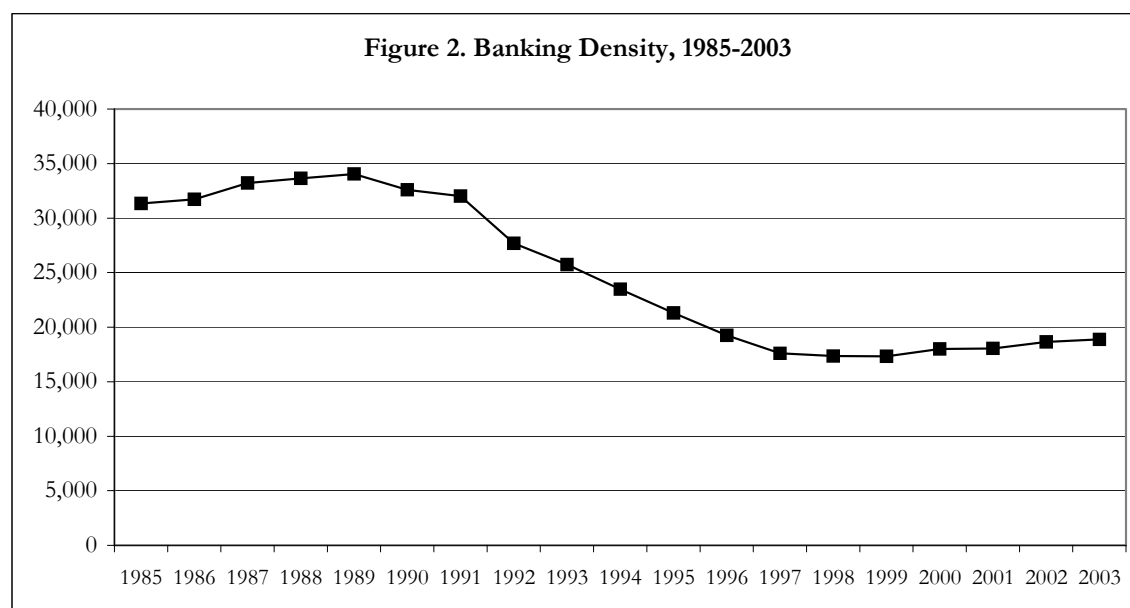
Source of data: Bangko Sentral ng Pilipinas

**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								
<i>Share in domestic banking system (%)</i>	12.50	13.33	13.33	12.90	12.50	12.50	12.12	30.43
<i>Share in total assets (%)</i>			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								
<i>Share in domestic banking system (%)</i>	28.57	33.33	33.96	36.54	40.91	39.53	43.18	45.24
<i>Share in total assets (%)</i>	12.70	17.50	15.60	16.40	15.30	16.00	14.60 ¹	13.5

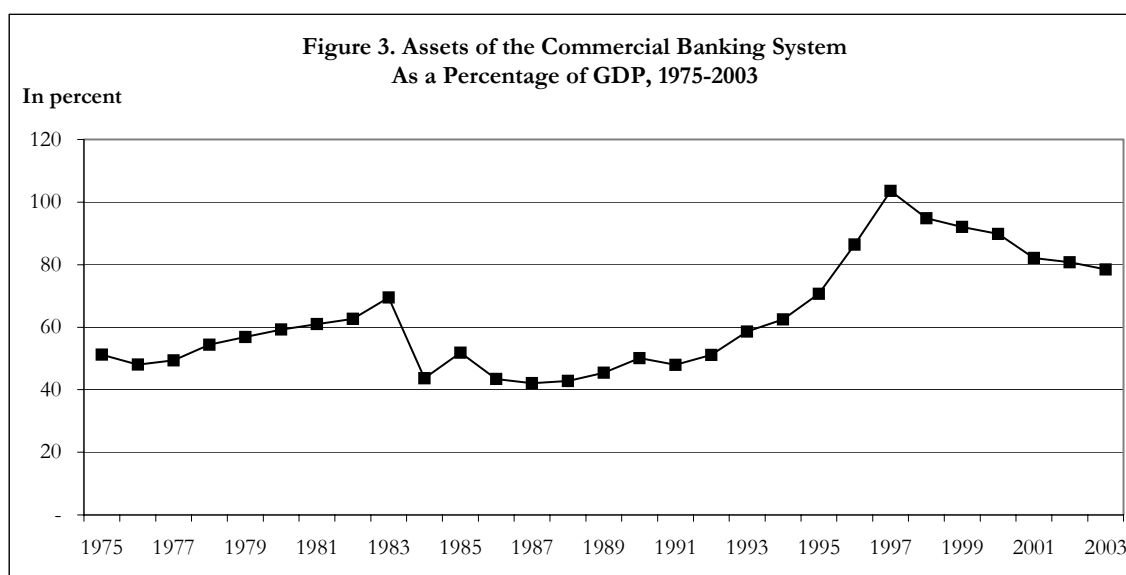
¹ As of September 2002

Source of basic data: Bangko Sentral ng Pilipinas



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

As a percent of GDP, total assets of the commercial banking rose sharply in the first half of the 1990s, surpassing 100 percent in 1997 (**Figure 3**). However, it consistently declined 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 they 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**).

B. 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 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**, there were 221 closed banks 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 period 2000-2003 (40 banks).

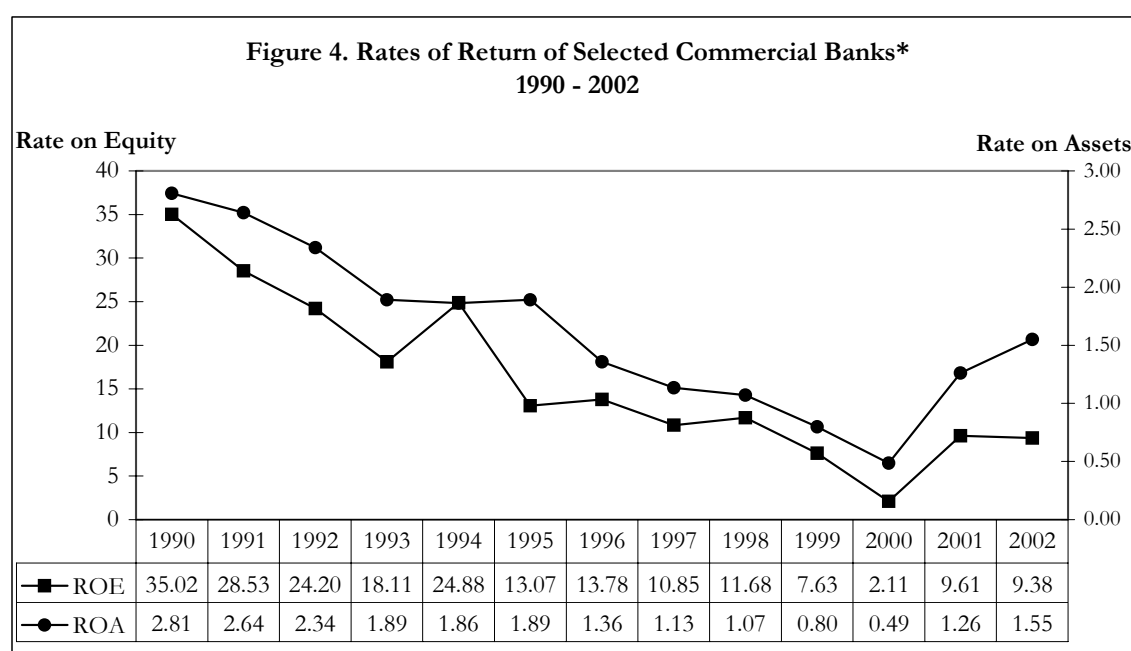
Table 6. Rate of Returns
The Commercial Banking System, 1995-2003
In percent

	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



**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

The current weakness of the commercial banking system can be gauged from their non-performing loans (NPLs). 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

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

**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

**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

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 indicating difference in risk exposures and portfolios between local and foreign banks.

As mentioned, the BSP has encouraged M&A to improve financial strengths of domestic banks and also as a tool to rehabilitate ailing banks. Indeed, several M&As occurred since 1999, and is the main reason for the decline in the number of commercial banks in the system (**Table 9**). Interestingly, M&A did not occur only between large and small banks or between strong and ailing banks but also between large and relatively strong banks. The latter was more in response

to the growing competition in the system and to the need to project themselves in the global market as significant players.

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

V. Empirical Design for Efficiency Estimation

A. 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 them accordingly. It 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, Berger 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 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 stochastic frontier approach (SFA), thick frontier approach (TFA) and 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 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 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, this implies that 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

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

sensitivity analysis using different forms to test for the robustness of the results can be made after using either of the methodologies given.

B. Cost and alternative profit functions

Although this study estimates both the cost and profit efficiencies using the standard cost function and the alternative profit function to gain information about the performance of commercial banks, however, we use 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). This is because 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, we start 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 of 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 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. We 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, $\ln \varepsilon_{a\pi}$.

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

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:

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

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.

C. 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

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

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 $\ln [\pi +$

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.

$1/\pi^{\min}/ + 1]$, where $1/\pi^{\min}/$ 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, $\theta = 1/\pi^{\min}/ + 1$, 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 $-\mu$.

D. 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. The 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. Increased concentration of ownership, as in the case of Philippine banks, and greater financial leverage limit managers' incentives to spend on perks and other wasteful activities. Thus, DEPLIAB will likely be positively correlated with profit efficiency measure. However, 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.

E. 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 Bangko Sentral ng Pilipinas (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 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

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.

statements in some years that lacked details or breakdown 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 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.

VI. 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.

A. Average Efficiency Estimates

The average measured profit efficiency of the 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

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

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 measured profit efficiency and 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 as the correlation coefficient is only -0.43, which is significant only at the 14 percent level.

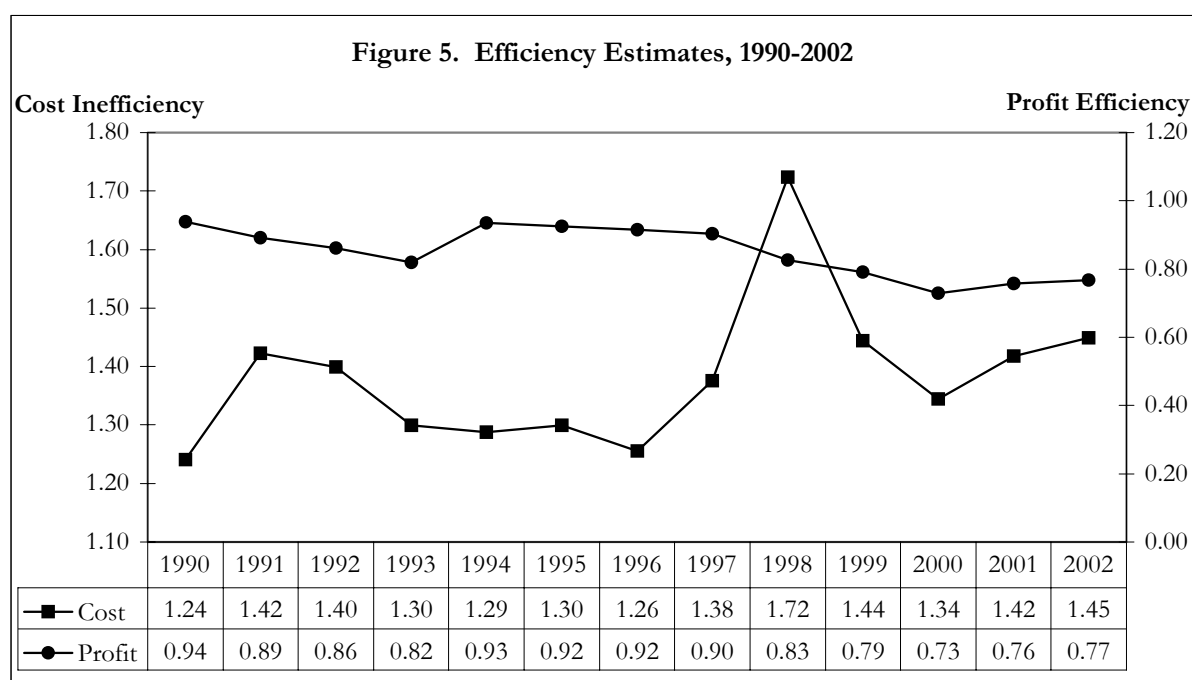
Before proceeding further, it is worthwhile to examine how the measured profit and cost efficiencies are correlated with standard profitability ratios, such as return on assets (ROA) and return on equity (ROE). Results show that measured profit efficiency is positively correlated with ROA ($r=0.65$) 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.

B. Behavior of Efficiency Measures over Time

Figure 5 presents the average measured profit efficiency and cost inefficiency of commercial banks for the period 1990-2002. The average measured profit efficiency declined in the first three years of the 1990s, but it 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

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.

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 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.

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.

C. 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 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.

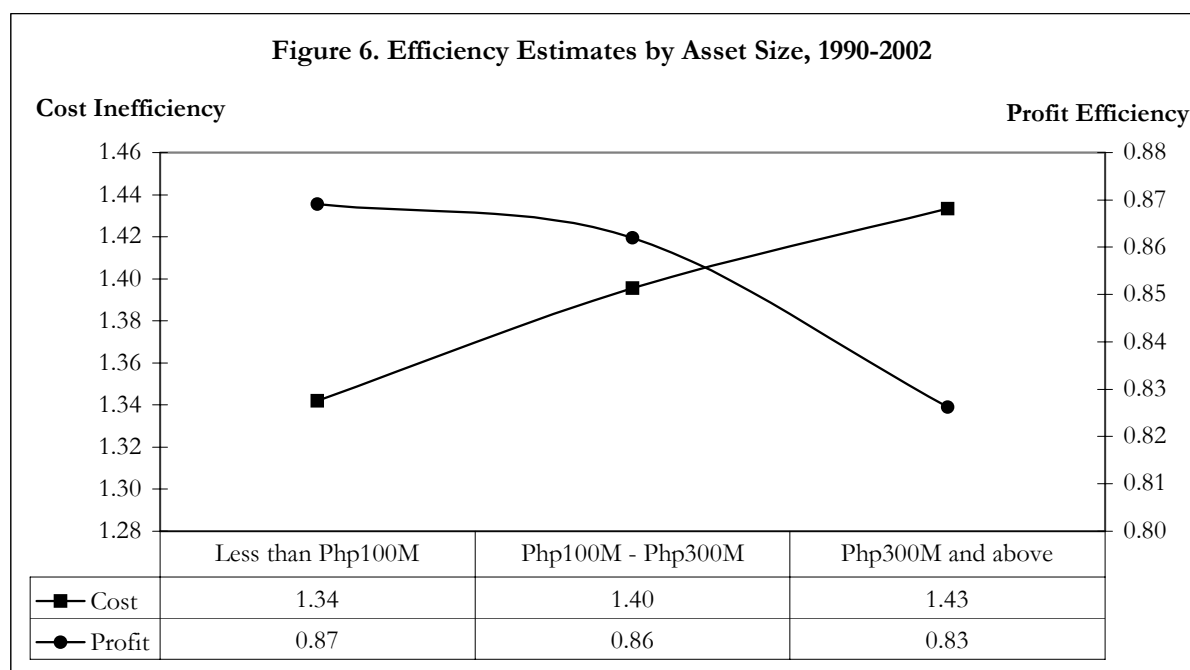
The finding above is not unusual. For instance, Berger (2000) found that profit efficiency consistently declines as asset size increases with the smallest asset size group having the highest efficiency estimate. Also, Ferrier and Lovell (1990) found that small banks are more cost efficient than large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

D. 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-

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.



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

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 as 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 offices and

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.

Figure 7a. Profit Efficiency Estimates, 1990-2002
A Comparison Between Domestic and Foreign Banks

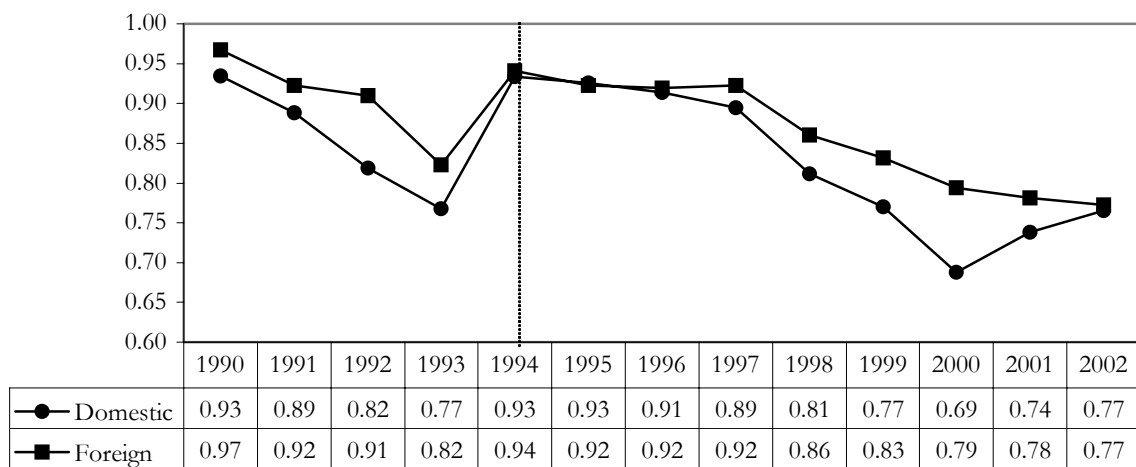
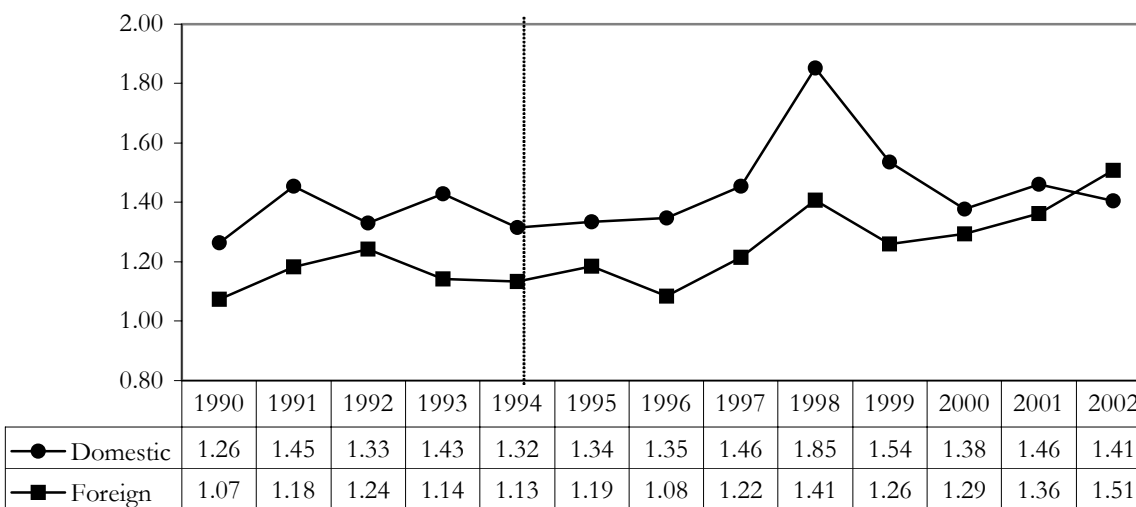


Figure 7b. Cost Inefficiency Estimates, 1990-2002
A Comparison Between Domestic and Foreign Banks



monetary offices that act as their private lenders of last 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.

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.

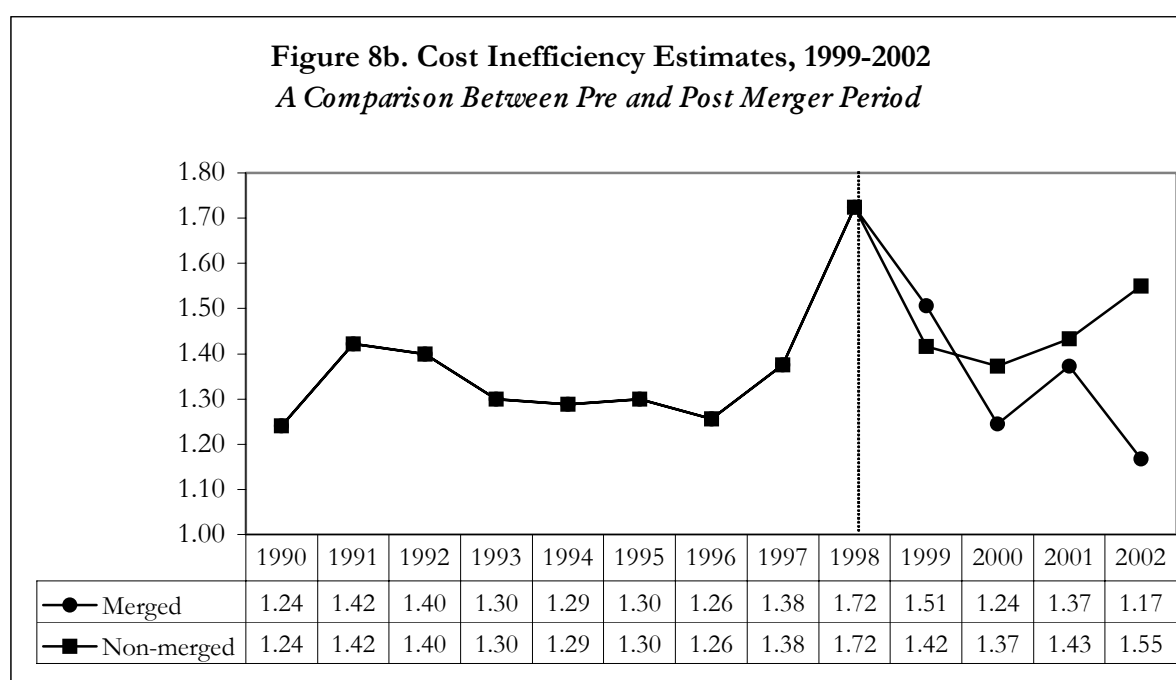
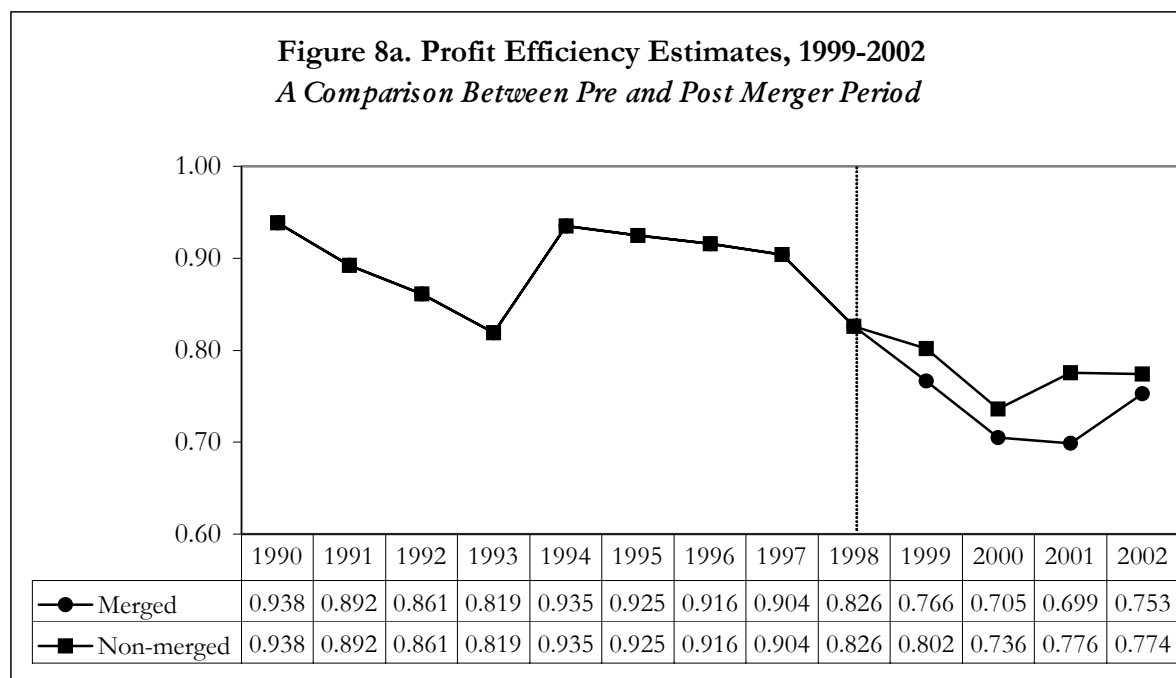
There is one important policy implication that can be drawn from results above which further refine the results discussed earlier. That is, domestic banks can be as efficient as foreign banks during normal times, but less efficient during crisis years. This suggests that the regulatory and supervisory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

E. Efficiency Measures: Merged vs. Non-Merged Banks

We now examine the impact of M&As on measured efficiencies of concerned banks and compare them with non-merged banks. It should be recalled that 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, 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 to 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.

B. Correlates of Efficiency

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

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*

1. 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 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.

2. 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.

3. 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, nevertheless, 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 crisis. 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.

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

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