Bank consolidation and credit concentration
in Brazil (1995-2004)

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Since monetary stabilization in 1994, bank consolidation has been gathering pace in Brazil as part of a global concentration trend following bank deregulation processes. This article analyses the effect of bank concentration on lending in Brazil in the period 1995-2004, distinguishing two stages and estimating panel data for Brazil's 27 federative units. The results support the hypothesis that the process of consolidation in the Brazilian banking sector has an adverse effect on lending, which mainly harms the less developed regions of the country.

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I

Introduction

Since monetary stabilization, the Brazilian banking system has consolidated rapidly, as part of a global trend of concentration in the banking sector, mainly driven by greater deregulation. From the theoretical standpoint, there are two contradictory ways to explain this phenomenon. The first argues that consolidation occurs because some institutions are more efficient than others, which encourages mergers to obtain scale advantages. In this case, consolidation benefits consumers, since it is founded on greater institutional efficiency. The other approach argues that bank mergers and acquisitions aim at obtaining greater market power, which is bad for consumers because they will have to pay more for banking services.

In the case of Brazil, the loss of inflation-generated profits has encouraged consolidation of the sector. The process has also received official support from the Government, through mechanisms such as the Incentive Programme for the Restructuring and Strengthening of the National Financial System (PROER), and the Programme of Incentives to Reduce the Presence of the State Public Sector in the Banking Activity (PROES), which aimed at making the banking system less vulnerable to shocks. Two types of concentration have been seen in Brazil since 1994: (i) a geographic concentration of bank branches; and (ii) a reduction in the number of banks as a result of merger and acquisition processes, compounded by liquidations and regional concentration.

This process has not gone unnoticed, not is it without major repercussions on the economy. Several international studies have sought to define the relation that exists between financial development and economic growth (Levine, 1997; Matos, 2002). Theoretical arguments have been put forward suggesting that financial system development has a positive and significant effect on economic growth; and there is evidence that such development also boosts the growth rate of the Brazilian economy in particular (Matos, 2002; Araújo and Dias, 2006).

The aim of this paper is to analyse the effect of the bank concentration process on lending in Brazil. For that purpose, in addition to a statistical analysis of banking-sector data and a review of articles published on this subject, panel data were estimated for the country's 27 federative units in the period 1995-2004, for the purpose of identifying the effects of the dynamic of bank concentration on lending at the regional level. The results support the hypothesis that bank concentration in Brazil between 1995 and 2004 had adverse consequences for credit: the absence of banks and branches, or a reduction in their number, has resulted in less lending. Lack of information makes it impossible to analyse this phenomenon for years later than 2004, in which lending in Brazil grew generally despite remaining well below the international average.

This article consists of five sections. Section II makes a brief review of theoretical studies of the relation between the financial system and economic development; and it outlines the process of consolidation in the banking sector and highlights a number of key factors in lending decisions. Section III analyses the case of Brazil, identifies the period of time in which the bank concentration process was most in evidence, along with the main characteristics of the process and its effects on lending. Section IV sets out the empirical results of the proposed model. Lastly, section V puts forward a number of conclusions.

II

The banking system and lending: theory
and evidence for the case of Brazil

Financial development and its relationship with general economic development have long aroused the interest of a variety of authors.[1] The question is whether economic development generates financial development, or whether the causality runs in the opposite direction. There is no consensus on this topic, and there may even be dual causality. Nonetheless, it is generally agreed that credit plays a crucial role in economic development.

Levine (1997) analyses the factors that promote the emergence and development of the financial system, along with its effect on economic development. The author points out that transaction costs, including the cost of obtaining information, create the incentives needed for financial markets and institutions to emerge. Such institutions have the following key functions: (i) to facilitate transactions, providing risk protection and diversification; (ii) to allocate resources; (iii) to supervise managers and exert corporate control; (iv) to mobilize saving; and (v) to facilitate trade in goods and services.

Through these functions and capacities, the financial system alters the rate of saving and redirects it to a diverse range of capital assets, thereby promoting capital accumulation. To fulfil such functions, banks have to make assets liquid and also provide information (Neuberger, 1997). This definition shows that the uncertainty associated with the capacity to convert assets into means of payment generates liquidity risk.[2]

Matos (2002) found evidence of a positive, causal and one-way relation in Brazil between financial development and economic growth. In another study, Araújo and Dias (2006) formed a model in which economic growth is a function of the capital stock and monetary variables such as bank reserves. Increases in the interest rate and inflation tax have a negative but non-permanent effect on the rate of growth of GDP, while an increase in bank reserves permanently reduces the economy's growth rate. In other words, the stock of bank reserves, calculated on the basis of regulation by the monetary authority and financial agents' expectations, has a permanent effect on the economy's growth rate.

By generating a demand for deposits and choosing an appropriate combination of investments, banks offer savers a climate of security with respect to liquidity risks, while simultaneously facilitating long-term investments in more profitable projects. They also make a major contribution to the effective functioning of the economy. In contrast, the concentration process directly affects lending, particularly in the less developed regions. There are two explanations for this: (i) the structural hypotheses argues that mergers and acquisitions are motivated by the purchaser's desire to gain market power and thus increase its profit margins; and (ii) the efficiency hypothesis suggests that, in a competitive environment, firms that manage to reduce their costs and increase their profits gain market share and thus increase their production scale; they therefore take over less efficient firms, introduce better management practices and thus increase their own profits.

With regard to concentration, De Paula and Marques (2004) list the factors driving this process worldwide: (i) deregulation of financial services; (ii) greater openness of the banking sector to international competition; (iii) technological progress; and (iv) changes in business strategy. Banks pursue consolidation to obtain economies of scale and scope, increase their profitability and extend their monopoly power. The objectives indicated in the two hypotheses are thus likely to be mixed.

In the debate over the degree of concentration of the banking system, the aim is to strike a balance between systemic stability and competitiveness. The greater the level of concentration, the larger banks will be and the more diversified their activities; consequently, the banking system will be more stable and less fragile in the event of a crisis (Beck, Demirgüc-Kunt and Levine, 2006, p. 1584). Moreover, greater concentration can

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[1] These include Levine (1997), Rajan and Zingales (1998), Demetriades and Hussein (1996), Arestis and Demetriades (1997) and Jayaratne and Strahan (1996).

[2] For Keynes (1992: pp.138), *"Liquidity preference is a potentiality or functional tendency, which fixes the quantity of money which the public will hold when the rate of interest is given."* Moreover, the necessary condition for liquidity preference to serve as a means of conserving wealth is uncertainty about the future interest rate. Accordingly, in periods of great uncertainty, the premium on relatively more liquid assets will rise in relation to less liquid ones.

increase the banks' market power, thus boosting their profits. Lastly, with fewer banks it is easier to supervise the system. Greater market concentration facilitates the task of systemic supervision and inspection; and less competition, arising from concentration, would be expected to reduce the risk of bank failures and systemic financial crises.

While the bank consolidation process affects lending, it is not the only factor. Banks manages their assets with a view to forming the best possible portfolio of securities within their expectations, both for the economy and in terms of returns on assets, seeking to balance liquidity and profitability (De Paula and Alves Jr., 2003; Baum, Caglayan and Ozkan., 2004; Blum and Nakane, 2005). According to Keynes (1992), conventional behaviour plays an important role in the formation of expectations.

Nonetheless, as pointed out by Minsky (1986), the greater and more permanent is economic growth, the more fragile the financial system will tend to be in times of crisis. Like any other economic agent, banks prefer liquidity, and this preference becomes accentuated when the future is more uncertain.[3] Thus, when the economy is growing, expectations become increasingly positive and banks start to make more audacious loans, reducing their lending requirements and extending more risky credit.

Apart from the effects of economic circumstances on lending and the analysis banks make of their customers and projects, the effect of the credit regulatory framework should not be ignored, nor the capital requirements imposed on banks operating in the Brazilian market, as a result of the adoption of the Basel Agreement.

In any event, the fact that credit has a positive effect on the economy is clear, and this makes it particularly important to analyse the consequences of bank concentration on lending. Banks in Brazil account for 96% of the financial system, although the credit/GDP ratio is lower than in other countries. The latter reveals the possibilities for credit growth in the country as a whole (IPEA, 2006). According to Meirelles (2006), the credit/GDP ratio in Brazil is roughly 30%, whereas in Chile it is 60% and in Germany it is above 100%.

III

Bank consolidation and concentration in Brazil

The bank consolidation process in Brazil, which gathered pace in the mid-1990s, began in 1988 when the National Monetary Council created the full-service bank (*banco múltiplo*) modality. In addition, following the stabilization process in 1994 and deregulation of the sector, the consolidation process was driven by additional bank concentration factors, such as the price stabilization process, the privatization program among State-owned banks and affiliation to the Basel Agreement.

Two simultaneous phenomena can be detected in the process of bank concentration in Brazil: geographic concentration of bank branches; and a large number of mergers, acquisitions and liquidations.

The first of these phenomena is related to the guidelines issued by the monetary authorities, which have been amended in recent years, particularly in the early 1990s. In the early 1980s, the Central Bank of Brazil pursued a goal of extending bank services to all municipalities in the country, improving services in municipalities with less support, and adopting bank regionalization measures. When this policy was later abandoned, as banks had to cut costs following the disappearance of inflation-generated profits, they began to redistribute their branches.[4]

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[3] The concept of liquidity preference as a defence against uncertainty is theoretically different from the concept of information asymmetry proposed by Stiglitz and Weiss (1981).

[4] At the present time, to provide banking services in less developed regions, banks work through other institutions, such as lottery houses and post offices, as part of a process known as *"bancarização"*. Through Resolution 2707, the Central Bank of Brazil authorised full-service banks with a commercial portfolio, commercial banks and the Federal Savings Bank (*Caixa Econômica Federal*) to hire firms as correspondents to supply the following services: reception and processing of applications to open demand, time and saving deposit accounts; reception and payments relating to demand, time and saving deposit accounts, together with investments in and withdrawals from investment funds; reception and payments arising from service agreements signed by the contracting party in accordance with current regulations; active or passive execution of payment orders on behalf of the contracting party; reception and processing of applications for loans and financing; credit analysis and property registration; execution of security collection; other control services, including data processing and operations as agreed upon, together with other activities at the discretion of the Central Bank of Brazil.

In addition, in the 1980s the banking system underwent two processes that significantly shaped its structure and fuelled the merger and acquisition phenomenon: the use of publicly-owned State banks to refinance the debts owed by federative units; and the inflationary process (Corrêa, 2006).

With regard to the inflationary process, the Real Plan cut off the main source of banking system profitability at that time, namely a floating currency. Stabilization forced the banking system to rationalize its costs, close branches, lay off staff and invest more in automation (Corrêa, 2006; Vilhena and Sicsú, 2006). In addition to the loss of earnings from inflation, publicly-owned State banks were confronting management problems. These changes in the economic environment of the Brazilian banking sector, in conjunction with the consolidation process that was already underway across the world, gave rise to a far-reaching restructuring of the system. In the same period, Brazil signed the Basel Agreement, with a view to stengthening the soundness of the financial sector; and it endeavoured to strengthen its banking sector against the risk of systemic crisis.

This restructuring was promoted by PROER and PROES,[5] set up in 1995 and 1996, respectively, and the Credit Guarantee Fund (FGC) (Corrêa, 2006). In addition, in 2001 the Federal Financial Institutions Strengthening Programme (PROEF) was created, under which the National Treasury took over part of the debts owed by the four banks controlled by the Federal Government: Banco do Brasil, Caixa Econômica Federal, Banco da Amazônia (BASA) and Banco do Nordeste (BNB). In addition, the Caixa, BASA and BNB each received an injection of funds.

In the early 1990s, of the 27 federative units, only the States of Tocantins and Mato Grosso do Sul had no State-owned commercial bank within their borders. It is easy to identify the effects of PROES and the privatization and liquidation processes. In 2002, only the States of São Paulo, Sergipe, Rio Grande do Sul and Espírito Santo still had a commercial bank under

their control. In addition, the Federal Government had taken over the State banks of Ceará, Piauí and Santa Catarina with a view to privatization, which was actually accomplished in 2005 with the Ceará State bank (Freitas, 2005).

Apart from this, several State development banks ceased to exist; some of them were absorbed by other State banks before privatization, while others simply closed down or were turned into development agencies. Several States that did not have development banks created development agencies with the aim of alleviating the lending effects of the lack of publicly-owned commercial banks, and the adoption of industrial and development policies in the region. Nonetheless, this paper only analyses lending by multipurpose banks with a commercial portfolio, commercial banks, and savings banks (*caixas econômicas*). This suggests that the activities of development banks and agencies should be analysed in the future.

It is important to note what happened with public banks in this restructuring process, after State-owned banks practically ceased to exist (see table 1). The reduction in the total number of banks was not linear and was much greater among public banks (about 56%) than among their private counterparts (almost 29%). In 2004, the share of privately owned banks in the banking system was greater than in 1985, while the share of foreign private banks had risen by almost 20 percentage points. The same table shows that privatization is not the only cause of bank consolidation in Brazil. In 1995-2004, the number of private banks dropped sharply, particularly in the first part of the period. The process included acquisitions of major financial institutions such as Banco Nacional, Banco Econômico and Banco Bamerindus, which helps to explain the concentration of assets in the second stage.

It is also interesting to note that the intensity of the process was much greater in the initial stage, especially in the case of publicly-owned banks. Later, although the number of banks continued to decline, the process was slower. Of the 18 public banks that disappeared in 1995-2004, 13 of them ceased to exist before 1999 and five afterwards. In other words, 72% of the reduction in the number of public banks during the period occurred in the first stage. The pattern was similar among private banks, although on a smaller scale. An analysis of the subject of bank concentration shows that the larger-sized banks hold a major share total banking sector assets (Central Bank of Brazil, 2006).

The largest banks have increased their share of the total assets of the banking system. In 1995-1999, only

[5] The main provisions of PROES were as follows: *(i) 100% of resources needed to restore State banks to financial health were made conditional on the privatisation of the institutions in question, or their transformation into development agencies, or else liquidation; (ii) federal assistance was limited to 50% of the resources needed if there was no transfer of shareholder control or transformation into development agencies (the other 50% would be the responsibility of State governments); (iii) the guarantees posted by the States, in the case of federal assistance, would need to be adequate in relation to the amount of loans; in the event of nonfulfilment, the States authorised creditors to withdraw the amount corresponding to their deposit bank accounts* (De Paula and Marques, 2004, p. 15).

TABLE 1

Brazil: number of banks, by type of ownership, at December each year

Banks[a]	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Public	32	32	27	22	19	17	15	15	15	14
Private	210	198	190	182	175	175	167	152	150	150
National[b]	172	157	141	123	110	105	95	87	88	92
Foreign[c]	38	41	49	59	65	70	72	65	62	58
Total	*242*	*230*	*217*	*204*	*194*	*192*	*182*	*167*	*165*	*164*

Source: Central Bank of Brazil, Reports on the evolution of the national financial system.

[a]   Includes full-service banks, commercial banks and savings banks (*caixas econômicas*).
[b]   Includes national banks and national banks with foreign participation.
[c]   Includes banks of mostly foreign ownership and branches of foreign banks.

the 20 largest banks increased their total asset share; and in the following stage, the 20 largest increased their share every year except 2001. Among the five and ten largest banks, the most significant increase in their total asset share in only occurred after 2001, when the share of the five largest banks was the lowest throughout the period analysed.

When the number of banks was shrinking fastest, particularly in the case of publicly-owned banks, the largest institutions did not increase their share of total banking-sector assets. Nonetheless, in the second stage, which coincided with a recovery in the proportion of national private banks in the sector, and in which the decline in the number of banks faltered, the leading banks increased their share of total banking system assets.

It is thus possible to distinguish two stages in this process. In the first (1995-1999), the number of banks operating in the system fell faster, particularly in the public sector. In the second stage (1999-2004), the number of banks continued to decline, but the largest players significantly increased their share of total banking sector assets.

Bank concentration and the need to split the period of analysis into two stages are clearly shown by the concentration indices in the banking sector. Table 2 shows the following indices: Herfindahl-Hirschman (HH), Hall-Tildeman (HT) and Theil enthropy index (T),[6] all three of which show increasing concentration over the period as a whole. In the first stage, however, all three indices clearly show an increase in concentration; whereas in second stage the Herfindahl-Hirschman index and the Theil entropy index show fluctuations,

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[6] For the Herfindahl-Hirschman and Hall-Tideman indices, the value tends to 1 in the case of a monopolistic market structure. In the case of the Theil entropy index, a monopolistic structure is indicated by a value of zero, and the index is closer to 1 the more closely the structure approaches perfect competition. The Theil and Herfindahl-Hirschman indices are the most widely used, since they take account of the relative size of each firm and can be standardised to facilitate conclusions. Nonetheless, it may be impossible to calculate those indices if the size of all enterprises in the sector is unknown, for which reason other partial indices are used such as the sector concentration ratio (Salazar and David, 2005).

TABLE 2

**Brazil: trend in the concentration of bank assets (indices)[a]
between December 1995 and June 2004**

Indices[b]	1995/12	1996/12	1997/12	1998/12	1999/12	2000/12	2001/12	2002/12	2003/12	2004/06
HH	0.0779	0.0789	0.0857	0.0965	0.0924	0.0893	0.0851	0.0906	0.0906	0.0836
HT	0.0408	0.0412	0.0511	0.0555	0.0566	0.0587	0.0585	0.0645	0.0631	0.0617
T	0.6908	0.6923	0.6708	0.6501	0.642	0.6555	0.6652	0.654	0.6734	0.6877

Source: Prepared by the authors on the basis of Araújo, Neto and Salazar (2005).

[a] Refers to total assets.
[b] HH= Herfindahl-Hirschman index. HT = Hall-Tildeman index. T = Theil index

but at the end of the period report a lower level of concentration than in 1999. The Hall-Tildeman index also displays fluctuations, but in 2004 indicated higher concentration than in 1999.

It is worth considering whether bank concentration follows any regional pattern; and in fact the sector consolidation process seems to be very closely related to the Prebisch centre-periphery theory. A study by Alexandre, Tadeo Lima and Canuto (2005) concludes that the concentration of banking activity has become more intensified in the city of São Paulo, and that this appears to be even greater when measured in terms of banking operations rather than the number of branches. A possible explanation for the high degree of bank concentration in São Paulo is local GDP. Corrêa (2006) supports this conclusion by showing that the main financial movements occur in cities with an intense demographic concentration and strong economic growth.

In terms of the number of bank parent companies (hereinafter referred to as head offices), the concentration that exists in São Paulo is clearly visible: at least 50% of bank have their head offices in that city in every year analysed. The State of Rio de Janeiro also is home to a large number of bank head offices, which contributes to their high degree of concentration in the southeast, a region that had 77% of head offices in 1995, but nearly 78.7% of them in 2004. Nonetheless, the percentage in the State of Rio de Janeiro itself dropped sharply from 19% to 14%. It is notable that all bank head offices in the northern region are in the State of Pará, all of those the centre-west region are in the Federal District, and all of them are publicly owned.[7]

Nationwide, the number of bank head offices decreased by about 25%, in the period analysed, and the process was more accentuated after 1998. In 1995, a total of 21 federal units were home to at least one bank head office, and there were 22 in 1996. From 1997 onwards, there was a new process of regional concentration among head offices, such that in 2004, only 14 federative units had one or more bank head office (Central Bank of Brazil, 2006).

Nonetheless, the spatial distribution of economic activity, at least in the case of Brazil, does not seem to be only factor explaining the level and trend of bank concentration; and the relation between GDP share of and the share of credit operations is not direct (Alexandre, Tadeo Lima and Canuto, 2005).

Sicsú and Crocco (2003) study the reasons why a bank locates a branch in a given region. The factors that motivate location of the bank head office are not necessarily the same as determine the location of branches. Agglomeration factors, for example, would have more of an effect on the location of the bank head offices than on branch location. These authors believe that dispersion forces are not yet sufficiently strong to cause activities to be relocated away from the large financial centres; and there is even more reason to doubt their effect on branch location. In the case of head offices, certain labour-market characteristics are probably more important, such as being able to find specialist labour. The same reasoning holds true for the demand for intermediate services and the dissemination of information technologies. In the latter case, branch clustering would not be necessary because head offices can transfer innovations to them.

Three related variables need to be taken into account to explain branch location: (i) demographic factors; (ii) income; and (iii) income distribution. These three factors are positively related to the number of branches existing in a given locality, such that the larger the population and income, and the better the income distribution, the greater will be the expected number of branches.

Nonetheless, although bank concentration exists, it is important to verify whether the market is imperfect.[8] According to Belaisch (2003), Brazil has an oligopolistic banking structure, in which bank earnings benefit from geographic diversification.[9] Nakane (2001) argues that, while the Brazilian banking sector does not act as a cartel, nor does it act competitively. This author also finds that Brazilian banks use their market power in the long-term more than in the short term. Accordingly, the behaviour of the Brazilian banking

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[7] In 2004, the banks with head offices in the Federal District were Banco do Brasil, Caixa Econômica Federal, Banco de Brasilia (BRB) and Bancoob. BASA and Banpará had their head offices in the State of Pará.

[8] According to Tonooka and Koyama (2003, p.16), *apart from the bills of exchange market, all markets display relatively low levels of concentration, possibly low enough not to notice the existence of market power among the banks*. This result was obtained in a case-by-case analysis of the products offered by banks, but without considering the regional dimension, on which the authors themselves raise the possibility of the existence of regional market power.

[9] The results do not make it possible to state that foreign banks also behave in an oligopolistic manner. In these cases, earnings are more sensitive to costs. Morever, the increased competition in the banking sector cannot be considered as the force lowering interest rates in the case of Brazil (Belaisch, 2003).

sector is consistent with an intermediate model between perfect competition and monopoly/cartel (Nakane, Alencar and Kanczuk, 2006). There are signs that regional factors have a strong influence on the level of market competitiveness and on bank lending activity.

With regard to lending, there are two other factors that affect the amounts lent: (i) the concept of hub-and-spoke regions: in the latter, which are seen as less stable, the banks show liquidity preference and credit is rationed; (ii) the concentration of bank head offices, which, in conjunction with information costs, accentuates the lack of knowledge in regions that are more distant from the bank's decision-making centres, making banks more cautious when lending to these regions. The decision to lend will depend on the trust that banks place in the available information base.

The climate of greater uncertainty in peripheral regions, together with the concentration of bank head offices in regions considered central, where information on the periphery is more remote, tends to result in a concentration of credit, which perpetuates and even reinforces the inequality that exists in the economy. Moreover, banks with nationwide activities tended to lend in peripheral regions through affiliate firms that also have their headquarters in the central region, and with which the bank has had previous dealings. Amado (2006) argues that the bank concentration process was fuelled particularly by the fact of not having given any importance to the existence of regional banks.

In addition, if credit already tends to be restricted in peripheral regions, the constraint may be even tighter for smaller firms, since it is hard to obtain information on them. Consequently, if such firms seek bank financing, they will probably turn to local banks, if they exist. The latter, meanwhile, will take advantage of geographic proximity, knowing that the customer will find it very hard to obtain financing in any more distant institution.

According to data from the Brazilian Institute of Geography and Statistics (IBGE), São Paulo and the Federal District account for larger shares of the total credit stock than their GDP shares. The case of São Paulo reflects the concentration of credit in the country, the counterpart of which is a leakage of deposits from states such as Acre, whose deposit share curve is above its credit share curve. The case of the Federal District seems to reflect the fact that the large public sector banks have their head offices located there.[10]

The trend of the State of Minas Gerais is interesting, because at the start of the series under study it matched the characteristics of a region from which saving was leaking. Between 2002 and 2004, however, the difference between its deposit and credit shares narrowed, such that those leakages practically ceased to exist in the final year of the analysis.

It is worth reiterating that the relation between credit and GDP is not direct. São Paulo has seen its national GDP share shrink, but its share of the stock of credit has grown, which in this case also indicates the effects of the bank concentration process. Clearly, São Paulo benefits as the home to several national business groups; and, as noted above, the large national banks prefer to lend to peripheral regions through firms that have their head offices in the central region.

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[10] *The operations of the two largest public banks (Banco do Brasil and Caixa Econômica Federal), are more heavily concentrated in the Federal District than in the other States* (Vasconcelos, Fucidji and others, 2004, p.10). Accordingly, and given that public- and private-sector banks have different lending rationales, these authors decided to remove the Federal District from the analysis.

IV

Bank concentration and lending:
empirical results in the case of Brazil

Based on the theoretical arguments presented above, the estimated model has the stock of credit as dependent variable and can be described as follows:

$$CREDPC_{IT} = \beta_0 + \beta_1 DVPC_{IT} + \beta_2 PIBPC_{IT} + \beta_3 POPAG_{IT} + \beta_4 THEIL_{IT} + \beta_5 SELIC_T + \beta_6 NUMSEDE_{IT} + \delta_1 DUMMYANO_{IT} + U_i$$

$CREDPC_{it}$: logarithm of the stock of credit per capita in the federative unit (UF_i);
$DVPC_{ti}$: logarithm of the stock of deposits in the UF_i;
$PIBPC_{ti}$: logarithm of per capita GDP of the UF_i;
$POPAG_{ti}$: logarithm of the ratio population/number of branches in the UF_i;
$THEIL_{ti}$: Theil index in the UF_i;
$SELICI_{t-1}$: logarithm of the interest rate lagged by one period;
$NUMSEDE_{It}$: number of bank branches existing in the UF_i;
$DUMMYANO_1$: Simulation for the period 1995-1999.
U_i: Error component (idiosyncratic and specific errors)

Sicsú and Crocco (2003) try to identify the key variables governing the location of bank branches. The expectation is that where there are a larger number of branches more loans will be granted. To make a comparison between States, a ratio between State population and the number of bank branches (*POPAG*) need to be calculated, seeking to reflect the scope of the activity of each branch.[11] The larger this ratio, the smaller will be the presence of bank branches in relation to the population and, hence, the smaller the amount of lending in the region.

The region's per capita income (*PIBPC*), together with the degree of income concentration (*THEIL*), complete the variables identified as relevant for bank branch location. Although these variables have not been introduced with same format as in Sicsú and Crocco (2003), all three are present in the model: GDP per capita, Theil index and the population/number of branches ratio. GDP per capita would be expected to

have a positive sign, i.e. the higher the average income of the region's population, the larger will be the stock of credit per capita. In the case of the concentration index, the expected sign is ambiguous, since income concentration can both discourage –regions with higher concentration tend to have a smaller number of branches– and stimulate, depending on local or sector-level policies that give incentives for credit as an tool of the regional income deconcentration process.

It should be noted that the number of branches used here relates to the number of branches with balances recorded at the Central Bank of Brazil. This was done to reconcile the number of branches with data on the stock of credit and demand deposits that are withdrawn from the balances in question. Henceforth this distinction will not be made, and the number of registered branches will be referred to simply as the number of branches.

Both credit and deposit data refer to the stock as of December each year, and are the result of aggregating a set of variables according to the National Financial System Accounting Plan (*COSIF*).[12] Lending is referred

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[11] Sicsú and Crocco (2003) developed two indices of the geographic distribution of bank branches, to make it easier to compare the results and gain a better understanding of the way location decisions are taken. One of the indices is the ratio between the State's share of the national population, and the State's share in the number of bank branches in the country as a whole. The second index has the same rationale but uses the GDP share instead of the population share. This article uses a simpler ratio, between the population of the federative unit and the number of branches located in it.

[12] COSIF was created by Circular 1.273 of 29 December 1987, with the aim of unifying the various accounting plans in existence at the time, and to standardize record keeping procedures and the preparation of financial statements (Central Bank of Brazil, 2006).

to as credit transactions and encompasses loans and discounted bills, financing, rural financing for crop farming and livestock activity,[13] agribusiness financing, appropriation of rents from rural and agribusiness financing operations, real estate financing, special transactions, credits in liquidation and other credit transactions. Deposits include those of the Government and the private sector.

Use of the deposit variable in the same period, unlagged, reflects the fact that banks manage their liabilities actively, which is characteristic of the evolution of the banking system (De Paula and Alves Jr., 2003).[14] A positive relation between deposits and lending is expected, as widely recognized in the relevant theory.

Inclusion in the model of the population/ number of branches ratio takes account of the regional concentration of branches. Nonetheless, the concentration of bank head offices also needs to be considered. To do this, the variable *NUMSEDE* measures the number of head offices existing in a given federative unit each year. The data were obtained from cadastral and accounting data published by the Central Bank of Brazil. The larger the number of bank head offices in a given region, the easier it would be to obtain information on customers and projects, and more likely that the regional market is competitive, which facilitates access to credit.

The variable *NUMSEDE* represents the number of head offices in the data we have analysed. The information obtained on credit, deposits and a number of branches refers to commercial banks, full-service banks with a commercial portfolio, and savings banks (*caixas econômicas*). The *NUMSEDE* variable also includes the entire list of banks considered by De Paula and Alves Jr. (2003), which could contain one or two that do not match the description of banks whose data we have analysed. We have not attempted to adjust

the list, for fear of making an error in the decision to exclude (or maintain) the banks included on the list.

Lastly, a dummy variable (*DUMMYANO*) was included for the 1995-1999 stage, along with the interest rate variable (*SELIC*).[15] The dummy variable seeks to capture the difference that exists in the sector consolidation process between that stage and 2000-2004, as analysed in Vasconcelos, Fucidji and others (2004). For the years 1995-1999, the value of the dummy variable is set at one, while for the years 2000-2004 it is zero. As noted above, the consolidation process in this first stage, in which a larger number of banks disappeared, had a smaller impact on the concentration of total banking sector assets than the subsequent stage. Following the concentration that occurred in 1995-1999, presumably the banks made more effective use of the market power gained in the process. Accordingly, the average credit stock in the initial stage should be greater than in 2000-2004, ending with a positive sign for *DUMMYANO*.

The real interest rate variable (*SELIC*) is calculated on the basis of the *over-SELIC* rate, minus the broad-based consumer price index (IPCA),[16] since this is an index that is less affected by exchange-rate variations, and it is the official inflation index. An annual interest-rate series was used, with data obtained on a daily basis using the value prevailing on the last day of the year. In addition, as widely recognized in economic theory, the effect of the interest rate on the economy has a time lag. Nonetheless, as the series analysed here consists of 10 observations, the time series is too small to apply time-series tests to identify the most appropriate lag. As it is impossible to adopt a lag shorter than one year, and given that a longer lag is unnecessary to capture the effects of the interest rate on the economy, it was decided to use a one-period (one year) lag. Again following economic theory, a negative relation is expected between the interest rate and lending.

With the aim of capturing the real effects of the variables, data on credit (*CREDPC*) and deposits (*DVPC*) were adjusted to December 2004 values, using the IPCA. For the GDP per capita variable (*PIBPC*) the implicit deflator was adopted, which is traditionally used to correct current GDP values. No inflation correction was necessary for the other variables.

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[13] Rural financing for crop farming and livestock activity includes cost/investment and marketing accounts.

[14] The evolution of the banking system can be described as follows: in the first phase, deposits are the systemic constraint and serve as the parameter for reserves and credits. In the second phase, deposits are treated as means of payment, and banks extend credits a multiple of their reserves. The third phase allows for the possibility of interbank loans, thus liberating lending from the reserves constraint, since reserves limit the system as a whole and not a specific bank. In the fourth phase, the monetary authority assumes the role of lender of last resort, and the entire system is freed from the reserves constraint. The fifth and last phase is characterised by the management of the banks' liabilities; the banks make loans and then seek new deposits to bring their balance sheets into line (Amado, 1998).

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[15] The acronym SELIC stands for *Sistema Especial de Liquidação e Custódia* (Special Settlement and Custody System).
[16] As stock data are being analysed, the December-December broad-based consumer price index (IPCA) was used, rather than the average for the year.

In the case of the Theil income concentration index (*THEIL*), the data series have a gap in 2000 (a census year). To estimate values for that year and ensure balanced panel data,[17] an interpolation was made over the years 1997-2003, giving a greater weight to the years closest to 2000. Making the interpolation over several years and using this weighting, the aim was to smooth the series and identify the trend more effectively.

Lastly, to facilitate sensitivity analysis, all variables were converted into logarithmic form, except for the Theil index, the number of head offices and the dummy variable for 1995-1999. In addition, variables for credit per capita, deposits per capita and GDP per capita were used to allow a better comparison or scaling of the effect of bank concentration on lending.

Although the study by Vasconcelos, Fucidji and others (2004) excluded the Federal District, as noted above, to avoid a possible bias in the results owing to the inherent characteristics of that region, this paper considers all federative units, because the Federal District is not the only one with specific characteristics; São Paulo and other units also do. It is precisely those characteristics that are captured by panel-data models. Moreover, unlike the aforementioned study, here we do not attempt to analyse the differences that exist between loans extended by public and private banks, but instead focus on the effect of bank concentration on lending.

Although legal and regulatory issues are relevant to the analysis, we do not consider them in this study

because the legal framework governing the banking system is the same in all Brazilian States.

Data on credit, deposits and branches are obtained from the Central Bank of Brazil. GDP per capita, the Theil concentration index series and the interest-rate series, together with inflation rates and data on population, were all obtained from the Institute of Applied Economic Research (IPEA) and IBGE. The descriptive statistical data are presented below (see table 3).

Using the variables described above, and with the aim of showing that the process of bank concentration resulted in a concentration of credit, panel data were analysed for the 27 federative units over the period 1995-2004.

As panel data contain periodic observations on the same variables, there are many opportunities to resolve issues that cross-section models cannot adequately deal with. Cameron and Trivedi (2005) argue that panel data modelling makes the estimation more accurate. Panel data modelling offers the following advantages: (i) it takes account of individual heterogeneity (in this case among the federative units); (ii) it offers more information, greater variability, less collinearity between the variables, more degrees of freedom and greater efficiency; (iii) it is better for studying the dynamic of adjustment; (iv) it is better for identifying and quantifying effects that simply cannot be detected in a pure cross-section or pure time-series model; and (v) it allows for the construction and testing of more complex behavioural models (Baltagi, 2005).

Various models can be estimated using panel data, including: (i) pooled; (ii) random-effect; and (iii) fixed-effect models. There are also different ways to estimate the coefficients, the most common being: (i) pooled ordinary least squares (ii) *between* effect;

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[17] Methods exist for estimating unbalanced panel data; for further details see Wooldridge (2002). Nonetheless, as the series analysed here does not span many years, it was decided to balance the panel data rather than exclude data from the series.

TABLE 3

Brazil: descriptive statistical data, 1995-2004

Variable	Observations	Average	Standard deviation	Minimum	Maximum
CREDPC	270	74.163	0.9643	58.830	104.674
DVPC	270	58.667	0.5971	48.132	80.727
PIBPC	270	87.607	0.5321	76.695	99.756
POPAG	270	95.831	0.4840	87.115	105.355
THEIL	270	0.6850	0.1116	0.3388	0.9608
SELIC	270	25.784	0.5012	18.617	35.218
NUMSEDE	270	46.407	130.902	0	76
DUMMYANO	270	0.5	0.5009	0	1

Source: Prepared by the authors.

(iii) considering the fixed effect; (iv) taking the first difference; and (v) considering the random effect. Table 4 shows the consistency of the estimators, in linear models, for different ways of obtaining the coefficients and the estimated panel model.

The model proposed may contain endogenous variables, specifically deposits (*DVPC*) and GDP (*PIBPC*). Nonetheless, the variables are highly correlated with their own lag, which affects their use as instruments. For that reason, and given the difficulty of obtaining other effective instruments, the model is estimated assuming exogeneity. Although it would be better if the variables GDP (*PIBPC*) and interest rate (*SELIC*) use the respective expectations, there is no data series covering the entire period studied.

The correlation matrix (see table 5) shows that the positive relation between the income concentration index (*THEIL*) and the population/number of branches ratio (*POPAG*) corroborates the arguments put forward by Sicsú and Crocco (2003): the more concentrated income is in a given region, the smaller is the number of branches needed to capture disposable income, and the

greater will be the population/branches ratio. Similarly, the larger the population/branches ratio, the smaller will be credit per capita, which shows that the presence of bank branches is essential for lending.

The variable *PIBPC* displays a positive and significant relation both with the stock of credit (*OCREDPC*), and with the stock of deposits (*DVPC*), as predicted by theory. The interest rate (*SELIC*) is negatively related to per capita GDP, as also predicted by theory, possibly arising from negative effects of interest rate increases on lending; in contrast, it is positively related to the stock of credit and deposits. This relation may also reflect the fact that deposits as analysed here correspond to the stock of deposits, which may be subject some type of correction.

The number of head offices (*NUMSEDE*) is positively related to the stock of credit, which reinforces the notion that a regional presence not only of branches but also of head offices affects lending. There is also a negative relation between the number of head offices (*NUMSEDE*) and the population/number of branches ratio (*POPAG*). This means that the larger the number of

TABLE 4

Brazil: linear panel data models

Estimation method	Assumed model		
	Pooled data	Random effects	Fixed effects
Pooled ordinary least squares	Consistent	Consistent	Inconsistent
Between effect	Consistent	Consistent	Inconsistent
Fixed effects	Consistent	Consistent	Consistent
First difference	Consistent	Consistent	Consistent
Random effect	Consistent	Consistent	Inconsistent

Source: Cameron and Trivedi (2005, p. 699).

TABLE 5

Brazil: correlation matrix, 1995-2004

	CREDPC	*DVPC*	*PIBPC*	*POPAG*	*THEIL*	*SELIC*	*NUMSEDE*	*DUMMYANO*
CREDPC	1.0000							
DVPC	0.7361	1.0000						
PIBPC	0.6895	0.8087	1.0000					
POPAG	-0.7859	-0.6579	-0.7581	1.0000				
THEIL	-0.0715	-0.3186	-0.4666	0.2952	1.0000			
SELIC	0.2371	0.0232	-0.0667	-0.0252	0.1091	1.0000		
NUMSEDE	0.4657	0.4137	0.4239	-0.3888	-0.1941	0.0163	1.0000	
DUMMYANO	0.3217	-0.0576	-0.0729	-0.0904	0.1544	0.8127	0.0284	1.0000

Source: prepared by the authors.

bank head offices in a given region, the greater will be the presence of branches located there, thereby reducing the population/number of branches ratio.

Another correlation that corroborates the hypothesis tested in this study is that obtained by the dummy variable for 1995-1999 (*DUMMYANO*). This is positively related to the stock of credit per capita, indicating that the stock of credit in that stage was on average greater than that obtained in the following phase.

Lastly, in the case of the ratios considered in the correlation matrix, and assuming there is a strong correlation between variables for absolute values above 0.8, the stock of deposits is strongly correlated with per capita GDP; and the interest rate is strongly correlated with the dummy variable in 1995-1999.

The variance inflation factor (VIF) was calculated to test for multicollinearity in the model. Specialist publications usually consider that severe multi-collinearity exists when the VIF has a value greater than 5. In this case, it is below 5 for all of the variables in the model. Accordingly, the model was estimated without excluding any of the variables analysed here.

All other models were estimated by adjusting the variance matrix to the robust form. As shown in table 6, the results obtained with pooled data were closest to expectations. In the pooled data model the coefficients obtained for all variables are statistically significant at the 1% level, apart from GDP per capita and interest rate, which are significant at 10%.

Analysing the pooled-data model shows that, as expected, the larger of the stock of deposits per capita and the higher is GDP per capita, the larger will be the stock of credit per capita. The signs obtained for the population/number of branches ratio, and also for the number of head offices, corroborate the hypothesis postulated here. Thus, the larger the populations/ branches ratio, the smaller the per capita credit stock, thus highlighting one of the negative consequences of the bank concentration process, namely the regional concentration of bank branches.

In addition, the larger the number of bank head offices in a given region, the larger the per capita credit stock. Nonetheless, the coefficient of *NUMSEDE* is small, which suggests it has a small impact on the credit stock. These results strengthen the foregoing analysis of the negative effects of the process of bank consultation on lending in the regional domain. Nonetheless, the bank branch relocation process had a greater effect on lending than the concentration of head offices.

These results suggest that branches have some degree of autonomy in making lending decisions; or

TABLE 6

Brazil: estimation results[a]

Independent variables	Pooled ordinary least squares	Random effects	Fixed effects
DVPC	0.666[b] (0.093)	0.497[b] (0.121)	0.319[c] (0.144)
PIBPC	0.177[d] (0.107)	0.159 (0.178)	-0.403 (0.396)
POPAG	-0.834[b] (0.084)	-0.959[b] (0.144)	-1.014[b] (0.349)
THEIL	1.831[b] (0.309)	1.366[b] (0.364)	1.006[b] (0.375)
SELIC	- 0.158[d] (0.092)	-0.104 (0.079)	-0.065 (0.101)
NUMSEDE	0.009[b] (0.002)	0.010[b] (0.003)	0.019 (0.016)
DUMMYANO	0.664[b] (0.101)	0.610[b] (0.086)	0.523[b] (0.114)
Constant	8.746[b] -1.605	11.300[b] -2.755	17.944[b] -4.144
Comments	243	243	243
R^2	0.84	0.54	0.56
F- value			44.39 0.0000
Variance inflation factor	2.79		
Rho statistic		0.3361	0.6602
HAUSMAN test		12.52 0.0848	
BREUSCH-PAGAN test		70.66 0.0000	

Source: Prepared by the authors, using data from the study.

[a]   Robust standard deviations shown in parentheses.
[b]   Statistically significant at 1%.
[c]   Statistically significant at 5%.
[d]   Statistically significant at 10%.

otherwise the type of loans granted –small and mostly to private individuals– means that the decision can be taken at the branch level.

As shown in the correlation matrix, the reduction in the number of head offices is negatively related to the *POPAG* variable. Moreover, taking account of the motivations driving the consolidation process, is not unreasonable to assume a causality relation between these variables, with the reduction in the number of head offices acting as one of the reasons for an increase in the population/branches ratio.

One way to reduce the negative impact of the drop in the number of branches is by using correspondent banks, which, as seen above, can also process loan

and financing proposals. Assuming the application is sent to the nearest branch, for logistical reasons, this effect would be captured in our analysis because its focus is regional and not municipal. Moreover, if the performance of the correspondent bank is above the regional average, the sign of the *POPAG* variable could be reversed, and it could even become non-significant. The fact that the result was as expected suggests that the correspondent bank modality does not change the negative impact on lending caused by a reduction in the number of branches in relation to the population.

Another aspect worth noting is the empirical confirmation of the need to divide the analysis period in two. In the first stage, 1995-1999, the per capita capital stock is greater than in 2000-2004. It can therefore be inferred that following an initial stage of far-reaching adjustments and vigorous concentration of the banking system, the banks that emerged from the process then made loans on a more rationed basis.

Clearly, the economic climate changed. But, this does not seem to be the origin of the reduction in the per capita credit stock in 1999-2004, since the period 1995-1999 included crises in Mexico, Asia and Russia, and also in Brazil, which put an end to exchange-rate flotation in 1999 and resulted in the adoption of an inflation targeting policy. In 1999-2004, there was only one crisis, the energy crisis, so the decline in the per capita credit stock in those years cannot be blamed on the external environment and crisis episodes.

It would therefore be no exaggeration to claim that banks intensified credit rationing in the second stage, when they enjoyed greater market power than previously.

Contrary to the results obtained in the correlation matrix, the interest-rate variable with a one-year lag shows a negative effect on credit, thus corroborating the findings reported by Araújo and Dias (2006). Given the economic situation in Brazil during that period, one can gauge the magnitude of the effects of the interest rate on lending, and hence on regional development. While the consolidation of the banking sector was taking place, real interest rates in Brazil were high, which magnified the impact on lending.

The deposit-stock, GDP-per-capita and interest-rate variables are all expressed in logarithmic form, to facilitate sensitivity analysis on the credit stock with respect to fluctuations in these variables. One can therefore infer that a variation of 1% in the stock of deposits per capita raises the per capita credit stock by roughly 0.7%. A GDP per capita variation on this order, means an increase of 0.18% of the credit

stock. Each percentage point rise in the interest rate causes a reduction of around 0.16% in the per capita credit stock.

Lastly, it is worth noting that the model used here reports an R^2 of 84%, thereby demonstrating its high explanatory capacity.

Analysing results for the random- and fixed-effects models, the findings, despite losing significance, are in the same direction as the expected results and those obtained for the pooled data model. Loss of significance for some variables may reflect the fact that the fixed-effects model considers specific effects of each federative unit, and there may be special characteristics for each region that affect the stock of credit, i.e. differentiated regional dynamics.

In any event, the random-effects model provides results that are closer to those obtained with pooled data than those using a fixed effects model; and this is precisely the most appropriate model according to the result obtained using the Hausman test. With regard to the serial autocorrelation of the residuals, the random effects model does not display autocorrelation at the 5% level.

The Breusch-Pagan test also rejects the hypothesis that the variance of the specific component is zero, which suggests it would be better to use a random-effects model in relation to the pooled data model. Similarly, the *Rho* statistic shows that the variance of the specific component is high in relation to the total variance of the residual, particularly in the fixed-effects model, thus demonstrating importance of that component.

Estimation of the random-effects model shows that the GDP per capita variable (*PIBPC*) loses significance, as does the interest-rate variable (*SELIC*). As explained in the previous section, the *over-SELIC* interest-rate was used, but this is only the base rate for the economy and not the rate obtained on a loan. As is well known, bank spreads were high in the Brazilian economy in 1995-2004, which meant high interest rates for the final borrower. Accordingly, the loss of significance of the interest rate, both with the random-effect and with the fixed-effects model, may be the result of using the economy's base interest rate.

The other results for the random-effects model are similar to those obtained with the pooled data model, but differ in terms of the magnitude of the coefficients. Here, it is worth highlighting the variation obtained for the coefficient on the population/number of branches ratio (*POPAG*), which makes the credit effects of this variable even more important.

Lastly –but no less important– the privatization process can explain much but not all of the sharp reduction in the number of bank head offices. In addition to privatizations, several State-owned banks were liquidated, and there were also bank mergers and acquisitions. The results show that the branch relocation was more significant than the reduction in the number of head offices (the coefficient on the bank head office variable is statistically significant but small). Nonetheless, the variable *POPAG* is negatively correlated with the *SEDE* variable, suggesting that a reduction in the number of head offices could cause an increase in the population/ branches ratio. This seems to be corroborated by the frequent practice of trying to obtain synergy and scale benefits following a merger or acquisition. In particular, following bank privatizations, it was common for branches to close, particularly in the less dynamic markets.

Studies that analyse panel data normally present the same model in cross sections for all the years studied, so as to gain a better understanding of the dynamics of the process and to corroborate the results

obtained, thereby making the model more robust. As our model includes a time-lagged variable, however, it is impossible to perform this robustness test.

Moreover, if the Theil index is replaced by the Gini coefficient to verify the model's robustness, the results are practically unchanged, except for the coefficient of the concentration variable itself, which is clearly higher, and the GDP per capita variable which ceases to be statistically significant.

In any event, taking account of the correlation matrix and the results obtained with the pooled data model and random-effects model using panel data, which was the method indicated by the Hausman test, the results corroborate the hypothesis as formulated and the analysis made in the previous sections.

In other words, if one analyses the process of banking sector consolidation in Brazil from the regional standpoint, its effect on lending is adverse. The number of bank branches serving the peripheral region falls, the presence of bank head offices virtually disappears, and credit is even more rationed.

V

Conclusions

This article has sought to identify the effects of bank concentration on lending, based on the hypothesis that consolidation of the banking sector reduces the number of loans granted. This hypothesis is corroborated by the results obtained. It was clear that the presence of bank branches and head offices in the regions is positively related to lending. Accordingly, the relocation of branches in the country's most developed regions, together with the regional concentration of bank head offices, reduces the per capita credit stock in the other regions. The results also show that the branch relocation process has a greater affect on lending than the concentration of head offices.

The fact that the regions which lost bank head offices and displayed a higher population/number of branches ratio are also the less developed regions, suggests the presence of a mechanism that obstructs their development. With regard to the effects of bank concentration, empirical observation shows that following a period of sharp adjustment, the banks started to ration credit much more, possibly as a result of the greater market power they had gained.

The other results obtained show that the model is consistent with current theory, whereby both GDP per capita and the stock deposits have favourable effects on lending, whereas interest-rate variations have the opposite effect on the credit stock.

One way of obtaining more robust results, which could be a topic for future research, is to use expectations for economic growth, interest rates and inflation as explanatory variables. Another possibility is to use detailed data for each municipality and disaggregate credit by transaction type (i.e. for each product offered by the bank). According to Corvosier and Gropp (2001), the nature of the product is an important element in analysing bank concentration and its effects on the interest rates charged. Moreover, banks in Brazil hold public-sector bonds in their portfolio that ensure them quite substantial liquidity and profitability. With a net public-sector debt of 47% of GDP in 2006, the banks, both private and public, definitely underwrote their profitability with those bonds. The impact of that strategy on the supply of credit should not be ignored, and probably explains part

of the concentration of credit in Brazil. In practice, the banks extend credit to the National Treasury through their demand for government bonds.

As pointed out by Cavalcante, Crocco and Jayme Jr. (2004), the supply of credit is affected not only by liquidity preference, but also by the degree of development of the banking system. It would therefore be worth making a more in-depth study of the level of development of the banking and financial system in Brazil. In view of the results obtained in this study, it would be interesting to create a mechanism to stimulate the deconcentration of bank head offices, which could take the form of a cut in bank reserve ratios or a reduction in taxes. Regional development funds are also very important, as noted by Jayme Jr. and

Crocco (2007), and they can channel credit under more favourable conditions towards the less dynamic regions. These funds can be used under the same principle as applied by the Brazilian National Development Bank (BNDES) with its financial agents; i.e. the Government could make these funds available for use by all financial institutions, which would increase competition and also the transparency of this financing.

Lastly, by adjusting the legal and regulatory framework governing the financial and legal system in Brazil –a topic that is beyond the scope of this article– a more favourable climate could be created for lending. Similarly, capital-market strengthening as an alternative to capture resources could open up a new possibilities for the larger firms.

(Original: Portuguese)

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