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BANKING COMPETITION IN LATIN AMERICA

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Abstract

In recent years, Latin American banking sectors have experienced an accelerated process of consolidation that was accompanied by important increases in concentration and, in most cases, internationalization. This process, which in many cases was triggered by episodes of financial distress, has posed questions about its implications for the competitive behavior of banks, and for the approach that the supervisory bodies should adopt to balance financial stability considerations with the goal of fostering competition. Exploiting a rich balance sheet database for 7 Latin American countries, we examine the evolution of concentration and foreign penetration indicators and their impact on competition. We conclude that, at least at an aggregate level, there is no evidence that industry consolidation has led to a less competitive environment. While most Latin American banking sectors are far from the perfect competition benchmark, competition estimates do not differ from those computed for developed economies and have remained remarkably stable. Moreover, if anything, the evidence suggests that consolidation led to more rather than less competition in the sector. This may be due in part to the fact that, in earlier years, Latin American banking sectors were overpopulated, with many banks specialized in niches on which they have some market power despite their relative size. Thus, concentration levels at the end of the consolidation process are not above international standards. This notwithstanding, we argue that financial stability considerations have so far outweighed competition concerns, and that a closer coordination between the competition and the bank supervision body is warranted in many cases.

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I. Introduction

In the last decade there have been important changes in the banking industry in several countries in Latin America. Participation of foreign banks has more than doubled in many cases while banking concentration has increased due to bank consolidation, led by mergers and, possibly, by regulatory changes that affected proportionally more smaller (and more specialized) institutions. These developments have raised concerns about the impact on competition (in particular, on borrowing costs and banking efficiency), stability of the financial system, and credit distribution among different sectors in the economy.

The purpose of this study is to explore empirically the recent evolution of selected banking sectors in the region and its effects on competition. The goal is to assess whether the consolidation process has negatively affected the competitive environment, and suggest the policy options available to governments of countries facing the tradeoff between attaining the welfare benefits associated with the introduction of competition in the sector and protecting the stability of the system.

Exploiting a rich balance sheet database for seven Latin American countries,⁴ we examine the evolution of concentration and foreign penetration indicators over recent years. In addition, we estimate a competitive behavior parameter on a yearly basis to test whether competition changed in the most recent years and whether these changes are related to changes in concentration (and, in particular, to the growing importance of large banks) and to changes in foreign participation. We conclude that, at least at an aggregate level, there is no evidence that industry consolidation has led to a less competitive environment. While most Latin American banking sectors are far from the perfect competition benchmark, competition estimates do not differ from those computed for developed economies. Moreover, they have remained remarkably stable in recent years. In addition, we find no clear cross-country correlation between concentration and internationalization indicators, on the one hand, and competition measures, on the other.

Our findings that concentration may reflect the fact that, in earlier years, Latin American banking sectors were characterized by an overpopulation of banks, many of them specialized in niches on which they have some market power despite their relative size. Thus, concentration levels at the end of the consolidation process are not above international standards. This notwithstanding, we argue that financial stability considerations have so far outweighed competition concerns, and that a closer coordination between the competition and the bank supervision body is warranted in many cases.

Hence, the empirical exploration is complemented with a survey of regulatory aspects that may influence banking competition, as well as the real examples of pro-competition regulatory actions.

⁴ Argentina, Brazil, Chile, Colombia, Costa Rica and Peru.

The plan of the paper is the following. Section II discusses the main issues of concern and reviews previous studies that addressed them analytically and empirically. Section III presents background data on the evolution of the banking sector in a group of selected Latin American countries, and analyzes different concentration measures in association with a number of competition-related variables, as a first approach to assessing the degree and recent evolution of banking competition. Section IV surveys the recent empirical literature on banking competition, describes the empirical methodology used in the paper and presents the main econometric results. Section V discusses the results from a policy perspective. Section VI concludes.

II. The Issues

In this section, we introduce the main issues associated with the link between concentration and foreign penetration, and banking competition, and a brief survey of previous work that addressed them analytically and empirically.

The impact of banking consolidation

It is widely believed that bank consolidation generates a more concentrated system and, as a consequence, a less competitive one. Despite this general belief, there is no clear evidence, from a theoretical point of view, that bank consolidation necessarily implies a less competitive banking environment, as it depends mainly on the pattern of mergers.⁵ As stated in Vives (1999), for example, a merger between firms serving overlapping or identical markets reduces competition and increases efficiency by eliminating duplication of activities. Alternatively, it is not at all clear whether competition and concentration should go in opposite directions. Elimination of branching restrictions, or a widespread use of ATMs that reduces the geographical barriers can be shown to enhance, rather than hinder, banking competition, while inducing consolidation as a result of narrower margins.⁶ At any rate, a wide range of studies that analyze the US and EU experiences conclude that mergers seem to have been pro-competitive in general.⁷

Efficiency considerations do not offer unambiguous answers either. Mergers can reduce competitive pressure and result in lessened efforts by managers to maximize operating efficiency.⁸ However, as noted, mergers may increase efficiency if the markets are overlapped, if the banks are operating at a small scale, and if the banks are very different in terms of technology and efficiency ex-ante. Empirical studies for the EU and US show

⁵ See Kroszner (1998), Carletti et al. (2002), Yanelle (1997), Scholtens (2000) and Canoy et al. (2001) for a survey of the literature.

⁶ See Matutes and Vives (2000) and Cordella and Levy Yeyati (2002) for an analytical discussion along these lines. The increase in concentration as a result of the elimination of branching restrictions in the U.S. is studied, e.g., in Economides et al. (1995). See also Schargrofsky and Sturzenegger (2000) for a related study of the Argentine banking sector.

⁷ For the US case see Kroszner (1998), Hannan (1996), Avery et al. (1998), Kroszner and Strahan (1998), Strahan and Weston (1996) and Berger et al. (1998). For the EU case see Vives (1999).

⁸ This effect was named “quiet life” by Hicks (1935) and is tested and found very big by Berger and Hannan (1998) and Resti (1998) for the Italian case.

that consolidations do not improve efficiency significantly, even when costs have been reduced in general.⁹ Furthermore, several studies have found that cost scale economies, typically used to justify the existence of big banks and consolidation processes, were exhausted at a relatively small size (well below US\$ 10 billion in assets).¹⁰ This tends to suggest that scale effects are not a major efficiency driver for mergers among relatively large banks.

There is an open discussion about the impact of consolidations and concentration on system stability. From a theoretical point of view, keener competition seems to reduce stability because of a drop in bank charter value that reduces incentives for prudent risk-taking behavior. According to this view, the promise of extraordinary profits associated with the presence of market power reduces the agency problem of limited liability banks (namely, their propensity to gamble). Alternatively, stiffer competition could give rise to a higher risk propensity, as documented in some empirical studies.¹¹ On the other hand, a more concentrated system, inasmuch as it implies the presence of a few relatively large banks, is more likely to display a “too big to fail” problem by which large banks increase their risk exposure anticipating the unwillingness of the regulator to let the bank fail in the event of insolvency problems. (Hughes et al. (1998).

Finally, constraining competition has the effect of reducing choices available to users of credit and other banking services. Thus, besides the welfare considerations related to the menu of products available, consolidation and concentration may influence the distribution of banking (particular loan) services between different sectors of the economy. In this aspect, the higher the degree of concentration, the larger seems to be the flow of funds to new enterprises and to sectors that rely more on external financing, possibly because these are also the sectors with a bigger proportion of informationally opaque firms. This fact was tested empirically in the literature for the US and is attributed both to a free riding problem in monitoring, which emerges in competition, and to the impossibility for a competitive bank to extract future rents from potentially successful young firms.¹²

There are no conclusive answers to the questions about the impacts of concentration and consolidation in the banking industry in Latin America, either from the theoretical or from the empirical literature. Furthermore, fast changes in technology, deregulation and globalization make it difficult to generalize findings from previous studies (mostly from

⁹ See Shaffer (1993), Rhoades (1998), Resti (1998), Peristani (1997), Vander Venet (1996).

¹⁰ See Wagenvoort (1999), Casu (2000) and Sheldon (2001). Exceptions include Hunter and Timme (1986), Hughes et al. (1997) and Berger and Mester (1997)

¹¹ See Cesari and Daltung (2000), Keeley (1990), Bergtresser (2001), Carletti et al. (2002). Cordella and Yeyati (2002), using an analytical framework, argue that a correct regulation and disclosure of information that enhances market discipline from bank creditors could reduce this perverse link between competition and risk.

¹² See Petersen and Rajan (1995), Cetorelli and Gambera (2001), Cetorelli and Peretto (2000), di Patti and Dell' Ariccia (2000), Caminal and Matutes (2002), Besanko and Thakor (1993), von Thadden (1997), Fama (1985).

European countries and the U.S.) to developing economies with different institutions and paths to development.¹³

The impact of foreign penetration

Unlike the case of financial centers like the U.S. or EMU, banking sector consolidation in Latin America appears to have been based to a large extent on the acquisition of local banks by bigger foreign institutions. The main underlying reason appears to have been in part related to the lower perceived vulnerability to financial shocks. This, in turn, was induced by the typically larger capitalization of foreign banks and perceived liquidity insurance from highly diversified parent houses and solid lenders of last resort in parent countries, all in a context of financial volatility and frequent banking crises. This fact is not trivial in the analysis of competition: other things being equal, depositors tend to demand higher returns from local banks than from their foreign counterparts.¹⁴

Related to this, Claessens et al. (1998) analyze bank-level data covering 80 countries during 1988-1995, and find that in developing countries the presence of foreign banks is typically associated with higher net interest margins and higher profitability than domestic banks. In addition, they find that foreign banks have higher overhead costs, casting additional doubt on the hypothesis that foreign banks' profitability is driven by efficiency.¹⁵ Cull et al. (1998) find that, for Argentina, domestic banks' performance is negatively correlated with their relative exposure to manufacturing, where foreign banks have been particularly active, and argue that foreign competition has inflicted a negative shock on domestic bank profitability. This illustrates the difficulties involved in identifying efficiency effects when measures of bank services cannot be adjusted for factors such as difference in quality or transient versus permanent effects.¹⁶

Regarding the link between foreign penetration and financial stability, Demirguc-Kunt et al. (1998) find that, other things being equal, the presence of foreign banks is associated with a lower probability of financial crisis. The result can be interpreted in at least two ways. On the one hand, highly protected banking sectors could generate inefficient institutions, and negatively affect the efficacy of their regulation and supervision. On the other hand, foreign-owned banks may forestall liquidity shocks better aided by their highly capitalized parents, so that a country with an internationalized banking sector may be partially isolated from bank runs.

¹³ See Edwards and Mishkin (1995), Miller (1998), Mishkin (1999).

¹⁴ After episodes of financial stress in the region, it is common to observe a flight to quality that tend to result in a larger concentration of deposits in foreign-owned banks.

¹⁵ They attribute this to the fact that recent entrants have to incur an additional cost to make up for incumbent advantages and gain a reasonable market share. However, while an increase in overhead costs may be related to organizational changes aimed at improving efficiency, they may also be linked to a surge in (economically inefficient) marketing costs. The two effects are difficult to disentangle as their results do not correct for product quality. At any rate, the previous findings suggests that, at least in the short run, cost efficiencies are not likely to be visible.

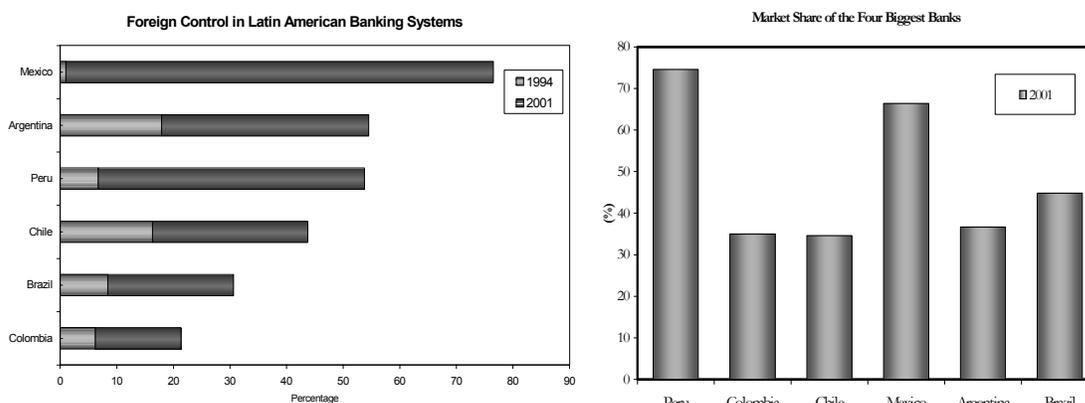
¹⁶ This applies directly to the standard discussion on concentration and competition, that emphasizes economies of scale, implicitly assuming that consolidation is achieved through mergers of ex-ante homogenous banks.

One concern that has been associated with foreign penetration is its influence on the distribution of credit through what is usually referred to as “cherry picking,” namely, the choice of one sector or a narrow segment of customers (e.g., multinationals, prime credits, exporters) leaving part of the economy underfinanced. While, as noted, cherry picking could be in principle associated with bank concentration in general, the evidence on cherry picking is mixed.¹⁷ However, there are sectors that may be negatively affected in their access to credit by consolidation and foreign penetration, such as small businesses previously served by small specialized banks.¹⁸

III. Background Data

Evolution of banking sectors in Latin America

If a pattern emerges from the observation of the recent evolution of banking sectors in Latin America, it is a trend towards consolidation and internationalization.¹⁹ As can be seen in the following graphs, participation of foreign banks has more than doubled while banking concentration is relatively high in comparison with EU and US standards.



In this section, we present an exploratory discussion of the main trends in concentration and foreign penetration, as well as its correlation with standard indicators of competition, efficiency, banking stability, and credit allocation between different sectors of the economy, based on balance sheet data from individual countries. We center our attention

¹⁷ Nicholls (1997), analyzing the highly internationalized New Zealand banking sector, finds that foreign bank operations has been increasingly diversified, as banks gather information on local borrowers. In Argentina, on the other hand, foreign-owned banks have been extremely active in personal and mortgage lending (Cull et al., 1998).

¹⁸ As Scharfrodsky and Sturzenegger (2000) illustrate, consolidation in Argentina was accompanied by a decreasing market share of regional and cooperative banks, specialized in relationship banking to small local firms.

¹⁹ It has to be noted at this point that there are signs of reversion in the internationalization trend after the Argentine crisis, due to the stagnation of local credit markets and a growing perception of the risks involved in their Latin American operations.

on a selected sample that includes Argentina, Brazil, Chile, Colombia, Costa Rica, El Salvador, and Peru.

The Appendix figures provide a first glance at relevant aggregate data for our sample countries. There we present indicators of the evolution of banking depth (deposit and credit over GDP),²⁰ the real and nominal GDP, the domestic reference interest rate (which may influence interest rate spreads and bank pricing behavior),²¹ financial dollarization (which in many countries underscored the process of financial deepening and helped reduce bank margins),²² and fiscal exposure (credit to the public sector over total assets).

As expected from a cross-country study, the evolution of these variables tends to differ in each case. However, some basic patterns can be unveiled from simple inspection. First, it is apparent that, while banking sectors in Latin American countries have, on average witnessed an expansionary trend over most of the last decade, growing steadily and faster than GDP, in many cases this trend was reversed in recent years due to episodes of financial turmoil or outright financial crisis as in Argentina.

Where countries clearly differ is in the exposure to the public sector. Only a sub-group of countries has displayed a sizable increase in the share of credit to the public sector (Argentina, Brazil, Colombia, Costa Rica, Mexico). Even among this group, the underlying reasons are not always similar. Thus, while the fiscal exposure of Mexican banks jumped after the Tequila crisis reflecting the consequences of the crisis resolution (more precisely, the swap of non-performing assets by government bonds), the cases of Argentina, Brazil and Colombia reflect a trend to finance government financing needs in the domestic markets (either due to the lower financing costs or to the closure of international capital markets).²³

Concentration and foreign penetration

While there is a wide array of concentration measures proposed in the industrial organization literature,²⁴ hardly any of them have been used in the empirical banking literature with the exception of the k-firm concentration ratio (CR_k) and the Herfindahl index (HI), defined below:

²⁰ To minimize the impact of inflation on these ratios, credit and deposits are averaged over the year.

²¹ Measured as the Treasury bill or the central bank rediscount rate or, whenever these are not available, as the money market rate. While a higher interest rate (e.g., due to higher nominal uncertainty) may be reflected in wider interest margins, in cases in which nominal rates increase substantially (e.g., as a result of high inflation), we could observe the opposite (narrower margins) if banks do not pass through the increase in funding costs to borrowers due to rationing.

²² Financial dollarization is computed as the deposit and loan dollarization ratios for those countries where foreign currency intermediation was allowed.

²³ Increasing fiscal demands are likely to crowd out domestic borrowers in a differential way, affecting the distribution of credit. Moreover, changes in fiscal exposure beg the question of the differential propensity to lend to the public sector of banks of different size and ownership and the impact that changes in the composition of banks may have on credit access.

²⁴ For a survey, see Bikker and Haaf (2001) and Shaffer (1992).

$$CR_k = \sum_{i=1}^k s_i$$
$$HI = \sum_{i=1}^m s_i^2$$

where i is an index that orders banks from largest to smallest, and s_i is the market share of bank i , (typically measured in terms of total assets).

In addition, the HI is used as a statutory measure to evaluate the impact of a proposed merger on competition in the US.²⁵ For the sake of comparability, we compute these two measures (CK_5 in the case of the concentration ratio) based on total bank assets, for our selected sample of countries and different periods of time, to offer a first look at the evolution of banking concentration during the period of analysis. Moreover, to take into account the multi-product nature of banks and the different patterns of specialization displayed by different types of banks, we compute the same concentration measures for a subset of markets, namely private deposits, private credit, mortgage loans (typically but not exclusively associated with real estate consumption) and consumer loans (usually tied to the purchase of durables other than real estate).

In turn, regarding foreign penetration, we measure in two relatively standard ways: as the ratio of foreign to total banks, and as the foreign-owned to total asset ratio. Here, we define foreign banks as those controlled by institutions with headquarters in developed countries, as opposed to institutions from within the region, which we label regional banks.²⁶

The Appendix figures show the evolution of the number of operating banks, along with different concentration indicators. As can be seen, consistent with the focus of this paper, we observe a visible consolidation trend (as measured by the number of operating banks) in most countries, which are clearly reflected in the different concentration measures. Indeed, in the only case in which concentration has not increased for the whole system (Costa Rica) it has done so for the private segment.²⁷

As expected, concentration indicators in different markets are highly correlated, with the salient exception of mortgage, which in many countries has been supplied early on by specialized (often state-owned) institutions. Thus, interestingly, while *concentration has*

²⁵ According to antitrust laws in the US, if post-merger market HI does not exceed 0.18 and the merger does not raise the HI by 0.02 or more, the merger is automatically approved.

²⁶ There is some indication that regional banks tended to display particular characteristics, particularly a smaller size, and a concentration in consumer loans or cross-border operations. In addition, many of the advantages often attributed to foreign banks (e.g., implicit protection from well-capitalized headquarters) are not extensible to regional banks.

²⁷ This study will not delve into the potential reasons underscoring consolidation, which may include the opening of the banking sector to foreign competition, stiffer internal competition due to relaxation of restrictions on the line of business, technological progress (e.g., ATMs and pc banking) or market developments that induced more homogenous banks (e.g., the boom in the dollar mortgage market in Argentina), regulatory tightening as countries increasingly embraced Basle standards, or even aggressive competition for market share in the context of an expanding market.

generally increased in recent years,²⁸ in parallel with banking sector consolidation, mortgage loans have displayed a downward trend as lenders in this market have increased from a few specialized institutions to most large banks in the system.²⁹

Has this trend towards concentration been led by a few large foreign-owned banks, or is it the result of another trend toward larger, similarly-sized institutions in search of economies of scale? Is concentration disguising a growing participation of public institutions? To address this issue, the figures also show the CK₅ and HHI indicators (based on total assets) for private banks.³⁰ In all cases, the results do not differ qualitatively from those obtained for the whole sample.

Finally, before getting into a more rigorous estimation of the degree of banking competition, we have a first glance at the correlation between concentration and internationalization, on the one hand, and competition, on the other, by comparing the evolution of the previously described measures with standard indicators of banking competition. More precisely, in the last panel of the figures we look at net interest and financial rate margins (NIM and NFM)³¹ and profits (measured as returns on assets and on equity, or ROA and ROE, respectively). In addition, to examine the relation with efficiency, we look at overhead costs. All variables are normalized by total assets.

At first sight, it appears that the recent banking sector trends have not been accompanied by a deterioration of the competitive environment, as indicated by (in most cases) low and relatively stable returns and interest margins, or by lower efficiency, as suggested by slightly declining overhead expenses.

IV. Econometric Analysis

As noted above, there is not a consensus about the link between concentration and foreign penetration, on the one hand, and competition, on the other. This presence and the nature of such a link remain an empirical question and require a case-by-case exploration. This is the purpose of this section, where we address these links in a more rigorous way. More precisely, whereas in the previous section we described recent developments based on standard indicators of concentration, penetration and competition, and their correlation, here we estimate country-by-country competition measures, and use them to look more closely into the relation between competition and recent concentration and

²⁸ While the general trends unveiled by these figures are likely to be robust, cross-country differences may be reflecting the presence of holdings of small banks that may bias the indicator downwards. The incidence of bank groups in concentration indicators has been documented for Brazil by Sampaio (2001), who, as expected, finds significantly larger concentration ratios once bank groups are taken into account.

²⁹ The fact that we are dealing with outstanding rather than new loans partially disguises the growing participation of other banks.

³⁰ We omit indicators for different product markets for conciseness.

³¹ While both measures are highly correlated, increased competition may be associated with a relative increase of the latter over the former due to lower interest margins and a growing share of non-interest income (assuming that a larger scope for diversification in liquidity services allows banks to better preserve their market power in this segment).

internationalization trends, as well as changes in regulation that may influence market structure. In the next section, we use our competition measure to explore its link with bank risk indicators and the distribution of credit across sectors.

Measures of competition

The literature on the measurement of competition can broadly be divided into two branches: the (non-formal) structural approach and the (formal) non-structural approach.³² The structural approach centers on the Structure-Conduct-Performance paradigm (SCP) or the efficiency hypothesis, according to what they assume to be the main reason for superior market performance. For the SCP, the collusive behavior among large firms due to a highly concentrated market is the main driver of market overperformance. On the other hand, the efficiency hypothesis, implicitly assumes the presence of economies of scale through which large firms achieve increased efficiency and improved performance. Thus, if a firm is more efficient than the rest (e.g., due to a lower cost structure) it could gain market share by reducing prices,³³ and hence, market structure is endogenously shaped by firms' performance so that concentration is a result of the superior efficiency of the leading firms."³⁴

New developments in industrial organization and the refinement of formal models of imperfectly competitive markets, as well as the realization of the need to endogenize market structure have led recent empirical work to rely increasingly on non-structural models. In particular, the application of the SCP in the banking literature has been criticized for the one-way causality (from market structure to market performance) that the original model imposed.³⁵

There are three main non-structural models proposed in the literature: Iwata's (1974), Bresnahan's (1982) and Panzar and Rosse's (1987) models. Of these, Iwata's model has not yet been applied to the banking industry, due to the lack of micro data needed for empirical estimation. Empirical applications of Bresnahan's model are also relatively scarce for developed countries.³⁶ There are a number of papers that apply this model to the Latin American banking sector. Variations on Bresnahan's conjectural variation approach find competitive markets in Colombia (Barajas et al, 1999), Brazil (Nakane, 2001) and Argentina (Burdisso et al., 2001).

In this paper, we use Panzar and Rosse's (PR) approach, which has the advantage of using bank specific data and therefore allows us to control for variables of interest such as size and foreign ownership. The PR approach has been used in several studies that test

³² For a survey, see Bikker and Haaf (2001) and Shaffer (1992).

³³ See Molyneux and Forbes (1995).

³⁴ See Vesala (1995).

³⁵ See Gilbert (1984), Reid (1987) and Vesala (1995). For a survey of the literature applying the SCP to the banking industry see Gilbert (1984) and Molineux et al. (1996).

³⁶ See Shaffer (1989, 1993) for the US loan market and the Canadian banking industry, Ribon and Yosha (1999) for the banking industry of Israel, Suominen (1994) for the Finnish loan market, and Neven and Roller (1999) for a group of European countries.

competition for the European Banking Industry (Table X presents a survey of the main results).

The PR Panzar-Rosse model

The model starts by assuming profit maximizing individual banks, from which it derives a first order condition for profit maximization of the type:

$$R'_i(OUT_i, n, BSF_{i, rev}) = C'_i(OUT_i, FIP_i, BSF_{i, cost})$$

where OUT is output, n is the number of banks, FIP denotes factor input prices, and $BSF_{i, rev}$ and $BSF_{i, cost}$ are bank-specific factors affecting the banks revenue and cost functions, respectively. In addition, if the market is in equilibrium, the zero profit constraint should hold at the market level, so that:

$$R^*_i(OUT^*, n^*, BSF_{rev}) = C^*_i(OUT^*, FIP, BSF_{cost}).$$

Under these conditions, Panzar and Rosse (1987) show that the sum of the elasticities of the reduced-form revenue function with respect to factor prices:³⁷

$$H \equiv \sum_j \frac{\partial R_i}{\partial FIP_{j,i}} \frac{\partial FIP_{j,i}}{\partial R_i}$$

is equal to one under perfect competition, while it is zero or negative under monopoly. Thus, values significantly different from zero or one would indicate monopolistic competition.

The following specification of the reduced-form revenue equation is used for empirical testing:

$$\ln FINR_{it} = \alpha_i + \sum_y (\beta_y \ln AFR_{it} + \gamma_y \ln PPE_{it} + \delta_y \ln PCE_{it}) + \eta \ln OI_{it} + \sum_j \xi_j \ln BSF_{jit} + \sum_j \lambda_j X_{jt} + v_{it}$$

where:

- $\beta_y, \gamma_y, \delta_y$, are set to 0 if quarter t does not belongs to year y
- $FINR$ = ratio of total financial revenue to total assets
- AFR = ratio of annual interest expenses to total funds, or the Average Funding Rate
- PPE = ratio of personnel expenses to the total balance sheet, or the (approximated) Price of Personnel Expenses)
- PCE = ratio of physical capital expenditure and other expenses to fixed assets, or the (approximated) Price of Capital Expenditure
- BSF = Bank specific exogenous factors (fundamentals), lagged one quarter, reflecting differences in risks, costs, and size of the bank:

³⁷ See also Vesala (1995) for a formal derivation.

1. Risk component, proxied by equity (EQ) and loans (LO) ratios, and by the liquidity (CASH) ratio, all normalized by total assets.
 2. Differences in the deposit mix, captured by demand deposits from customers to total customer and short-term funding (DDC).
 3. Size, proxied by total assets (LASSETS).
- OI = ratio of Other Income to the Total Balance Sheet
 - X = time-variant macroeconomic factors such as the reference interest rate (INT) and the inflation rate (INF).

In order to test competition, we use PR's measure of competition, H , defined as the sum of the elasticities of the reduced-form revenues with respect to factor prices, which in our specification corresponds to:

$$H_y = \beta_y + \gamma_y + \delta_y$$

Econometric results

For each country, we estimate the parameter H_y according to our baseline specification, along with one in which we eliminate the time interactions so as to compute a time-invariant H for each country.³⁸

In Table 2, rows 1 and 2 report the estimates of time-invariant H s for private and state-owned banks with and without bank fixed effect.^{39 40} The third row presents the time-invariant H s for private banks using fixed effect. Coefficients differ significantly across countries, with high values for Chile and Brazil to low values for El Salvador and Argentina. Perfect competition ($H = 1$) hypotheses are rejected at the 5% significance level in all cases but Chile using the whole sample without bank fixed effect. For all countries, we reject the monopoly hypothesis ($H=0$) at the 1% significance level in all specification.

For the purposes of this paper, we are interested in controlling for bank type, particularly along the size and ownership dimensions, to illuminate the incidence of concentration and foreign penetration. In addition, the previous findings are underscored by the presence of state-owned banks that, as shown in the previous section, represent in some cases an important portion of the system. Presumably, state-owned banks tend to differ in their pricing behavior from private banks. In particular, we conjecture that, as they are generally not motivated by profit maximization, they should exhibit smaller factor price elasticity than their private counterparts, biasing the results away from the perfect competition outcome. At any rate, different H parameters may be reflecting different private state-owned compositions across countries.

To filter the influence of the presence of state-owned banks and test whether foreign or large banks differ from other private banks, we rerun the specification in row 3 for the

³⁸ Replacing total financial revenue over total assets as our dependent variable.

³⁹ Estimations include all control variables described in the previous section.

⁴⁰ As we mention below, the former is closer to other estimates obtained for developed countries and is presented for comparison.

sub-sample of private banks, with different H for large and foreign banks.⁴¹ We report the p-values of pairwise comparisons between large and foreign banks. Surprisingly, once size and ownership are controlled for, private banks do not exhibit higher than average competitive behavior. The presence of state-owned banks does not appear to be reducing our estimation of H. In addition, with the exception of Costa Rica where state-owned banks play a predominant role and private banks tend to be small, large and foreign banks are associated with higher Hs.⁴²

The time-invariant H computed in column 1 is directly comparable with similar estimates obtained by Bikker and Haaf (2002) for banking sectors in developed markets in 1997.⁴³ Interestingly, our estimates of H for Latin American countries do not differ in range and cross-country variability for those found in more developed countries.

Results from our baseline specification, where H changes over time on a yearly basis, are presented in Table 3. Reassuringly, the results do not deviate noticeably from the constant Hs reported before. Indeed, the parameters tend to move surprisingly smoothly over time.⁴⁴ As before, we rerun our baseline after excluding state-owned institutions. Results are reported in Table 4.⁴⁵ The private sub-sample displays higher Hs in Argentina and Costa Rica, but does not differ from estimations using the whole sample in other cases. At any rate, there appears to be no significant bias from estimating the parameter for the whole system.

As a final remark, unlike in the case of concentration indicators, the presence of bank holdings should underestimate H. For holdings, due to inside transfers, unit costs may not reflect real costs for the unit implying a less than one-to-one sensitivity even though in the case of perfect competition, it biases our estimates downwards. For Brazil, where bank groups comprise an important portion of the system, previous analysis suggests that the competition level in the banking industry is larger than the one suggested by our estimated H.

In sum, while most Latin American banking sectors are far from the perfect competition benchmark, competition estimates do not differ from those computed for developed economies and have remained remarkably stable in recent years, despite the important consolidation that characterizes the period.

⁴¹ Large is defined, with a view to focusing on market power, as those with a market share in terms of total assets of 5% or more. We tried several other thresholds and market criteria (assets and deposits) to control for market share, with comparable results. Alternatively, we could define large banks based on the sample for all countries (e.g., as the 10% largest for the whole set of countries), also measured in terms of total assets (to facilitate a cross-country comparison). As before, the foreign group excludes regional banks.

⁴² As a robustness test we estimate the model using first difference instead of fixed effects. Results do not change even though there is more noise.

⁴³ While Bikker and Haaf (2002) also estimate a time-curve that compounds with H to capture the gradual evolution of competitive behavior, this curve is not pronounced and is often not statistically significant. Molyneux et al. (1994) also presents estimates for five European markets, although their cross-section year-by-year estimation tends to yield highly volatile parameter values.

⁴⁴ While results do not differ qualitatively when we replace macro variables by year dummies, parameters do tend to vary more. The results, available from the authors, are omitted here for conciseness.

⁴⁵ Peru does not have public deposit banks and thus is excluded.

Concentration, foreign penetration and competition

The baseline estimates obtained in the previous section can be used to address the link between competition, on the one hand, and concentration and foreign penetration, on the other, both across time within a country and among countries. It is important to note that the estimated levels of H depend on the specific characteristics of the industry in each individual country, most of which may not be captured by our observable control variables (and fixed effect). Thus, we do not expect that our estimations are fully comparable across countries. On the contrary, our estimates allow us (and are intended) to assess *changes* in the competition parameter vis-à-vis changes in other indicators.⁴⁶

With this in mind, we present a first glance at the data in Figure 3, where we plot changes in H against changes in concentration (HI) and foreign penetration (measured over assets) over the period of analysis. The first thing to note is the fact that, with the exception of Colombia, all banking sectors appear to have moved towards more competition in recent years, suggesting that consolidation has not inflicted serious damage in terms of non-competitive practices.

Second, the figures illustrate the difficulties in drawing consistent results using a small sample of countries and dates. At first sight, one would be inclined to see a negative link with concentration indicators and a positive one with foreign penetration.⁴⁷ However, two out of seven countries in our sample are clear outliers (Colombia and Costa Rica). The case of Costa Rica does not conform with the general pattern in other ways. In particular, while concentration seems to have gone down lately as a whole, the opposite is true for concentration within private banks (see Figure 1b) which represent a growing but still minor portion of the system. On the other hand, consolidation trends in Colombia display two distinct phases: an early opening of the market with new entry and declining concentration,⁴⁸ and a more recent selection process with exit and downsizing of the system, possibly related in part to the economic slowdown.

We take a more rigorous look at these links in Tables 5 and 6. In the first table we present simple correlations between values of our competition parameter H , the two measures of concentration (CR_k and HI) and foreign participation (measured in terms of number of banks and in terms of assets) depicted in the previous section, for each individual banking sector.

⁴⁶ The temptation to use the PR approach to derive cross-country comparisons is apparent in existing empirical studies. In those cases, we should at least separate the cross-sectional and dynamic dimensions through the use of panel techniques, as we do in this paper. The criticism applies to New Industrial Organization models of competition more in general

⁴⁷ The former, in particular, would be consistent with what seems to be the conventional view.

⁴⁸ The process in fact started even earlier, with Laws 45 of 1990 and 35 of 1993, which simplified entry and exit conditions and moved towards a universal banking model. The number of banks peaked in 1995, when it reached 148 institutions. See Uribe (200X) for a detailed account.

Note that the concentration indices used here can be rewritten as a function of both the size distribution and the number of banks.⁴⁹ As a result, they tend to be inversely correlated with the number of banks (or, more generally, with the size of the banking sector, independently of the size distribution), as can be seen from the table, suggesting that both the index and the number of banks should be used if we want to control for the distribution.⁵⁰

Table 5 shows a positive correlation between the number of banks and our competition measure (H). Focusing in the most standard measure of concentration, H and CR, we observe a positive correlation between them and H, although they are not statistically significant. The fact that it is the number of banks rather than the concentration measures what appears to follow the competition parameter more closely, while consistent with the view that a more is better for competition, may also be a cross sectional spurious correlation. This appears to be the case, as indicated by the panel regressions in Table 6. There we report results from selected country fixed effects regression of H on several combinations of concentration and foreign penetration measures, and year dummies. Once we control for country fixed effect and time trend, we find a positive correlation between our competition measure and all concentration index (measured as number of banks, the Herfindahl and the CK₅ and CK₃ indices, all of them over assets). Foreign penetration, in turn, remains positively correlated with H and is significant at 15% in two specifications. The results, while still weak, suggest that foreign penetration, if anything, led to *more* rather than less competition in Latin American banking sectors. Finally we do not observe any negative relationship between concentration and competition level.

As mentioned, these results should be taken with caution in those cases in which concentration measures may be biased by the presence of multibank holdings that may make the consolidation trend even steeper. However, the sign of the basic correlations unveiled in this section should remain unaltered.

What is behind this somewhat unexpected result? While the answer exceeds the purpose of this paper, the point is not unrelated to the policy discussion that follows and, as such, deserves some elaboration. We can think of two candidate explanations to account for these findings. On the one hand, it was recognized that, before consolidation, Latin American banking sectors were characterized by an overpopulation of banks, many of them specialized in niches on which they have some market power despite their relative size.⁵¹ Thus, concentration levels at the beginning of the period may have been suboptimally low (particularly if we take into account the very limited size of the domestic market), in association with high entry costs and protection from foreign competition that resulted in overall inefficiencies and, to some extent, cartelization of the market.⁵²

⁴⁹ For example, the HI can be rewritten as $HI = (\mu_2 + 1) / n$, where μ_2 is the variation coefficient of the size distribution, and n is the number of banks.

⁵⁰ For this reason, we include the number of banks as an additional control in the regressions that follow.

⁵¹ The fact that specialized banks tend to enjoy greater market power has been pointed out by the banking literature. See, e.g., Petersen and Rajan (1995).

⁵² Using a different approach, Levine (2000) makes a similar argument for the case of Chile: concentration levels are not high compared with those in developed countries. In addition, using survey data on

On the other hand, as noted, the nature of the link between concentration and competition depends on the underlying factors driving the consolidation of the sector. For instance, the introduction of ATM networks, by reducing product heterogeneity across banks, may have eliminated the scope for non-competitive rents. The federalization of liquidity services that ensued, with large national banks competing with local banks in small provincial cities, is a good example of the latter.^{53 54}

We can conclude that the consolidation process, which led to concentration levels that are not above international standards, did not impinge on the competitive environment, and may have even enhanced it through a shift toward more homogenous universal banks that compete with each other in most banking product markets. Indeed, mere size considerations would indicate that the consolidation trends are not over in Latin America, and open the question about the approach that policymakers should adopt in the future.

V. Policy Discussion

The fact that consolidation has so far been indifferent or even beneficial for competition does not imply that we should not be concerned with increased concentration at all; nor should we disregard competition considerations in the event of further concentration, an outcome that, as noted, appears to be highly likely.

Underlying the process of consolidation reported in the paper are a number of common features that characterized the policy approach to changes in the banking sector. The two most salient issues are the increase in the regulatory burden, both as a result of increasing international (Basle-oriented) standards and the cautionary effects of recurrent regional financial crisis, and the prevalence of financial stability considerations in the shaping of regulation and authorities' reaction to mergers and acquisitions within the system.

In this section we briefly review these two issues, to draw some preliminary policy conclusions on how pro-competition policies should interact with financial stability policies in order to balance financial soundness and efficiency considerations. We conclude that, unlike in the past when financial stability considerations outweighed competition concerns, future mergers and acquisitions should assign greater importance to its competition effects, and should consequently require a coordinated effort of the competition and financial supervision authorities.

Regulation and market structure

competition for the economy as a whole, he finds no evidence of a cross-country correlation between concentration and competition.

⁵³ The consolidation that followed the elimination of branching restrictions in the U.S. is a standard example of how product homogenization may induce more competition and a fewer number of banks at the same time. On this, see, e.g., Keeley (1990) and Economides (199X).

⁵⁴ A third possibility, namely increased competition, which has been the consequence of the privatization of public banks in some of the countries in our sample, is at odds with the lack of evidence of a significant difference in behavior between public and private institutions.

The current consolidation trends are not independent, in many cases, of the recent implementation of stricter prudential norms, both as a result of changes in international standards and as a response to episodes of financial distress. In particular, there are a number of fronts in which more stringent regulation contributes to concentrate the market in large diversified and well-capitalized institutions.⁵⁵

For example, it has been noted that the increase in risk-weighted capital to asset ratios favor large (foreign) banks inasmuch as they tend to have better access to capital and concentrate in lower risk clients (with consequently a lower requirement). While this portfolio bias may not be general, it is true relative to smaller local (provincial, cooperative) banks specialized in relationship banking and small- and medium-sized firms.⁵⁶ The same can be said of the tendency, in financially dollarized economies, to require increasing liquid asset requirements to compensate for the limited lender of last resort capacity.⁵⁷

In addition, in some cases the concentration thrust was fueled by the lifting of restrictions on banks' activities and entry conditions. A regulatory move towards universal banking during the last decade can be seen, for example, in Brazil and Colombia, leading to mergers of banks and non-bank financial institutions controlled by the same group.⁵⁸

The relaxation in foreign entry restrictions, in turn, while initially feared based on excessive competition arguments, was curiously triggered by financial crisis as a way to induce well capitalized foreign institutions to absorb insolvent domestic ones in order to prevent massive bank closures.⁵⁹ At any rate, entry conditions have been mostly equalized between domestic and foreign capital, with the latter typically allowed both in the form of a foreign branch or as a subsidiary institution.

This last point is not trivial when it comes to competition. Foreign banks are often perceived as implicitly guaranteed by their parents, and thus tend to enjoy lower funding rates and a privileged position to gain market share at low cost. This can certainly foster internationalization beyond what can be accounted by greater access to international capital in financially constrained countries. However, while the extent of this guarantee is unclear, it certainly differs whether the bank is a branch of a foreign institution (in which case it shares responsibility with the parent) or a subsidiary (in which case, the guarantee does not exist beyond the reputational cost of letting a similarly-named subsidiary fail).⁶⁰

⁵⁵ The Appendix table presents a brief survey of the main regulatory aspects in selected Latin American countries.

⁵⁶ Schargrodsky and Sturzenegger (2000) present evidence of the gradual disappearance of specialized banks in Argentina *pari passu* with the introduction of stricter requirements after the Mexican crisis.

⁵⁷ Apart from those countries surveyed in the Appendix, we should note the high liquidity requirement in formally dollarized El Salvador and Ecuador, as well as in financially dollarized Uruguay.

⁵⁸ See Sampaio (2001) and Uribe (200X).

⁵⁹ We come back to this below when we discuss the approach to mergers and acquisitions.

⁶⁰ Interestingly, banks tend to differ in the extent to which they exploit the name of the parent. In most cases of foreign acquisitions in the form of a subsidiary, the parent attaches their names to the former name of the local bank, as a way of retaining part of the local brand name value and hint at an internationally

In light of this, the fact that regulations do not distinguish between the two and do not require the bank to do that clearly to their clients is rather puzzling.

Associated with the surge of foreign penetration in post-crisis periods there was in many countries a move toward privatization of state- and province-owned banks, often seen as a source of vulnerability due to political favoritism and unprofessional management. Conditions imposed by multilateral financial institutions or even the supervisory authority when dealing with troubled state-owned banks have deliberately induced concentration through mergers or through purchase by an incumbent bank.

Mergers and acquisitions

A good illustration of the financial bias discussed above is given by the extent to which competition concerns played a role in the analysis of mergers and acquisitions (M&A), and whether there is in place a regulatory body and institutions that may cope with the problem should these concerns arise in the future.

A rapid survey of the context in which the majority of M&A took place in Latin American countries indicates that, with minor exceptions, considerations of potential competition problems play second fiddle to questions related to the stability of the financial sector, particularly in those cases in which M&A were contemporary (and event triggered) by episodes of financial disarray.

For instance, a perfunctory analysis of the evolution of the banking sector in Brazil reveals that concentration and internationalization went hand in hand with a deliberate attempt by the Brazilian government to bring new capital to distressed institutions, through their acquisition by either solvent domestic banks or by well-capitalized foreign banks. This was reflected in a number of incentives, above all those associated with the PROER, which assisted bank acquisitions with credit lines.⁶¹ Indeed, the opening of the sector to foreign institutions was conditioned on privatization or acquisition of troubled banks.⁶² As a result, “existing bank problems induced a preference for keeping the system stable, leaving the principle of defending competition unattended” (Coutinho and Oliveira, 1999, see ref, in Sampaio, 2001).⁶³

The same picture appears in the case of Colombia; the Superintendence of Banks is in charge of assessing and approving a merger proposal, and financial solvency and stability

backed institution. On the other hand, international banks that choose to operate as a branch tend to rapidly drop the old bank's name.

⁶¹ Starting in July 1994, a successful inflation stabilization program (the Real plan) inflicted a considerable blow to the Brazilian banking sector that depended to a large extent on inflationary transfers (or “float”) as a source of income, which, according to Sampaio (2001) dropped from around 4% of GDP between 1990 and 1993 to 2% of GDP in 1994. This combined with the spillover of the Mexican crisis to put the banking sector under considerable stress.

⁶² Only invoking the interest of the Brazilian government could authorities bypass at the time the impediments previously imposed to expansion of foreign participation.

⁶³ The first exception to this rule occurred in end-1998 with the acquisition of Banco Real by ABN Amro.

considerations clearly outweigh competition considerations, which limit to a quantitative cap of 25% the new bank's market share in their operating markets.

Financial stability criteria have been predominant also in the Argentine case, where consolidation and foreign participation were part of the strategy of the central bank to cope with banking distress in the aftermath of the Mexican crisis.⁶⁴ To our knowledge, competition concerns never entered in the discussion of a M&A.

It is important to note that the financial bias when dealing with M&As in the banking sector, which characterizes many Latin American countries, does not imply that competition concerns are not voiced or dealt with in general and that a competition authority is lacking. On the contrary, what we want to stress is that the competition authorities (deliberately or de facto) abstain from intervening in banking matters, *even in tranquil periods*.⁶⁵

Chile is in this respect a singular case in that it has been spared episodes of financial distress in recent years. As a result, it appears to be a country in which anti-trust studies have relatively more say in the approval of M&As. The country witnessed its two most important mergers very recently. In 2001, Banco Santander merged with its controlled Banco Santiago to represent at the time about 28% of total assets. Interestingly, the profits in 2001 of the resulting institution represented 36% of total profits of the system, a fraction significantly above its market share. While this triggered some mild domestic resistance to the deal, a study by the Anti-trust Commission did not present objections. With this precedent, in 2002 two banks, representing about 20% of total assets, proceeded to merge.⁶⁶ Thus, currently, half of the assets of the banking sector belong to the two largest banks. Besides the standard competition fears, recently there has been some debate about the way in which a concentrated banking sector affects the central bank's capacity to conduct monetary policy. More precisely, some analysts argue that insensitive interest rates conspired against the Chilean Central Bank's attempt to act countercyclically in the face of the recent recession.

In sum, financial stability considerations may have not only underscored by also stimulated concentration, in line with the view that domestic banking sectors were plagued by too many banks that were too small, too inefficient, or both. As a result, it is not surprising that little if any attention was paid to issues related with competition and distribution of access to credit, to which we turn next.

Consolidation, internationalization and the distribution of credit

There is a question about the impact of concentration and foreign penetration on particular sectors or credit types at the cost of the rest. In particular, large as well as

⁶⁴ This was also the case in tranquil times. The Argentine crisis resolution scheme relies heavily on asset separation and sale of the failing bank.

⁶⁵ Such is the case, e.g., of the Argentine Secretary of Competition Defense, which has successfully acted against non-competitive practices in other concentrated industries.

⁶⁶ Both banks were controlled by the same group at the time of the merger.

foreign banks are usually believed to favor prime clients at the expense of small and medium businesses, and tradable producers at the cost of credit to non-tradable producers and real estate and consumer loans. Previous empirical studies, however, seem to contradict this view.⁶⁷

Despite our positive results regarding competition, our data does not discriminate across sectors and thus does not allow us to study the sectoral distribution and its determinants. A perfunctory look at concentration indicators for different types of loans does not unveil a significant concentration in one of these sectors.

However, the issue of distribution merits a more rigorous study. The obvious way to go about it would be to disaggregate loans and interest rate data according to variables such as sector, size, and location of the borrower, as well as some indicator of the borrowers' risk class.⁶⁸ In the absence of this data, one could alternatively try to loosely relate different credit categories to different types of borrowers. For example, credit lines, usually associated with the funding or working capital of small- and medium-sized businesses, could be used as a proxy for credit access for this sector; mortgage and consumer loans could proxy long- and short-term loans to individuals; pledge loans, typically longer-term loans, could be associated with large businesses, and, finally credit to the public sector could be used to test the presumption that large banks tend to display a preference towards safer public bonds as opposed to riskier credits.

At any rate, and despite some existing studies, the issue of distribution is still open and a recurrent source of concern, notably in the context of the discussion of the privatization of public, specialized banks. Analyzing the pattern of specialization can test the hypothesis that concentration and foreign penetration have reduced access to credit from specific borrowers. The issue is further complicated, however, by the presumption that new players tend to change the composition of their supply as they gather information about the market and build track records of their clients. In general, in contrast with the visibility this issue tends to have in the media, there appears to be a significant vacuum in the empirical analysis of credit distribution that needs to be filled primarily by the competition authority.

As a final remark, the policy discussion cannot ignore the question about the optimal distribution of credit. More precisely: even in case a sector has been disfavored by the new composition of the banking industry, how do we know whether the distribution of credit supply before consolidation was to be preferred? If not, restricted access for some sectors (e.g., characterized by higher but previously mispriced risk) may end up being an enhancement rather than an undesired by-product.⁶⁹ Moreover, how should we factor in a potentially harmful effect of credit incentives (if directed towards riskier borrowers) on the stability of the sector, whose cost only becomes visible when a crisis erupts? All this

⁶⁷ See, e.g., Clarke et al. (2002).

⁶⁸ While supply and demand effects in equilibrium values could be identified through interest rates, the informational requirement of such a study, which would require data on flows rather than on stocks of loans, is certainly not trivial.

⁶⁹ Naturally, the problem relates to the presence of market imperfections (absent which the unregulated market equilibrium would lead to the optimal resource allocation).

leads us to conclude that the question of distribution needs to be pondered very cautiously.

Are some markets more collusion-prone than others?

Just because there is no overall indication of monopolistic competition does not imply that monopolistic practices do not appear in particular markets. Systemic empirical analysis is too broad to detect this behavior, which should be examined recurrently by the competition authority. Moreover, as opposed to the case of M&A, financial stability criteria have a more limited role to play when competition in particular markets is at risk.

One can think of many examples of specific products for which concentration increases dramatically and may lead to tacit collusion. Credit card interest rates, for example, are always under suspicion; this is not surprising given that typically there is a limited number of issuing banks. Access to ATM networks is another potential source of non-competitive practices, due to network externalities.

Location is a natural barrier, particularly in sparsely populated regions. In the absence of competition from large national banks due to economies of scale, small regional banks serving the area may enjoy significant rents. In this case, concentration, by reducing the number of small banks potentially serving the region, may substantially increase the market power of the remaining banks.⁷⁰

All things considered, while a competition authority should conduct periodic studies on each of the distinct markets in which banks operate, it has to bear in mind that in most cases competition should be measured against national standards. International comparisons based on crude indicators, while useful to assess systemic *trends*, may be misleading if applied at face value to evaluate the *level* of competition within specific markets. Thus, the competition authority has to develop its own standards, including the approach to measure the relevant markets and the criteria on which action should be taken.

Policy actions: Balancing financial stability and pro-competition considerations

As noted, cooperation between competition and regulatory bodies in Latin American countries has been rare. Competition concerns have taken the lead only in the most developed of these markets and in the absence of financial unrest. Thus, while thorough competition studies are starting to be conducted in Brazil, Chile and Mexico only recently, in other cases these studies have faced limitations due to lack of technical capacity or overwhelming financial considerations.

It has been long acknowledged by the profession that the banking sector enjoys a particular status as an industry, due to its high leverage ratio, its systemic impact on the

⁷⁰ Underservicing of low population areas is indeed one of the strongest arguments for the disciplining presence of a public bank. The argument does not imply, however, that the prices set by the public bank are indeed closer to the social optimum.

real economy and its interrelations within the industry (both through the interbank market and the possibility of contagion effects). As a result, it is not only the most regulated industry but also one in which regulation is based on both anti-trust and prudential considerations. This poses a problem regarding the body that should oversee competitive practices in this case. If the task is left to the supervisory agency (the central bank or the superintendence of banks) it is likely that competition aspects will be dominated by prudential aspects. On the other hand, any competition-related policy action would have to weigh its prudential implications.

As a result, close coordination between the competition and the supervisory bodies appears to be the best way to balance both aspects. In the particular case of Latin American banks, where this balance is tilted towards prudential issues, this recommendation would translate into a strengthening of the analytic capacity of the competition authority and even more participation in the evaluation of M&A and other market practices in the sector.

VI. Conclusions

In this paper, we examined the evolution of concentration and foreign penetration in selected Latin American banking sectors in recent years. While in most cases concentration and foreign participation increase substantially, this does not appear to have given rise to a less competitive industry. We find that competition measures remained stable or improved, and that there is some (albeit weak) evidence that consolidation may have had a beneficial effect in this respect. Therefore, we did not think that market consolidation should be taken as an indication of a deterioration of the competitive environment.

Given that, despite these developments, there is still a relatively large number of banks when measured against domestic market depth, it is likely that the consolidation process will continue in most countries, mirroring a trend also apparent in developed economies. Market consolidation was to a great extent triggered by episodes of financial distress and, as a result, competition concerns have played a secondary role to prudential issues. In line with this, we argue in favor of a closer coordination between supervisory bodies and the competition authorities, to strike a balance between prudential and competition aspects.

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Table 1
Applications of the PR model to banking competition

	Period	Banking sectors studied	Results
Shaffer (1982)	1979	New York	Monopolistic competition
Nathan and Neave (1989)	1982-1984	Canada	Perfect competition (1982); monopolistic competition (1983- 1984)
Lloyds-Williams et al. (1991)	1986-1988	Japan	Monopoly
Molyneux et al. (1994)	1986-1989	France, Germany, Italy, Spain, United Kingdom	Monopoly (Italy); monopolistic competition (France, Germany, Spain, UK)
Vesala (1995)	1985-1992	Finland	Monopolistic competition for all but two years
Bikker and Groeneveld (2000)	1989-1996	EU – 15 countries	Monopolistic competition
Coccorese (1998)	1988-1996	Italy	Monopolistic competition
Rime (1999)	1987-1994	Switzerland	Monopolistic competition
De Brandt and Davis (1999)	1992-1996	France, Germany, Italy	Large Banks: monopolistic competition in all countries Small Banks: monopolistic competition in Italy, monopoly in France and Germany

Table 2
Estimates of time-invariant H

	Method	Coefficient	Chile	Argentina	Brazil	Colombia	Costa Rica	Peru	Salv
All Banks	OLS	H	0.959*	0.546*a	0.911*a	0.753*a	0.806*a	0.758*a	0.3
	FE	H	0.849*a	0.470*a	0.850*a	0.676*a	0.675*a	0.641*a	0.4
Private Banks	FE	H	0.852	0.500	0.875	0.686	0.721	0.641	0.4
	FE	H	0.828*	0.490*	0.835*	0.695*	0.753*	0.631*	0.2
		H Large Banks	0.019	0.035*	0.063*	0.015	-0.101*	-0.009	0.0
		H Foreign Banks	0.065*	0.005	0.062*	-0.027	-0.110	-0.012	0.6
		P-value	HLB=HFB	0.215	0.027	0.962	0.404	0.902	0.815
Period			94-02	95-02	94-02	94-02	95-02	93-02	97

Note: * significant at 5%; ** significant at 1%. a different from 1 at 5%, aa different from 1 at 10%.

H Large Banks and H Foreign banks measure the deviation from private small bank in the system.

All tests based on robust standard errors.

Table 3
Estimates of time-varying H – All banks
(baseline specification; all banks)

	Argentina	Brazil	Chile	Colombia	Costa Rica	Peru	El Salvador
1993						0.483	
1994		0.725	0.852	0.618		0.511	
1995	0.356	0.751	0.910	0.552	0.677	0.510	
1996	0.405	0.784	0.897	0.521	0.684	0.487	
1997	0.415	0.816	0.893	0.516	0.682	0.500	0.340
1998	0.418	0.826	0.802	0.570	0.694	0.523	0.308
1999	0.396	0.827	0.878	0.529	0.712	0.548	0.337
2000	0.401	0.820	0.839	0.541	0.693	0.542	0.358
2001		0.811	0.848	0.516	0.693	0.572	0.417
2002		0.831	0.874	0.552	0.701	0.559	0.348
Average	0.398	0.799	0.866	0.546	0.692	0.523	0.351
Period	1994- 2002	1995- 2000	1994- 2002	1994- 2002	1995- 2002	1993- 2002	1997- 2002

All tests based on robust standard errors.

Table 4
Estimates of time-varying H – Private banks
(baseline specification)

	Argentina	Brazil	Chile	Colombia	Costa Rica	El Salvador
1993						
1994		0.749	0.851	0.620		
1995	0.402	0.789	0.914 ^a	0.547	0.745	
1996	0.445	0.805	0.901 ^a	0.518	0.757	
1997	0.462	0.836	0.898	0.507	0.733	0.349

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1998	0.461	0.853	0.804	0.562	0.728	0.345
1999	0.449	0.860	0.880	0.511	0.749	0.318
2000	0.451	0.849	0.841	0.524	0.731	0.336
2001		0.843	0.849	0.496	0.733	0.419
2002		0.868	0.881	0.492	0.728	0.398
Average	0.445	0.828	0.869	0.531	0.738	0.361
Period	1994- 2002	1995- 2000	1994- 2002	1994- 2002	1995- 2002	1997- 2002

The subscript indicates that the hypothesis $H = 1$ (perfect competition) cannot be rejected. All tests based on robust standard errors.

Table 5
Concentration, foreign penetration and competition measures - Correlation matrix

	H	H (private banks)	CK ₅	CK ₃	HHI (assets)	HHI (loans)	FP (assets)	FP (loans)	Log number of banks
H (total)	1.000								
H (private)	0.990 (0.000)***	1.000							
C5	-0.202 (0.133)	-0.175 (0.192)	1.000						
C3	-0.209 (0.118)	-0.178 (0.185)	0.992 (0.000)***	1.000					
HHI (assets)	-0.214 (0.111)	-0.184 (0.171)	0.974 (0.000)***	0.978 (0.000)***	1.000				
HHI (loans)	-0.152 (0.258)	-0.151 (0.264)	0.923 (0.000)***	0.903 (0.000)***	0.867 (0.000)***	1.000			
FP (assets)	0.192 (0.152)	0.166 (0.217)	-0.313 (0.014)***	-0.374 (0.003)***	-0.383 (0.002)***	-0.191 0.141	1.000		
FP (loans)	0.085 (0.532)	0.060 (0.659)	-0.261 (0.042)**	-0.318 (0.013)**	-0.332 (0.009)***	-0.170 (0.190)	0.983 (0.000)***	1.000	
log(banks)	0.326 (0.013)**	0.376 (0.004)***	-0.580 (0.000)***	-0.532 (0.000)***	-0.625 (0.000)***	-0.561 (0.000)***	0.071 (0.588)	0.042 (0.750)	1.000

p-values in parentheses.

Table 6
Concentration, foreign penetration and competition indicators – Panel regressions

	H	H(Private)	H	H(Private)	H	H(Private)	H	H(Private)
Banks (ln)	-0.163 (2.26)**	-0.173 (2.31)**						
Foreign Penetration	0.049 (0.57)	0.134~ (1.50)	0.036 (0.42)	0.114 (1.27)	0.022 (0.29)	0.101 (1.27)	0.045 (0.57)	0.128~ (1.54)
HHI (Assets)			0.487 (1.81)*	0.647 (2.58)**				
CK5 (Assets)					0.229 (1.90)*	0.267 (2.20)**		
CK3 (Assets)							0.226 (2.12)**	0.266 (2.46)**
Observations	57	57	57	57	57	57	57	57
R-squared	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98

Robust t-statistics in parentheses

~ significant at 15%; * significant at 10%; ** significant at 5%; *** significant at 1%

Figure 1
Concentration, Foreign Penetration and Competition Indicators
(changes over the period of analysis; in percent)

