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Bank Concentration and the Supply of Credit in Argentina

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Abstract

This paper examines the effects on the supply of credit of the concentration of financial institutions in Argentina that followed the crisis caused by the December 1994 devaluation of the Mexican peso. While the concentration process may have improved the efficiency of domestic financial intermediation, the analysis suggests that, due to the presence of information asymmetries in the banking sector, it also may have contributed to the contraction in bank lending observed during 1995.

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Summary

After the December 1994 devaluation of the Mexican peso Argentina experienced a concentration of financial institutions. This paper examines the effects of that concentration on the supply of credit. While the concentration process may have improved the efficiency of domestic financial intermediation, it also may have contributed to the temporary contraction in bank lending observed during 1995.

The concentration in financial intermediation activity would not have had any effect on total lending to the private sector had expanding institutions substituted for shrinking institutions on the credit side and the deposit side. However, an argument can be made, based on the literature on asymmetric information, that large financial institutions are not able in the short run to replace the credit provided by small institutions, particularly in circumstances such as those prevailing in Argentina in 1995. Exchanging information on their customers' past and current situations is difficult in the short run and therefore financial institutions can not properly evaluate their creditworthiness. This exchange is particularly restricted between small and big institutions as the type of relationship-driven activities standard in a small bank are difficult to replicate in the loan approval channels of a larger organization.

Evidence of this contractionary effect on loan supply is given. First, the likely relevance of imperfect information in the Argentine credit market is analyzed by looking at the disparities in portfolio holdings of different institutions, the significance of such disparities is corroborated by a Simple Factorial Analysis of Variance. Second, an estimation of the effect on credit of information destruction is given.

Although other factors (such as a change in the demand for loans, increased prudential requirements, a more cautious lending behavior on the part of banks, or the worsening in the quality of collaterals resulting from the recession) may have contributed to the observed outcome, the evidence presented lends support to the hypothesis that financial concentration and loss of information also played a role in explaining the decline in credit that took place in 1995. The paper concludes by discussing what could be expected for the Argentine credit market from a longer-term perspective.

I. Introduction

This paper examines the process of concentration of financial institutions in Argentina experienced after the December 1994 devaluation of the Mexican peso and its effects on the supply of credit. While the concentration process may have improved the efficiency of domestic financial intermediation, it also may have contributed to the temporary contraction in bank lending observed during 1995. Information asymmetries in the market for loans may explain this result.

Out of 173 private financial institutions, some 123 survived the withdrawal of deposits and the liquidity crisis experienced between February and May 1995. Of the 50 banks that disappeared, 24 were absorbed by other banks, 19 banks were merged in 4 banks, and 11 were liquidated. Small and medium-sized private institutions (i.e., private domestic banks, cooperatives and credit unions each with less than 1.5 percent of total assets of the system) were those most adversely affected by the financial crisis. The deposits of these financial institutions fell by about Arg$4.5 billion or 30 percent during 1995, while deposits of big private banks increased by Arg$2.0 billion, or 14 percent (Table 1). [2] During the same period, loans extended by small and medium-sized private financial institutions shrunk by Arg$3.5 billion, or 21 percent, while those of big private banks increased by Arg$1.4 billion, or 8 percent.

The concentration in financial intermediation activity that occurred in 1995 would not have had any effect on total lending to the private sector if expanding institutions could have fully replaced shrinking institutions on the credit side as well as the deposit side. However, an argument can be made, based on the literature on asymmetric information, that large financial institutions are not able in the short run to substitute for the decline in credit provided by small institutions, particularly in circumstances such as those prevailing in Argentina in 1995. A financial institution's knowledge about its customers' past and current situation is fundamental for evaluating credit worthiness [3] and such knowledge is difficult to exchange between banks, at least in the short run. These barriers are particularly important between small and big institutions, as the type of relationship-driven activities standard in a small bank are difficult to be substituted by the loan approval channels of a larger organization. [4] Or, as Williamson

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[2]Minor differences could arise between the figures reported here and other aggregate data for the financial system reported by the Central Bank, as the balance-sheet information may not be updated for a few banks.

[3]Although information asymmetries also affect the deposit side, this paper addresses this issue exclusively from a credit perspective.

[4]Similarly, foreign bank subsidiaries could also find difficult to offer loans in the same conditions than medium and small domestic institutions do, as their contracts would probably need to resemble those in more developed economies, demanding stricter accounting

argues, there are organization diseconomies in trying to manage transaction-driven and relationship-driven loans within the same institution.[5] In this context, a process of bank concentration that entails a loss of specific information about customers' creditworthiness could contribute to a temporary decline in credit. Although the adverse consequences of information asymmetries could be limited by the use of collateral, the public dissemination of information about borrowers, and the strengthening of enforcement mechanisms, the effectiveness of such tools is generally limited.

The difficulties of dealing with asymmetric information in the Argentine banking system are well described in statements during 1995 by executives of the large banks on the subject of lending to small and medium enterprises: ".. A great deal of analysis is needed to grant a credit to small and medium size companies, because in this sector accounting figures are not as important as the bank's knowledge of the company and their owners.." (Manuel Sacerdote, Bank of Boston); or, "..Independent small and medium size companies are very difficult to evaluate. In general, we face managerial, technological and scale problems to carry such an evaluation..", (Domingo Stamati, Banco Rio de la Plata); and, "..There is a problem of guarantees with respect to small and medium size companies..", (Daniel Llambias, Banco de Galicia)[6].

Evidence of a link between banking concentration and credit supply has been recently reported for the United States. For example, A. Berger et al (1995) find evidence that the increase in the proportion of banking industry assets controlled by the largest banking organizations in the 1990s, due to the liberalization of geographic restrictions on banking in the United States, may have been responsible for part of the credit crunch observed in 1989-92. In addition, J. Peek and E. Rosengren (1996), combining a single cross-section data on lending businesses in the New England states for 1994 with some information on mergers and de novo entry, find that after larger banking organizations merged with smaller organizations, the consolidated organization typically reduced the amount of small business lending that was conducted earlier by the acquired institution. And, A. Berger and G. Udell (1996) find that large banks not only tend to have a smaller proportion of their loans made to small borrowers, but also tend to charge lower average prices than other banks to small borrowers, indicating that large banks only issue business loans to higher-quality credits, which usually can be evaluated through analysis of financial ratios.

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[4](...continued)
procedures and more credit guarantees.

[5]Besides Williamson (1988), see Petersen and Rajan (1994) for evidence of the importance of relationship lending. See Berger and Udell (forthcoming) for evidence that small banks engage in more relationship lending than do large banks.

[6]All appeared in Diario Clarin, September 24, 1995, Argentina.

Information difficulties tend to affect more credit provision in countries with a weak legal framework and an inefficient judicial system that preclude strong enforcement mechanisms; inadequate accounting practices; and where there are no credit rating agencies. Such was the case in Argentina through 1995. Moreover, small Argentine financial institutions, which suffered the largest contraction in deposits in 1995, usually had a much higher share of unguaranteed loans extended on the basis of personal relationships. In contrast, foreign banks and large Argentine financial institutions, which tended to expand their intermediation activities in 1995, generally demanded stricter accounting procedures, more credit guarantees, and other requirements that normally only few relatively big firms could meet.

The paper proceeds as follows. Section II provides a first insight into the likely relevance of imperfect information in the Argentine credit market by looking at the disparities in portfolio holdings of different institutions. Also in this section, these disparities are found significant using a Simple Factorial Analysis of Variance. An estimation of the effect on credit from information destruction is attempted in Section III. Based on lending functions for different types of loans to the private sector, estimated for the period 1993-94, a projection of loan supply is provided for 1995. The results obtained are in line with the expectations raised in the previous section as a large asymmetry in the lending behavior between expanding large institutions and contracting small and medium domestic institutions is observed. Although other factors (such as the worsening in the quality of collaterals resulting from the recession or a change in the demand for loans) may have contributed to the observed outcome, the fact that a strong asymmetry is estimated between institutions, and that this asymmetry is particularly important in personals loans in a period when interest rates for these loans actually increased, lends support to the hypothesis that financial concentration and loss of information played a role in explaining the decline in credit that took place in 1995. Section IV concludes, discussing what could be expected for the Argentine credit market from a longer term perspective.

II. Financial Institutions' Portfolios

Table 1, presenting the changes in balance-sheets of private financial institutions during 1995 by groups of institutions, provides a first insight into the likely relevance of imperfect information in the Argentine credit market. Although total assets of those institutions as a whole increased by about Arg$5.1 billion during 1995, this really entailed different situations; large banks experienced an increase of Arg$5.8 billion while total assets of medium and small institutions, drained by the run on deposits, shrunk by Arg$0.7 billion. The concentration process was accompanied by a reduction in the supply of credit to the private sector of medium and small institutions by Arg$3.5 billion, while large banks were increasing theirs by only Arg$1.4 billion. In particular, the type of loans most reduced were personal loans and advances (credit lines not backed by any guarantee). This is what would be expected if information asymmetries were important, as lending through these lines of credit is probably based more on informal knowledge that other credit operations.

Further evidence of the importance of imperfect information in the Argentine credit market could be found by examining the portfolios of different financial institutions. A Simple Factorial Analysis of Variance (ANOVA) on the shares of different assets held by each financial institution is done for that purpose. Table 2 presents the estimated average portfolios (and their standard deviation) observed in 1993-94 by group of financial institution, excluding institutions closed as of end-1995 to avoid sample bias problem. The formal tests for differences in average portfolio among those groups are reported in Table 3. The ANOVAs reported there use two classifying variables (or factors): the institution size and type, as defined in Table 1, and their effects are evaluated after controlling for the assets quality of each bank.[7] The latter is done by using the share of normal debt in total assets as an explanatory variable (or covariate), entered before the factor effects are evaluated.[8] Moreover, foreign small and medium institutions are excluded from the analysis, as they, according with the arguments presented above, may not represent the average small and medium institutions in terms of information management.

Various results arise from the analysis of variance. First, in all types of institutions lending with some form of guarantee is smaller than unguaranteed lending: on average, about 10 percent of assets are in guaranteed loans compared with more than 25 percent of total assets in uncollateralized personal loans and about 17 percent in uncollateralized advances to customers. This, together with the institutional weaknesses noted above, suggests that there was room for information asymmetries to play a role in determining credit flows once the concentration process accelerated.

Second, there are significant differences among financial institutions in the composition of loan portfolios. These differences were found to be statistically significant at the 5 percent confidence level for almost all type of assets, as reported in Table 3. The most notable differences are the following: (1) Foreign and domestic commercial banks had similar shares of loans to assets, while credit unions and cooperatives had higher shares of loans in total assets. (2) Credit unions and cooperatives concentrated most of their lending in unguaranteed loans; in contrast, foreign banks allocated a relatively high share of their portfolio to the overnight inter-bank market--classified as other loans in the balance sheet. (3) Advances comprised a relatively important share of the lending activities of credit unions and cooperatives (27.8 percent and 19.7 percent, respectively). In addition, finance houses and banks allocated an important share of their assets to the inter-bank market, while cooperatives and credit unions only a limited proportion; cooperatives and credit unions had a larger share

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[7]The sums of squares decomposition in the ANOVA followed the so-called experimental approach. This approach evaluates factor main effects before factor interactions, adjusting each kind of effect for the effect of the remaining factors.

[8]There is a classification for "normal debt" in the institutions' balance-sheets that excludes all loans with any performance problem.

of peso deposits and loans; and finance houses and cooperatives suffered from a significantly higher share of nonperforming loans.

Third, portfolio differences among institutions of different size were also found to be statistically significant. Some of these differences are suggestive. For example, large banks had a lower share of personal lending than small institutions and much higher share of dollar denominated lending. Also, large banks had a higher share of "other" loans (including those in the interbank overnight market) than small institutions.

The above portfolio differences, together with the severe loss of confidence in (and disruption of) the banking sector during the 1995 crisis, suggest that the restructuring of the financial system could have had an important effect on credit provision. This is because unguaranteed lending accounted for almost 85 percent of total lending, and because information on customers' creditworthiness was likely lost with the disappearance of many institutions, and the rebuilding of this information in remaining institutions would generally take time to complete. Furthermore, the decline of deposits of cooperatives and credit unions not only reduced their lending capacity, but also could have affected adversely that of the system as a whole given their higher "propensity" to lend.

III. Estimation Error of Bank Lending for 1995

Notwithstanding that total assets of private financial institutions increased by 10.1 percent, credit to the private sector declined by 6 percent during 1995. A weaker demand for loans, but especially a more cautious lending behavior on the part of banks and increased prudential requirements that reduced the supply of loanable funds largely explain the decrease in lending.[9] However, information destruction as a result of increased concentration also seems to have played a role.

To estimate the effect of increased concentration of financial institutions on the supply of credit, lending reaction functions are estimated for the period 1993-1994 and applied to 1995. The estimated lending equations, explain the changes in each category of loan provided by the different types of financial institution in terms of the changes in the source of funds, changes in interest rates, and changes in the quality of the portfolio, which affects provisioning and capital adequacy ratios.

$$\Delta Loan_i = F(\Delta \$Deposit_i, \Delta US\$Deposit_i, \Delta Borrowing_i, \Delta OLiabilities_i, \Delta Capital_i,$$
$$interest\ rate_i, \$Deposit_i, US\$Deposit_i, Share\ of\ Performing\ Loans_i) \tag{1}$$

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[9]See L. Catao (forthcoming) for a broader analysis on bank credit in Argentina during 1995.

where i is for each type of loan . The regressions use annual data for the 123 private institutions that continued operating through 1995. The different financing sources are introduced as separate explanatory variables in the regressions recognizing the different financing costs associated with each of them. This issue was particularly important in 1995 as Central Bank rediscounts and borrowing from abroad, two relatively expensive financing sources, increased the most. All variables are deflated by the GDP deflator. The estimation results are presented in Table 4.

On the basis of the estimated lending equations, Table 5 presents estimates of the actual and projected changes in the levels of credit by loan category observed in 1995 in the 123 institutions that continued in operation.[10] The projections for 1995 are done after adjusting for the effects of changes in reserve/liquidity requirements introduced during that year, which reduced loanable funds.

As indicated earlier, the decline in credit to the private sector from the institutions that disappeared was not fully made up by the surviving institutions. But even among the latter, the actual change in total private lending during 1995 fell substantially short of the projected change. The projection indicated that lending was to grow by 18.1 percent, compared with an actual increase of only 7 percent. Although, there are a number of factors that explain the reduced pace of lending, there is evidence that financial concentration also contributed to this result. The estimation error, i.e., the difference between the projected and actual expansion of credit, is more pronounced for large banks than for small banks, both absolutely and as a share of their assets. Similarly, once excluding operations in the interbank market, the estimation error is relatively more important for foreign banks, than for domestic banks. These statistically significant results imply that the banks that benefitted from the system-wide shift in deposits lent out less of the new funds than what they would have done based on their previous history. The loss of information resulting from concentration is likely to have contributed to this result. Such a loss could, in theory, have been overcome by an increase in the collateralization of loans, and a limited move in this direction actually occurred in 1995 as interest rates on guaranteed loans fell slightly, while interest rate on personal loans rose. However, a corresponding shift in credit was not detected and both guaranteed and personal loans fell far short of projected levels in the lending equations estimated above.

Although other factors (such as the worsening in the quality of collaterals resulting from the recession or a change in the demand for loans) may have contributed to the observed outcome, the larger than expected asymmetry in lending between expanding and contracting institutions lends support to the hypothesis that financial concentration and loss of information played a role in explaining the decline in credit that took place in 1995. Besides, the fact that this asymmetry is particularly important in personals loans, the type of loans more affected by information destruction in a period when interest rates for these loans actually increased is

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[10]The differences with Table 1 account for the assets and liabilities of institutions that disappeared in the course of 1995.

very suggestive (Charts 1 to 4). The ANOVA results on the projection errors presented in Table 6 corroborate that these differences, between expected and actual provision of loans, of large banks and medium and small institutions are significant.

IV. Conclusions

Factors like a more cautious lending behavior on the part of banks, increased prudential requirements that reduced the supply of loanable funds, the worsening in the quality of collaterals resulting from the economic recession, and a weaker demand for loans may largely explain the decrease in lending observed in 1995 in Argentina. However, the analysis presented above suggests that, due to the presence of information asymmetries in the banking sector, the process of concentration of financial institutions experienced that year may have also contributed to such a contraction.

There is a question whether this process will have permanent effects on the system. The evidence from the American experience seems to indicate that credit to small and medium firms, those more vulnerable through the asymmetric information problem, could be hurt even in the long run. In the Argentine case, and according with the analysis of financial institutions' portfolios presented above, the fact that Cooperative and Credit Unions were the financial institutions that reduced their business the most may be also suggesting that these effects could be of a long run nature. Nevertheless, it is to expect that market forces, probably assisted by guidelines from the monetary authority, would tend to solve, in part at least, the informational problem, generating the necessary institutional changes. For example, the introduction of a Credit Bureau in Argentina in May 1996, the planned creation of a Financial Court that would improve the legal framework for the use of credit guarantees and strengthen property rights, and of a credit rating agency for small and medium enterprises are moves in that direction. Moreover, financial concentration may be expected to result in efficiency gains in the long run, strengthening financial intermediation activity and enhancing financial deepening on a lasting basis.

Chart 1

Argentina: Peso Denominated Loans
Projection Error for 1995

- Projected
- Actual

$0.5 bill

$0.4 bill

In percent of total assets

Large Domestic
and Foreign
Institutions

Small and Medium
Domestic
Institutions

Chart 2

Argentina: Dollar Denominated Loans
Projection Error for 1995

- Projected
- Actual

$1.6 bill

$0.2 bill

In percent of total assets

Large Domestic
and Foreign
Institutions

Small and Medium
Domestic
Institutions

Chart 3

Argentina: Guaranteed Loans
Projection Error for 1995

Chart 4

Argentina: Personal Loans
Projection Error for 1995
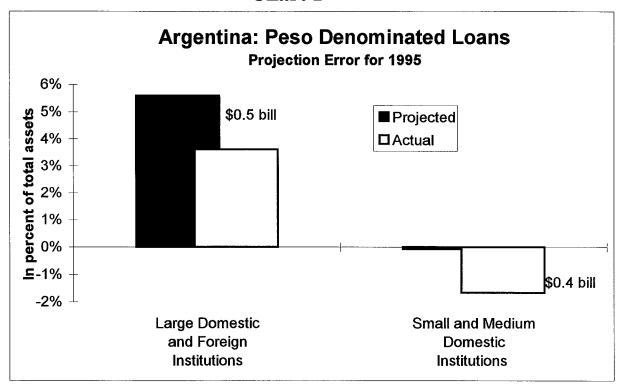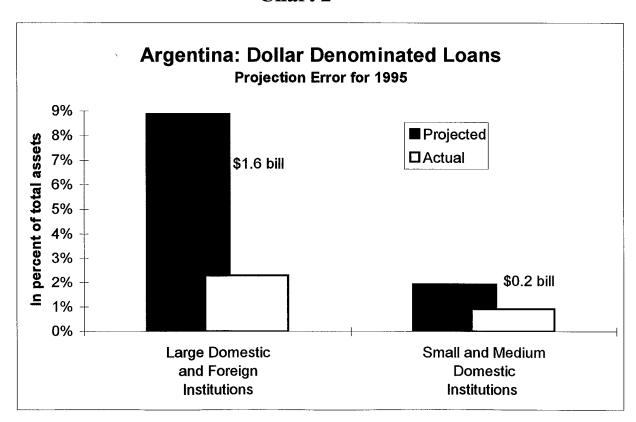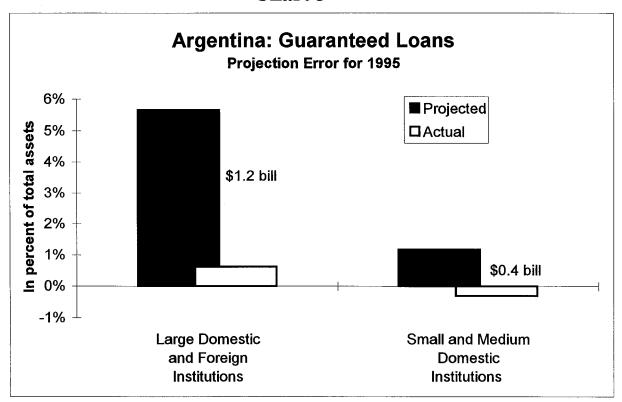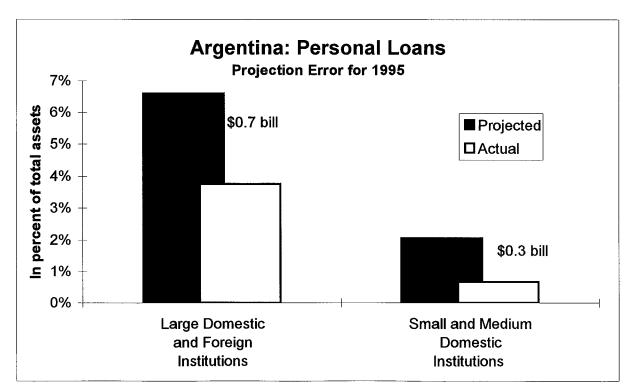
Table 1. Argentina: Changes in Balance-Sheets of Private Financial Institutions during 1995

(In millions of Arg$)

	Number of Banks	Change in Total Assets	Change in Loans to the Private Sector 1/							Change in Deposits		
			Total	Arg$	US$	Guaranteed	Personal	Advances	Others	Total	Arg$	US$
Total private system	173	5,116	-2,063	-1,194	-869	-631	-942	-544	54	-2,441	-1,067	-1,373
Domestic banks	64	2,347	-598	-138	-460	-245	56	134	-543	-524	-4	-520
Foreign banks	30	5,682	1,196	307	889	81	298	53	764	907	317	590
"Financieras"	25	-314	-344	-144	-200	-107	-140	-53	-43	-332	-117	-214
Cooperatives	40	-2,548	-2,275	-1,193	-1,083	-362	-1,113	-676	-125	-2,451	-1,240	-1,212
Credit unions	14	-52	-41	-27	-14	1	-42	-2	1	-40	-23	-17
By size of institutions 2/												
Large	10	5,826	1,396	854	543	147	889	713	-353	2,020	946	1,074
of which: Foreign	4	1524	294	138	155	84	177	157	-123	762	259	503
Medium	22	615	-429	-498	70	13	-228	-360	146	-911	-352	-560
of which: Foreign	6	416	10	-85	94	-32	-69	-179	290	-222	-88	-134
Small	141	-1,325	-3,030	-1,549	-1,481	-792	-1,603	-897	262	-3,549	1,662	-1,887
of which: Foreign	20	3,743	893	253	639	30	190	75	598	367	146	221

Sources: Central Bank of Argentina; and Fund staff estimates.

1/ Guaranteed loans include loans guaranteed by real estate, goods, bonds, and third party endorsements. Advances include advances in checking accounts. Others include the remaining loans net of provisions.
2/ Large institutions include those with more than 1.5 percent of total assets as of December 1994; medium institutions include those with more than 0.5 percent of total assets but less than 1.5 percent; and small institutions include those with less than 0.5 percent of total assets.

Table 2. Argentina: Private Financial Institutions' Portfolios, 1993-94 1/

(As a proportion of total assets in each group; in percent) 2/

	Number of Banks	Loans to the Private Sector							Share of	
		Total	Arg$	US$	Guaranteed	Personal	Advances	Others	Deposits	Normal Debt 3/
Total private banking system	123	62.2	25.8	36.4	9.3	28.9	17.2	6.8	46.8	86.4
		1.2	1.1	1.2	0.9	1.4	1.0	1.5	1.6	0.9
Domestic banks	52	58.7	22.0	36.7	9.7	27.8	16.2	5.0	44.8	87.7
		1.7	1.1	1.2	0.9	1.8	1.0	1.5	2.0	1.2
Foreign banks	29	58.5	14.1	44.3	4.6	18.3	12.3	23.2	39.5	90.0
		2.8	1.1	1.2	0.9	2.1	1.8	3.1	3.2	1.6
"Financieras"	19	63.7	29.9	33.8	20.6	34.1	20.2	-11.1	46.8	81.8
		3.7	1.1	1.2	4.1	4.2	3.8	3.9	5.0	2.6
Cooperatives	13	69.1	34.6	34.6	7.8	33.8	19.7	7.9	54.8	84.0
		1.1	1.1	1.2	1.2	2.5	1.5	3.1	3.1	2.4
Credit unions	10	75.6	52.1	23.5	2.0	49.1	27.8	-3.3	62.4	88.3
		2.6	1.1	1.2	1.0	6.8	6.3	4.6	7.7	2.5
Large institutions	10	67.0	18.1	48.9	12.1	23.3	18.5	13.1	36.5	92.3
		1.6	1.1	1.2	1.6	2.2	2.1	3.7	1.5	0.8
of which: Foreign	4	69.5	17.2	52.3	12.0	18.2	9.5	29.8	92.1	31.7
		1.6	1.1	1.2	1.9	3.6	1.3	5.7	1.4	1.4
Medium institutions	17	67.5	26.9	40.7	9.9	27.9	17.4	12.3	46.0	84.0
		1.9	1.1	1.2	1.1	2.2	1.2	3.6	2.3	3.8
of which: Foreign	5	70.2	23.2	46.9	10.1	19.9	20.2	20.0	92.2	42.9
		3.5	1.1	1.2	2.4	3.9	2.7	4.8	0.6	4.6
Small institutions	96	60.7	26.7	34.1	9.0	30.1	17.2	4.5	48.2	86.0
		1.5	1.1	1.2	1.1	1.7	1.3	1.7	2.0	1.0
of which: Foreign	20	52.9	11.2	41.7	1.5	19.0	11.4	21.1	88.2	40.4
		4.0	1.1	1.2	0.5	2.8	2.7	4.4	2.5	4.8

Sources: Central Bank of Argentina; and Fund staff estimates.

1/ For the definition of bank and loan groups see Table 1.
2/ The standard deviation of the average share of total assets is presented directly below the share itself.
3/ Excluding nonperforming loans.

Table 3. Argentina: ANOVA on Portfolio Shares in Private Financial Institutions 1993-94

(As a proportion of total assets in each group; in percent) 1/

		Total		Arg$		US$		Loans to the Private Sector							
								Guaranteed		Personal		Advances		Others	
Source of Variation	DF	Sum of Squares	Sig of F 2/	Sum of Squares	Sig of F 2/	Sum of Squares	Sig of F 2/	Sum of Squares	Sig of F 2/	Sum of Squares	Sig of F 2/	Sum of Squares	Sig of F 2/	Sum of Squares	Sig of F 2/
Covariates	1	0.17	0.01	0.00	0.83	0.15	0.03	0.01	0.38	0.12	0.08	0.03	0.29	0.02	0.22
Share of Normal Debt	1	0.17	0.01	0.00	0.83	0.15	0.03	0.01	0.38	0.12	0.08	0.03	0.29	0.02	0.22
Main Effects	6	0.78	0.00	2.03	0.00	0.78	0.00	0.54	0.00	1.12	0.00	0.35	0.06	0.57	0.00
Institutions Size	2	0.47	0.00	1.05	0.00	0.53	0.00	0.00	0.88	0.70	0.00	0.09	0.20	0.07	0.09
Institutions Type	4	0.31	0.00	0.98	0.00	0.25	0.08	0.53	0.00	0.42	0.03	0.26	0.06	0.50	0.00
2-Way Interactions	2	0.21	0.07	0.05	0.27	0.08	0.26	0.13	0.02	0.12	0.19	0.01	0.88	0.02	0.59
Institutions Size - Type	2	0.21	0.07	0.05	0.27	0.08	0.26	0.13	0.02	0.12	0.19	0.01	0.88	0.02	0.59
Explained	9	1.16	0.00	2.08	0.00	1.00	0.00	0.69	0.00	1.36	0.00	0.39	0.13	0.61	0.00
Residual	187	2.88		3.06		4.85		2.88		6.37		4.72		2.32	
Total	196	4.04		5.14		5.85		3.57		7.73		5.11		2.92	

Source: Fund staff estimates.

1/ For the definition of bank and loan groups see Table 1; although, foreign small and medium institutions are excluded in this analysis.

2/ The smaller the Sig. F-value, the more significant are the differences in average shares.

Table 4. Argentina: Estimates of Lending Functions 1/

(Panel of Private Financial Institutions; 1993-1994) 2/

	Guaranteed		Personal		Advances		Others	
	Arg$	US$	Arg$	US$	Arg$	US$	Arg$	US$
Peso deposits	**-0.057** 0.025	0.163 0.104	**0.298** 0.070	0.185 0.156	**0.197** 0.066	**-0.580** 0.131	**0.327** 0.061	0.279 0.176
Dollar deposits	-0.001 0.015	**-0.363** 0.065	**-0.176** 0.043	0.021 0.097	**0.092** 0.041	**0.583** 0.082	**-0.201** 0.037	**0.269** 0.109
Borrowed funds 3/	0.005 0.007	**0.081** 0.029	0.020 0.020	0.057 0.044	-0.016 0.018	-0.050 0.037	-0.021 0.017	0.067 0.049
Other liabilities	-0.026 0.112	**-2.704** 0.470	**1.471** 0.316	**-3.823** 0.703	0.221 0.297	**1.733** 0.589	0.429 0.273	**5.118** 0.791
Own capital	-0.147 0.039	**0.441** 0.164	**0.210** 0.110	**1.097** 0.245	0.141 0.103	0.013 0.205	-0.044 0.095	**-0.736** 0.276
Interest rates	**-7.618** 3.310	3.311 13.890	1.220 9.347	25.160 20.768	7.025 8.784	-16.844 17.401	2.756 8.074	-6.499 23.376
Stock of peso deposits	**0.058** 0.010	-0.021 0.042	0.030 0.028	**-0.125** 0.063	**-0.054** 0.026	0.084 0.053	**-0.081** 0.024	-0.019 0.071
Stock of dollar deposits	**-0.019** 0.007	**0.161** 0.029	**0.081** 0.020	**0.073** 0.034	0.010 0.018	-0.051 0.038	**0.073** 0.017	0.084 0.050
Share of performing loans	**7.497** 3.832	-5.545 16.082	-5.444 10.822	-22.135 24.037	-5.498 10.170	16.778 20.146	-2.528 9.348	-1.579 27.064
N. Obs.	123	123	123	123	123	123	123	123
R square	0.425	0.813	0.802	0.527	0.299	0.507	0.300	0.560
Adjusted R square	0.375	0.797	0.785	0.487	0.238	0.464	0.240	0.522
Standard error	4.879	20.475	13.778	30.602	12.948	25.649	11.901	34.456
F (Wald test)	8.557	50.294	46.900	12.912	4.932	11.868	4.969	14.743
Sig. level	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Source: Fund staff estimates.

1/ The coefficients are OLS estimates. A system of equations was also estimated and the results did not change. The significance level of the Wald test shows the P-value for the whole equation to be significantly different from zero. Numbers below the estimates correspond to standard errors. Bold indicates that a coefficient is statistically different from zero at the 5 percent level.

2/ For a definition of loan groups see Table 1.

3/ Includes rediscounts and funds borrowed abroad.

Table 5. Argentina: Actual and Projected Changes in Private-Sector Credit during 1995 1/

(In millions of Arg$)

			Change in Loans to the Private Sector 2/			
	Total	Arg$	US$	Guaranteed	Personal	Advances	Others
				(Actual)			
Total private system	2,078	532	1,546	52	1,209	509	309
Domestic banks	307	284	23	-118	520	333	-428
Foreign banks	1,694	417	1,277	143	492	303	756
"Financieras"	-203	-106	-98	-63	-79	-48	-13
Cooperatives	298	-50	348	89	294	-78	-7
Credit unions	-18	-14	-4	1	-18	-1	0
Large institutions	1,396	854	543	147	889	713	-353
of which: Foreign	294	138	155	84	177	157	-123
Medium institutions	1,242	133	1,109	189	562	221	270
of which: Foreign	507	25	482	29	125	71	282
Small banks	-560	-455	-105	-284	-243	-425	392
of which: Foreign	893	253	639	30	190	75	598
				(Projected)			
Total private system	5,345	1,365	3,980	1,872	3,012	-78	711
Domestic banks	2,363	858	1,505	1,148	1,282	-307	411
Foreign banks	2,467	572	1,895	748	1,404	225	116
"Financieras"	-7	-115	108	-22	86	-66	3
Cooperatives	541	123	418	62	192	70	185
Credit unions	-19	-73	54	-64	49	0	-3
Large institutions	3,425	1,324	2,101	1,340	1,562	139	550
of which: Foreign	1,306	426	880	501	664	133	99
Medium institutions	1,388	523	865	444	684	41	220
of which: Foreign	459	97	362	132	174	52	55
Small institutions	122	-443	565	170	469	-455	-62
of which: Foreign	512	7	505	137	375	26	-25

Sources: Central Bank of Argentina; and Fund staff estimates.

1/ Data reflect only those financial institutions that continued operating through the end of 1995.

2/ For the definition of bank and loan groups see Table 1.

Table 6. Argentina: ANOVA on Projection Errors from Estimated Lending Equations for Private Financial Institutions, 1995

(As a proportion of total assets in each group; in percent) 1/

		Total		Loans to the Private Sector															
				Guaranteed				Personal				Advances				Others			
				Arg$		US$		Arg$		US$		Arg$		US$		Arg$		US$	
Source of Variation	DF	Sum of Squares	Sig of F 2/	Sum of Squares	Sig of F 2/	Sum of Squares	Sig of F 2/	Sum of Squares	Sig of F 2/	Sum of Squares	Sig of F 2/	Sum of Squares	Sig of F 2/	Sum of Squares	Sig of F 2/	Sum of Squares	Sig of F 2/	Sum of Squares	Sig of F 2/
Covariates	1	12.65	0.17	0.02	0.48	14.85	0.00	1.23	0.12	2.64	0.22	0.06	0.76	3.85	0.09	1.87	0.07	0.25	0.76
Share of Normal Debt	1	12.65	0.17	0.02	0.48	14.85	0.00	1.23	0.12	2.64	0.22	0.06	0.76	3.85	0.09	1.87	0.07	0.25	0.76
Main Effects	6	207.40	0.00	0.52	0.04	95.06	0.00	43.99	0.00	14.46	0.22	6.36	0.13	140.89	0.00	13.23	0.00	17.49	0.38
Institutions Size	2	138.62	0.00	0.46	0.00	91.66	0.00	42.18	0.00	2.02	0.56	5.63	0.01	95.32	0.00	11.40	0.00	6.28	0.32
Institutions Type	4	68.78	0.04	0.05	0.83	3.40	0.69	1.81	0.47	12.43	0.13	0.73	0.88	45.57	0.00	1.83	0.50	11.21	0.39
2-Way Interactions	2	8.25	0.53	0.01	0.91	2.26	0.48	0.05	0.95	5.19	0.23	0.04	0.97	0.21	0.92	0.13	0.89	1.21	0.80
Institutions Size - Type	2	8.25	0.53	0.01	0.91	2.26	0.48	0.05	0.95	5.19	0.23	0.04	0.97	0.21	0.92	0.13	0.89	1.21	0.80
Explained	9	228.30	0.00	0.54	0.13	112.17	0.00	45.27	0.00	22.29	0.18	6.45	0.33	144.95	0.00	15.23	0.00	18.95	0.64
Residual	187	502.86		2.92		118.48		39.24		133.28		47.94		98.60		41.94		210.67	
Total	196	731.16		3.46		230.64		84.51		155.57		54.40		243.55		57.17		229.62	

Source: Fund staff estimates.

1/ For the definition of bank and loan groups see Table 1.

2/ The smaller the Sig. F-value, the more significant are the differences in average projection error.

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