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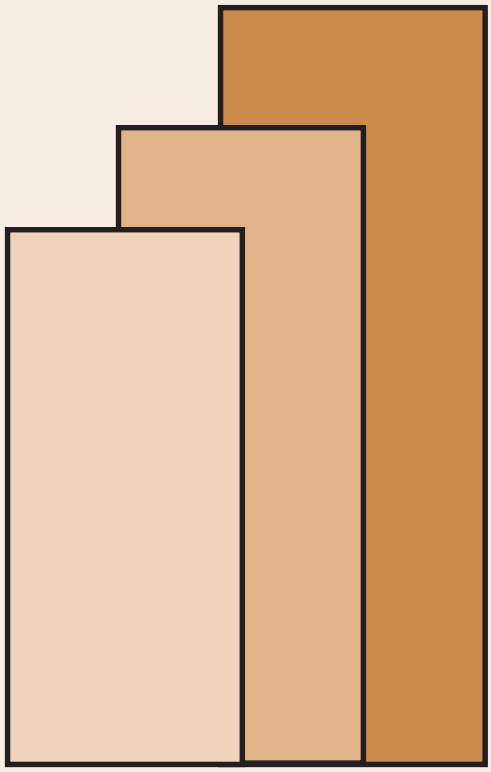

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Gloria O. Pasadilla and Melanie Milo*

Abstract

The paper analyzes the impact of major policy changes on banking structure, performance and competition, using bank-specific data from 1990-2002. We find that the entry of more market players is correlated with drops in interest spread and profits which, partly, bespeaks of possible dissipation of previous monopoly profits of large commercial banks. We also compute the H-stat based on the Panzar-Rosse methodology and find that, in general, despite the characteristic presence of few, large commercial banks, the sector is fairly competitive, specially in the loan-granting business. Moreover, competition has increased in the latter half of 1990s, primarily due to the presence of more small commercial banks, rather than big banks.

Keywords: banking reform, bank liberalization, h-statistics, competition policy, Panzar-Rosse methodology
JEL Code:

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I. Introduction

The 1990s ushered in major changes in the Philippine banking sector. Not only were there landmark legislative laws passed governing the regulations of financial sector and dizzying technological advances, but the industry also changed its "face" through bank consolidations and entry of new participants, specially foreign banks. Developments like what transpired in the 1990s seldom leave an industry unchanged. It is sure to leave its mark on cost efficiency, profitability, and competitive behavior among industry participants. The paper makes some assessments of these changes and their impact on banking structure, performance, and specially, competition.

If past empirical studies were to be the basis for projecting the outcome of the changes in the 1990s, greater competition, improved efficiency, and less market concentration are to be expected from the policies that allowed an increased number of market participants. Empirical studies on banking that deal with the relationship between market concentration, efficiency, and profitability, generally, find a positive relationship between non-competitive behavior and profitability (Berger and Hannan, 1989), and a negative relationship between bank concentration and efficiency, except in rich countries with more developed financial systems (Demirguc-Kunt, Laeven, and Levine, 2003). Other studies that link government regulation with interest margins and efficiency find that tight entry regulation is positively related to high interest margins and overhead expenditures, and negatively related to efficiency (Barth, Caprio, and Levine, 2003). If these results are applied to the Philippines, this can be translated as follows: the monopoly power accorded domestic banks from restricted entry is actually the reason for their high profits, high interest margins, as well as high costs and inefficiency. Therefore, greater market contestability, or freer market entry, should help improve bank efficiency and stability.

On foreign bank entry, studies show that it makes domestic banking systems more efficient and reduce interest margins (Claessens, Demirguc-Kunt and Huizing, 2001). Claessens and Laeven (2003) also find that allowing greater foreign bank entry and fewer activity restrictions improve the competitiveness of the banking sector. The results of these studies demonstrate how foreign bank entry can improve the functioning of national banking markets and improve national welfare, even as it reduces domestic banking profits. The direct implication is that the liberalization in the 1990s in the Philippines should be expected to increase banking competition.

Yet, it is difficult to just directly translate these findings from other countries or from a cross-section of countries because any reform efforts have to interact with local and specific country and sector characteristics. Thus, while these results provide us with an initial hypothesis, we seek to validate them using bank-specific financial data spanning from 1990 up to 2002.

Empirical research on the above issues applied to the Philippines is still fairly limited and most find modest effects on competition, efficiency, and profitability. Montinola and Moreno (2001) attribute the fairly small impact on competition and efficiency to the limited scope of liberalization. Manzano and Neri (2001) find that the entry of foreign banks lessened industry concentration but find no significant effect on profitability of domestic banks which, they argue, are affected more by macroeconomic policies than by entry of foreign competition. Unite and Sullivan (2002), however, find

that foreign bank entry is associated with a reduction in interest spreads and bank profits, but only for those domestic banks that are affiliated to a family group. Moreover, they find that foreign bank entry is also associated with improved operating efficiencies.

The problem about analyzing trends in interest margins and profitability is that, while it points some relationship between concentration and returns, the method draws no sharp benchmark for competitive returns (Shaffer, 1993). How much drop in interest margins, for instance, would qualify as signifying a shift from monopoly power to perfect competition? Thus, this method allows for no certain determination of the exact degree of competition. Moreover, many other factors like macroeconomic variations, tax policies, quality of information and judicial systems, etc., as well as bank-specific characteristics like risk preferences or scale of operations, affect bank profitability and margins, making them inadequate indicators of competitiveness in the banking system (Claessens and Laeven, 2003).

This paper, therefore, ventures on a different methodology measuring the competitiveness in the banking sector, using the structural, contestability approach along the lines pursued in the industrial organization literature. In particular, we attempt to measure the degree of actual competitive conduct using the Panzar-Rosse methodology on bank-level data.

The paper has three major sections. The next section discusses the major policy reforms in the banking sector in the 1990s, and their impact on structure and overall performance. In particular, it discusses trends in various market structure indicators typically used to assess changes in competitive structure, including number of institutions, concentration ratios and profitability ratios. Section III then seeks to measure the competitiveness in the banking sector by applying the Panzar-Rosse method on bank-specific data, and computes the time-varying H-statistics to assess if there had been a change in the degree of competition among the industry players. Finally, some conclusions and policy implications are drawn in Section IV.

II. Changes in Market Structure

There are several major factors that affected the structure of the commercial banking sector in the Philippines in the 1990s. One is the easing of restrictions on domestic bank entry and branching in the early 1990s. This led to the rapid growth of banking offices across all types of banks, commercial, thrift and rural banks (see below).

This was followed by the passing of Republic Act No. 7721 (An Act Liberalizing the Entry and Scope of Operations of Foreign Banks in the Philippines) in 1994. Since the 1948 General Banking Act, no foreign bank had been allowed entry, except for the four already in operation at that time.[1] Even then, these four foreign banks faced strict restriction on branching. Republic Act No.7721 allowed foreign banks to operate in the Philippines through (only) one of the following modes of entry: (i) acquire, purchase or own up to 60 percent of an existing domestic bank; (ii) invest in up to 60 percent of the voting stock of a new banking subsidiary incorporated in the Philippines; or (iii) establish a branch with full banking authority. Mode (iii) had a sunset provision of 5 years and was limited to ten foreign banks that were allowed to open at most six branches each. As a

[1] Citibank, HSBC, Standard Chartered Bank, and Bank of America.

result, twenty two foreign banks applied for mode (iii), and the ten chosen banks were announced in February 1995, raising the number of branches of foreign banks to 14.

Another factor is the consolidation trend that took place in the latter part of the decade, mainly as a response to prospective increased competition from foreign banks, and a result of the BSP encouraging domestic banks to meet higher capital requirements through mergers and acquisitions. To better prepare the local banks for increased foreign competition, the BSP also mandated a schedule of increases in their minimum capital requirements from 1995-2000. Following similar strategy in other Asian countries of limiting the number of banks that the central bank regulates, the BSP also gave various incentives to promote bank consolidation but without imposing it as a "fiat" like Malaysia. Incentives included revaluation of physical assets, staggered booking of valuation reserves, and temporary exemption from certain prudential requirements (e.g., prescribed net worth to risk assets ratio) and restrictions (e.g., on branching, ownership ceilings, concurrent officerships and directorships.

Another major event is the 1997 Asian crisis which again shook up the banking industry, increasing the amount of bad bank assets and forcing the exit or acquisition of a few small banks by foreign banks. The Asian crisis also led the BSP to reimpose a moratorium on the establishment of new banks and branch expansion of existing banks (except microfinance-oriented banks) to temper the rapid expansion of the banking system. The moratorium was formalized under the new General Banking Law (GBL) passed in 2000, although it had a time limit of three years from the enactment of the GBL. On the other hand, the GBL also lifted the 60 percent ownership limit for foreign banks that will enter (or have entered) the market through mode (i) of RA 7721, again subject to a time limit of 7 years. With respect to foreign equity held by individuals or nonbank corporations, the ceiling on total foreign equity participation in a domestic bank was raised from 30 to 40 percent of the voting stock of a domestic bank under the GBL.

Impact on market structure

The easing of restrictions on domestic bank branching resulted in the rapid expansion of the Philippine banking system. From 1990 to 1999, total number of bank branches more than doubled (see Table 1). In particular, double-digit growth rates were recorded in the number of branches of rural banks beginning in 1990, and beginning in 1992 for commercial and thrift banks. This led to an improvement in banking density ratios across all regions, making banking services more accessible. On the other hand, the number of head offices of thrift and rural banks significantly declined due to bank failures and consolidations.

Table 1 **Number of banking institutions, 1980-2003**

	1980	1985	1990	1995	1999	2003
Banking Institutions	3,419	3,632	3,638	5,569	7,689	7,494
Head offices	1,209	1,055	940	938	976	899
Branches/Agencies	2,210	2,577	2,698	4,631	6,713	6,594
A. Commercial Banks	1,501	1,744	1,813	3,047	4,326	4,296
Head offices	32	30	30	46	52	42
Branches/Agencies	1,469	1,714	1,783	3,001	4,274	4,254
B. Specialized gov't banks [a]	92	100	127	251	-	-
Head offices	3	3	3	3	-	-
Branches/Agencies	89	97	124	248	-	-
C. Thrift Banks	671	671	653	925	1,478	1,277 [b]
Head offices	144	118	103	99	118	92
Branches/Agencies	527	553	550	826	1,360	1,184
D. Rural Banks	1,155	1,117	1,045	1,346	1,885	1,921
Head offices	1,030	904	804	790	806	765
Branches/Agencies	125	213	241	556	1,079	1,156

Source of basic data: Bangko Sentral ng Pilipinas. (Fact Book)
Note: [a]Before they were consolidated with commercial banks.

The effects of entry restrictions and subsequent opening up to new domestic and foreign participants are borne out by the rapid rise in the number of head offices of commercial banks[2]. Table 2 shows that while the number of commercial banks was fairly stable during the 1980s as a result of entry restrictions, the number jumped by more than 50 percent just from 1990 to 1995. Over that period, the number of private domestic bank entrants reached 12 (4 of which were other banks upgrading to commercial banks), although this was tempered by a number of exits and mergers and acquisitions. And in 1995 alone, 10 new branches of foreign banks entered the market, which represented full implementation of mode (iii) of RA 7721[3]. Subsequent foreign bank entrants came either through modes (i) or (ii). A total of seven foreign bank subsidiaries were established in the second half of the 1990s – four under mode (ii) and three under mode (i), two of which acquired domestic commercial banks that suffered difficulties as a result of the Asian crisis. Eventually, three foreign bank subsidiaries were acquired by domestic banks while the rest increased their ownership stake from 60 to 100 percent. Overall, foreign bank branches and subsidiaries accounted for only 149 branches in 2003.

[2] Includes both universal (or expanded commercial) and (regular) commercial banks.

[3] Of the ten branches of foreign banks that entered in 1995, two changed ownership due to the merger of their head banks with other banks in their home countries. One changed its mode of entry - the Development Bank of Singapore (DBS) shifted from mode (iii) to mode (i) in 1998 when it acquired one of the commercial banks that suffered difficulties as a result of the Asian crisis. Bank of China was granted a license in 2000 under mode (iii) to replace DBS, and began operations in 2002.

Table 2 **Number of head offices of commercial banks by type of bank, 1980-2003**

Type of bank	1980	1985	1990	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total	32	30	30	48	49	54	53	52	45	43	42	41
Private domestic bank	27	25	25	30	28	33	32	30	23	22	20	20
Universal[a]		8	10	15	17	18	17	16	12	12	12	12
Commercial	27	17	15	15	11	15	15	14	11	10	8	8
Branch of foreign bank	4	4	4	14	14	14	13	13	13	13	14	14
Universal							1	2	2	3	3	3
Commercial	4	4	4	14	14	14	12	11	11	10	11	11
Foreign bank					3	4	5	6	6	5	5	4
Government bank[c]	1	1	1	4	4	3	3	3	3	3	3	3
Domestic entry		(2)[d]	(2)	3 (5)[e]	(1)	5	1					
Domestic exit		3[d]					1		1			
Mergers & acquisitions		4[d]		2[e]	3	1	1	2	6	2	3	1
Foreign entry				10	3	1	1	1			2	
Foreign exit							1			1	1	1

Source of basic data: Bangko Sentral ng Pilipinas; Hutchcroft (1993).
Notes: [a]Universal banking was introduced in 1980; [b]All commercial banks; [c]All universal banks; [d]1980-89; [e]1991-95.

After increasing to 33 in 1997, the number of private domestic banks steadily fell in the years following the outbreak of the Asian financial crisis. This was initially due to the failure of a few small commercial banks, and later because of mergers and acquisitions. As noted earlier, the BSP reimposed a moratorium on the establishment of new banks and the branch expansion of existing banks in 1999 to temper the rapid expansion of the banking system and to promote consolidation. Thus, prospective investors were encouraged to acquire existing banks instead of applying for new operating licenses, while banks wishing to expand were encouraged to do so by taking over smaller banks, leading to a significant decline in the number of private domestic commercial banks from 30 in 1999 to 20 in 2002. Besides acquiring banks, a number of commercial banks chose to acquire thrift banks, including the two biggest foreign banks - Citibank and HSBC.

Table 3 shows the bank mergers and acquisitions that took place from 1998 to 2003. Consolidation took place among both the small and the very big banks. The former conformed to the BSP's strategy of encouraging mergers and acquisitions to enter the market, meet higher capital requirements, or to expand, while the latter seemed to be aimed at protecting market share.

Greater foreign participation in the Philippine banking sector is also reflected in the ownership structure of private domestic banks. Table 4 shows that less than half have remained purely Filipino-owned in 2003. Of those in the top 20 banks, only six remain with 100% Filipino-owned equity. However, only four have foreign equity participation higher than 20 percent. Thus, the 40 percent ceiling on foreign equity participation of individuals and nonbank corporations is still far from becoming a constraint.

Table 3 **Mergers and acquisitions in the commercial banking sector, 1998-2003**

Acquired on:	Acquiring bank	Acquired Bank	Surviving Bank
Sep 1998	Dev't Bank of Singapore [a] (50)	Bank of Southeast Asia (36)	DBS Bank (Philippines) [b](35)
Sep 1999	Equitable Banking Corp (11)	Philippine Comm'l Int'l Bank(5)	Equitable PCI Bank (2)
Nov 1999	United Overseas Bank Phil [b]	Westmont Bank (25)	United Overseas Bank Phil [b](26)
Feb 2000	Prudential Bank (21)	Pilipinas Bank (32)	Prudential Bank (17)
May 2000	Global Bank (40)	Philippine Banking Corp. (29)	Global Bank
Oct 2000	Global Bank	AsianBank Corp. (20)	Global Bank (15)
Apr 2000	Bank of the Philippine Islands(5)	Far East Bank & Trust Co. (7)	Bank of the Philippine Islands(2)
Oct 2000	Metropolitan Bank & Trust Co(1)	Solidbank Corp. (15)	Metropolitan Bank & Trust Co. (1)
Sep 2000	Bank of Commerce (28)	Panasia Banking Corp. (50)	Bank of Commerce (23)
Jul 2001	Banco de Oro (13)	Dao Heng Bank [b] (41)	Banco de Oro (13)
Aug 2001	BPI Family Bank (thrift bank)	DBS Bank Philippines [b] (28)	BPI Family Bank
Dec 2001	Bank of Commerce (23)	Traders Royal Bank (35)	Bank of Commerce (23)
1st qtr 2002	ABN AMRO Bank, Inc. [b]	TA Bank of the Phils., Inc. (42)	ABN AMRO Bank, Inc. [b] (35)
Sep 2002	Metropolitan Bank & Trust Co. (1)	Global Bank (15)	Metropolitan Bank & Trust Co. (1)
Sep 2002	Banco de Oro (13)	First e-Bank (thrift bank)	Banco de Oro (9)
Jul 2003	Banco de Oro (9)	Banco Santander [b] (39)	Banco de Oro (9)

Source: Business World Fourth Quarter Banking Report 2003, February 10, 2004.
Notes: [a]Branch of a foreign bank; [b]Foreign bank subsidiary. Numbers in parenthesis are the banks' ranks in terms of assets prior to the merger/acquisition.

Table 4 **Ownership structure of private domestic banks: percentage share to total subscribed capital, 2003**

	Filipino	Foreign		Filipino	Foreign
Allied Banking Corp.	100	0	MetroBank and Trust Co.	87	13
Asia United Bank	70	30	Phil Bank of Communications	74	26
Banco de Oro	100	0	Philippine National Bank	81	19
Bank of Commerce	84	16	Philippine Trust Co.	99.9	0.1
Bank of the Philippine Islands	70	30	Philippine Veterans Bank	100	0
China Banking Corp.	91	13	Prudential Bank	89	11
East West Bank	100	0	Rizal Comm'l Banking Corp.	87	13
Equitable PCI Bank	93	7	Security Bank Corp.	91	9
Export and Industry Bank	77	23	Union Bank of the Philippines	100	0
International Exchange Bank	100	0	United Coconut Planters Bank	100	0

Source of basic data: Securities and Exchange Commission.

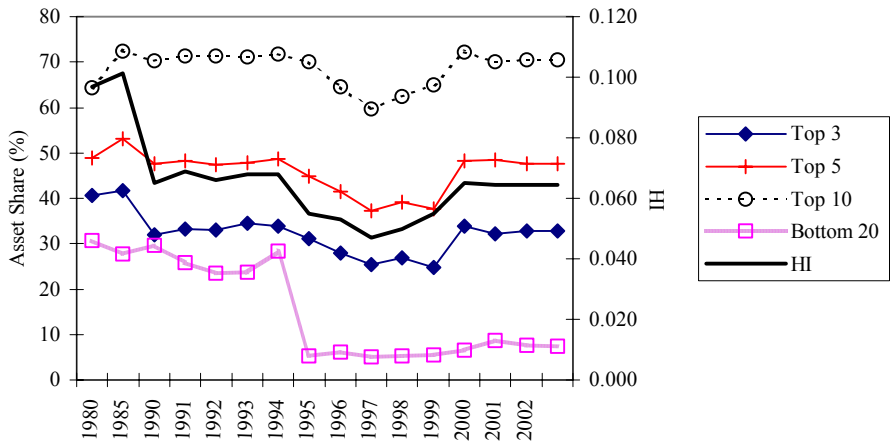
A final note also needs to be said about government banks which, up to the early 1990s, played a dominant role in the Philippine banking sector. The three specialized government banks[4], i.e., banks that were created to finance specific sectors or activities, were upgraded to commercial banks in the mid-1990s. On the other hand, privatization of the Philippine National Bank, which the government established in 1916, began in 1989 with its listing in the stock exchange and public offering of 30 percent of its outstanding

[4] These included: the Development Bank of the Philippines created in the late 1950s to provide medium- and long-term credit for agricultural and industrial development, and to promote the establishment of development banks; the Land Bank of the Philippines created in the early 1960s to finance the government's land reform program; and the Philippine Amanah Bank created in the early 1970s to serve the special banking needs and assist in the reconstruction of the southern Muslim provinces.

stocks. It passed into majority private ownership in 1996, with the government's stake reduced to 46 percent.

The change in market structure and concentration since 1980 is summarized in Figure 1. Although the actual value of the Herfindahl index (HI)[5] may not be indicative of undue concentration given its very low values, the trend shows declining concentration in the first half of 1990s and eventual rise in the latter half, reflecting the initial liberalization of bank entry and subsequent moves towards consolidation.[6] The HI was fairly stable from 1990-94. It began to decline beginning in 1995 with the entry of the new foreign banks, indicating that the system was becoming less concentrated. However, this trend was reversed beginning in the late 1990s, which means that the mergers and acquisitions especially among the very big banks also resulted in increasing concentration. The index then reverted back to the same level as in the early 1990s. Similar trends are also evident when one looks at the asset share of the top three, five and ten commercial banks. The wide gap between the biggest banks and the twenty smallest banks before 1995 is striking. The gap even widens after 1995, and this is true even if the new foreign entrants (which are all in the bottom 20) are excluded.

Figure 1 **Measures of commercial bank asset concentration, 1980-2003**



Source of basic data: Published balance sheet statements of commercial banks.

The reciprocal of the Herfindahl index gives the number of equally-sized banks that would generate a degree of concentration equivalent to the actual concentration. In 1982, this was around 7 banks. It increased to around 15 banks in 1990 and 21 banks in 1997, then fell again to around 16. This means that the distribution of resources among the 41 commercial banks existing at the end of 2003 was equivalent in concentration terms to an industry of 16 equally-sized banks. Again, this indicates the presence of many small banks.

[5] The Herfindahl index, which is a commonly used measure of industrial concentration, is calculated by squaring and summing the share of industry size accounted for by every firm in the industry, with a maximum value of 1 (or 10,000 where the market share is measured in percentage terms) indicating a monopoly. While it is a good measure of a monopolistic structure, it does not adequately capture the existence of an oligopolistic structure because of the relatively greater weight it gives to very large firms.

[6] The sharp drop from 1985 to 1990 was due to the rehabilitation of PNB, which halved its asset share from around 27 percent to less than 14 percent. But it still remained the largest bank until 1995, and was either the second or the third largest bank until 2000 when it was ranked as the sixth largest bank.

Overall, the Philippine banking system continues to be characterized by the presence of a few very large expanded commercial or universal banks and a lot of very small banks.[7] In 2003, the top 5 banks accounted for almost 50 percent of total commercial bank assets; the top 10 accounted for around 70 percent, with the next 10 accounting for around 20 percent; and the bottom half accounted for just 10 percent, which consisted mostly of the new foreign bank branches and subsidiaries. Although such asset distribution is similar to the 1980s, the underlying structures are very different. In should be noted that in the 1980s, the structure was largely a result of government regulation with the government dominating the sector, whereas the current structure is a market-outcome and largely private-sector owned. Universal banks also play a major role in the capital markets whether as issuers, underwriters, investors, or guarantors. Again, this reflects their dominance of the financial markets, as well as the high reputation and informational advantages that they enjoy. The sustained dominance of a few and large universal banks raises the issue of market power which the paper tackles in the next section.

Effect on performance

With liberalization shaping a new banking sector landscape in the 1990s, how was banking performance affected? Tan (1989) had previously argued that the ultimate effect of the policy of restricted entry into the banking sector had been to shield both the big and small banks from competition, which allowed the big banks to earn abnormal profits and the small banks to operate at high costs. Table 5 shows that, in the early part of the decade, after tax profit of the entire banking sector is more than 2% which, compared to other Asian countries, are somewhat higher. For instance, Indonesia's profitability is 0.9% over total assets, while Thailand's is 1.1% [8] (Demirguc-Kunt and Huizinga, 1997).

Table 5. Performance of Philiippine Banks
(Percent of Total Assets)

	1992-1994	1995-1999	2000-2001
Net Interest Income	3.862	4.863	3.234
Non Interest Income	0.380	0.303	0.227
Bad debt expenses	0.453	2.308	2.130
Tax	0.380	0.303	0.227
Profit After Tax	2.031	1.231	0.860

Source of Basic Data: Securities and Exchange Commission

An examination of cost ratios in early 1990s does not, however, show that the higher profitability was due to greater banking efficiency in the Philippines. Average overhead cost as a ratio of total assets in 1988-95 was around 4.4 percent, compared to 2.9 percent and 2.0 percent for Indonesia and Thailand, respectively. The relatively high profit ratios in the Philippines have declined to 1.2% in 1995-1999 and further dropped to 0.8% in 2000-2001. Yet, while the drop may be attributed to increased competition

[7] In 2003, of the 18 universal banks, 12 were private domestic banks, 3 government banks and 3 branches of foreign banks. The 23 regular commercial banks consisted of 8 private domestic banks, 11 branches of foreign banks and 4 subsidiaries of foreign banks.
[8] Average from 1988-1995.

amongst banks, the profound effect of the crisis condition during the period cannot be discounted.

One of the structural weaknesses identified in the Philippine banking sector in the past was the large spread between commercial bank deposit and lending rates which, in turn, was attributed not only to high profit margins but also to high intermediation costs in the form of taxes and reserve requirements (World Bank 1986). The entry of more foreign banks has, so far, led to some significant impact on bank spreads. Table 6 shows that commercial banks' average spread based on short-term time deposits, both prior to and after the restriction on foreign bank entry in 1995, declined only slightly even in the years prior to the Asian crisis. Bank spread over savings deposits have been cut by almost half. Figure 2 shows the effective spread on loans by type of bank from 1995 to 2003. It also shows a declining trend for all commercial banks, and even more so for universal banks.

Table 6. Bank Average Lending Rates, Savings and Short-term Deposit Rates and Bank Interest Spread

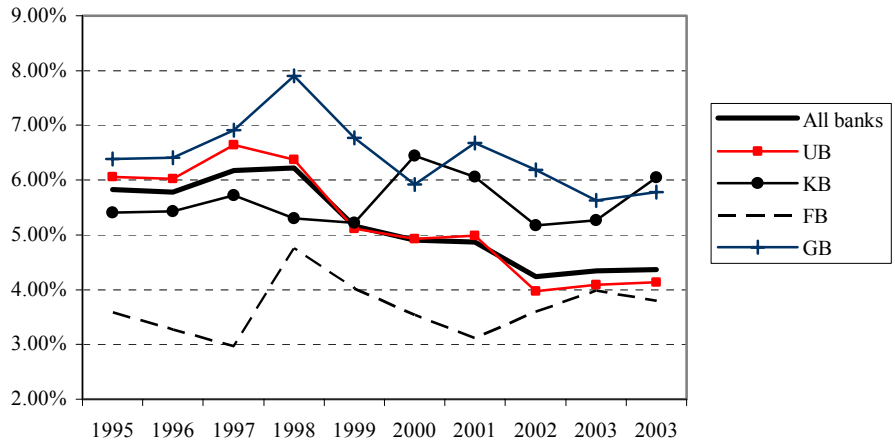
YEAR	Bank Average Lending Rate[2] (1)	Savings[1] (2)	Short-Term Time Deposits (3)	Bank Spread (1-2)	(1-3)
1990-94	19.36	9.73	14.67	9.63	4.69
1995-97	15.25	8.37	10.53	6.88	4.72
1998-99	15.07	9.14	10.92	5.93	4.16
2000-03	10.41	5.82	6.94	4.59	3.47

[1] Refer to the annual percentage equivalent of the 10 sample commercial banks' actual monthly interest expenses on peso-savings deposits to the total outstanding levels of these deposits

[2] Starting December 1992, monthly rates reflect the annual percentage equivalent of sample commercial banks' actual monthly interest income on their peso-denominated loans to the total outstanding levels of their peso-denominated loans, bills discounted, mortgage contract receivables and restructured loans.

Source: BSP SPEI, BSP Statistics online.

Figure 2 **Effective spread on loans (yield on loans – deposit cost)[a] by type of bank, 1995-2003**



Source of basic data: PDIC.
Note: [a] Yield on loans = Interest income from loans/Average current loans
Deposit cost = Interest expense on deposits/Average current deposits

The drop in interest spread can be telling of many developments. One is greater operational efficiency, since cost efficient banks need relatively lower interest spread than inefficient ones. It can also tell of greater confidence in the economic environment because a more stable macroeconomic environment will lead to a lower risk premium over lending, thus leading to a lower spread (Ersel and Kandil 2000). Finally, it can also speak about possible dissipation of monopoly profits of large commercial banks.

III. Measuring competitiveness

The previous section has highlighted the policy change towards liberalized entry of new banking participants and an industry trend towards some consolidation of both small and big banks. Predictably, as shown by the herfindahl and other concentration indexes, the entry of new banks caused a slight decrease in concentration after 1994, while bank consolidation resulted in a slightly more concentrated market in the latter part of 1990s. Still, the herfindahl index show little cause for alarm over undue concentration.[9]

We also indicated certain trends that appear to support increased competition in the banking sector, evidenced in the decline in profits margin and average bank interest spread. However, analyzing trends in interest margins and profitability is not adequate because, while it points some relationship between concentration and returns, the method draws no sharp benchmark for competitive returns and, thus, the exact degree of competition remains in doubt (Shaffer, 1993). Moreover, profitability and bank margins are affected by a number of other factors, such as the macro-performance and stability, degree of taxation and intermediation, quality of country's information and judicial systems, as well as bank specific factors like scale of operations and risk preferences making them inadequate indicators of competitiveness in the banking system (Claessens and Laeven, 2003). This section now, therefore, ventures on measuring the competitiveness in the banking sector using the structural, contestability approach along the lines pursued in the industrial organization literature.

In a structure-conduct-performance paradigm, the decrease and subsequent rise in market concentration should result in a corresponding change in the degree of competition. However, the SCP paradigm does not always have to hold because alternative conditions do exist that can undermine the market structure and competition link. One such condition is market contestability. The threat of entry present in contestable markets can enforce competitive conduct without regard to the number of firms or market concentration. On the other hand, collusive actions can be sustained even when there are many firms.

Many banking studies have, indeed, found results of competitive banking behavior even where the industry is purportedly concentrated, and unexpected monopoly behavior for certain segments of banks with presumed weak market power. For instance, Shaffer (1989, 1993) found results consistent with perfect competition in the US and Canadian market, respectively, despite being relatively concentrated. Nathan and Neave (1989), using a different methodology, corroborates Shaffer's finding on the Canadian market and

[9] The nearer the index approaches the value of 1, the more concentrated the industry is. The HHI for the Philippines, based on asset share, is below 0.10 in 2002 which attests to the existence of many small banks.

rejects bank monopoly power. On the other hand, small banks in some EU countries actually exhibit monopoly behavior, while big banks show greater competition (Bikker and Haaf, 2001; De Bandt and Davis, 2000). Angelini and Cetorelli (1999), found that merged Italian banks with presumed market power do not exhibit different competitive behavior from non-merged banks.

Direct tests of correlation between market concentration and competitive outcomes have, thus far, yielded no definitive relationship. Using cross-section data for 23 mainly developed countries, Bikker and Haaf (2001), tested market structure impact on competition and found support for the conventional view that concentration impairs competitiveness. Claessens and Laeven (2003), using a sample of 50 countries, however, found that the degree of competition is not necessarily related to market structure. They conclude that, more than structure, contestability, and, therefore, market openness, is what is more important for competition.

Structural Approach

In many country studies of competitiveness, two types of empirical tests of competition are typically applied. One is based on the models of Bresnahan (1982) and Lau (1982) which typically yields an estimatable parameter providing a measure of the degree of imperfect competition. Its empirical advantage is that it can use aggregate industry data or firm-specific data (Claessen and Laeven, 2003).

The other empirical approach, which we use in this paper, is based on Rosse and Panzar (1977), Panzar and Rosse (1982, 1987). The underlying idea is that market power is measured by the extent to which changes in factor prices are reflected in revenues. Under monopoly, an increase in input prices will increase marginal cost[10], reduce output, and consequently reduce total revenue or leave it unchanged[11]. If the implementation strategy is to compute an index (H-statistic) as the sum of the elasticities of revenue to unit factor cost in a reduced form revenue equation, the corresponding H value under monopoly condition, therefore, is negative or zero.

Under perfect competition, and when banks are in their long-run equilibrium, a proportional increase in factor prices induces equiproportional changes in gross revenues, output volume does not change and price rises to the same extent as the input price.[12] The corresponding H-stat value, therefore, should be equal to 1 if firms are competitive.

While monopolistically competitive firms, similar to a monopoly firm, face immediate output reduction from input price increase, the resulting losses and exit by some firms shift the demand curve of the representative firm upwards until equilibrium (tangency of average cost curve with demand curve) is re-established. Thus total revenue

[10] In fact, a 1% change in all factor prices will result to a 1% upward shift in <u>all</u> of the firm's cost curves: average, total, marginal.
[11] See Theorem 1 in Panzar and Rosse (1987).
[12] A 1% rise in factor prices shifts the cost curves upward by 1%, leaving the minimum point unchanged. Since, in long run equilibrium, competitive firms always operate at said minimum, the equilibrium output is unchanged. But the equilibrium price is always equal to minimum of average cost which has increased by 1%. Thus, equilibrium revenues also go up by 1%, the amount of the increase in factor prices (Panzar and Rosse, 1987).

may decrease or increase less than proportionally to unit change in all factor inputs. The implication for H-stat is that the sum of the elasticities of the firm's reduced form revenues with respect to factor prices is less than or equal to unity (H≤1). The empirical implementation to test for monopolistic competition is if the hypothesis of non-positive H-stat and H-stat equals 1 are rejected but H-stat less than or equal to 1 is not rejected.

In sum, less than or equal to zero values of H-stat means collusive (joint monopoly) competition, positive values less than 1 mean imperfect competition, and 1 means perfect competition. Furthermore, assuming constant elasticity of demand and Cobb-Douglas technology, the H-stat value can be directly interpreted as an inverse measure of the degree of monopoly power, with higher values (closer to 1) implying greater competition.[13]

Model

Following other studies that use the Panzar-Rosse structural approach of measuring competition, we estimate a reduced form regression of revenue,

$$\ln R_{it} = \sum^{3}_{j-1} \alpha_j \ln w^j_{it} + \beta_k \ln S_{it} + \gamma_n X_{it} + \varepsilon_{it}$$

where R_{it} is either total bank income or income from loans; w_{it} are different factor prices namely, funding cost, wage cost, and other costs. Funding cost is defined as interest and financial cost over bank liabilities; wage cost equals compensation over sum of deposits and loans; and other cost, which proxies for capital expenses, equals occupancy costs over bank premises, equipment, furnitures and fixtures.

$\boldsymbol{S_{it}}$ represents vector of scale variables measuring the bank capacity level. We chose log of equity and log of fixed asset. Finally, $\boldsymbol{X_{it}}$ is a vector of exogenous variables and bank-specific variables that affect cost and revenue schedules. In the regression, we used loan-to-asset ratio and deposits over total liabilities.[14]

There are a few things that are worth highlighting in this specification. One is the choice of revenue variable instead of revenue over assets ratio done, for instance, by Claessen and Laeven (2003) and Bikker and Haaf (2001). Following De Bandt and Davis (2000), Nathan and Neave (1989), Molyneux (1994) and several others, we chose the revenue variable because it is what the P-R method advocates, while the ratio of revenue to total balance sheet ends up being more like a price variable rather than revenue. Under the P-R methodology, the change in revenue can be a combination of both price and output changes, except in the case of perfect competition where output price changes proportionally with input price alone. We deem it, therefore, more appropriate to use actual revenue variables rather than revenue ratio.[15]

[13] Panzar and Rosse(1987) also discuss the case of conjectural variation oligopoly. The important implication in this discussion is the possibility that the industry's aggregate output falls in the elastic portion of the market demand curve, and consequently, the possibility of having H-stat greater than 1.
[14] The regression set up has been largely patterned after De Bandt and Davis (2000).
[15] We also tried revenue ratio as dependent variable only for robustness check. The result does not materially change the conclusions using revenue.

Second, trying two different dependent variables, total revenue and loan revenue, underscores the growth in importance of other fee-based revenue generating activities of banks. In this case, bank output is not limited to loans and investments but also to other services. Third, we tried different regression equation specifications namely, with and without fixed effects, with fixed effects and time dummies, as well as between estimator for some specification where the length of data allows it.[16]

Finally, to determine change in competition over time, we estimate a time-varying H-stat. Following De Bandt and Davis (2000), we estimate a constrained version of the above equation by assuming that the H index follows a quadratic time trend, that is, $H_t = H_0 + \downarrow t + °t^2$, t = 1, .., T-1.[17] Bikker and Haaf (2001) also estimate a time varying H-stat using a logistic trend which implies that the trend is either always increasing or decreasing. In contrast, the quadtratic trend allows flexibility for short term reversion to less or more competitive conditions.

Data and Results

Full Sample Regression

We estimated the regression on two different samples of specific bank financial information - an unbalanced panel comprising of 44 banks from 1990-2002 and a balanced panel with 25 banks from 1995-1999. The unbalanced panel has 354 observations while the balanced panel has 120.

Results from both samples show H-stat values that are significantly different from zero, implying that Philippine banks show no monopoly behavior (see Table 7). Rather, the results support a generally competitive environment.[18] Even where the H-stat rejects the hypothesis that H=1 (e.g. rows 6 and 10) and thereby show monopolistic competition, the actual values themselves are quite high and close to 1. The other results show H-stat values that are greater than 1 but the hypothesis that H=1 cannot be rejected.

Moreover, the H-stat result from regressions using loan income show higher values of H than those equations where the dependent variable is total income. This implies that competition is more stiff in the loan-granting business than in fee-generating activities.

[16] The latter is not reported here but is available from the authors upon request.

[17] De Bandt and Davis (2000) implement the quadratic trend constraint by imposing that all factor costs follow the same trend (i.e., $\rightarrow_{it} - \rightarrow_{i0} = \rightarrow_{jt} - \rightarrow_{j0}$, i, j =1,3)

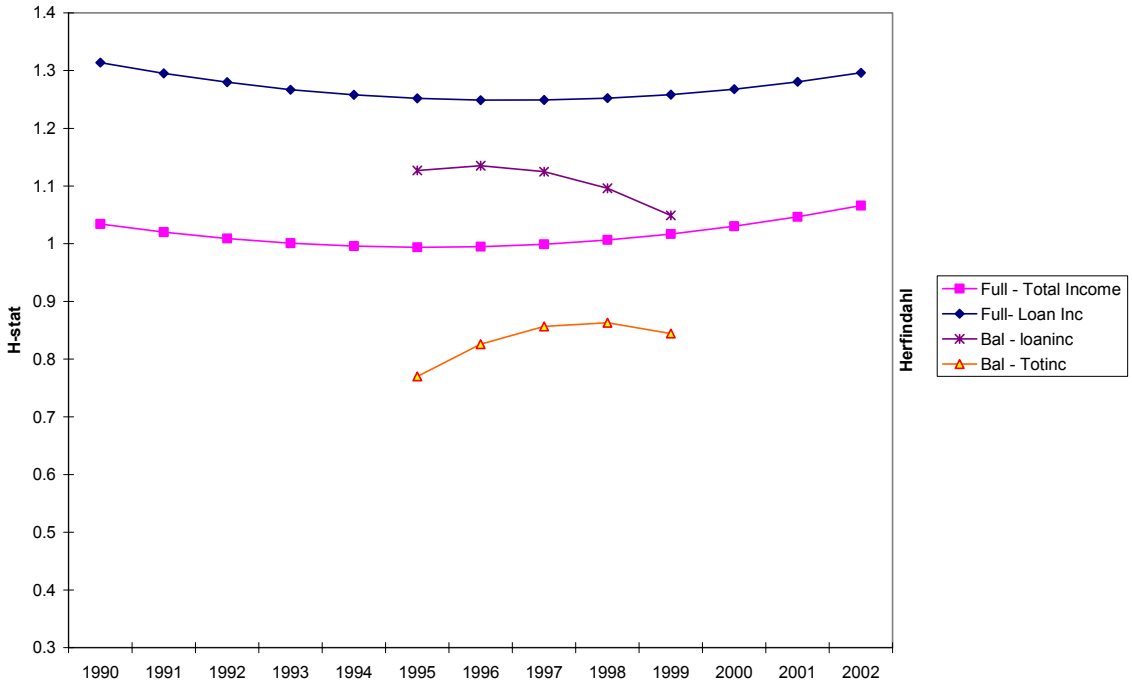
[18] A caveat in this interpretation, however, is the fact that, for the unbalanced panel, regression of log of return on assets (ROA) on the same right hand variables gave results which reject the null hypothesis of long run equilibrium for the simple full period regression and regression with fixed and time dummies. In the regression using fixed effects, we were unable to reject the hypothesis of long run equilibrium.

Table 7. H-Statistics for Philippine Banking Sector
(standard errors in parentheses, full sample regression)

Dependent Variables	Balanced Panel		Unbalanced Panel	
1.a. Number of Observations	120		354	
1. Full Period OLS				
1.b. Total Income	0.972	C	1.050	C
	(0.070)		(0.039)	
1.c. Loan Income	1.060	C	1.084	C
	(0.080)		(0.065)	
2. With Fixed Effects				
2.b. Total Income	0.822	MC	0.910	C
	(0.070)		(0.049)	
2.c. Loan Income	1.080	C	1.100	C
	(0.090)		(0.073)	
3. With Both Fixed Effects and Time Dummies				
3.b. Total Income	0.850	MC	0.949	C
	(0.060)		(0.055)	
3.c. Loan Income	1.100	C	1.159	C
	(0.130)		(0.087)	

Estimates of time-varying H-stat show an interesting result. Figure 3 shows that for the unbalanced panel, competition has decreased first in the first half of the 1990s and then increased towards the latter half. However, a simple test of means show that only the second half directional change is statistically significant, while the first half is not. Competition trend in the latter half of 1990s appears to be supportive of the structure-conduct-paradigm in that the greater number of banks during the period led to increased competition. Data in Table 2 in section II above shows that a total of 24 new banks entered from 1995-1997, thereby boosting local competition significantly.

Figure 3. Time Varying H-Statistic



Interestingly, the 1995-1999 balanced sample yields a slightly different direction of change in banking competition, showing declining, instead of rising, competition. Could this decline be the result of mergers and acquisitions? Examination of data of entry and exits, however, shows that the major commercial bank mergers, about 7 bank mergers, took place in 2000, which is outside the balanced sample data. An alternative explanation is that, since the balanced panel sample is comprised of a reduced number of banks, it is possible that among a reduced set of commercial banks, competition have declined.

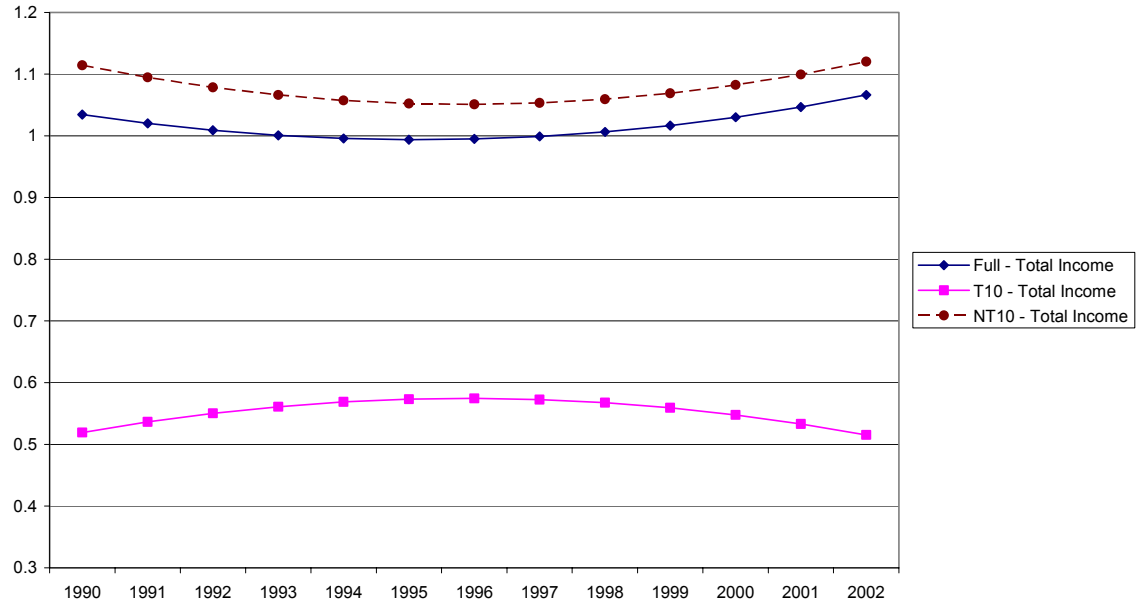
This explanation leads us to examine H-stat values from specific sub-samples of banks.

Big vs. Small Banks

Figure 4 shows that the H-stat values of the top 10 banks[19], ranked according to asset share, indeed declined in the second half of 1990s, while the rest of the banks show increasing competition. Moreover, a simple test of means reveals that the increase and subsequent decline in competition among the top banks are statistically significant, while for banks not belonging to the top 10, only the trend in the second half of the 1990s is significant. This result confirms our initial conjecture that within the entire banking sector, certain groups are more competitive than others, which explains the seemingly opposing result from the balanced and unbalanced panel. In this case, it is the smaller banks that show greater competition than larger banks. The combined sample shows the greater influence of the smaller banks on banking competition.

[19] These are: Metrobank, Equitable, PNB, BPI, Citibank, RCBC, UCPB, Allied, China Banking Corp., Security Bank.

Figure 4.
Time Varying H-statistic
(Top 10 vs. Non Top 10)



The decrease in competition among big banks may be attributed to the consolidation among some of them in the latter part of the decade. Significantly, from 1995-1997, the period when many new banks rushed into the banking business, the H-stat remain relatively constant, and only started to decline in 1998. Thus, the decline in competition may have also been affected by the Asian crisis, with the big banks becoming less keen on stiff competition.

Besides the declining trend in competitive behavior among the top banks, the values of the H-stat, likewise, show that they behave as monopolistic competitors, while the smaller ones act in perfect competition. This finding is markedly different from the findings of other studies (e.g. De Bandt and Davis, 2000; Bikker and Haaf, 2001) which found smaller banks exhibiting monopoly behavior while bigger banks acting more competitively.[20] If we use loan income as dependent variable, however, the big banks continue to act as perfect competitors, again implying that big banks enjoy some measure of monopoly in fee-generating banking activities. In loan-making business, however, big banks have to compete not only among other big banks but also with smaller banking institutions.

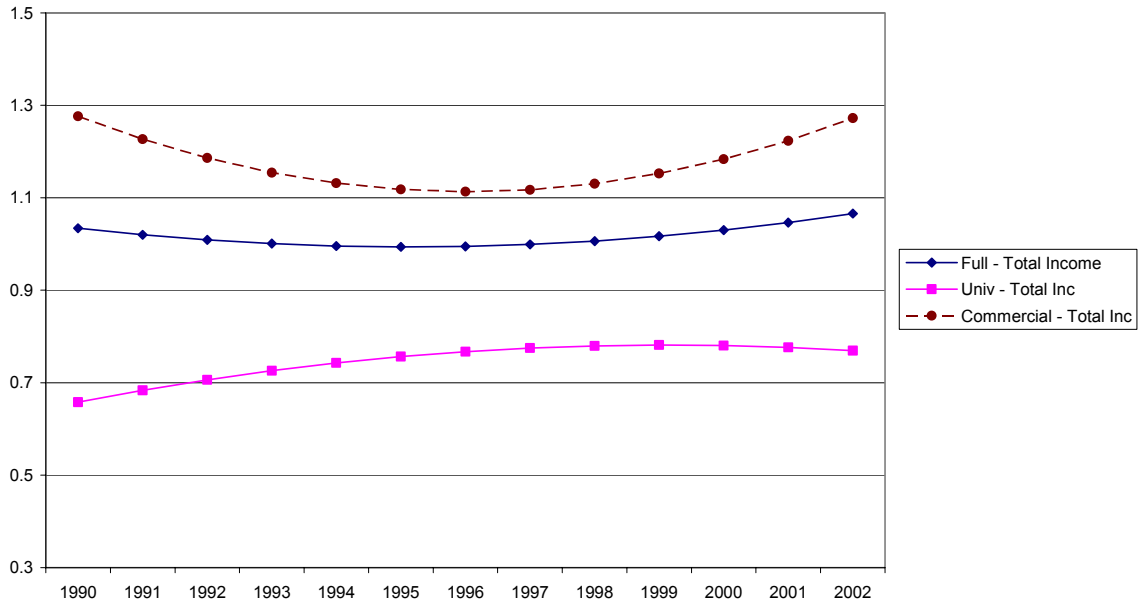
Universal vs. Ordinary Commercial Banks

Not surprisingly, the graph showing H-stat values for universal[21] and ordinary commercial banks closely resemble that for the top 10 and non-top 10 banks. Universal banks are monopolistic competitors while ordinary commercial banks are perfect competitors. Using loan income as dependent variable, universal banks are, likewise, perfect competitors.

[20] This is a result of the control of small banks over specific geographic banking area.
[21] This consists of 20 banks in our sample.

The only difference in Figure 5 is that the rise in competition among universal banks is more pronounced, particularly in the first half of the decade, before relatively exhibiting mild decline in the latter part. Among commercial banks, the swings of declining and rising competition are even more pronounced than in earlier graphs.

Figure 5.
Time Varying H-statistic
(Universal vs. Commercial Banks)

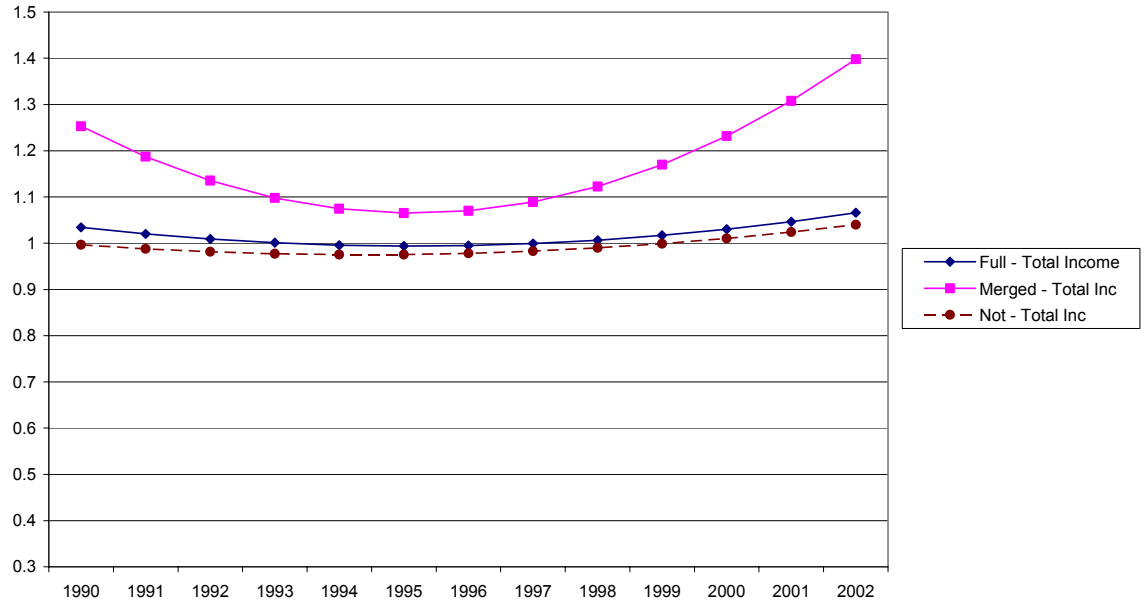


Merged and Not Merged Banks

Based on Table 3, we use data of six banks which survived the merger process from 1998 – 2002 to compute the varying H-stat for merged banks.[22] In theory, because of its size, the behavior of merged banks is expected to be closer to that of a monopolist. Hence, we expect the H-stat to go down, as in previous graphs. Our estimates, however, show increasing competition in the behavior of merged banks. It is possible that this result is influenced by the presence of the three smaller banks, Banco de Oro, Prudential, and Bank of Commerce in the sample which, as we have earlier found, tend to be more competitive than big banks. The sample, however, has the smallest number of observations with only 69 data points, rendering the H-stat estimates less reliable than in other regressions.

[22] These banks are BPI, Metrobank, Equitable, Prudential, Banco de Oro, and Bank of Commerce. We dropped ABN AMRO for lack of data.

Figure 6.
Time Varying H-statistic
(Merged vs. Not Merged Banks)



IV. Summary and Conclusions

The paper analyzes the impact of the various policy reforms that took place in the 1990s on bank competitiveness. In particular, we look at how the lifting of domestic and foreign bank entry and branching restrictions, as well as the consolidation trend that followed affected banking market structure, performance, and competition.

We find that, while the number of banks and branches has increased, the Philippine banking system continues to be characterized by the presence of a few very large expanded commercial or universal banks and a lot of very small banks in the fringe. Yet, although the asset distribution is similar to the 1980s, the underlying structure is very different in that, in the 1980s, the sector was largely dominated by the government, whereas the current structure is a market-outcome and largely private-sector owned. Moreover, the herfindahl index does not point to any undue banking concentration.

The ensuing entry of more market players are correlated with drop in interest spread and profit, and can be telling of many developments. One is greater operational efficiency, since cost efficient banks need relatively lower interest spread than inefficient ones. It can also tell of greater confidence in the economic environment, or it bespeaks of possible dissipation of monopoly profits of large commercial banks.

Our computation of H-statistics using the Panzar-Rosse methodology disclose no monopoly or collusive oligopoly behavior. Rather, the behavior is fairly that of perfect competition, in general. Further, the trend in the changes of H-stat values show that the entry of foreign and domestic banks have increased banking competition, specially in the

latter part of 1990s. We also find that competition among banks is stiffer in loans business than in fee-generating ones.

Dividing banks into different subgroups, however, show a different trend in competition. In particular, the biggest banks tend to exhibit a decline in competition and are more monopolistically competitive, while the small banks are highly competitive and show increase in competition. However, big banks are, likewise, highly competitive when it comes to loans granting. Similarly, universal banks show behavior of monopolistic competition and decreased competition, while ordinary commercial banks are more perfect competitors and increased competition. Merged banks, a combination of both big and small banks, exhibit, as a group, increased competition. In sum, most of the increase in banking competition appear to have come from small banks rather than from big ones.

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Appendix Table. H-Statistic Values for Different Subsamples

	Top 10	Non-Top 10	Universal Banks	Commercial Banks	Merged Banks	Non Merged Banks
1. Full Period OLS						
1.a. Total Income						
1.a.1. Number of Observations	121	233	198	156	69	285
1.a.2. Results	1.1115 C	1.0411 C	1.0788 C	0.9336 C	1.0576 C	1.0417 C
	(0.0805)	(0.0408)	(0.0426)	(0.0664)	(0.1894)	(0.0405)
1.b. Loan Income						
1.b.1. Number of Observations	121	225	190	156	69	277
1.b.2. Results	1.2090 C	1.0663 C	0.9960 C	1.0784 C	0.8138 C	1.0903 C
	(0.1291)	(0.0666)	(0.0789)	(0.1045)	(0.2881)	(0.0676)
2. With Fixed Effects						
2.a. Total Income						
2.a.1. Number of Observations	121	233	198	156	69	285
2.a.2. Results	0.6294 MC	0.9287 C	0.8820 C	0.8873 C	0.6880 C	0.9152 C
	(0.0916)	(0.0560)	(0.0822)	(0.0608)	(0.1769)	(0.0513)
2.b. Loan Income						
2.b.1. Number of Observations	121	225	190	156	69	277
2.b.2. Results	0.8641 C	1.1050 C	1.1410 C	1.0876 C	0.5966 C	1.1155 C
	(0.1601)	(0.0880)	0.1286	(0.0858)	(0.2173)	(0.0803)
3. With Both Fixed Effects and Time Dummies						
3.a. Total Income						
3.a.1. Number of Observations	121	233	198	156	69	285
3.a.2. Results	0.6202 MC	0.9541 C	0.9324 C	0.8448 MC	0.9207 C	0.9596 C
	(0.1201)	(0.0651)	(0.0858)	(0.0624)	(0.2227)	(0.0616)
3.b. Loan Income						
3.b.1. Number of Observations	121	225	190	156	69	277
3.b.2. Results	1.0564 C	1.1121 C	1.2939 CV	1.0468 C	1.1298 C	1.1676 C
	(0.1689)	(0.1005)	(0.1149)	(0.0948)	(0.3228)	(0.1008)
4. Equilibrium Test						
4.a. Number of Observations	117	203	190	130	68	252
4.b. Full Period OLS		*		*		*
4.c. With Fixed Effects			*			
4.d. With Both Fixed and Time Dummies		*				*