

Credit Crunch or What? Australian Banks during the 1986–93 Credit Cycle

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CYCLES IN CREDIT HAVE IMPORTANT IMPLICATIONS FOR THE EFFICIENCY OF RESOURCE ALLOCATION AS WELL AS FOR DEVELOPMENTS IN THE MACROECONOMY. DURING THE UPSWING OF A CYCLE, RAPID CREDIT GROWTH CAN SUPPORT INCREASING ECONOMIC ACTIVITY AND RISING ASSET PRICES. CONVERSELY, LOAN LOSSES AND THE UNWINDING OF A CREDIT

boom can exacerbate an economic downturn if financial intermediaries become less willing to lend, thereby imposing further financial constraints on firms.

When bank loan growth slows or contracts, is this change due to a reduction of loan supply or loan demand, or both? Assuming that the typical answer is “both,” what are the relative contributions of supply and demand factors for explaining a contraction in bank loan volume? Finding evidence that credit-supply constraints reduced loan issuance noticeably in addition to contractions in credit demand would suggest that the credit-supply constraints could add to the macroeconomic costs of an economic downturn.

These questions have motivated a plethora of empirical studies using U.S. banking data to investigate them. The empirical literature has experienced a major resurgence especially since the observation of the U.S. credit cycle starting in the mid-1980s.

Specifically, many researchers have asked whether there was a “credit crunch” following the institution of the Basel risk-based capital standards—that is, whether bank capital supply-induced financial constraints led to observable restrictions on bank loan growth in the United States. Despite abundant empirical literature using U.S. banking data, these basic questions remain unsettled.

Most of the research into supply-based lending contractions relates to the experience of U.S. banks. These studies seek to measure a relationship between indicators of bank financial condition and bank lending. Hancock, Laing, and Wilcox (1995) assert that large losses experienced by U.S. banks in the early 1990s implied a negative shock to bank capital. They find evidence that such shocks were a major factor underlying the observed reduction in bank lending. Bernanke and Lown (1991) also

demonstrate a link between bank capital and lending by conducting a cross-section study examining the effect of the ratio of capital to assets on banks' subsequent loan growth. The study detects a significant relationship, indicating that a fall in the capital ratio reduces loan growth.² Hancock, Laing, and Wilcox (1995) provide evidence not only that lending declines in response to an economic contraction but also that banks alter their portfolio composition.³ Kaufman (1992) supports this view, providing evidence that in periods of capital constraint banks tend to shift away from commercial lending and into

Given that developments in the real economy can affect the financial sector, and that developments in the financial sector can affect the real economy, monetary policy must account for changes in the pattern of financial intermediation.

residential mortgages. Yet Berger and Udell (1994) offer evidence and reasonable alternative hypotheses to suggest that the evidence supporting the existence of important supply-based forces on bank lending is not significant.

In the pursuit of more evidence to bear on the subject, recent empirical work has examined banking data from other coun-

tries. Kang and Stulz (2000) examine whether banking shocks affected the performance of borrowing firms in Japan in the early 1990s. The results show that the firms with a higher proportion of bank loans performed worse than other firms. In contrast, Ongena, Smith, and Michalsen (1999) examine the Norwegian banking crisis (1988–91) and find evidence suggesting that bank distress had only a small impact on the real economy. More international evidence can be brought to bear on these questions.

This article investigates the credit cycle during the late 1980s in Australia as additional evidence on whether supply factors are important to bank loan behavior. Along with other studies that use banking data from foreign countries, this article examines bank loan behavior as if it were an additional credit-cycle observation, following the implementation of the Basel risk-based capital standards.⁴ There are key differences and similarities between the U.S. and Australian banking systems that can be evaluated up front, and the comparison allows a useful analysis of the Australian experience as it relates to the general economic issue of supply-based loan contraction.

Specifically, this article analyzes the 1986–93 credit cycle in Australia, paying particular attention to the lending behavior of banks during the down-

swing of the cycle. While demand-side factors account for much of the credit cycle, evidence is presented consistent with the argument that supply-side elements also played a role.

The study focuses on the examination of reporting data as collected by the Reserve Bank of Australia (RBA), in conjunction with information contained in banks' annual reports. Analysis of the data suggests that banks subject to relatively high levels of impaired assets during the early 1990s experienced a relatively sharp decline in loan growth. The results are consistent with the proposition that losses weakened the condition of banks' balance sheets and added a supply-based element to the contraction in lending.

Australian banks dramatically altered the composition of their portfolios during this credit cycle. One interpretation of this observation is that, in response to strong demand for housing loans and weak demand for commercial loans, banks did so to boost capital ratios and improve the risk profile of lending. This portfolio shift was particularly noticeable for banks with weaker balance sheets. In part the shift was made possible by a reduction in nominal interest rates, which allowed the household sector to increase its borrowing. In addition, the concessional risk weighting of housing loans in the risk-based capital standards introduced in 1988 gave reasons for banks with weak balance sheets to move toward more housing loans.⁵ The improvement in the condition of banks' balance sheets was also aided by the widening of margins on housing loans. However, this widening of margins also dampened credit growth because the high margins reduced the demand for loans.

Overall, while evidence in the article indicates only the existence of a credit-supply channel, it constitutes a circumstantial case that the loan losses of the early 1990s played some role in retarding lending growth, particularly of commercial loans in Australia. Hence, supply-based contractions in aggregate loan growth in Australia may have contributed non-trivially to the length and macroeconomic cost of the observed credit contraction associated with the 1990–91 recession.

Bank Condition and Lending: The Australian Experience

Deregulation of the Australian financial system in the 1980s reduced constraints on banks' access to depositor funds and gave banks the discretion to make price and quantity decisions with regard to credit allocation.⁶ There was a view that access to a broader funding base and the ability to participate in a wider range of lending

activities would eliminate the practice of credit-rationing among banks (Committee of Inquiry 1981; Grenville 1991). The credit expansion of the late 1980s supported this view. Blundell-Wignall and Gizycki (1992) estimate supply and demand for business loans, finding no evidence of credit rationing during the 1980s.

An alternative view emerged during the downturn of the credit cycle. Some business commentators argued that even in the deregulated environment of the 1990s, banks were restricting the supply of credit to creditworthy firms. The gist of the argument was that losses incurred by banks as a result of ill-fated loans made in the 1980s had forced banks to restrict lending to borrowers with otherwise viable investment opportunities.

Despite the hypotheses offered in the popular press, there has been little research examining the relationship between bank lending and indicators of bank condition among Australian banks. This article is motivated by the notion that credit contractions initiated by economic downturns are exacerbated by banks' subsequent reluctance to extend credit—that is, economic downturns can increase borrower defaults and impose large losses on banks' consolidated operations. To the extent that banks must rely on capital to absorb these loan losses, and to the extent that raising additional capital is costly, they are forced to curtail future lending and to reassess the composition of their loan portfolios. The supply response of banks is mixed, differing across banks according to their respective capital positions.

The techniques used in U.S. studies cannot be directly replicated using Australian banking sector data. First, although information on capital adequacy is available beginning in 1985, data on impaired assets for Australian banks are available only from

TABLE 1
Shares in Bank Lending Markets
(Percentage of Total; Average over 1990–96)

	Major Banks	Regional Banks	Foreign Banks
Total loans	68.48	22.79	8.73
Commercial loans	61.98	21.69	16.33
Housing loans	71.60	25.12	3.27
Personal loans	80.61	15.85	3.54

Source: Reserve Bank of Australia *Bulletin*

1990 onward, leaving few data points for time-series analysis. Second, the Australian banking sector is highly concentrated relative to that of the United States; only thirty-one Australian banks operated continuously during the downturn in the 1986–93 credit cycle, compared with many thousands of banks in the United States (see Berger, Kashyap, and Scalise 1995, Appendix A, Table A1). Australia's four major banks, Australia and New Zealand Banking Group (ANZ), Commonwealth Bank of Australia (CBA), National Australia Bank (NAB), and Westpac Banking Corporation (WBC), account for around 70 percent of total bank lending (see Table 1); the six U.S. money-center banks hold only around one-quarter of U.S. commercial bank assets. Therefore, data constraints for Australian banks, along with the dominance of the four major banks, limit the ability to replicate U.S. studies meaningfully.

Although there is only limited scope for econometric analysis of the credit-supply channel in Australia, direct analysis of bank reporting data shows that Australian banks were subject to significant loan losses during the early 1990s and that this experience weakened their capital position.

1. This work was initiated while Tallman was a visiting senior research economist at the Reserve Bank of Australia. The views expressed are those of the authors and should not be attributed to the Reserve Bank of Australia, the Federal Reserve Bank of Atlanta, or the Federal Reserve System.
2. The effect is stronger for those banks that are capital-constrained, with capital ratios approaching the regulatory minimum. The regulatory minimum is determined by capital adequacy guidelines, discussed below in the section on impaired assets and capital ratios. Berger, Herring, and Szego (1995) also participate in the debate by asserting that the safety net associated with deposit insurance weakens the relationship between capital and lending. This assertion implies the existence of moral hazard problems, whereby banks covered by deposit insurance have less incentive to control risk exposures.
3. In addition, Hancock and Wilcox (1998) produce evidence that small banks in the United States shrank their loan portfolios more than large banks in response to declines in their bank capital. By examining explicitly the transmission mechanism linking small bank loans to small firms, this research aims more directly at the question of how the supply-based credit contractions affect the real economy.
4. Basel risk-based capital standards were instituted in Australia on August 23, 1988 (see Thompson 1991, 141).
5. The Basel risk-based capital standards recommend that a housing loan has a risk weight that is half the risk of a commercial loan. Hence, a bank faced with a choice between a commercial loan and a housing loan of the same amount would have to hold only half as much capital for the housing loan as for the commercial loan.
6. Fisher and Kent (1999) show that the financial market in Australia changed dramatically prior to the 1890 financial crisis. These observations suggest that intermediaries must learn to adjust to new powers and new environments.

Extrapolating from U.S. results, these losses may have reduced subsequent loan growth and extended the contraction in credit beyond that associated purely with a fall in demand for credit. A subsequent section discusses this issue more fully.

The 1986–93 Credit Cycle

The 1986–93 credit cycle was Australia’s first cycle in a deregulated environment. The key features of this cycle, examined briefly in this section, include

- a large increase, and then fall, in the ratio of credit to gross domestic product (GDP);
- the increasing importance of banks relative to other financial institutions;
- large losses by banks in the downswing of the cycle;
- a narrowing, and then widening, of lending margins; and
- a fall in loan growth and changes in portfolio composition.

The Ratio of Credit to GDP. The ratio of credit to GDP is a standard measure of intermediated credit as a proportion of the aggregate economy. In Australia, the ratio of intermediated credit almost doubled over the 1980s, reaching a peak for the 1986–93 credit cycle of 0.9 in June 1990. Chart 1 shows that the credit expansion occurred primarily in the second half of the 1980s following deregulation of the financial sector. The deregulation and innovation in the financial market may have lowered the price of intermediated credit. The expansion coincided with an asset price boom and relatively high inflation (Macfarlane 1991).⁷ Rising asset prices increased collateral values, thus improving the balance sheet position of borrowers and enabling an increased demand for credit, to which a deregulated Australian financial system was able to respond. In 1990–91, however, the economy slid

into recession, and a sharp decline in credit followed. The ratio of credit to GDP fell for three years, and it took almost five years to reach its previous peak.

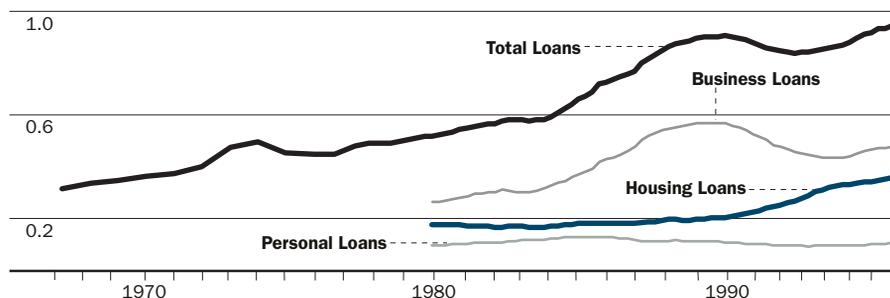
Chart 1 includes subcategory measures of business, housing, and personal loans, each of which includes loans made by foreign subsidiary banks as well as domestic Australian banks. The breakdown shows that the 1986–93 credit cycle was driven primarily by the cycle in business credit. The ratio of business credit to GDP more than doubled over the 1980s, reaching a peak of 0.57 in June 1990. The downturn in aggregate credit also coincided with that of business credit. In contrast, the ratio of housing credit to GDP remained fairly stable over the 1980s but increased steadily during the 1990s as Australian households began to increase their comparatively low levels of debt (Stevens 1997).

Although the downturn in the ratio of credit to GDP began in September 1991, the pace of credit expansion had begun to slow a couple of years earlier. Loan commitments are sometimes viewed as a signal for future lending growth. This pattern is observable in Australian data as well. Chart 2 shows that banks’ net lending commitments fell substantially in 1989 and were weak in nominal terms for the following two years, anticipating the weakness in bank loan growth that took place in 1990.⁸

The Importance of Banks. Although the economic expansion of the late 1980s stimulated strong lending growth across all financial intermediaries, the banking sector contributed most to the expansion in credit. Chart 3 shows real (inflation-adjusted) growth in lending by financial intermediaries.⁹

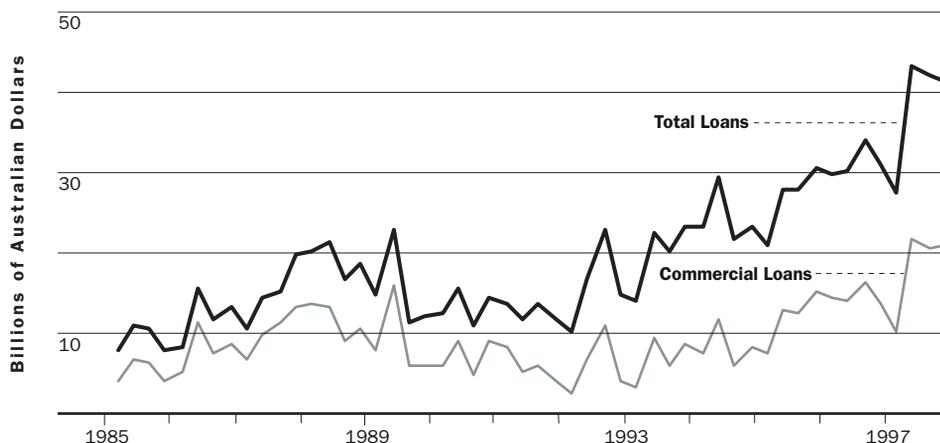
Real growth in lending by banks increased sharply between 1988 and 1990, briefly reaching annual rates of almost 30 percent and averaging 21.5 percent over the second half of the 1980s. This pace was considerably faster than the rate of growth in lending by all financial intermediaries and faster than the growth rate of M3 (which averaged 14 percent over the second

CHART 1 Ratio of Credit to Nominal GDP



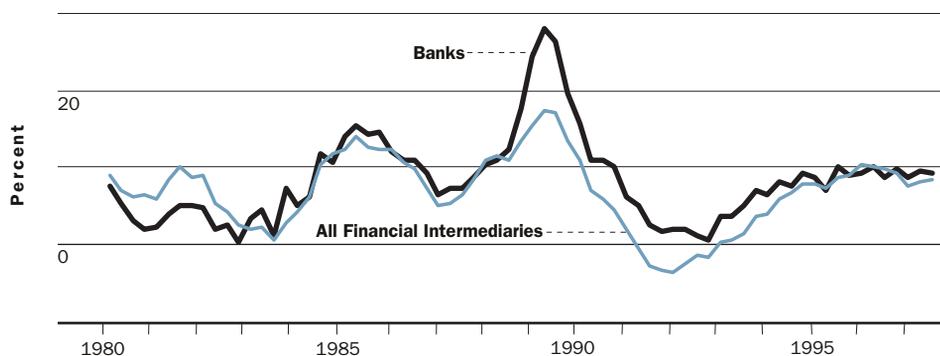
Source: Credit measures, Reserve Bank of Australia *Bulletin*; GDP, Australia Bureau of Statistics

CHART 2 Banks' Net Lending Commitments



Source: Reserve Bank of Australia *Bulletin*

CHART 3 Real Growth in Lending by Financial Intermediaries



Source: Reserve Bank of Australia *Bulletin*

half of the 1980s), as banks financed some of their lending growth from abroad.¹⁰

Edey and Gray (1996) argue that deregulation led to a one-shot expansion in the financial sector and allowed banks to reassert their dominance as financial intermediaries. Prior to the mid-1980s, the assets of nonbank financial institutions grew rapidly relative to those of banks.¹¹ Controls on bank deposit and lending rates as well as on asset composition had left banks at a competitive disadvantage

(Battellino and McMillan 1989). The gradual removal of those controls saw this disadvantage diminish, with bank intermediation gaining strength over the 1980s. Between 1985 and 1990, total assets of banking institutions as a share of GDP rose from 57 percent to 88 percent (Edey and Gray 1996).

The rapid growth in bank lending following deregulation has some historical antecedents. For Australia, Fisher and Kent (1999) describe the Banking Crisis of 1893; they note that in the years

7. It is notable that the unequivocal policy recommendation from Boyd and others (2000) is that banking crises tend to occur in environments of high inflation. They note that even predictable inflation is unhealthy for the financial system.
8. Net lending commitments are defined as bank offers to provide finance, minus cancellations of commitments; the duration of commitments differs across borrowers. Between 1986 and 1993, banks' net lending commitments averaged around 40 percent of their loans outstanding to the private sector.
9. Lending by financial intermediaries comprises loans, advances, and bills held with the private nonfinancial sector.
10. Growth in bank lending and M3 is adjusted for the conversion of building societies (institutions similar to U.S. savings and loans prior to 1989) to banks. M3 is currency plus bank deposits of the private nonbank sector, excluding commonwealth and state government deposits and interbank deposits.
11. In many cases banks established nonbank subsidiaries in order to bypass regulatory constraints.

prior to the crisis there was a notable growth in the assets of intermediaries that could effectively compete with trading (note-issuing) banks. In response, they argue, banks then began acquiring a riskier portfolio to maintain profitability. Given the seriousness of the banking collapse of 1893 in Australia, it seems clear that banks were relatively unprepared for the rigorous credit assessment necessary for maintaining risky portfolios profitably. More recently, the savings and loan institutions in the United States grew rapidly upon gaining new powers in the early 1980s, and most Americans are well aware of the requirements needed to recover from the loan losses of savings and loan institutions.

The rapid growth in the loans among both U.S. savings and loan institutions and Australian banks in the 1980s exposed the underdevelopment of their respective credit-assessment skills at that time. In both cases, the institutions had operated in a constrained environment for many years and hence had devoted insufficient resources to credit assessment and the pricing of risk (see Ullmer 1997 for a discussion of the Australian case). As a result, when deregulation relaxed constraints, Australian banks were not well positioned to manage credit risk. With pressure to regain market share, banks may have extended loans that under other circumstances they would not have made. Some anecdotal evidence in support of this view is contained in ANZ's 1992 annual report: "Undoubtedly, there was some imprudent lending during the boom period of the late 1980s, particularly in the small and medium business sectors, where the battle for market share following deregulation was hardest fought" (1992, 2). The end result was rapid growth in bank lending and increasingly risky loan portfolios.

Large Losses for Banks in the Downturn of the Credit Cycle. When the downturn in economic activity occurred, the previous rapid loan growth came home to roost, so to speak, and indicated, *ex post*, the inadequacy of existing credit assessment. There was a substantial increase in the level of banks' nonperforming loans accompanied by sharply falling profits and a sharp deterioration in the average return on shareholders' funds, as shown in Chart 4. In fact, the average return on shareholders' funds in 1991–92 was negative, at –1.8 percent.

One indicator of Australian banks' exposure to nonperforming loans is the ratio of impaired assets to capital. The data presented here are for net impaired assets (total impaired assets less provisions held against specific loans; see Appendix A for more details). This is a standard measure of the vulnerability of banks' capital to problem assets.

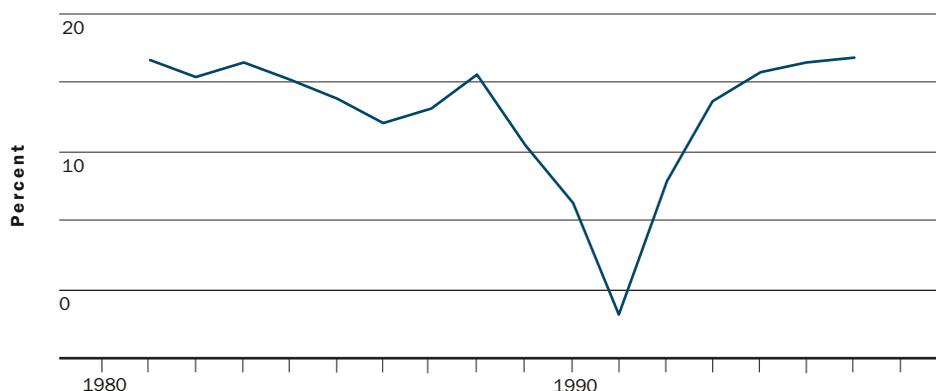
Chart 5 presents this measure for major, regional, and foreign banks.¹²

The early 1990s recession in Australia contributed to the sharp increase in impaired assets across all bank categories. For foreign and regional banks, net impaired assets during 1991 were equivalent to their entire capital base. More importantly, the net impaired assets of the major banks also reached high levels in 1991, covering more than 60 percent of their capital base. Major bank impaired assets remained high for a relatively long period; it was not until late 1994 that the ratio of net impaired assets relative to capital fell below 0.2.

Bank Lending Margins. Amid sizable loan losses and a falling cash rate in the early 1990s, the margin between bank lending rates and the cash rate (the cost of funds) increased. The top panel of Chart 6 shows the difference between the mortgage rate and the cash rate and the difference between the business indicator rate and the cash rate.¹³ Some background on the institutional structure of the Australian financial market will help clarify the significance of these figures. The cash rate in Australia is analogous to the federal funds rate in the United States; the cash rate represents the marginal cost of funds to the Australian banking system. Also, the cash rate is the rate of interest set by the Reserve Bank of Australia. During the 1986–93 period, the typical mortgage in Australia did not have a fixed interest rate. Instead, banks typically adjusted the mortgage rate based on market conditions, namely, some premium over the cash rate. In essence, during the time period for the data in this study, the mortgage rate paid in Australia was set periodically by the bank holding the mortgage. Only somewhat later did competitive pressure arising from new mortgage providers reduce the power of banks to dictate the mortgage rate.

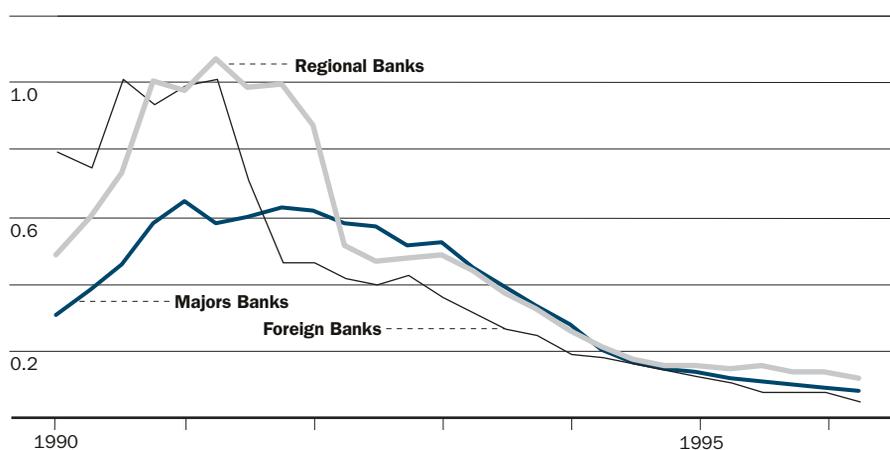
The differential between lending rates and the cash rate narrowed in the late 1980s as the cash rate was increased and competitive pressures within the financial sector also increased. Based on the business indicator rate, the differential associated with commercial loans averaged around 2.5 percent through the late 1980s but then widened to around 4 percent in 1991 and remained at this level for almost three years. The housing-loan interest rate spread followed a similar pattern over the 1990s, also peaking at a little over 4 percent. Part of the explanation for this widening of interest rate margins (measured relative to the cash rate) is that while the cash rate fell substantially over this period, banks' average cost of funds did not fall to the same extent (see Lowe 1995 and Reserve Bank of Australia 1992). To maintain average margins, the

CHART 4
Average Return on Bank Shareholders' Funds (Major Banks)



Source: Reserve Bank of Australia *Bulletin*; annual reports of major banks, various issues

CHART 5 **Ratio of Net Impaired Assets to Capital**



Source: Internal reports to Reserve Bank of Australia (Prudential Statements)

difference between lending rates and the cash rate widened. One effect of this development was that it made the writing of new loans, particularly housing loans, more profitable.¹⁴ Undoubtedly, this increased profitability was a factor underlying the rebound in average returns on shareholders' funds, which returned to almost 15 percent only two years after reaching negative levels in 1991–92.

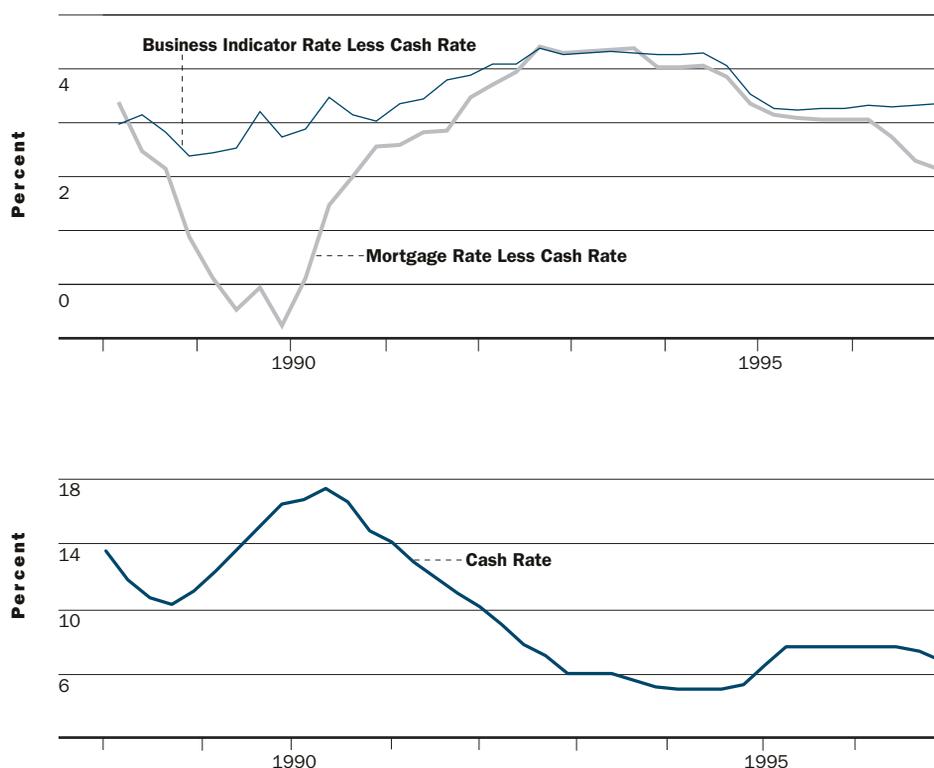
Contraction in Lending and Large Portfolio Shifts. Although the asset portfolios of major, regional, and foreign banks exhibit the same general response to losses in the early 1990s, there are differences in the timing and magnitude of lending responses across these categories. Chart 7 presents growth in total loans and commercial loans across bank categories, adjusted for breaks in lending

12. The sample consists of the thirty-one banks that traded continuously during the downturn in the 1986–93 credit cycle. There are four major banks, eleven regional banks, and sixteen foreign banking subsidiaries; their shares of total bank lending are 70 percent, 20 percent, and 10 percent, respectively. For more details, see Table 1 and Appendix B.

13. The standard variable rate on bank housing loans is taken as a measure of the mortgage rate on housing loans. The commercial lending rate is given by the business indicator rate on banks' large, variable-rate business loans.

14. High levels of profitability also encouraged mortgage managers to enter the market and contributed to the narrowing of margins evident in the mid-1990s.

CHART 6 Bank Lending Margins (Major Banks)



Source: Reserve Bank of Australia *Bulletin*

series. These breaks are the result of bank reclassifications and the transfer of loans to or from intermediaries outside the category under consideration.

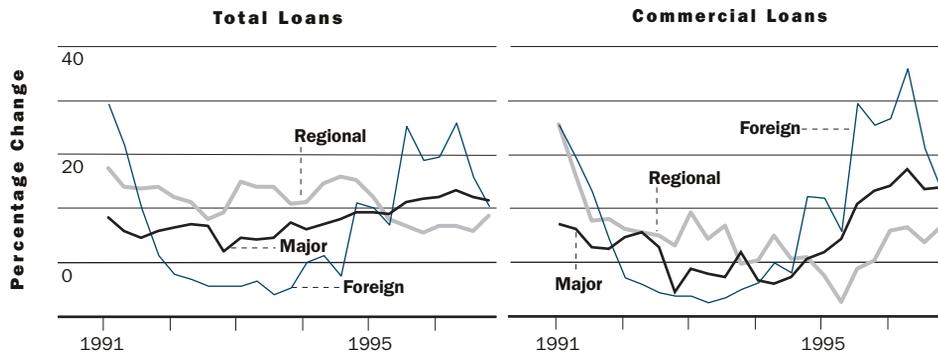
Foreign banks suffered the most rapid and extreme decline in total lending, with loan growth becoming negative in 1992.¹⁵ Growth in regional banks' total loans also fell during 1991 but fluctuated at positive rates of between 10 percent and 15 percent. Despite the fact that growth in major banks' total loans remained positive, reaching a trough of 2 percent in 1992, major bank lending only began a sustained recovery in 1994.

The chart shows that the decline in commercial loan growth was more uniform across bank categories. Growth in commercial lending suffered a more extreme fall than growth in total loans. During 1991, growth in commercial loans fell from 25 percent to around 10 percent for both regional and foreign banks. Foreign banks' commercial loan growth became negative in 1992, with the decline in lending continuing until 1994. Major banks also reduced commercial lending in the early 1990s, with growth becoming negative in late 1992. Growth in commercial lending remained weak for an extended period, only showing signs of recovery in 1995.

Sizable changes in bank loan growth over the 1986–93 credit cycle were accompanied by substantial shifts in the composition of banks' lending portfolios. Chart 8 presents the loan portfolio composition of major and regional banks, respectively. Portfolio shares in commercial, housing, and personal loans combined account for almost 100 percent of total loans, the residual being lending to government. Sharp changes in portfolio shares, such as that of commercial loans in the regional bank portfolio in 1992, can be explained by breaks in lending series. These breaks are listed in Appendix C.

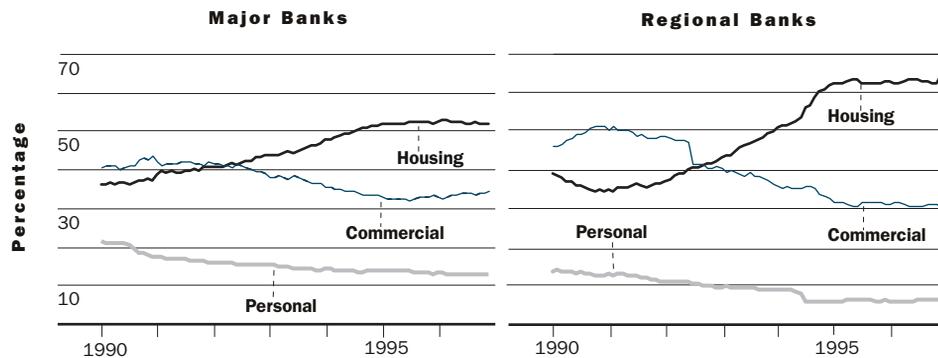
For major and regional banks, the most notable trend is the steady decline in the share of commercial lending and the corresponding increase in the share of housing loans. By 1995, housing loans accounted for more than 50 percent of major bank lending, compared with 40 percent in 1992. The shift toward housing loans was even more marked for regional banks, with the share of housing loans increasing from around 40 percent in 1992 to a share of 65 percent by the end of 1996. This shift from commercial loans to housing loans following large losses is consistent with the analysis of U.S. banks presented in Kaufman (1992) and Hancock, Laing, and Wilcox (1995). But, as will be discussed

CHART 7
Loan Growth across Bank Categories (Percentage Change over Four Quarters)



Source: Reserve Bank of Australia *Bulletin*

CHART 8
Portfolio Composition of Major Banks and Regional Banks (Percentage of Total Loans)



Source: Reserve Bank of Australia *Bulletin*

below, the shift toward housing loans was further reinforced by the lower risk-weighting given these loans by the Basel standards.

The 1986–93 credit cycle was one of the more pronounced cycles experienced in Australia’s history. In part, it can be explained as a by-product of the transition from a highly regulated financial system to a deregulated system. The cycle saw banks contribute significantly to the increase in lending during the late 1980s but incur large losses in the downswing of the cycle. There was a subsequent widening of lending margins and a decline in banks’ loan growth during the early 1990s. Furthermore, there was a distinct shift in banks’ loan portfolio composition away from commercial lending and into housing loans. The analysis in the next section suggests that the characteristics of the 1986–93

credit cycle are consistent with the existence of a credit-supply channel.

The Credit-Supply Channel

While the downturn in the credit cycle saw a significant fall in banks’ loan growth and major changes in the structure of Australian bank portfolios, it is not immediately clear whether these changes were driven by the demand for credit or a combination of demand and supply factors. The discussion now turns to the relationship between loan losses and capital positions across individual banks and the subsequent changes in those banks’ portfolios. Analysis is predicated on the assumption that all banks face broadly similar demand conditions so that differences in the size and composition of bank assets reflect decisions

15. Some observers viewed the losses among these banks as a transfer from overseas banks to Australian borrowers.

made by individual banks. Factors underlying these decisions are loosely referred to as supply-side influences.

It is important to acknowledge the difficulty in identifying credit-demand versus credit-supply channels. For example, the fall in banks' net lending commitments beginning in 1988 no doubt reflects a fall in demand for credit due to high interest rates. However, reduced commitments may in part also be a supply-side initiative, with banks recognizing that the prevailing growth in lending was not sustainable and that high interest rates would impose financial constraints on borrowers. Similarly, alternative explanations can be offered for the extended weakness in commercial lending commitments during the first half the 1990s (see Chart 2).

Restructuring of business and substitution away from debt financing undoubtedly reduced demand for commercial credit, but substantial loan losses may also have reduced banks' willingness to make relatively high-risk commercial loans. The Commonwealth Bank describes the contribution of demand and supply factors: "It is important to stress that the Bank (CBA) remains willing to lend—it is the lack of demand and, to a lesser extent, the absence of viable proposals, that is determining current lending levels" (CBA 1992, 7). The existence of the credit-demand channel is widely accepted, and, although far from conclusive, evidence does suggest that the credit-supply channel was active during the downswing of the 1986–93 credit cycle.

This article analyzes primarily the data for Australia's four major banks because these banks account for the bulk of bank-intermediated lending, provide relatively consistent data, and have comparable market shares (see Table 2). Also, the assumption that demand conditions are broadly similar across banks is probably more accurate for the major banks, each having national coverage and extensive branch networks, than for a more diverse grouping of financial institutions. Even so, the assumption is unlikely to hold exactly. Large loan losses are often the result of borrowers who take out large loans and default on loan repayments. To the

extent that customer markets exist, demand for loans from a bank with large loan losses might be significantly reduced because defaulting borrowers are unlikely to be borrowing additional funds. On the other hand, major banks have a long-established history in financial intermediation and they have banking relationships with a wide range of clients, so if one group of customers has reduced demand for loans, new customers can be attracted from other banks.

Facts on the Major Banks. In order to examine the relationship between loan losses and subsequent lending behavior, measures of bank condition—namely, impaired assets and capital—are obtained from the major banks' annual reports while lending data are those collected by the RBA.¹⁶

Impaired Assets and Capital Ratios. Data on impaired assets reflect the actual and potential losses of a bank. Up until 1994 each bank tended to disclose a slightly different measure of impaired assets in its annual report.¹⁷ Although the figures are not strictly comparable across banks and may over- or understate the true level of problem assets, they are presented here as an indication of the relative size of problem loans across major banks and the change through time in problem assets within each of the major banks.

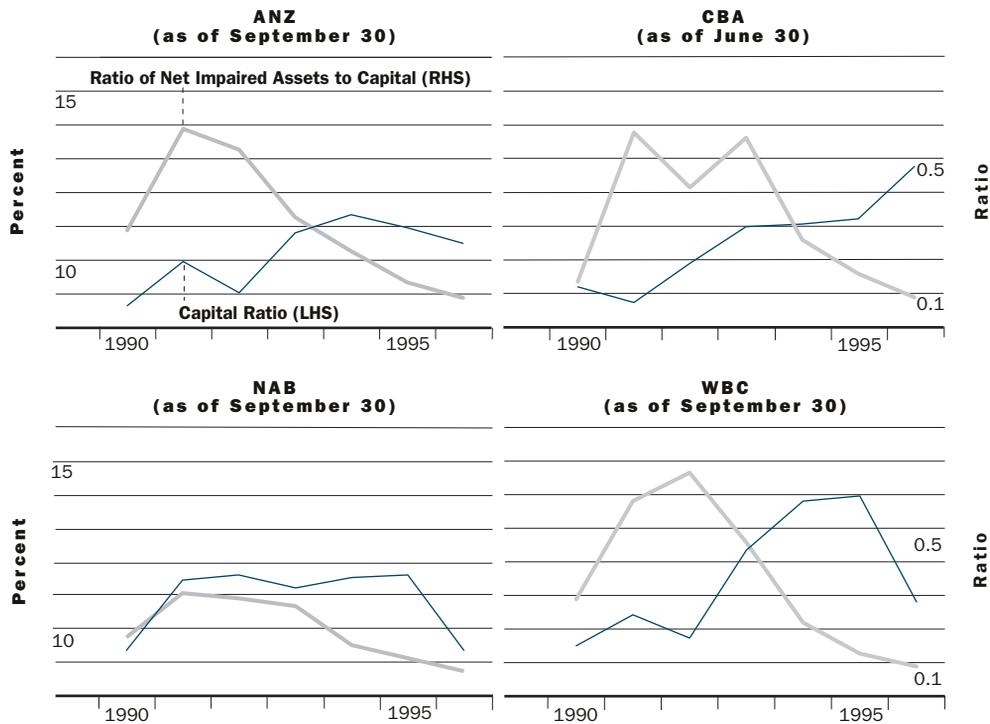
Chart 9 shows that for each of the major banks, the ratio of net impaired assets to capital peaked in 1991 or 1992. Each of these banks had nonbank subsidiaries that contributed to losses.¹⁸ WBC experienced the most marked deterioration in asset quality with net impaired assets in 1992 being equivalent to around 70 percent of its capital base. These problem loans contributed to a net after-tax loss of \$1,562 million in 1992. ANZ also suffered high levels of net impaired assets, which in 1991 amounted to almost 60 percent of capital. The peak in ANZ's impaired assets was also associated with a net after-tax loss of \$579 million in 1992. Although CBA's net impaired assets also covered a substantial proportion of its capital base in 1991, CBA managed to maintain positive after-tax profits. More notable, however, is the performance of NAB, whose net

TABLE 2
Shares in Major Bank Lending Markets (Percentage of Total; Average over 1990–96)

	ANZ	CBA	NAB	WBC
Total loans	20.69	28.84	25.92	24.55
Commercial loans	25.71	24.59	29.65	20.06
Housing loans	17.60	34.58	20.27	25.55
Personal loans	18.79	23.75	32.94	24.51

Source: Internal reports to Reserve Bank of Australia (Prudential Statements)

CHART 9 Measure of Major Bank Condition



Note: Capital ratio is percent of total risk-weighted assets.
Source: Annual reports of major banks

impaired assets were modest in comparison, peaking at 30 percent of capital in 1991.

The high levels of impaired assets experienced in 1991 and 1992 reflect a concerted effort on the part of banks to undertake a one-time write-off of problem loans in order to improve their balance sheet positions. This action would in part explain the rapid decline in net impaired assets after 1992, particularly for WBC and ANZ, whose ratio of net impaired assets to capital was halved within two years of its peak.

In addition to impaired asset data, Chart 9 presents capital ratios across the major banks as another

measure of bank condition. Conforming with international supervisory arrangements established by the Basel Accord, Australian banks have been subject to minimum capital requirements since August 1988. Capital adequacy guidelines stipulate that each Australian bank is expected to maintain a minimum ratio of capital to risk-weighted assets of 8 percent. Capital base is defined as tier 1 capital plus tier 2 capital, less goodwill and future income tax benefits. For detailed definitions see Appendix A. Risk-weighted assets are calculated by applying a 0 percent weight on gold and cash balances with the RBA, a 10 percent weight on federal and state

16. For confidentiality reasons, present capital adequacy and impaired asset data on individual banks as collected by the RBA are not presented. The measures taken from bank annual reports are year-end figures and do not reflect within-year variability.
17. In September 1994 the RBA provided banks with a set of guidelines for the definition of impaired assets, facilitating consistent reporting across banks. Impaired assets are defined as the sum of nonaccrual items, restructured items, other real estate-owned items, and other assets acquired through enforcement. See Appendix A for further details.
18. These losses are attributed to major banks' large exposures in the commercial property market. Conroy (1997) argues that in many cases subsidiaries failed to properly consult the lead bank when increasing their stake in property development. WBC subsidiaries Australian Guarantee Corporation (AGC) and Partnership Pacific Limited (PPL) made losses of \$107 million and \$146 million, respectively, in 1992. PPL also made losses of this magnitude in 1990 and 1991. ANZ's finance company, Esanda, made losses of \$139 million in 1992.

government securities and claims on governments and central banks of Organisation for Economic Cooperation and Development (OECD) countries, a 20 percent weight on local government securities and claims held against Australian and OECD banks, a 50 percent weight on mortgage-backed lending, and a 100 percent weight on commercial and foreign assets. Personal loans that are not mortgage-backed also attract a 100 percent risk weight. Lower risk weights are associated with assets that are typically assumed to be less subject to credit risk.

Chart 9 shows that the peak in impaired assets in 1991 and 1992 generally coincided with reductions in capital ratios. The coincident peaks are most apparent for both WBC and ANZ, whose comparatively large losses were associated with a fall in their capital ratios of almost 1 percentage point, to 9.7 percent and 9.0 percent, respectively. The fall in CBA's capital ratio was of lesser magnitude while NAB maintained a fairly constant capital ratio of around 11.5 percent in 1991 and 1992. After 1992, capital ratios increased quite quickly. In the case of WBC, capital relative to risk-weighted assets increased from 9.7 percent in 1992 to 13.8 percent in 1994. ANZ, being subject to the second-largest losses among the major banks, also significantly increased its capital ratio between 1992 and 1994, from 9.0 percent to 11.3 percent.

As the following equation shows, changes in a bank's capital ratio can be decomposed into three elements: changes in the bank's capital, changes in the bank's total assets, and changes in the composition of those assets. The capital ratio is defined as

$$k = \frac{K}{A^*}, \quad (1)$$

where K is the capital base and A^* is risk-weighted assets. For simplicity it is assumed that there are two assets and that one of the assets has a concessional risk weight of θ while the other has a risk weight of one. Therefore,

$$A^* = \theta A_1 + A_2 \quad 0 \leq \theta < 1, \quad (2)$$

where A_1 and A_2 are the two assets. This calculation can also be expressed as

$$A^* = [1 - w(1 - \theta)] A, \quad (3)$$

where A is total assets ($A_1 + A_2$) and w is the portfolio share of the asset attracting the lower risk weight.

Substituting (3) into (1) and totally differentiating yields

$$dk = \frac{dk}{A^*} - k \dot{A} + k \left[\frac{(1 - \theta)}{1 - w(1 - \theta)} \right] dw, \quad (4)$$

where a dot ($\dot{\cdot}$) above a variable denotes a percentage change.

Equation (4) implies that the capital ratio will increase if capital increases, if total assets decline, or if there is a portfolio shift toward the asset with the concessional risk weight. The lower the concessional risk weight (θ) is, the larger the effect will be on the capital ratio of a given change in the structure of a bank's portfolio. As will be discussed below, portfolio reallocation played an important role in the improvement of capital ratios among Australian banks in the 1990s.

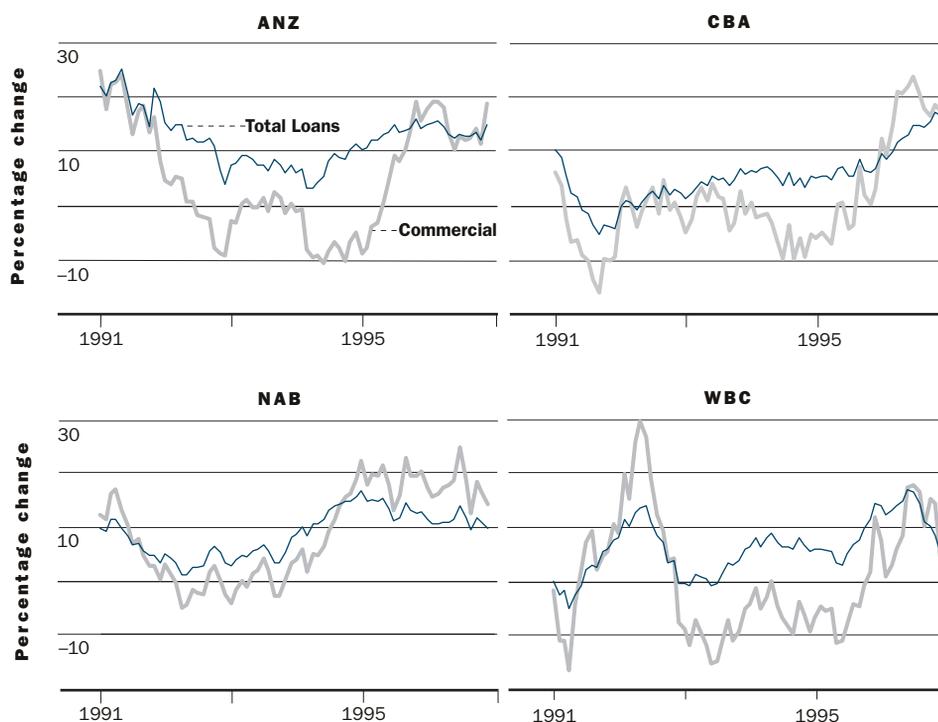
Lending Behavior. Chart 10 shows total loan growth and commercial loan growth for each of the major banks during the 1990s. Consistent with data published by the RBA, total loans are defined as lending to the nonfinancial sector. The lending figures presented here are those of the lead bank, and all growth rates are break-adjusted. The most notable adjustments occur for CBA in January 1991, given its acquisition of State Bank of Victoria, and for WBC in October 1996 when its subsidiary, Challenge Bank, transferred the bulk of its loans to the lead bank.

As Chart 10 indicates, following the peak in impaired assets in 1991 and 1992, each of the major banks experienced substantially slower loan growth. The contraction in commercial lending was generally more extreme and relatively extended compared with the contraction in total loans. Slow growth in major bank lending can in part be explained by reductions in net lending commitments, which occurred prior to the realization of loan losses.¹⁹

Having absorbed the largest losses among the major banks, WBC suffered the deepest and most extended contraction in commercial lending. The contraction in lending, however, was preceded by a brief period of rapid loan growth in 1992. This growth spike largely reflects changes in WBC's holding of bank bills in 1991 and 1992. Excluding the "bills held" component of lending shows that commercial loan growth was negative in 1992 (see Appendix A for more details).

Consistent with the established definition of commercial lending (including bills held), Chart 10 shows that growth in WBC commercial loans was consistently negative between 1993 and 1995, averaging around -8 percent. The contraction in ANZ commercial lending was less severe but followed the same broad pattern as that of WBC. However, growth in ANZ total loans was weaker than that of

CHART 10 Growth in Major Bank Lending (Percentage Change over Twelve Months)



Source: Reserve Bank of Australia collected data

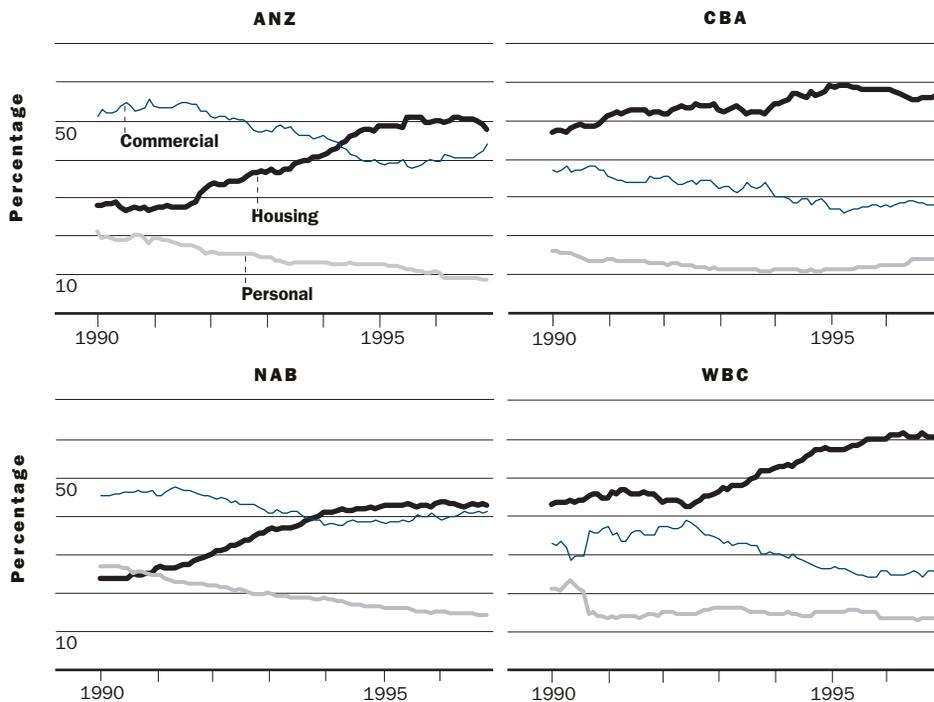
WBC. Total lending by CBA recovered slowly from 1993 onward. The contraction in CBA commercial lending was of a smaller scale than that experienced by WBC and ANZ, but the weakness in loan growth was relatively extended. Compared with the other major banks, NAB lending emerged strongly from the economic downturn, with a moderate slowdown in commercial lending. NAB total loan growth fell in 1991 but rebounded in late 1993, reaching 20 percent within a year; NAB commercial loan growth was positive and increasing during 1994, despite the contraction in commercial lending experienced by the other major banks. Charts 9 and 10 combined suggest that the banks that suffered most acutely from large loan losses in the early 1990s, namely, WBC and ANZ, were subject to deeper and more extended contractions in commercial lending as they were rebuilding capital ratios.

Composition of Loan Portfolios. Australian banks made a distinct substitution out of commercial lending and into housing loans in the aftermath of the recession of 1990–91. Consistent with the aggregates in Chart 8, Chart 11 shows a marked shift in portfolio composition among individual major banks.²⁰ Those banks subject to the highest impaired asset levels made an aggressive shift out of commercial lending and into housing loans. For example, housing loans accounted for almost 60 percent of the WBC lending portfolio by 1995, compared with 40 percent in 1992; the share of commercial loans fell from almost 40 percent to 25 percent over this period. Similarly, by 1995 housing loans accounted for 50 percent of the ANZ loan portfolio, compared with 35 percent in 1992, with the share of commercial loans falling from around 50 percent to 40 percent. CBA and NAB have also

19. Net lending commitments across the major banks are consistent with trends shown in Chart 2. Commitments turned down in 1988 and remained relatively weak for commercial lending in particular. Commitments data also confirm that weak loan growth was not simply the result of nonperforming loans being written off. Net lending commitments made by banks in weak condition were relatively low between 1991 and 1995, especially in the market for commercial loans. In contrast, NAB commitments recovered steadily from 1992 onward.

20. Once again, the sum of portfolio shares in commercial, housing, and personal loans accounts for almost 100 percent of total loans. Sharp changes in portfolio shares can be explained by breaks in lending series. These breaks are listed in Appendix C.

CHART 11
Portfolio Composition of Major Banks (Percentage of Total Loans)



Source: Reserve Bank of Australia collected data

devoted an increasing share of their portfolios to housing loans over the 1990s, with a moderate substitution away from commercial lending.

Some Evidence of a Credit-Supply Channel.

Chart 12 relates impaired assets across the four major banks to average growth in risk-weighted assets in the two years after the peak in impaired assets and average growth in total loans over the same period. Average growth in risk-weighted assets is calculated based on annual report data, that is, publicly available information, while growth in total loans is based on data reported to the RBA. Impaired assets, rather than net impaired assets, are taken as the point of reference given that exposure to problem loans (provisioning aside) is likely to prompt an internal review of lending policies.

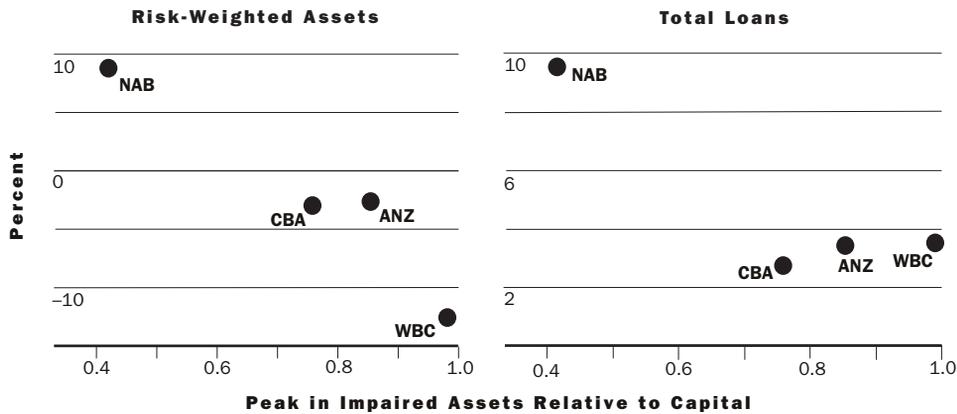
Chart 12 makes it apparent that the banks with a higher ratio of impaired assets to capital generally experienced relatively large contractions in risk-weighted assets and loan growth, observations generally interpreted and viewed as a shift by banks out of risky assets. The left-hand panel of Chart 12 shows that WBC, being most exposed to impaired assets, experienced an annual change in risk-weighted assets of around -12 percent in the two years following the peak in impaired assets. Only NAB experienced a significant increase in risk-weighted assets, with

growth averaging almost 10 percent per annum following the peak in impaired assets. The right-hand panel of Chart 12 shows that total loan growth remained positive for each of the major banks but was particularly strong for NAB, it having been the least exposed to impaired assets.

Given that average growth in total loans for each of the major banks was positive, any reduction in risk-weighted assets was due to changes in banks' balance sheet structure—a shift toward assets that attract a concessional weight in the calculation of risk-weighted assets. Thus it is not surprising that banks with the largest losses, and subsequent contraction in risk-weighted assets, exhibited the largest shift toward assets with a concessional risk weight.

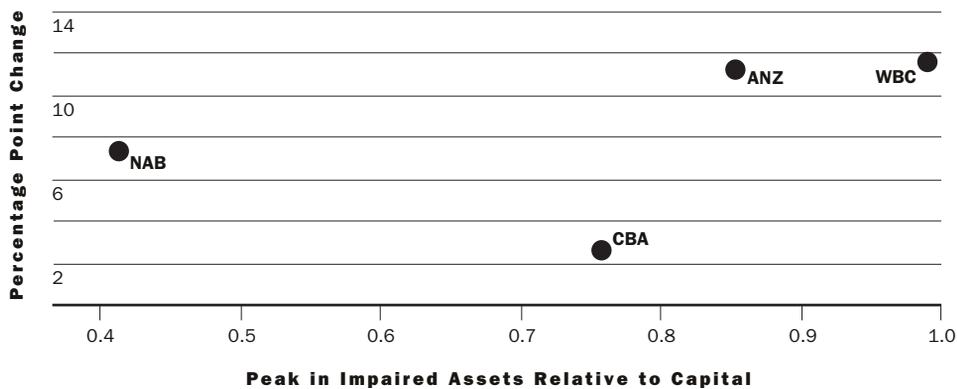
Chart 13 relates impaired assets across the major banks to the percentage point change in the ratio of housing loans to total loans two years after the peak in impaired assets. As suspected, those banks with the largest losses (ANZ, WBC) shift most aggressively toward assets with concessional risk weights. The chart shows that WBC, with the most sizable reduction in risk-weighted assets, undertook the most significant shift in portfolio composition. WBC, closely followed by ANZ, substituted most strongly into housing loans, which attract a risk weight of 50 percent as opposed to 100 percent on commercial loans.

CHART 12
Major-Bank Asset Growth Two Years after the Peak in Impaired Assets
(Average Annual Growth)



Source: Annual reports of major banks; Reserve Bank of Australia collected data

CHART 13
Major-Bank Portfolio Shifts Two Years after Peak in Impaired Assets
(Ratio of Housing Loans to Total Loans)



Source: Annual reports of major banks; Reserve Bank of Australia collected data

WBC and ANZ also experienced the largest corresponding shifts away from commercial lending, with the portfolio share of commercial loans falling around 9 percentage points and 8 percentage points, respectively (see Chart 11). NAB made a strong shift toward housing loans while the portfolio share of commercial loans declined by 4 percentage points.²¹

Using the simple model discussed above, one can obtain a rough guide to the importance of the shift from commercial lending into housing loans in improving capital ratios. It is assumed that housing loans initially account for 40 percent of total loans (that is, $w = 0.4$), rising to 60 percent (so that $dw = 0.2$).

The concessional weight on housing loans is known to be 50 percent (that is, $\theta = 0.5$). Furthermore, the initial capital ratio (k) is assumed to be 0.1, with the capital base and total assets held constant ($dK = 0$ and $\dot{A} = 0$). The resulting change in risk-weighted assets is

$$\begin{aligned} \dot{A}^* &= \dot{A} - \left[\frac{1-\theta}{1-w(1-\theta)} \right] dw & (5) \\ &= -\frac{1}{2-w} dw \\ &= -0.125 \end{aligned}$$

21. CBA's impaired assets peaked in 1991, but it is not until 1994 that the shift toward housing loans became apparent. As such, Chart 13, which is based on lending two years after the peak in impaired assets, does not capture this shift.

Thus, the assumed change in portfolio composition reduces risk-weighted assets by 12.5 percent. With no change in capital base or total assets, equation (5) implies that an increase in the portfolio share of housing loans from 40 percent to 60 percent will increase the capital ratio from 10 percent to 11.25 percent. For banks that suffered extreme loan losses and weakened capital condition, the more marked substitution toward housing loans served to reduce risk-weighted assets, thereby boosting capital ratios.

More fundamentally, however, loan losses caused banks to reassess portfolio allocations among assets in different risk classes. Banks were apparently less willing to absorb the heterogeneous risks associated with commercial loans when low-risk housing loans could be issued at similar margins. This approach was reinforced by the fact that mortgage-backed loans attract a concessional risk weighting in the calculation of risk-weighted assets. Given that the risk-based capital standards were introduced in 1988, it does not appear that the introduction of those standards alone generated the dramatic portfolio shift, but it was clearly a contributor. In essence, the question becomes one of whether banks altered risk-weighted assets to maintain capital ratios or whether large losses motivated banks to become more active risk managers when making loans. Both reflect supply-based credit responses.

Interpretation of the Evidence

Following the economic downturn and the collapse of the credit boom in the early 1990s, there was an extended contraction in bank lending among Australian banks. In large part this reaction reflected the unwinding of rapid increases in corporate leverage during the 1980s. High interest rates, high leverage, and weak economic growth saw a significant decline in the demand for loans. However, there is some indication that the contraction in lending was reinforced by supply-based constraints. There is evidence of a relationship between measures of bank condition and bank lending, with those banks subject to the largest loan losses having experienced larger-than-average declines in lending growth and substantial changes in the composition of their portfolios. This outcome is consistent with the view that the decline in loan growth in part reflected banks' reluctance to lend in light of the deterioration in the quality of their balance sheets. Although WBC, for example, stresses that it in no way sought to restrict lending, its 1991 annual report states, "Following the rapid asset growth of the 1980s, we have managed our balance sheet very

tightly, a process more recently facilitated by the reduction in credit demand in Australia" (1991, 5). Reduced loan growth may also be a decision on the part of banks to control risk-weighted assets in order to lift capital ratios.

Weak loan growth was combined with a change in the composition of banks' loan portfolios away from commercial lending and into housing loans. In large part this shift was made possible by strong demand for housing loans as the economy emerged from recession. The portfolio shift was, however, more marked for banks in relatively weak balance sheet condition. The ability of banks to undertake large changes in portfolio composition was an important element in the recovery of banks' balance sheets.

This portfolio shift had two effects. First, it allowed banks to increase capital ratios by reducing risk-weighted assets given that housing loans attract a lower risk weight of 50 percent compared with the 100 percent risk weight on commercial loans. Second, portfolio substitution allowed banks to reduce their exposure to commercial loans, which are inherently riskier than housing loans. More specifically, however, the shift toward housing loans also stimulated a recovery in the profitability of Australian banks. Increased margins on lending helped restore profitability following the loan losses of the early 1990s. Between 1992 and 1994, margins on housing loans reached their highest level at around 4 percent, equal to the margin on commercial loans.

In part, the portfolio reallocation undertaken by banks was made possible by falling nominal interest rates. The consequent reduction in mortgage lending rates, to interest rate levels well below those of the 1980s, encouraged households to increase their indebtedness and hence augmented their demand for housing finance (see Stevens 1997).²² Australian banks were fortunate that there was a ready demand for low-risk, high-yielding housing loans. Meeting this demand meant that banks were able to generate higher returns with lower risk while simultaneously improving their capital ratios. Banks in other countries, such as the United States and Japan, also faced large loan losses during the 1990s. However, banks in these countries were not in the same fortunate position as the Australian banks. In the United States, banks were forced to shift into lower-yielding Treasury securities for some time before their balance sheets recovered. Japanese banks are still working to recover. In contrast, Australian banks enjoyed a strong demand for a concessionally weighted asset that was also relatively high-yielding, thereby speeding the recovery of Australian banking.

Conclusion

This article analyzes the relationship between measures of bank condition and bank lending during the downswing in the Australian credit cycle of 1986–93. The concentrated nature of the Australian banking sector and a short data history mean that conclusions are based on direct observation of the data rather than econometric tests. While changes in the demand for loans clearly account for much of the cycle in credit growth, the analysis describes evidence consistent with the hypothesis that the sizable losses Australian banks incurred in the early 1990s played at least some role in constraining the availability of funds for commercial lending.

The basic conclusion from the Australian experience is that there is a relationship, albeit a relatively weak one, between the loan loss experience of the early 1990s and subsequent lending behavior. In essence, the conclusions imply that the larger the losses of a particular bank are, the slower its subsequent loan growth tends to be and the larger the change in its balance sheet structure toward housing loans tends to be. This description of the Australian data is consistent with the view that a bank's recent profitability (and its capital position) can affect its lending decisions. The bank losses also contributed to an increase in interest rate margins, which in turn constrained the demand for loans. The fall in lending, combined with the portfolio reallocation away from commercial lending and into housing loans, served to increase capital ratios by reducing risk-weighted assets. The shift toward housing loans also gave banks the opportunity to restore profits with a relatively low-risk, high-yielding asset, given

that margins on housing loans were similar to those on commercial loans.

What is less clear is whether the reduced supply of loans from banks with recent weak performance was compensated for by additional loans from banks with stronger profit performance. However, even if other banks did compensate through an increased supply of loans, the widening of lending margins that followed the banking problems is still likely to have reduced loan demand and thus credit growth.

Australian bank lending between 1986 and 1993 is of particular interest because it was the first credit cycle following financial deregulation in that country. Emerging from a regulated era, Australian banks had limited experience in managing portfolios with a rapidly increasing proportion of risky commercial loans. Batellino and McMillan (1989) argue that deregulation encouraged banks to be active liability managers. However, deregulation and the following credit expansion required that banks also become active asset managers; they were now exposed to risks that had not been on the balance sheet during the regulated era.

As numerous examples in a range of countries over the past decade illustrate, one can argue that large losses by financial institutions can exacerbate economic downturns. Given that developments in the real economy can affect the financial sector, and that developments in the financial sector can affect the real economy, monetary policy must account for changes in the pattern of financial intermediation. Understanding the linkages between the real economy and the financial sector remains a major challenge for macroeconomic policymakers.

22. In addition, relatively low inflation ensured that repayment burdens in the early phase of a loan were lessened, making borrowing more feasible for low-income earners.

Construction of Banking Data

Bank Lending

Balance sheet data are used to generate lending series based on banks' reporting to the RBA in Form D. Form D is a weekly return that covers assets and liabilities on Australian books. These data are used to construct the following series:

- *Total loans*, defined as lending to the nonfinancial sector.
- *Commercial loans*, defined as the sum of bills held, other promissory notes, commercial fixed loans, leasing finance, commercial overdrafts, commercial charge cards, and commercial other loans.
- *Housing loans*, defined as the sum of secured owner-occupied housing, unsecured owner-occupied housing, and non-owner-occupied housing.
- *Personal loans*, defined as the sum of personal fixed loans, personal overdrafts, personal charge cards, and other personal loans.

The "bills held" item is included in the definition of both commercial and total lending. A client in need of finance may approach its bank with a request to draw a bill. Should the bank choose to hold the bill, it is reported as bills held in Form D. Alternatively, if the bank chooses to accept the bill but subsequently sells it to another bank, the bill is still reported as an asset (with an offsetting liability) but is not included in the definition of lending. As in the case of WBC, the treatment of bills as a lending item or a separate asset can affect growth rates. To illustrate, the chart presents growth in WBC lending, excluding bills held.

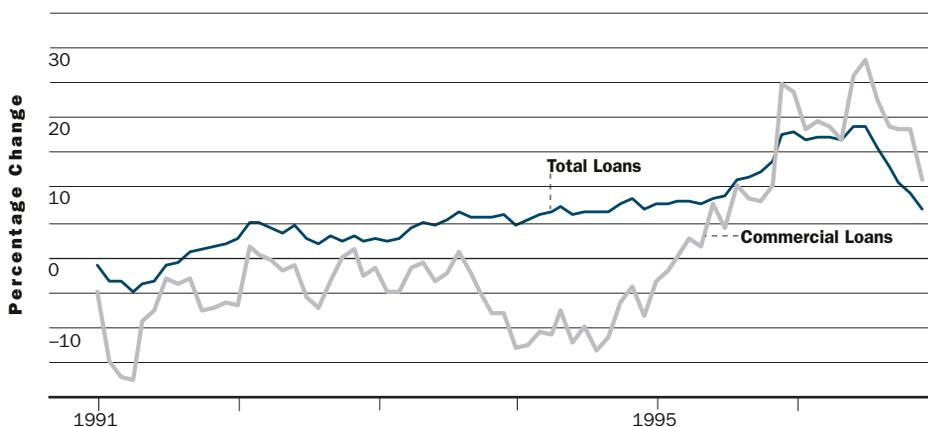
Measures of Bank Condition

The Capital Adequacy Return and the Impaired Assets Return are used to construct measures of bank condition for major, regional, and foreign bank categories.¹ Both returns are quarterly, and both are completed on a consolidated group basis. (For confidentiality reasons, annual report data are used when presenting capital ratios and impaired assets for individual banks.)

The Capital Adequacy Return is used to construct the following series:

- *Capital base*, defined as tier 1 capital plus tier 2 capital less goodwill and future income tax benefits. Tier 1 capital includes paid-up ordinary shares, nonrepayable share premium accounts, general reserves, retained earnings, noncumulative irredeemable preference shares, and minority interests in subsidiaries consistent with the foregoing components. Tier 2 capital is supplementary capital. It is classified as (1) upper tier 2 capital: general provisions for doubtful debts, asset revaluation reserves, cumulative irredeemable preference shares, mandatory convertible notes, and perpetual subordinated debt; and (2) lower tier 2 capital: term subordinated debt and limited life redeemable preference shares.
- *Total risk-weighted assets* are a regulatory measure of assets. It is with respect to this measure that the minimum capital requirement is defined. The concept of risk-weighting assets is designed to provide capital concessions to those banks that hold relatively less risky assets.

**Growth in WBC Lending (Excluding Bills Held)
(Percentage Change over Twelve Months)**



Source: Prudential Reports of Reserve Bank of Australia; Westpac Banking Corporation annual reports

Prior to September 1994, impaired assets were reported as “Nonperforming, Renegotiated, and Doubtful Items,” for which data began being collected in June 1990.² The Impaired Assets Return is used to construct the following series:

- *Total impaired assets*, defined as the sum of nonaccrual items, restructured items, other real estate-owned items, and other assets acquired through security enforcement. Nonaccrual items

are those assets for which the bank does not expect further returns and hence cannot accrue income ahead of receipt. Restructured items are contracts that have been modified to provide concessions for the borrower.

- *Special provisions*, defined as those provisions held against individually identified exposures if there is doubt surrounding collectibility. Special provisions can be held against both nonaccrual and restructured items.

1. Guidelines for the Capital Adequacy Return and Impaired Assets Return are detailed in Prudential Statements C1 and L1, respectively.
2. The Impaired Assets Return is based on RBA definitions as opposed to the Nonperforming, Renegotiated, and Doubtful Items Return, which is based primarily on banks’ subjective definitions.

A P P E N D I X B

Sample of Australian Banks

Major Banks

Lending series for each major bank are constructed based on lending by the lead bank. When trading and savings banks operate as separate entities, their lending series are combined.

Australia and New Zealand Banking Group Limited (ANZ) is combined with Australia and New Zealand Savings Bank between January 1990 and June 1992.

Commonwealth Bank of Australia (CBA) is combined with Commonwealth Savings Bank between January 1990 and December 1992.

National Australia Bank Limited (NAB) is combined with National Australia Savings Bank between January 1990 and September 1992.

Westpac Banking Corporation (WBC) is combined with Westpac Savings Bank between January 1990 and September 1993.

Regional Banks

Advance Bank Australia Limited (ADV)
Banks of Melbourne Limited (BML)
Bank of Queensland Limited (BQL)
Bank of South Australia (BSA)
BankWest Australia Limited (BWA)

Challenge Bank Limited (CBL)
Macquarie Bank Limited (MBL)
Metway Bank Limited (MET)
Primary Industry Bank of Australia Limited (PIB)
State Bank of New South Wales (SBN)
Trust Bank (TBT)

Foreign Banks

Bank of America Australia Limited (BAL)
Barclays Bank Australia Limited (BBA)
Banque Nationale de Paris (BNP)
Bank of China (BOC)
Bank of Singapore Australia Limited (BOS)
Bank of Tokyo Australia Limited (BOT)
Bankers Trust Australia Limited (BTA)
Chase Manhattan Bank (CMB)
Citibank Limited (CTI)
Deutsche Bank Australia Limited (DBA)
Hong Kong Bank of Australia Limited (HBA)
IBJ Australia Bank Limited (IBJ)
Lloyds Bank Limited (LBL)
Mitsubishi Bank of Australia (MBA)
NatWest Australia Bank Limited (NWA)
Standard Chartered Bank Australia Limited (SCB)

Breaks in Lending Series

Portfolio Composition of Major Banks and Regional Banks

Shifts in portfolio composition shown in Chart 8 can be explained by the following breaks in lending series:

- (1) In September 1990, the change in major banks' portfolio composition reflected one bank's reclassification of certain personal and government loans as housing and commercial loans.
- (2) In January 1991, major banks shifted out of commercial loans and into housing loans as a result of the acquisition of State Bank of Victoria by CBA.
- (3) In July 1992, the share of commercial loans in the regional bank portfolio dropped as a result of one bank's reclassification of certain commercial loans as government loans.
- (4) In July 1994, the share of personal loans in the regional bank portfolio dropped as a result of one bank's reclassification of certain personal loans as commercial loans.

Portfolio Composition of Major Banks

Shifts in major bank portfolio composition, as presented in Chart 11, can be explained by the following breaks in lending series:

- (1) In November 1991, there was a shift in ANZ portfolio composition as the lending activity of subsidiaries National Mutual Royal Bank and National Mutual Royal Savings Bank was transferred to the lead bank's balance sheet.
- (2) In January 1991, the share of commercial loans in the CBA portfolio dropped, with a corresponding increase in the share of housing loans. This change was due to the acquisition of State Bank of Victoria.
- (3) In August 1990, NAB reclassified certain housing loans as personal loans, generating the observed shift in portfolio shares.
- (4) In September 1990, WBC reclassified certain personal and government loans as housing and commercial loans. This reclassification resulted in an increase in the share of commercial loans in the WBC portfolio and a decrease in the share of personal loans.

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