RESTRUCTURING, CONSOLIDATION AND COMPETITION IN LATIN AMERICAN BANKING MARKETS*

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Abstract

This study examines the competitive conditions in the banking industries of eleven Latin American countries for the period 1993 to 2000. For these countries, the time interval under examination corresponds to an era characterized by substantial reforms to restructure their banking systems, increased consolidation and foreign bank penetration. The banks in our sample are found to be earning their revenues as if operating under monopolistic competition, as in many other developed and emerging financial systems. The results indicate that, overall, market concentration is not significantly related with competitive conduct. At the country level, however, we do observe a decline in competition for Brazil, Chile, and Venezuela in late 1990s which may be attributable to increased consolidation. Further, we observe that deregulation and opening up of the financial markets for foreign participation serves as an important catalyst to increase the competitiveness of banking markets. Higher degree of competition in the sector, in return, is associated with reduced bank margins and profitability but improved cost efficiency.

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1. Introduction

Globalization, advances in information technology, and episodes of financial crises in the last two decades have changed banking in Latin America profoundly and forced the national banking authorities to deregulate and restructure domestic banking industries. Financial markets were opened up to foreign participation in order to enhance competition and efficiency. Government efforts for large-scale privatization of state-owned banks, mergers and consolidations, and unprecedented increase in foreign participation profoundly changed competitive conditions in banking.

Although competition is widely accepted as a positive phenomenon for most industries, it has historically been a very contentious issue for banking. A certain degree of competition is generally perceived to be essential and desirable to improve allocative and productive efficiency in the provision of financial services. Furthermore, a healthy rivalry among banks can serve as a driving force in improving the quality, pricing and availability of the products offered to customers, and promote financial innovation by introducing more modern banking skills, management techniques, and technology. There is also some evidence that increased competition can stimulate economic growth by raising the availability of credit and financial services to businesses and households.[1]

In view of the structural and operational reforms in the Latin-American banking systems, a serious question can be asked regarding their efficacy and effects on the

[1] For a recent review of the theoretical literature on bank competition, see Vives (2001).

competitive nature of the systems. Specifically, we wish to know whether the structural reforms along with the massive privatization and increased foreign participation made the banking sectors more competitive and efficient, or whether the increased concentration due to consolidation hindered the realization of a competitive structure by creating market power for banks. To answer the above question we analyze the competitive conditions in the banking sectors of eleven Latin-American countries for the period 1993 to 2000 by employing the Panzar and Rosse (1987) approach. We find that increased market concentration does not impede the level of competition in the region's banking markets. Furthermore, a higher degree of foreign bank participation is associated with higher level of competitiveness and efficiency in domestic markets and reduced bank margins and profitability.

The remainder of the paper is structured as follows. Section 2 summarizes briefly the recent banking deregulation and restructuring activities in the region, and reviews the relevant literature. Section 3 introduces the empirical model, testable hypotheses and the data employed. Section 4 discusses the empirical results, and Section 5 concludes.

2. Reforms in Latin American Banking

Over the past two decades, governments in the region introduced substantial financial reform programs to strengthen the regulatory framework and stabilize their financial systems. These reforms have focused on two primary areas: (1) the structure of the banking systems, i.e., the legal capacity granted for banks to conduct different types of financial operations and the legal authority to integrate financial or universal groups; and (2) the structure and main institutional characteristics of the entities responsible for banking regulation and supervision.

The main causes of the banking reform process in the region were as follows: (1) Crises or serious problems in the banking systems of the region. According to a recent study by the IMF staff, "almost 90 percent of the region's countries have faced crises or serious problems in their banking systems" (Lindgren et al., 1997); (2) Changes in the global economic environment and the introduction of new technology. According to Aguirre and Norton (2000), the liberalization of the region's economies with free trade and capital flows spearheaded the demand for new financial products and services, that was accommodated by the reformed and restructured banking systems; and (3) Global progress in banking regulation and competition. For example, the Basle Committee on Banking Supervision developed guidelines on capital adequacy and coordination between bank supervisory agencies, particularly for transnational financial groups.

In effect, legislative changes for banking reform were enacted in nearly all countries in the region. These banking reform changes allow us to classify these countries into three groups. In the first group, enacted new laws changed existing banking legislation drastically [Chile (1986), Mexico (1990), El Salvador (1991), Bolivia and Venezuela (1993), Ecuador (1994), Honduras (1995), and Paraguay and Peru (1996)]. In the second group, including Colombia and Costa Rica, the legal reforms were not as drastic as in the first group; nevertheless, new legal provisions were enacted that altered substantially the previous structure in the banking systems. Finally, in the third group, new laws were issued that amended specific aspects of the legal framework for banking. This group of countries includes Argentina, Guatemala, and Uruguay. Additionally, Brazil instituted banking reforms through new regulations.

Following numerous episodes of financial sector crises, the number of banks in the region declined significantly, leading to a consolidation in banking markets.[2] This consolidation in Latin American banking was due mainly to government efforts with the aim of restructuring inefficient banking systems rather than a market-driven consolidation. In addition, deregulation and globalization of financial services led to an unprecedented increase in foreign bank presence during the late 1990s. Despite the increased entry of foreign institutions under the new regulatory framework, the structure of the banking markets remained considerably concentrated during the same period.

On the possible effects of consolidation, Demirguc-Kunt et al. (2004) find that industry concentration in developing countries is negatively associated with the efficiency of the banking system. They further note that, regulatory restrictions on domestic and foreign bank entry and on banking activities are associated with higher level of interest margins. Regarding the impact of foreign bank participation, Levine (1996) argues that the benefits of foreign entry, in terms of improved financial services and regulation, should outweigh potential costs such as cream skimming, foreign market dominance, and destabilizing sudden capital outflows. In another study, Clarke et al. (2000) examine the effect of foreign entry for Argentine banks from 1995 to 1997, and find that foreign banks did exert competitive pressure on domestic banks as evidenced by lower profit and interest margins during that time. Similarly, Claessens et al. (2001) report that increased foreign penetration reduces bank margins, thus improving the efficiency of the banking systems.

The new industrial organization literature offers at least two types of empirical tests for competition. The first one is the model developed by Bresnahan (1982) and Lau (1982), which

[2] According to a recent study, from 1996 to 2002 the decline in the number of banks in the region's banking

estimates an index that measures the degree of rivalry by employing industry level data.[3] The second approach is the Panzar and Rosse (PR) (1987) H-statistic, which is also used in this paper. By using firm level data, it measures the extent to which changes in input prices are reflected in equilibrium revenues. The PR approach has been applied extensively to examine the competitive structure in various banking markets. Early studies that examined the U.S. and Canadian banking markets [see Shaffer (1982), Nathan and Neave (1989)], were followed by later studies concentrating on mature and emerging European markets.[4] These studies report that, in general, the banking markets of industrialized countries and transition economies could be characterized by monopolistic competition, although some of them could not reject the case of monopoly for sub-samples of small banks and perfect competition for large banks in several countries.

3. Empirical Model and Database

In evaluating the competitive structure in banking, we use the PR test, which is based on reduced-form revenue equations of the sample firms. Based on the premise that banks will employ different pricing strategies in response to changes in input costs depending on the market structure, PR developed a so-called "H statistic" which is the sum of the elasticities of the reduced form revenues with respect to input prices.[5] The H-statistic is equal to unity when the market structure is characterized as perfectly competitive, it ranges from zero and unity for monopolistic competition, and is less than or equal to zero in monopoly or perfect cartel.

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markets ranged between 21% to 32% (Yeyati and Micco, 2003a,b).

[3] This method has been applied to banking studies to test competition in Uruguay [Spiller and Favaro (1984)], the United States [Shaffer (1989)], Canada [Shaffer (1993)], Finland [Vesala(1995)], Colombia [Barajas et al. (1999)], seven European countries [Neven and Roller (1999)], and Brazil [Nakane (2001)].

[4] For example, we can cite Molyneux et al. (1994) for Germany, UK, France, Italy, and Spain, Vesala (1995) for Finland, De Bandt and Davis (2000) for Germany, France, and Italy, Bikker and Groeneveld (2000) for EU countries, Yildirim and Philippatos (2005) for 14 Eastern European countries, Gelos and Roldos (2004) for 13 emerging markets, Yeyati and Micco (2003a,b) for eight Latin American countries, and Claessens and Laeven (2004) for 50 developed and emerging countries.

Under the constant elasticity of demand assumption and a Cobb-Douglas production technology, it can be shown that, the magnitude of H can be interpreted as an inverse measure of monopoly power or alternatively, a measure of the degree of competition. In order to apply the PR method we estimate the following equation:

$$\ln(REV_{it}) = h_1 \ln(PF_{it}) + h_2 \ln(PL_{it}) + h_3 \ln(PK_{it}) + \beta_k \ln(BSF_{kit}) + \sum_{t=1}^{T} \alpha_t D_t + \varepsilon_{it} \qquad (1)$$

for t=1,…..,T where T is the number of periods observed, and i=1,….. ,n, and where n is the total number of banks and ln is the natural logarithm. The dependent variable (REV) is the ratio of total revenue to total assets. The model posits that banks use three input factors-namely, deposits, labor, and physical capital. Variables PF, PL and PK are the unit prices of these three inputs or reasonable proxies: (PF) the ratio of interest expenses to deposits and other liabilities, (PL) the ratio of personnel expenses to total assets, and (PK) the ratio of other non-interest expenses to fixed assets.[6] A number of bank-specific factors (BSF) are included to account for size, risk, and capacity differences. These factors are total assets (TA), equity (EQTY), net loans (LOAN), and capacity indicator (FA) such as total fixed assets. To control for the yearly macro effects, year dummy variables were also added in the estimations. Under the PR framework, the H- statistic is equal to the sum of the elasticities of the revenue with

[5] The details of formal derivation of the H-statistic can be found in Panzar and Rosse (1987) and Vesala (1995).
[6] Ideally, the ratio of personnel expense to the number of full time employees would be a better proxy for labor cost. Due to the unavailability of data on the number of employees, using the ratio of personnel expense to total assets as labor cost is a common approach in studies that employ BankScope data. [Molyneux et al. (1994), Bikker and Groeneveld (2000), De Bandt and Davis (2000)]. However, we should also note that a change in total assets due to some exogenous factors will result in a change in the unit labor cost even if the number of employees and/or total labour costs do not change (We thank an anonymous referee for this point).

respect to the three input prices: $H = h_1 + h_2 + h_3$. The testable hypothesis for monopolistic competition is $0 < H < 1$, while $H \leq 0$ is monopoly.[7]

Annual balance sheet and income statement data for the banks were obtained from the BankScope database. Since the banks reported by BankScope represent a large proportion of banks in each country, this sample represents fairly the average bank in the region. The initial sample consisted of 6,126 bank-year observations on 843 financial institutions. To be included in the final sample, banks had to be classified as commercial or cooperative banks. We also eliminated countries with less than 25 banks and 100 bank-year observations. The selection process yielded an unbalanced panel with 3064 bank-year observations belonging to 608 banks over the period 1993-2000. The countries included are Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Peru, Paraguay, Uruguay and Venezuela. Table 1 presents the number of banks and descriptive statistics of bank characteristics for each country. All data are reported in US$ as the reference currency and adjusted for inflation.

4. Empirical Results

Table 2 reports the empirical results of the OLS estimations.[8] The computed H values as reported in panel A range from 0.62 (Mexico, Colombia) to 0.83 (Argentina) and are significantly different from both zero and unity. These results lead to the rejection of the monopoly and perfect

[7] The PR approach assumes that banks operate in their long-run equilibrium phases, thus implying that their returns should not be statistically correlated with input prices. For the equilibrium test, we follow the extant literature by running the model in Equation (1) with return on assets being the new dependent variable. As suggested by Shaffer (1982), under this specification a value of H = 0 would indicate an equilibrium. We performed equilibrium tests for individual countries over the sample period. Although we do not report them to save space, results rejected the existence of equilibrium for Argentina, Mexico, Paraguay, and Venezuela at the 5 percent significance level. Therefore, the results for these countries should be interpreted with the necessary scrutiny.

[8] The model is estimated by OLS method. Year dummies are also included in the estimation but not reported in Table 2. For robustness check, we also employed GLS fixed-effects estimators. We found qualitatively similar results which are not reported to save space, but they are available upon request.

competition hypotheses and are broadly similar to those in earlier studies for both developed and emerging markets. According to the above findings, we conclude that banks in these countries seem to earn their revenues as if under the conditions of monopolistic competition. The results suggest that the highly concentrated banking markets of Latin American countries do not seem to lead to anti-competitive conduct.

We further analyze the significance of changes in H-statistic over time by dividing the overall sample period into two sub-periods: 1993-1996, 1997-2000.[9] The results of testing for structural changes in competition are presented in Panel B of Table 2. Similar to previous findings they are statistically significantly different from the bipolar cases of unity (perfect competition) and zero (monopoly). The estimates for the sub-periods indicate a statistically significant decrease (lessened competition) in the H-values for Brazil, Chile, and Venezuela, and statistically significant increase (increased competition) for Argentina, Peru, Paraguay and Uruguay. The model rejects the hypothesis that the H statistics were the same during the two sub-periods for Colombia, Costa Rica, Ecuador, and Mexico. In other words, there is no clear indication of overall change in competitive behavior in the banking markets of this group of countries over the sample period. These results are broadly in line with Yeyati and Micco (2003a) who report that seven banking sectors in Latin America (except Colombia) have moved towards higher competition in recent years. In a related report, Yeyati and Micco (2003b) show that consolidation has not inflicted serious damage to competitive practices in the region as reflected in increased H-statistics (except for Mexico and El Salvador) between 1993 and 2002. Gelos and Roldos (2004) also find no indication of a broad decline in competition intensity following the large-scale consolidation process in three Latin American

countries. They report that H-statistics remained constant for Argentina, Brazil and Chile over the period 1994-99.

In order to account for size effects in banking services, we also defined two sub-markets based on asset size for each country, (large and small banks according to whether total assets are above and below the median asset size in the sample) and estimated their H-statistics. Estimation results for large and small banks as well as test statistics for differences between size groups are presented in Panel C, Table 2. The H values for large banks are significantly higher than those for smaller banks for Argentina, Brazil, Chile, Peru, and Uruguay. Therefore, we can infer that large banks in these countries operate in a relatively more competitive environment compared to small banks; or, by implication, competition is relatively lower in local markets compared to national and international markets. A possible interpretation is that smaller banks can exercise some market power due to their strong competitive position in local retail markets and enjoy certain degree of spatial differentiation accompanied with it. Regarding the market power of local banks, Coccorese (1998, 2004) reports evidence of highly competitive behaviour from banks in spite of the existence of local monopolies or oligopolies for the Italian banking industry; the given explanation is that local banks can not count on a monopolistic position because of the dimension of national banks and their possibility of enjoying scale economies, factors that are often able to balance their little territorial roots as well as the information asymmetries. The H value for small banks in Venezuela is greater than that of large banks. However, the model can not detect any significant difference between small and large banks in Colombia, Costa Rica, Ecuador, Mexico, and Paraguay.

[9] For the countries under examination we chose 1997 as the year of structural break when many of these countries started to experience significant consolidation in their banking markets.

Having computed the competition index, we now turn to the examination of the relationship between market structure and bank performance. We proxy the degree of competition by H, which is computed for each year and country as previously explained. We use two common measures for industry concentration: (1) the 3-bank concentration ratio (CR3), defined as the sum of market shares for the largest three banks and (2) the Hirschman-Herfindahl Index (HHI), which equals the sum of the market shares squared for all n firms in a market. The foreign bank penetration is proxied by the percentage of the banking system's assets held by banks with 50 percent or more foreign ownership (FORSHR) and the ratio of the number of foreign banks to total number of banks (FORNO). Also included in the analysis are return on assets (ROA) as a measure of profitability, net interest margin (NIM) as a measure of efficiency, and the ratio of overhead expenses to total assets (OVHD) which reflects banks' overhead associated with their borrowing and lending activities. To account for the impact of competitive pressures coming from non-bank financial institutions such as insurance firms and from capital markets we included two measures: the degree of insurance firms' penetration as the ratio of insurance premiums collected to GDP (INS), and the ratio of stock market capitalization to GDP (MARKET). We expect to get positive coefficients on these measures.

Columns (1)-(4) of Table 3 present the results from the OLS regressions. As shown in columns (1) and (2) the coefficients on both measures of concentration are positive but statistically insignificant. We also find no evidence indicating that higher market concentration leads to a lower degree of competition. These results are consistent with Yeyati and Micco (2003a,b) and Claessens and Laeven (2004). What is also interesting is the positive correlation between the degree of foreign ownership and H, indicating a higher competitive environment

as a results of increased foreign penetration.[10] These results are consistent with Claessens and Laeven (2004) who find that greater foreign bank presence is associated with more competitive banking systems. Yeyati and Micco (2003a) also provide some weak evidence suggesting that foreign penetration leads to higher competition in Latin American banking.[11] Higher competition, in turn, seems to be associated with lower bank margins and profitability as reflected by negative coeffcients on the NIM and ROA variables. Further, we observe that higher degree of competition is associated with reduced overhead costs (OVHD) as reflected by its negative coefficient. This is probably due to increased foreign competition, which reduces market power of domestic banks and forces them to improve their cost efficiency by reducing overhead costs. The results also suggest that in terms of inter-industry competitive pressures from non-bank sectors, the size of the stock market and the insurance sector do not seem to affect significantly the competitive conditions in banking.

The results in column (3) show that concentration does not have any significant effect on interest margins. However, foreign bank penetration significantly reduces interest margins, indicating its positive effect on operational efficiency. The ROA ratio is positively linked to NIM, as expected. The overhead expenses are negatively associated with interest margins, indicating that banks cannot easily pass their higher overhead costs on to customers, due possibly to competition intensity. According to the estimation results in column (4), bank profitability is also not significantly related to market concentration and exhibits a weak negative correlation with the degree of foreign participation. Finally, bank returns are

[10] The coefficient on the FORNO variable is significant only at the 10 percent level.
[11] In a related paper Yeyati and Micco (2003b) find that foreign participation is associated with weaker competition in eight Latin American banking markets.

positively related with interest margins and negatively related with overhead costs, as one might expect.

5. Summary and Conclusions

Latin American Banking systems have undergone significant restructuring and experienced large-scale consolidation and internationalization over the past decade. This study examines the competitive conditions in eleven Latin American banking markets for the period 1993-2000. Based on the computed market-power coefficients we conclude that banks in these countries seem to earn their revenues, as if operating under conditions of monopolistic competition. In banking services such conditions are, of course, expected *a priori* from the results of previous empirical studies and from economic theory, since banks (a) are licensed, regulated, and supervised, and (b) engage in product (service) differentiation.

Further, we obtain two important conclusions from the second-stage regression analyses: (1) concentration in banking markets does not necessarily lead to a lower level of competition and higher bank performance, and (2) bank returns are negatively linked to the degree of competition and, to a lower extent, to foreign bank participation. Thus, the notion that high concentration in banking markets will result in monopoly rents is not supported by our empirical results. We find a strong positive pattern linking the foreign ownership indicator to our measure of competitiveness. Further, higher degree of competition in the sector is associated with lower bank margins and profitability, but improved cost efficiency. These findings are consistent with previous research which finds foreign bank entry can stimulate competition in national banking markets and thus force domestic banks to improve their operating efficiency.

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Table 1
Descriptive Statistics of the Variables in Equation 1[1]

Country	Total Assets	Total Revenues	Interest Expense	Personnel Expense	Other Op. Expense	Total Deposits	Loans	Equity	Fixes Assets	No. of Banks
Argentina	1,499	181	62	46	45	1,127	803	174	57	106
	(3,112)	345	(126)	(90)	(64)	(2,505)	(1,673)	(379)	(127)	
Brazil	4,264	1,720	1,000	472	171	1,974	1,422	386	119	162
	(10,663)	(7,701)	(4,320)	(2,479)	(1,541)	(5,605)	(3,737)	(900)	(342)	
Chile	2,614	328	195	45	36	1,803	1,732	207	67	33
	(2,995)	(376)	(222)	(54)	(41)	(2,015)	(2,071)	(226)	(78)	
Colombia	872	188	90	31	42	628	537	124	38	42
	(925)	(199)	(97)	(37)	(54)	(675)	(566)	(151)	(53)	
Costa Rica	278	35	20	7	9	213	116	28	16	33
	(499)	(60)	(36)	(14)	(20)	(442)	(184)	(39)	(41)	
Ecuador	646	158	87	16	26	471	336	73	53	43
	(1,011)	(295)	(187)	(25)	(41)	(728)	(552)	(144)	(93)	
Mexico	6,381	1,488	1,035	143	44	4,986	4,024	506	200	49
	(10,965)	(2,471)	(1,712)	(293)	(190)	(8,689)	(7,062)	(945)	(410)	
Peru	857	117	51	22	8	675	497	75	38	26
	(1,327)	(169)	(74)	(29)	(12)	(1,079)	(778)	(110)	(52)	
Paraguay	117	25	15	4	4	85	65	16	4	26
	(109)	(26)	(20)	(4)	(4)	(81)	(67)	(14)	(5)	
Uruguay	634	189	118	16	41	515	470	105	12	29
	(981)	(396)	(206)	(24)	(196)	(740)	(744)	(296)	(28)	
Venezuela	1,270	269	122	44	34	1,049	577	145	52	59
	(1,572)	(339)	(197)	(53)	(68)	(1,324)	(796)	(183)	(75)	

[1] Figures are means in millions of US$ for 1993-2000. Standard errors are given in parenthesis.

Table 2
Test For Competition, Structural Change in Competition and Size Groups

	Panel A: H-Statistic for Individual Countries			Panel B: Test for Structural Change[b]			Panel C: Test for Size Groups[c]			
Country	H-Stat.[a] (Std. Err.)	F-value for H=0 p(F-test)	F-value for H=1 p(F-test)	H 1993-1996	H' 1997-1999	H_O: H=H' p(F-test)	H_S Small Banks	H_L Large Banks	H_O: H_S=H_L p(F-test)	# of Obs
Argentina	0.83	892.10	38.93	0.75	0.87	(0.03)	0.80	0.85	(0.01)	612
	(0.03)	(0.00)	(0.00)	(0.03)	(0.03)		(0.03)	(0.03)		
Brazil	0.76	781.64	80.42	0.80	0.71	(0.02)	0.72	0.78	(0.01)	820
	(0.03)	(0.00)	(0.00)	(0.04)	(0.04)		(0.04)	(0.04)		
Chile	0.67	302.50	74.62	0.73	0.62	(0.00)	0.67	0.76	(0.02)	225
	(0.04)	(0.00)	(0.00)	(0.05)	(0.05)		(0.05)	(0.05)		
Colombia	0.62	250.45	91.26	0.59	0.65	(0.64)	0.64	0.63	(0.53)	244
	(0.04)	(0.00)	(0.00)	(0.06)	(0.06)		(0.07)	(0.06)		
Costa Rica	0.79	871.50	60.34	0.81	0.78	(0.12)	0.81	0.80	(0.24)	155
	(0.03)	(0.00)	(0.00)	(0.04)	(0.04)		(0.04)	(0.04)		
Ecuador	0.66	213.00	53.27	0.65	0.71	(0.12)	0.65	0.68	(0.11)	152
	(0.05)	(0.00)	(0.00)	(0.06)	(0.06)		(0.05)	(0.05)		
Mexico	0.62	175.32	63.23	0.74	0.58	(0.17)	0.61	0.64	(0.20)	240
	(0.05)	(0.00)	(0.00)	(0.07)	(0.07)		(0.07)	(0.07)		
Peru	0.70	510.33	42.13	0.67	0.78	(0.00)	0.70	0.75	(0.03)	168
	(0.04)	(0.00)	(0.00)	(0.04)	(0.04)		(0.04)	(0.04)		
Paraguay	0.65	89.65	26.02	0.56	0.65	(0.00)	0.63	0.66	(0.18)	144
	(0.07)	(0.00)	(0.00)	(0.04)	(0.04)		(0.05)	(0.05)		
Uruguay	0.70	437.42	27.38	0.68	0.73	(0.03)	0.71	0.78	(0.00)	101
	(0.04)	(0.00)	(0.00)	(0.05)	(0.05)		(0.05)	(0.05)		
Venezuela	0.79	260.43	18.85	0.83	0.69	(0.01)	0.82	0.73	(0.00)	203
	(0.05)	(0.00)	(0.00)	(0.04)	(0.04)		(0.04)	(0.04)		

Panel A: [a] The H-statistic is equal to the sum of the elasticities of the revenue with respect to three input prices.
Standard errors for H-statistics are given in parentheses underneath.
Hypotheses H=0 (monopoly) and H=1 (perfect competition) are rejected at the 1 percent significance level, for all countries.

Panel B: Hypotheses H=0 (monopoly) and H=1 (perfect competition) are rejected at the 5 percent significance level, for all countries and sub-periods.
[b] The F- test is used to test the H_O: H=H' hypothesis. p(F-test) gives the p-values of F-test.

Panel C: [c] Large and small banks are determined by total assets above and below the median asset size in the sample
Hypotheses H=0 (monopoly) and H=1(perfect competition) are rejected at the 5 percent significance level, for all countries and size groups.
The F- test is used to test the H_O: H_S=H_L hypothesis. p(F-test) gives the p-values of F-test.

Table 3
Competition, Concentration, Foreign Penetration and Bank Performance

	(1)	(2)	(3)	(4)
	H Statistic	**H Statistic**	**NIM**	**ROA**
Concentration (CR3)	0.067		-0.009	
	(0.047)		(0.009)	
Concentration (HHI)		0.004		0.0002
		(0.004)		(0.0004)
Foreign Ownership (FORSHR)	0.127		-0.004	-0.007
	(0.035)***		(0.002)**	(0.003)*
Foreign Bank No. (FORNO)		0.107	-0.027	-0.022
		(0.057)*	(0.019)	(0.012)*
Net Interest Margin (NIM)	-0.346			0.846
	(0.119)***			(0.113)***
Return on Assets (ROA)		-0.106	0.55	
		(0.05)**	(0.10)***	
Overheads (OVHD)	-0.163	-0.144	-0.132	-0.435
	(0.067)**	(0.053)**	(0.028)***	(0.211)**
Insurance Penetration (INS)	0.243	0.294	0.025	0.206
	(0.285)	(0.279)	(0.018)	(0.214)
Stock Market Capital. (MARKET)	0.051	0.0452	0.037	-0.003
	(0.046)	(0.048)	(0.031)	(0.003)
Adj. R^2	0.36	0.38	0.28	0.34
Number of Observations[a]	77	77	77	77

The H-statistic is equal to the sum of the elasticities of the revenue with respect to three input prices, computed for each year and country.

All regressions also include country and time dummy variables which are not reported.

Heteroscedasticity-corrected standard errors are given in parentheses.
*,**,*** indicate significance levels of 10, 5 and 1 percent respectively.
[a] Since we were not able to calculate the H- statistic for year 1993 due to insufficient data, the number of observations for each estimation is reduced to 77 (11 countries, 7 years).