

Banking Concentration, Financial Stability and Public Policy

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Abstract

Although widespread industry consolidation over recent decades has resulted in a decline in the number of smaller banks, there has been little overall increase in various indicators of concentration. Technological and regulatory change suggest that ongoing consolidation will continue to reduce the number of smaller banks, and that large multinational banks will play an increasing role in domestic banking markets. More foreign and mid-sized domestic competitors may reduce concerns about the effects of concentration on competition but raise important issues for prudential policy and financial stability. Unfortunately, academic research on bank concentration provides limited guidance for policy-makers in countries such as Australia, where a handful of banks dominate the financial sector. Some of those policy issues and their interrelated nature, as they apply to Australia, are examined in this paper in the light of the available evidence.

1. Introduction

The structure of the banking sector has long been an issue of policy interest focused largely around a presumed tendency towards concentration and its effects upon economic efficiency, bank profitability, financial and hence macroeconomic stability. There has been greater tolerance of concentration in banking than in other industries, because of a presumed benefit of increased financial stability. Of 105 countries for which data on bank concentration were available for 2005, 85 had three-firm concentration ratios above 50 per cent, 53 above 75 per cent, and 31 above 90 per cent.¹

The topic has remained at the forefront of debate in recent years for several reasons.² Within many national banking markets there has been substantial consolidation, reflecting influences such as regulatory and technological change. There has been substantial merger activity among large banking groups (including cross-border expansion), raising the issue of the impact of increased concentration both at a global and national level. At the same time, central banks and prudential regulators have responded to recent international experience of financial crises with an increased focus upon financial stability. Academic research into the implications for efficiency, stability and economic growth of alternative financial system structures

1. Based on data in World Bank (2006).

2. For example, a major study of trends in financial consolidation was undertaken by the Group of Ten (G10 2001).

has grown markedly, both at the theoretical level and through empirical analysis based on the recent development of relevant cross-country databases.

A focus upon banks is not surprising, given their central role in financial systems. However, for several decades the boundaries between banks and other parts of financial markets have been blurring as banks have expanded into other activities including in securities markets, funds management and insurance. Other types of financial institutions have emerged, most recently hedge funds and private equity groups, albeit with significant involvement of large banks. These developments have served to further focus attention on the role of large banking groups in financial sector stability.

This paper addresses several questions with an objective of contributing to policy formulation regarding financial sector concentration in Australia. First, what does the empirical evidence suggest about trends in banking sector concentration? Second, do the economics and technology of banking mean that high concentration is inevitable? Third, what does the extant literature say about the impact of banking sector concentration and financial sector structure on financial system stability? Fourth, how should Australian policy-makers approach the issue of concentration in banking?

The main premise of the paper is that increasing contestability of domestic banking markets by multinational banks is changing the nature and policy implications of banking sector concentration for many countries. Large foreign banks, if permitted to compete in domestic retail and business banking markets, can provide an effective competitive counterweight to large domestic banks. Since Basel II (or the competitive advantages arising from sophisticated internal risk-rating models being implemented by large banks) may reduce the (already tenuous) competitiveness of small authorised deposit-taking institutions (ADIs), removing remaining impediments to access by foreign banks should be a prior step to any review of bank merger restrictions currently applying in Australia.

An increased role for large multinational banks in domestic banking markets requires a number of issues to be addressed by financial regulators. These include protection of depositors and resolution processes for large banks in financial distress. Since these issues would become more pressing were large Australian banks to merge, they also warrant attention prior to any review of bank merger restrictions.

Unfortunately, should a review of bank merger restrictions be warranted, there is relatively little policy guidance to be gained from either theory or evidence for countries such as Australia with high bank concentration ratios.

2. Trends in Banking Concentration

Banking sector concentration can be considered at global, national or regional levels. Analysis is complicated because banks operate in multiple product markets which can have geographical boundaries ranging from small communities to the world economy. In both traditional banking products and other activities they are subject to varying degrees of competition from other types of institutions.

Table 1 illustrates the dramatic growth in the size of the world's largest banks over the past two decades. The 'top ten' institutions have varied substantially over time, reflecting both individual fortunes and developments (including exchange rate movements) in their home economies. Between 1985 and 1995, the ratio of the top ten banks' assets to world GDP fell from 25.7 to 22.5 per cent. However, between 1995 and 2004, it increased to 35.3 per cent as the banks' annual asset growth rate of 8.8 per cent outstripped world GDP growth of 3.8 per cent.³ The largest bank's size increased from assets of 2.6 per cent to almost 6 per cent of the Group of Seven (G7) countries' GDP.⁴ In 2005, the two largest banks (as measured by assets) were banks which had not featured in the top ten the previous year.

This increase in the size of the largest global banks has outstripped the growing importance of the financial sector overall, and suggests increased global concentration in the financial sector. For example, between 1995 and 2004 the top ten's ratio of assets to G7 GDP increased by 66 per cent while total bank assets to GDP increased by 15.5 per cent.⁵ Some of this difference could reflect the expansion of the largest global banks into other activities but this does not appear to be the complete explanation. For example, in the United States the increase in the ratio of assets to GDP of all financial institutions was only 19 per cent, while the same ratio for banks increased by 13 per cent.

The data thus suggest that there has been an increase in the concentration of financial wealth under the control of the world's largest banks in the past decade.⁶ While they still have a relatively small share of global bank assets, and there are regular changes in rankings by size, their importance for competition and stability in both global and multiple local financial markets creates an ongoing policy challenge involving a need for increasing coordination between regulatory authorities across countries.

Turning to domestic banking markets, overall there is no apparent trend towards increased concentration. Figure 1 plots the three-firm concentration ratios for various countries for 1995 and 2005. For the OECD countries, significant increases in concentration are observable in Switzerland and Spain, and to a lesser extent in Portugal and Norway (which were already highly concentrated), but a number of countries also experienced significant declines in concentration. One factor contributing to this development has been the growth in cross-border banking, particularly in Europe as a result of the European Economic Community initiatives towards developing a

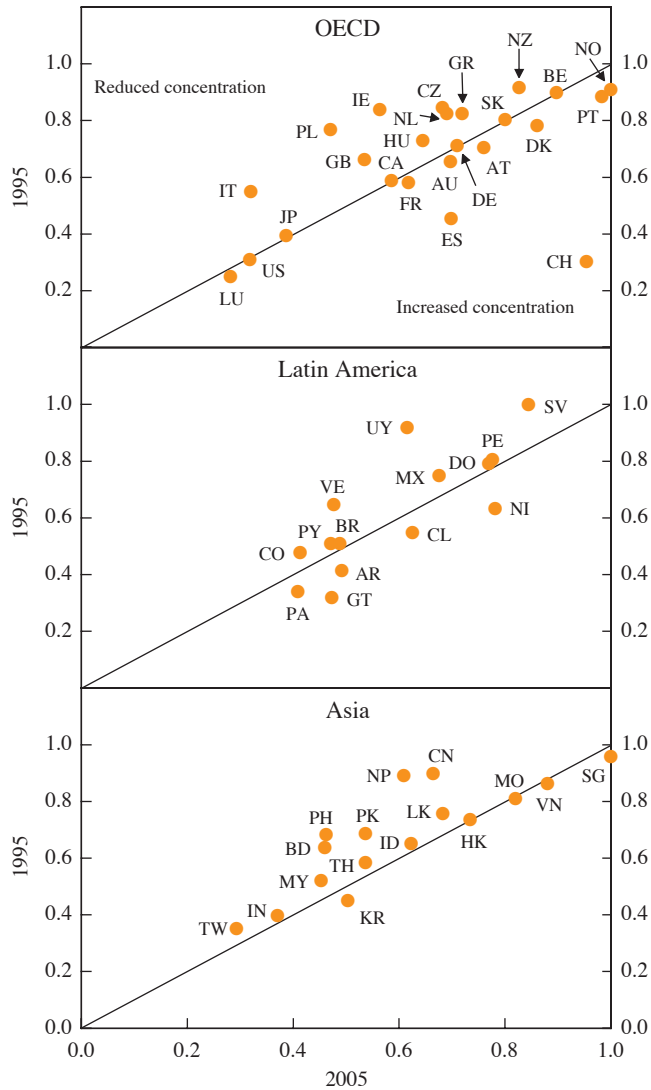
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3. These calculations use current price GDP in US dollars sourced from the IMF's *World Economic Outlook* database. Similar trends exist if PPP-based figures or GDP for the G7 countries are used.
 4. The growth rate of the largest bank in 2004 (UBS) was substantially more – since it did not even rank in the top ten in 1995.
 5. An (unweighted) average using data sourced from World Bank (2006).
 6. Also significant is the fact that the asset totals include those arising from activities such as wealth management. Indeed, two of the three largest banking groups in 2005 (Barclays and UBS) rank significantly lower (14th and 16th) when measured by equity, reflecting the relative importance to them of such 'low capital intensity' activities.

Table 1: World's Largest Banks by Assets
US\$ billion

	2005	Bank	2004	Bank	1995	Bank	1985
1	Barclays Bank	1 587	UBS	1 553	Deutsche Bank	Citicorp	167
2	Mitsubishi UFJ F.G.	1 585	Citigroup	1 484	Sanwa Bank	Dai-ichi Kangyo	158
3	UBS	1 563	Mizuho Financial Group	1 296	Sumitomo Bank	Fuji Bank	142
4	HSBC Holdings	1 499	HSBC Holdings	1 277	Dai-ichi Kangyo Bank	Sumitomo Bank	136
5	Citigroup	1 494	Crédit Agricole	1 243	Fuji Bank	Mitsubishi Bank	133
6	BNP Paribas	1 484	BNP Paribas	1 234	Sakura Bank	BNP	123
7	Groupe	1 380	JPMorgan Chase	1 157	Mitsubishi Bank	Sanwa Bank	123
8	Crédit Agricole						
8	Royal Bank of Scotland Group	1 334	Deutsche Bank	1 144	Norinchukin Bank	Crédit Agricole	123
9	Bank of America	1 294	Royal Bank of Scotland	1 119	Crédit Agricole	BankAmerica	115
10	Mizuho F.G.	1 268	Bank of America	1 110	ICBC (China)	Crédit Lyonnais	111
	<i>Total</i>	<i>16 494</i>		<i>14 621</i>			<i>3 316</i>
	Largest bank's assets/G7 GDP	5.9%		6.0%			2.1%
	Top 10 banks' assets/G7 GDP	60.9%		56.2%			41.3%
	Top 10 banks' assets/world GDP	36.9%		35.3%			25.7%

Sources: Bank assets – *The Economist*, 20–26 May 2006, 'A Survey of International Banking', Survey p 4; *Eurozone*, August 2006, 'Bank Atlas', p 80; World GDP – IMF *World Economic Outlook* database, April 2007 (<http://www.imf.org/external/pubs/ft/weo/2007/01/data/index.aspx>)

Figure 1: Bank Concentration – Selected Countries
Share of assets of the three largest commercial banks



Note: See Glossary for a listing of country codes
Source: World Bank (2006)

unified financial market. In the emerging markets of Latin America and Asia, there are also no general signs of increased concentration over this period.

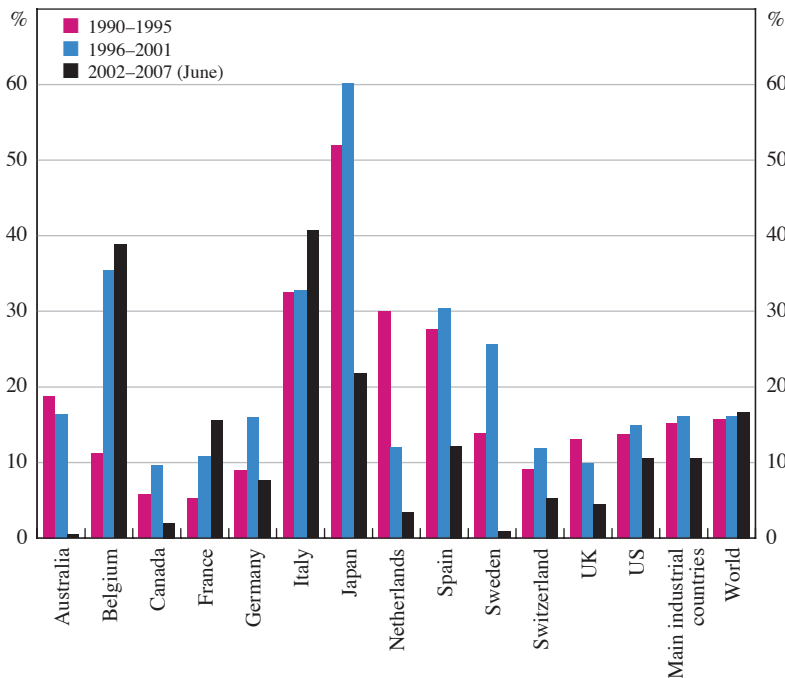
Three-firm concentration ratios provide only limited information but it is apparent from Figure 1 that national banking sectors around the globe are typically highly concentrated. The US (where the bulk of academic research on banking structure has been undertaken) is an outlier, with low concentration partly reflecting past restrictions on interstate banking. While the three-firm concentration ratio for the

US has not increased, this disguises significant consolidation in the US banking market. Between 1990 and 2005, the share of the industry's assets held by the top 100 banks increased from 68 per cent to 83 per cent, with the top ten's share of assets (domestic deposits) increasing from 25 (17) per cent to 55 (45) per cent. Around 50 per cent of commercial bank-holding companies existing in 1985 had disappeared by 2005 (Jones and Oshinsky 2007).

Figure 2 and Table 2 indicate the significance of mergers and takeovers in the banking sector worldwide over the past two decades and demonstrate a number of interesting phenomena.⁷

First, if the share of banking in total mergers shown in Figure 2 is compared to the financial sector's share of GDP (or employment) – which is typically in the range of 5 to 10 per cent – it is apparent that there has been relatively greater merger activity in the financial sector than in other industries, at least over the 1990s. Second, the number of bank mergers has declined since peaking at the turn of the century, but there has been a much smaller decline in the aggregate value of mergers. There have been fewer smaller institutions available as merger partners, and a greater role for

Figure 2: Consolidation Trends in Banking
Banking/total mergers – by value



Note: Includes: commercial banks; bank-holding companies; savings and loans; mutual savings banks; credit institutions; real estate; and mortgage brokers and bankers

Source: Thomson Financial SDC Platinum

7. Amel *et al* (2004) present similar data for the period ending 2001.

Table 2: Banking Merger Trends

	Number of mergers			Value of mergers US\$ billion		
	1990–1995	1996–2001	2002–2007	1990–1995	1996–2001	2002–2007
Australia	129	389	31	9.3	25.2	1.5
Belgium	10	32	8	1.2	33.5	24.8
Canada	40	248	17	3.7	30.0	6.3
France	56	82	36	4.7	56.8	60.6
Germany	24	69	27	5.5	66.4	21.5
Italy	50	99	72	14.6	79.1	94.6
Japan	14	117	81	36.4	198.4	61.9
Netherlands	20	66	17	12.6	25.3	6.9
Spain	24	168	22	6.3	42.5	27.6
Sweden	27	80	7	7.1	25.7	0.9
Switzerland	17	19	10	3.5	27.1	5.6
UK	255	937	77	38.6	154.5	40.2
US	1 946	3 091	1 004	151.8	876.3	450.9
Main industrial countries	2 612	5 397	1 409	295.3	1 641.0	803.4
World	3 024	6 472	4 538	343.2	1 786.5	1 480.5

Notes: Includes the institutions listed in the note to Figure 2. The data for 2002–2007 are to June 2007.
Source: Thomson Financial SDC Platinum

larger-scale mergers, including an increase in cross-border mergers.⁸ As a broad generalisation, the changing size distribution of banking firms in national markets is largely the result of mergers rather than organic growth, showing up as fewer small and more mid-sized banking firms, but not in the measures of concentration considered above. Such changes may, however, show up in other measures of concentration such as Herfindahl indices.

One important feature of recent bank merger activity has been the importance of cross-border acquisitions. For the 106 countries for which data were available in a recent World Bank survey (World Bank 2007), there were 321 applications for foreign bank entry by acquisition over the five years to 2006. This compares to 592 applications for entry by establishing a branch or new subsidiary for the same set of countries.

There is little obvious evidence of any relationship between concentration and foreign penetration of domestic banking markets.⁹ Table 3 presents data for

8. In Australia, for example, a large proportion of the mergers reported in Table 2 were between small institutions such as credit unions.

9. While advances in technology may make historical evidence of limited current relevance, the question of whether threat of foreign bank entry affects incumbent behaviour in concentrated domestic banking markets is clearly an important one warranting further research.

Table 3: Foreign Bank Share and Concentration
End 2005

Foreign share	Number of countries	Average foreign bank share	Average government bank share	Average five-firm concentration ratio
Per cent				
Equals 0	4	0	4	78
0–10%	18	7	25	67
10–30%	24	20	20	75
30–50%	17	42	13	71
50–70%	14	59	13	79
70–100%	21	92	2	73

Note: Market shares and concentration measured in terms of commercial bank assets

Source: World Bank (2007)

98 countries, grouped by foreign bank market share.¹⁰ For a significant number of countries, foreign banks have a large market share, but there is no obvious correlation between concentration ratios and foreign bank shares. There does, however, appear to be a negative relationship between government-owned bank market share and foreign bank market share (except for those few countries where foreign banks have zero presence).

Turning to Australia, where the four ‘majors’ dominate banking, Table 4 suggests that, if anything, concentration has been declining slightly.¹¹ Between 2004 and 2007, all indicators of the share of the four majors declined marginally, and the increased share between 2000 and 2004 can be primarily attributed to the takeover of the Colonial State Bank by the Commonwealth Bank of Australia (CBA) in 2001. The share of the four majors in the fast-growing securitisation market is relatively low, suggesting that the on-balance sheet figures understate the increasing role of other participants in lending markets. In domestic loan markets (excluding securitisation), four banks each with portfolios of more than A\$30 billion have emerged (compared to the majors with portfolios of more than A\$170 billion each) and another five each with portfolios of more than A\$10 billion. In domestic markets, those same four banks each have deposits exceeding A\$25 billion and deposits at another nine banks each exceed A\$10 billion. So, while the four majors still dominate the markets, a significant group of competitors of moderate size now exists.

These figures reflect both the growing role of foreign banks and smaller domestic banks in the Australian financial sector, with the impact of the former being particularly

10. These were countries for which data were available on each of banking sector concentration, foreign bank and government-owned bank shares for the end of 2005.

11. The Australian figures illustrate the dangers of relying on coarse measures of concentration such as the three-firm concentration ratios. For many countries, the relatively tolerable three-firm ratios tend to disguise the fact that there are one or more additional large banks, and thus may understate the true extent of industry concentration. For example, at the end of 2005, only 15 (14) countries out of 114 for which data were available had a five-firm concentration ratio for commercial banking deposits (loans) of less than 50 per cent, while 31 (28) had ratios in excess of 90 per cent (based on data from World Bank 2007).

Table 4: Banking Concentration Trends – Australia

	March 2000	March 2004 ^(a)	March 2007
Total resident assets			
All banks \$b	700	1 107	1 650
Share of four majors	65.4%	68.5%	64.8%
Amount securitised			
All banks \$b		57	109
Share of four majors		24.4%	23.2%
Gross loans and advances			
All banks \$b		729	1 064
Share of four majors		71.8%	71.0%
Total deposits			
All banks \$b	392	605	843
Share of four majors	63.9%	68.2%	62.2%
Number of licensed banks	50	53	54

(a) The takeover of Colonial State Bank by the CBA in 2001 accounts for virtually all of the increase in the four majors' share of assets between March 2000 and March 2004, and for around 75 per cent of the increase in their deposit share.

Source: APRA *Monthly Banking Statistics*

significant for policy-makers. Even if further consolidation of domestic entities occurs, successful entry by foreign banks may, in the longer term, offset any trend towards increased concentration. Domestic banking sectors appear likely to be increasingly shared between a number of very large multinational banks, together with smaller specialist domestic entities.

These figures also caution against reliance on ratios based on total banking assets (such as in the readily available databases commonly used). Four-firm concentration ratios for Australia calculated using domestic assets, loans or deposits (see Table 4) are substantially lower than when calculated using total assets of the banking groups.¹² Two factors are relevant here. First, the biggest banks have larger international operations than their smaller domestic competitors.¹³ As can be seen from Table 5, loans and advances on the Australian books of the major banks range between 68 and 84 per cent of total loans and advances of the banking group. Second, the large banks have expanded their activities well beyond the boundaries of traditional banking. The ratio of total loans and advances to total assets of the large Australian banking groups in 2006 varied between 58 per cent (for National Australia Bank (NAB), which has significant life insurance business) to 78 per cent.¹⁴

12. For Australia, that latter figure was around 80 per cent for 2004 (higher than the figures in Table 4 by around 10 per cent).

13. It also appears to be the case that the figure for banking sector total assets used in the denominator of the calculations uses only the domestic assets of branches and subsidiaries of multinational participants.

14. Comparisons between the banks' activities within Australia are also complicated by the fact that two of the banking groups – Australia and New Zealand Banking Group (ANZ) and CBA – have non-bank subsidiaries accounting for around 10 per cent of their lending, while the other two majors – NAB and Westpac (WBC) – undertake most lending through the bank itself.

Table 5: Major Australian Banks – Selected Financials
A\$ billion, September 2006

Bank	Loans and advances		Total assets	
	Domestic		Global	
	Bank	Consolidated	Consolidated	Consolidated
ANZ	165.6	180.5	255.4	335.8
CBA	208.5	219.8	262.0	369.1
NAB	192.4	193.9	283.8	484.8
WBC	195.4	195.7	234.5	299.6

Sources: banks' annual reports

3. Bank Concentration and Competition

Because concentration measures do not necessarily provide a good indication of market contestability, a number of recent studies of banking markets have applied techniques such as the Panzar-Rosse (1987) H -statistic. This is a measure of competition based on the estimated responsiveness of firm revenue to changes in factor input prices.¹⁵ There is little relationship between this statistic and standard measures of concentration. Casu and Girardone (2006) examine banking markets for 15 European Union countries over the period 1997 to 2003 and find no evidence that their calculated H -statistics are related to concentration measures. Similar results are found by Claessens and Laeven (2004) in a study of 50 countries over the period from 1994 to 2001.¹⁶ Yildirim and Philippatos (2007) find no significant link between concentration and competition (using the H -statistic) for 11 Latin American countries for the period from 1993 to 2000, but do find evidence that openness to foreign entry increases competition.¹⁷

15. The H -statistic is calculated by summing the estimated elasticities of revenue to factor prices, with a value of one indicating perfect competition, a value of zero (or less) indicating monopoly, and intermediate values indicating the degree of monopolistic competition.

16. While Bikker and Haaf (2002), in a study of 23 industrialised countries using data from the 1990s, report a negative relationship between their calculated H -statistics and concentration ratios, they do not control for variables relevant to competitive conditions such as activity and entry restrictions, which Claessens and Laeven find important.

17. This apparent lack of any relationship between measures of concentration and competition is consistent with the ambiguous results from a large literature examining whether concentration and efficiency measures such as net interest margins, operating costs and profits are related (after controlling for other relevant variables). Northcott (2004) reaches such a conclusion from a recent survey, although Canoy *et al* (2001) draw a cautious conclusion that studies based on the 1980s and 1990s do suggest a negative relationship between concentration and competition. Demirgüç-Kunt, Laeven and Levine (2004) in a cross-country study find no role for concentration in explaining net interest margins after controlling for regulatory impediments to competition and indicators of an economy's institutional characteristics, such as property rights. They also find that net interest margins are higher for banks with larger market shares, which they suggest is consistent with such banks extracting rents by use of market power.

For Australia, Claessens and Laeven calculate an H -statistic of 0.80,¹⁸ which implies that the market is relatively competitive, despite the high degree of concentration. Bikker and Haaf (2002) calculate H -statistics for large Australian banks of 0.63 and 0.68 in 1991 and 1997 respectively. While these results suggest that high concentration does not impede competition in domestic banking markets, data limitations mean that the results should perhaps be treated with some caution. Consolidated data are used, thus incorporating offshore and non-traditional banking activities of the banks. Proxies for factor input costs (such as the ratio of labour expenses to total assets for unit wage costs) may be poor measures in a time of significant changes in the ways that banks deliver their services. The robustness of the calculated H -statistic – which is based on estimation techniques that assume cost minimisation – may also be questionable, since existing research (Avkiran 1999; Sathye 2001; Neal 2004) indicates quite low levels of average cost efficiency in Australian banking (relative to an estimated best-practice frontier).

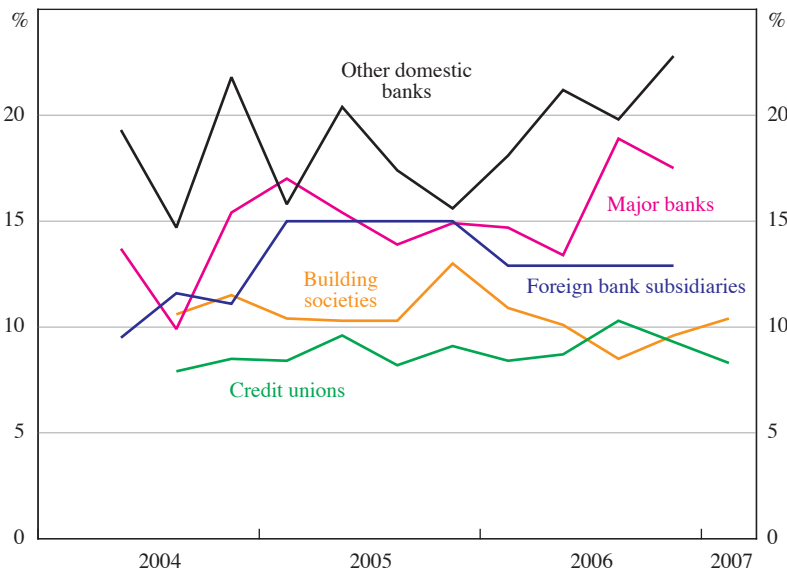
Another concern is that the H -statistic was developed for single-product market industries, but in the case of banking it is applied to multi-product firms. It may not adequately reflect the state of competition (or contestability) in specific financial markets viewed as important by merger authorities such as retail and small business finance. In Australia, retail deposit and loan markets are dominated by the four majors and a small number of other domestic banks and foreign bank subsidiaries, with competition from an increasingly concentrated sector of small credit unions and building societies (CUBs), mortgage originators and securitisers, and credit card providers. The CUBs are specialised in retail (and some small business) financing, and it is instructive to compare their recent profitability with that of the banks, as shown in Figure 3.

There are a number of possible explanations for the substantial gap between the rates of return of banks and CUBs. Most of the latter are mutuals, may not aim to maximise profits and operate with higher capital ratios than the banks. A higher return on equity for banks may be due to higher profitability in other markets.¹⁹ The small scale of CUBs (only four of them exceed A\$5 billion in assets) may lead to higher average costs. However, the data are also compatible with an interpretation that Australian banks have been able to exploit a degree of market power in retail markets, possibly due to factors such as the limited competitive ability of the smaller CUBs, some impediments to foreign bank entry into retail finance, and customer switching costs. At the same time, however, bank interest margins have been declining (Battellino 2006) and fees charged to retail customers (while increasing in aggregate value due to increased use of banking services) do not appear to have involved increased fee rates (RBA 2007).²⁰

18. This is the seventh-highest value among the 50 countries studied.

19. The Australian Bankers Association (ABA 2004) estimates that retail business generates 56 per cent of the profit of the major banks (and that 66 per cent of their profit is from Australian activities).

20. Whether changes in margins and fees have fully reflected reductions in the cost of providing banking services due to technological advance is another question.

Figure 3: Australian ADIs – Return on Equity

Note: Annual averages are used for foreign bank subsidiaries for 2005 and 2006 due to the excessive volatility of quarterly reported profits data.

Source: APRA

There have been significant structural developments in Australian (and international) financial markets in recent years that are relevant when considering bank performance and competitive conditions. However, trends such as growth in funds management activities, increased importance of capital markets, marked growth in credit transfer mechanisms, a growing role of private equity and increased prominence of hedge funds have done little to reduce the relative importance of banking firms (and particularly the four majors) in Australian financial markets. Over the past decade, the banking sector's share of total assets of financial institutions (including managed funds) has remained at around 50 per cent (Table 6).²¹

While the relative importance of capital markets as a form of financing has increased over time, its growth has not been as significant *vis-à-vis* the banks as might be imagined. As Figure 4 shows, stock market capitalisation (reflecting external and internal equity funding as well as valuation changes) has trended upwards relative to bank assets, but bank financing clearly remains very important.²² It is also apparent that the use of corporate bond markets by Australian non-financial companies has not increased relative to the size of the banking sector.

21. These figures represent the assets on the banking books, so that if the consolidated banking position were considered (including significant interests in funds management activities, insurance, etc) the relative share of the banking groups would be higher.

22. Increased use of equity finance rather than debt would be expected following the introduction of dividend imputation in 1987, which removed (for Australian investors) the double taxation of dividends.

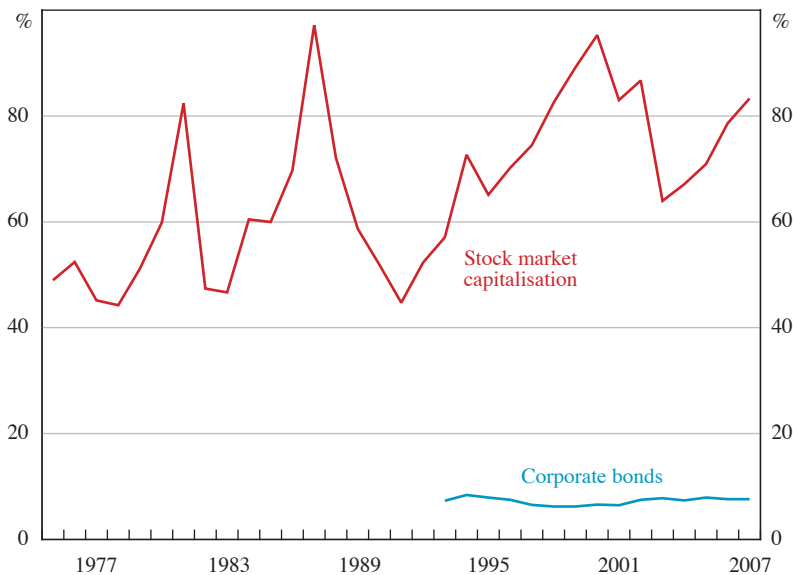
Table 6: Assets of the Australian Financial Sector
Percentage share of total

	1997	2002	2007
Securitisation	1.7	5.7	7.0
General insurance	4.9	4.4	3.5
Other managed funds	7.4	9.4	8.9
Insurance/Superannuation	26.5	25.8	24.1
Registered finance corporations	10.8	9.0	5.9
Banks	48.7	45.8	50.8

Notes: Building societies and credit unions are omitted from the data because of their small scale. Data in columns may not add up to 100 due to rounding.

Source: RBA *Bulletin* Table B.1 Assets of Financial Institutions

Figure 4: Australia – Corporate Capital Markets
Ratios to bank assets



Notes: The corporate bond figure is calculated as short- and long-term debt securities issued in Australia by non-financial Australian companies. It excludes securitisations and international issues.

Source: RBA *Bulletin*, Tables B.1 Assets of Financial Institutions, D.4 Debt Securities Outstanding, F.7 Share Market

These figures indicate that the importance of banks in the overall financial sector is not declining, and is most likely increasing given the activities of the banking groups in non-bank financial markets. This creates two problems for public policy. First, the influence of large banks permeates the entire financial sector, meaning that issues of safety and financial sector stability must be viewed from a much

broader context than purely banking markets. Second, ascertaining the state of competition in retail deposit and lending markets, and the potential implications of increased concentration is only one part of the difficult task confronting any merger authority.

4. Is Bank Concentration Inevitable?

There have long been concerns that economies of scale and scope will lead to concentration in the banking sector and dominance of the financial sector by a few large entities. Significant consolidation in the banking industry worldwide, accompanying the application of new electronic technology, has reinforced those concerns.

Anticipated cost savings or reduced risk due to diversification are generally advanced as the rationale for bank mergers, but potential to exploit increased market power and depositors' perceptions of increased safety (due to government unwillingness to allow the failure of large banks) are also relevant. Managerial hubris and personal preferences for growth and larger size may also play a role,²³ and although capital markets should inhibit excessive expansion and inefficiency, it is well documented that substantial levels of operating inefficiency do persist in banking markets.²⁴

There is an extensive empirical literature investigating the characteristics of bank production processes so as to measure economies of scale and scope and levels of inefficiency. Amel *et al* (2004) provide a recent review of the literature and conclude that there is consensus on the existence of economies of scale, but only up to a relatively small scale, while there is little evidence in support of significant economies of scope. Short-term gains from mergers are not readily apparent, either in terms of cost saving or stock market reactions.²⁵

Berger *et al* (2007) argue that technological developments have changed the underlying economics of banking in such a way that some of the negative effects of increased size have diminished. These include changes in service delivery methods and information processing techniques that may offset the advantages that smaller institutions possess in closeness and relationships with customers. While suggesting that recent research indicates that average cost savings may still occur at sizes of up to US\$25 billion or more and that large multi-market banks may have superior risk-adjusted performance, they also note that there is (US-based) evidence of

23. Hughes *et al* (2003) find that good performance is more closely associated with internal growth than with growth via acquisitions for a sample of US bank-holding companies for the period from 1992 to 1994, and that while banks with non-entrenched management generally benefit from acquisitions, the reverse outcome occurs when management is entrenched – consistent with managerial self-interest and consumption of agency goods.

24. The impact of maximum bank share ownership restrictions (which are common internationally) on either market discipline or incentives to expand by way of merger do not appear to have been studied in the literature.

25. They do caution that gains may only be realised over the longer term, and that merger waves create difficulties in disentangling the consequences of individual mergers from underlying forces (such as technology changes), which reshape the industry structure.

some diseconomies (albeit declining) associated with geographical dispersion of activities across multiple markets. By examining how the performance of small single-market US banks is affected by the presence of large multi-market banks for both the 1980s and the 1990s, they conclude that ‘... technological progress allowed large, multi-market banks to compete more effectively against small, single-market banks ...’ (p 365) and suggest ‘... the possibility that the efficiency improvements in banking may have been primarily important for banks to expand geographically, rather than increasing scale per se ...’ (p 366). Whether these conclusions apply for multinational expansion or for concentrated branch-banking systems is an important question for future trends in national banking market structures.

Some insights into these issues for a concentrated national, branch-banking system are provided by Allen and Liu (2007), who estimate scale economies and efficiency measures for the big six Canadian banks over the period 1983 to 2003. They find evidence of scale economies (a 1 per cent increase in output would increase costs by 0.94 per cent), inefficiency overall (relative to a best practice frontier) of between 10–20 per cent, but with larger banks having slightly better efficiency ratings.

Contrasting results on scale economies are found by Bos and Kolari (2005) in a study of 985 large European and US banks (of US\$1 billion or more in assets, and average assets of over US\$50 billion) for 1995 to 1999. Cost function estimates indicate diseconomies of scale on the cost side, although profit function estimates suggest economies of scale exist on the revenue side. They find no evidence of economies of scope, and X-inefficiency appears to be somewhat higher for the European banks than for US banks. They also conclude that geographical dispersion of a bank’s activities has a negative effect on profits, and that while international expansion reduces cost efficiency, it increases profit efficiency.

One source of potential benefit from increased scale (or scope) may be a reduction in risk. The ability to implement more sophisticated and costly risk management systems is one possible benefit, while another lies in the diversification effect – although whether any such benefit is priced by the market is an open question. The available evidence on the relationship between size and risk is somewhat mixed. Carletti and Hartmann (2002) review some of the earlier studies on this topic, which typically examine whether variables such as volatility of bank earnings or stock prices, or z -scores (probability of failure) are related to bank size or change following bank mergers. They conclude that there is some evidence that size and risk are inversely related, but note that the study of US bank failures between 1971 and 1994 by Boyd and Graham (1996) indicates a higher failure rate of larger banks than smaller banks. Demsetz and Strahan (1997) find evidence that larger US bank-holding companies were more diversified than their smaller counterparts over the period from 1980 to 1993, but that this did not translate into lower risk due to greater leverage and larger commercial and industrial loan portfolios.²⁶

Overall, there appears to be little evidence (Allen and Liu 2007 excepted) that very large banks gain substantial cost savings from increased scale or product

26. Their measure of diversification is the R-squared of a regression of bank stock returns on market returns (and other factors).

diversification either from mergers or organic growth. There is, though, no evidence that larger banks are less efficient than their smaller counterparts, and the net benefits from geographical diversification appear unclear particularly given technological change of recent years. However, size, and the ability to exploit market power, may lead to economies of scale on the revenue side and higher profits. Looking forward, the relatively lower capital ratios envisaged for large sophisticated banks under Basel II may alter the relationship between profitability and size – although the net effect will depend upon the costs incurred by banks in developing sophisticated risk management systems to achieve internal ratings-based (IRB) status.

5. Concentration, Competition and Stability in Banking: A Trade-off?

For over two decades, following the work of Diamond and Dybvig (1983) and Bryant (1980), economists have had rigorous analytical models to support the long-held view that banking is susceptible to runs and crises. Since those analytical breakthroughs, there has been substantial effort directed at deepening our understanding of the nature and causes of instability in banking, both in terms of its origins and propagation (including contagion).²⁷ Canoy *et al* (2001), Lai (2002) and Allen and Gale (2007) provide overviews.

Historically, relatively high levels of concentration in banking have been tolerated, or even encouraged by governments, based on a view that a less competitive banking sector may be less prone to banking failure and crises, and more conducive to financial stability. There has thus been a view (often unstated) that there is a trade-off between the efficiency benefits of increased competition and the risk of instability in the financial sector arising from reduced concentration.

There have been a number of arguments advanced in support of that view. First, larger banks may tend to be more diversified (in terms of both geography and products), reducing the inherent risk of failure. Second, larger banks may be better able to implement sophisticated risk management systems, which increase their ability to measure and manage risk-taking *vis-à-vis* smaller banks. Third, higher profitability arising from lessened competition generates a *franchise* or *charter value* exceeding book value (Keeley 1990) which, because it depends on the ongoing survival of the bank, acts as a disincentive to excess risk-taking. Fourth, a smaller number of larger banks may be easier for regulatory authorities to effectively monitor and may involve less risk of contagion.

As Beck, Demirgüç-Kunt and Levine (2003) point out, there are equally plausible counter-arguments. The systemic importance of large banks may induce a too-big-to-fail attitude in governments, with the implied guarantee of survival leading to excessive risk-taking. Market power may also enable banks to charge higher interest rates on loans, possibly inducing greater risk-taking by their borrowers. Big banks

27. Rapid growth of derivative and risk transfer markets has added new dimensions to the interrelationships within the financial system relevant to financial stability.

may be more opaque, and internal control systems may become less effective with large scale.

There have been many empirical and theoretical studies examining one or more of these aspects. Allen and Gale (2004, 2007) review (and develop) various models of banking markets which focus upon the implications of inherent characteristics such as imperfect information, incomplete markets and incomplete contracts for the optimal characteristics and structure of the financial sector. Given the limitations imposed by those inherent characteristics, 'constrained efficient' outcomes can involve financial sectors characterised by some degree of concentration and probability of financial instability. Different models they consider produce a variety of conclusions, but there is no general conclusion that greater competition increases financial instability nor that regulatory measures aimed at reducing financial instability increase welfare (since by distorting financial market structure and activities they can reduce static efficiency associated with the constrained efficient market structure).

The empirical literature has produced mixed results, partly reflecting the fact that there is relatively little correspondence between measures of bank concentration and competition or contestability. Because a concentrated market may be highly competitive, hypotheses about stability based on arguments about competition effects cannot be satisfactorily tested using data on market concentration.

One alternative is to consider the effect of banking consolidation on both individual bank risk and systemic risk as was done in the major study by the G10 (2001). They conclude (p 3) that 'the potential effects of financial consolidation on the risk of individual institutions are mixed, the net result is impossible to generalise ...', but that most risk reduction potential would appear to stem from geographic (including international) diversification. At the systemic level, the net effects of consolidation are also difficult to identify, but they point to increased importance of issues such as: greater difficulties in achieving an orderly exit of large complex banking organisations (LCBOs) and the risks of implicit adoption of a too-big-to-fail approach; increased interdependencies between large institutions; and increasing opaqueness of LCBOs and thus potential for a reduced role for market discipline (despite increased disclosure). They also note apparent evidence of increased interdependencies between LCBOs in the US, as reflected in the increased correlation between bank share prices (accompanying increased concentration and consistent with other indicators of interdependency such as interbank lending and derivatives activities). Increased correlation between share prices of the major banks has also been identified in Australia (RBA 2006), but attributed there to common profit experience rather than reflecting increased interdependencies.²⁸

Beck, Demirgüç-Kunt and Levine (2006) focus on the relationship between concentration and crises. They estimate how the likelihood of a financial crisis

28. Increased diversification by banks, by reducing idiosyncratic risk and increasing the correlation of bank returns with the common factor of market returns, could be expected to increase interbank return correlations without necessarily indicating increased interdependencies between banks. Such increased correlations could also reflect increased correlation in the discount rates investors use in pricing bank shares.

depends upon various banking system, regulatory and country characteristics for a sample of 69 countries over the period from 1980 to 1997. They find no evidence that increased concentration leads to greater banking sector fragility but that stability is higher in countries where regulations preventing entry or a wide range of activities are lower and where institutional conditions are conducive to competition. While their findings are consistent with the concentration-stability view, they suggest that the importance of competition indicates that something other than a possibility of higher profitability in a concentrated banking system (and Keeley's charter-value hypothesis) is responsible.

Another recent study (Schaeck, Čihák and Wolfe 2006) has focused on the relationship between competition and stability using cross-country data on the occurrence of crises and estimates of the H -statistic discussed earlier. Their results, using both a duration model and a logistic probability model to predict the occurrence (and timing) of crises for 38 countries over the period from 1980 to 2003, suggest that: greater competition is associated with lower risk of crisis; higher concentration *per se* does not increase the risk of crisis; and a more restrictive regulatory system may contribute to the build-up of instability.

Recent theoretical literature on concentration in banking has emphasised the fact that the economic functions of banking need to be considered when assessing what type of industrial structure is optimal. While competition is generally desirable given perfect information, information imperfections which give rise to financial institutions imply that a market involving institutions with some market power may be optimal. Allied to this is the fact that banking technology may involve economies of scale, leading to the emergence of large institutions as the most cost-effective operators.

Boyd and De Nicoló (2005) argue that increased banking sector concentration may lead to lower interest rates on deposits and higher interest rates on loans, but that the latter effect would induce borrowers to adopt more risky projects. This potential response is taken into account by banks in setting their loan rates. Boyd and De Nicoló demonstrate that, under certain assumptions about bank strategic interaction (among others), an increased number of banks leads to a lower overall level of asset portfolio risk.

Allen and Gale (2000 and 2007, Ch 10) develop models that help to explain the characteristics of banking market structure which may give rise to contagion. They consider the ways in which banks are interconnected (through mechanisms such as interbank deposit markets) and demonstrate that, in an incomplete network structure, liquidity shocks that lead to runs on one bank can trigger failures at other banks. Liquidity shocks in one region lead affected banks to liquidate assets (including claims on other banks) in a particular order, with incomplete networks inhibiting the countervailing adjustments involving other banks which might otherwise occur. These models do not provide conclusions on whether contagion or financial instability is related to banking sector concentration, but highlight the fact that careful analysis of inter-linkages within the financial sector is crucial for understanding the transmission and ultimate effects of shocks to the system.

6. Bank Concentration and Financial Sector Structure

Analyses such as that of Allen and Gale (2000) indicate that the structure and interrelationships within the financial sector, involving both institutions and markets, are potentially important for financial stability. Those analyses, while concentrating on the provision of liquidity by banks, tend to downplay one potentially important implication of the monetary nature of bank liabilities. This is the layering of financial claims emphasised in earlier banking literature, whereby non-bank financial institutions use bank deposits as their liquid reserves.²⁹ In such circumstances, providing that investors do not convert withdrawals from a financial institution into currency, switches in their preferences between different types of financial assets do not change the aggregate of bank deposits, only their ownership.³⁰

Financial market conditions, participants and practices have changed substantially since the deregulation of financial markets began several decades ago. Adjustment mechanisms to external shocks or changes in investor preferences now involve changes in asset prices and interest rates, rather than simply the quantity adjustments assumed in the old derivations of money and credit multipliers. However, the layering of claims is potentially important for thinking about how the structure of financial markets may be relevant to the issue of financial stability.

Consider, for example, a simple financial sector involving banks and mutual (hedge) funds, with no holdings of base money (currency and central bank deposits) other than that held by banks. Liquidity or confidence shocks causing investors to withdraw funds (by cheque or electronic funds transfer) from a particular bank do not reduce the aggregate amount of base money held by the banking sector. (Recipients of those funds, including mutual funds, will have increased bank deposits.)

Interest-rate, exchange-rate and asset-price adjustments will be induced (through reactions of the affected bank and others), but in principle the interbank market can redistribute the available liquidity as required. Even if withdrawals of deposits from bank A were used to pay out loans at bank B, a new equilibrium could be established with interbank loans from B to A restoring A's liquidity and maintaining the scale of each bank's balance sheet (albeit with different composition). In practice, price effects could be expected to occur and the willingness of bank B to provide interbank loans may depend on whether the liquidity shock was random or due to some more fundamental features of A's business. In a concentrated branch-banking system, where networks are likely to be relatively complete, the risk of contagion occurring due to such shocks to bank liquidity appears relatively small, unless the resulting asset-price adjustments expose fundamental weaknesses in the structure of bank portfolios.

However, the layering of financial claims, whereby secondary non-bank institutions such as mutual (hedge) funds use bank deposits as a means of payment and liquidity,

29. See, for example, Davis and Lewis (1980).

30. The standard models involving liquidity shocks may be able to partially capture this effect by assuming offsetting idiosyncratic liquidity shocks that cancel out in the aggregate, but they would need extra structure to reflect the layering of claims effect.

creates potential for an incomplete network and disorderly reactions to liquidity shocks. Consider, for example, decisions by investors to withdraw funds from a mutual fund, which runs down its bank deposit holdings and sells assets to meet that withdrawal. As well as the asset-price reactions, the initial adjustment is likely to involve a quantity effect, as the size of the mutual fund decreases, but only the ownership and not the total of bank deposits is affected. Only if the investor has withdrawn funds to reinvest with another mutual fund, or if banks expand their lending, is the initial contraction in size of the secondary institution likely to be avoided. Depending on the structure of relationships (including lending) between banks and such secondary institutions, the potential for incomplete network effects to occur seems more likely in the case of a flight to quality by investors from secondary institutions to banks, than within the banking sector itself.

While failures in secondary institutions such as hedge funds lie outside the responsibility of prudential regulators, the effects of such events are of concern to both them and central banks charged with a financial stability objective. It would thus appear that understanding the inter-linkages and adjustment process involving secondary financial institutions and banks in countries with highly concentrated banking systems is a more important agenda item for future research on financial stability issues than analysis of banking concentration *per se*.

7. Bank Concentration and Public Policy

In this section, the focus is upon the implications of banking sector concentration for public policy in Australia. As evident from previous sections, the Australian banking sector is relatively highly concentrated, the major banks play an important role across the entire financial sector, but the evidence points to a significant level of competition and a growing presence of foreign banks and (partly through mergers) modest-size domestic institutions in Australian financial markets. Internationally, available evidence (and theory) also appears to indicate no obvious relationship between levels of concentration and either financial sector stability or competition, as well as a lack of evidence for economies of scale at very large sizes. Also apparent is an increasing interest of large international banks for cross-border expansion into domestic retail and commercial banking markets.

7.1 Four pillars policy

Since the late 1980s, Australian governments have articulated a position which prohibits the possibility of mergers between the four major banks, known since 1997 as the four pillars.³¹ It is based on the fact that, in addition to meeting conditions of the *Trade Practices Act 1974* regarding competition effects, banking regulation requires that any merger between banks needs to be approved by the Federal

31. In Canada, which has a similarly concentrated banking sector, proposed mergers between the major banks were prevented in 1998, although there appears to be no specifically articulated policy of prohibition.

Treasurer. While there is no explicit prohibition on takeovers of the four majors by overseas banks, approval by the Treasurer would be required after consideration on national interest grounds.

The rationale for the policy is based largely upon concerns about ensuring adequate competition in the banking sector, and appears to reflect a fear that any merger between two of the big four would induce a merger of the remaining two.³² Concerns have also been expressed (such as in submissions to the Wallis Inquiry held in 1996–97) that issues of too-big-to-fail and concentration of economic power would become more problematic if a larger institution were created by merger. The banks themselves have generally argued against the retention of the policy, on the grounds that it prevents achieving economies of scale and inhibits their ability to reach a scale necessary for effective competition in international markets.

Any discussion of the future of the four pillars policy requires that attention be paid to the alternative regulatory processes and responsibilities for approval of potential mergers. Internationally, there are a wide variety of practices. Carletti and Hartmann (2002) provide a review of approaches in the G7 countries, noting that it is common for financial regulators to play a role in merger processes. One reason is that bank mergers sometimes reflect regulator-aided solutions to the potential (or actual) failure of banks. But more generally, the special licensing requirements for banks suggest a role for the licence-granting authority, while concerns about the potential impact of mergers for prudential regulation and financial stability are also relevant.

In Australia, the Wallis Report (Financial System Inquiry 1997) argued for the removal of the then six pillars policy, on the grounds that competition policy as applied by the Australian Competition and Consumer Commission (ACCC) would provide an adequate substitute for the evaluation of anti-competitive effects of potential mergers. Harper (2000) indicated a potential role for the Australian Prudential Regulation Authority (APRA) in such an evaluation process, but limited primarily to advising whether any prudential concerns should be taken into account.

While the ACCC would undoubtedly consult widely in making any decision, the particular features of banking suggest that there is a major role for other public sector entities. Specifically, APRA through prudential regulation and bank licensing requirements, as well as the RBA through systemic risk concerns and its oversight of the payments system would warrant involvement.

Imposing a blanket ban may be a cost-effective form of policy if it is certain that any application for merger between the four majors would be rejected, although it prevents the case being put to the test. But also relevant are game-theory considerations. Were it believed that one, but not two, mergers among the big four would be permitted, removal of the blanket ban might induce merger applications to protect against private losses should the others merge. For example, consider the

32. This view was expressed by the Federal Treasurer, the Honourable Peter Costello in an interview in 1998, where he also noted that ‘... if you can be satisfied that there’s new competition, then we’ll look at it at that point’ (<<http://www.treasurer.gov.au/tsr/content/transcripts/1998/061.asp>>).

highly simplified pay-off scenario outlined in Table 7 in which it is assumed that there is some natural pairing of banks associated with potential mergers. In such a scenario, each group would have an incentive to apply first for merger approval, even though (by assumption) mergers create no net social benefit. Given the difficulties for a merger authority in calculating social costs and benefits of mergers (perhaps particularly so in an industry such as banking) it would seem advisable to avoid a regulatory structure which might induce such pre-emptive merger applications.

Table 7: Hypothetical Costs/Benefits of Mergers

		Banks A and B	
		Merge	Don't merge
Banks C and D	Merge	Private benefit to A and B = 0	Private benefit to A and B = -x
		Private benefit to C and D = 0	Private benefit to C and D = x
	Net social benefit <0	Net social benefit = 0	
	Not permitted by authorities	May be permitted	
Don't Merge	Private benefit to A and B = x	Private benefit to A and B = 0	
	Private benefit to C and D = -x	Private benefit to C and D = 0	
	Net social benefit = 0	Net social benefit = 0	
		May be permitted	

On the basis of the evidence reviewed earlier, the rationale for opposition to mergers between the four majors appears to be weakening. Other banks, multinational and local, have been increasing their share of domestic banking business – and this trend looks likely to continue.³³ Despite high profit rates of the major banks, competition in financial markets does appear to have increased.

At the same time, however, the arguments that such mergers are necessary or desirable on economic grounds do not appear strong. Recent empirical studies (surveyed earlier) do not find convincing evidence of economies of scale or scope for institutions of the size of the four majors. The assertion that increased scale (through increased size and concentration in domestic markets) is necessary to enable effective participation in global wholesale markets is untested. Its relevance is also questionable for the case of the four Australian majors who: (in 2005) all ranked in or near the top 50 worldwide (by asset size); had greater emphasis on large scale international wholesale funding than is common elsewhere; and would appear to have ready access to increased equity capital to fund increased offshore activities. Also the ability of a much smaller local bank (Macquarie) to compete in international investment banking, securities and wholesale markets would appear to weaken the argument, and suggest that ‘culture’ may be a more important issue than domestic commercial banking scale.

33. At the time of writing, BankWest, a subsidiary of the UK bank HBOS, had just announced plans for a major expansion of its retail banking network.

Mergers between major banks may be less of a concern if there were not restrictions on entry into retail banking markets or regulations that may reduce the ability of some participants to compete effectively and thus reduce contestability. There are two principal issues involved here.

7.2 Basel II regulatory capital requirements

The impact of Basel II is potentially relevant to future developments in banking market structure. Large banks, such as the four majors and their multinational peers, will be regulated under the internal ratings-based (IRB) provisions, which involve different levels of regulatory capital than will be required for smaller banks operating under the 'standardised' approach for particular types of activities. In particular, estimates of capital requirements available under the Quantitative Impact Studies undertaken by the Basel Committee indicate quite substantial reductions in the regulatory capital required for retail and housing mortgage lending under the IRB approach relative to the standardised approach. To the extent that bank internal economic capital allocations and loan pricing reflect regulatory capital requirements, entry hurdles into these loan markets for deposit-taking institutions may be higher for *de novo* entrants subject to the standardised approach than for multinational banks able to operate under the IRB approach.

Foreign banks operating in Australia as branches would fall into that latter category (if their parents have IRB status in their home country), but small domestic banks would not, and foreign bank subsidiaries may not be able (or find it worth incurring the cost) to achieve IRB accreditation by APRA. Consequently, any impediments to entry by foreign bank branches into retail banking, while possibly reducing prudential and financial stability concerns (as discussed below), may have adverse effects on future competition in retail financial markets. This needs to be viewed in the context of the challenges faced by small domestic institutions in matching competitive gains of larger banks with more sophisticated internal risk-based ratings systems and (potentially) lower regulatory capital requirements.³⁴

7.3 Foreign branches and retail banking

When foreign bank entry into Australia was permitted in the 1980s, the option of entry via either a branch or subsidiary was allowed, but restrictions were placed on the permissible activities of foreign bank branches. Specifically, they are not allowed to accept an initial deposit of less than A\$250 000 from a customer, thereby effectively precluding them from competing in the retail deposit market. To the extent that foreign banks desire entry into retail banking and their preferred mode of entry is via a branch network, this restriction lessens potential competition in retail deposit markets.

34. On the other hand, deposit insurance schemes (as discussed later) may work to the advantage of such smaller institutions (particularly if premiums are not fully related to risk) by reducing the advantages of institutional age, size and reputation as signals of safety to potential depositors.

Several considerations motivated this restriction. First, prudential supervision of foreign branches is the responsibility of home-country regulators. Although Australia has no explicit deposit insurance, perceptions of government protection of retail depositors meant that the complications arising from the failure of a foreign branch operating in retail deposit markets made this unattractive. Second, at that time, banking sector economics and technology made it unlikely that many foreign banks would seek to establish a retail market presence (and could do so via the subsidiary method), thus making the costs of such a restriction relatively small.

This regulation now seems an unnecessary barrier to entry into retail banking. Foreign banks are now more readily able to establish a domestic retail presence through new ways of delivering products and greater brand recognition through their other financial services activities. Their preferred method of operation appears to be via branches than subsidiaries.³⁵ Regulatory authorities have agreed on protocols for the supervision of internationally active banks, so concerns about inadequate home-country supervision of foreign branches have largely declined.

Removing the restriction on foreign branch participation in retail deposit markets would thus appear to be warranted on the grounds of increasing contestability and limiting concentration in these markets. It would, however, require the resolution of one issue – namely the protection afforded to Australian depositors should such an institution fail.

7.4 Failure management and depositor protection arrangements

Significant concentration in the banking sector creates potential complications for the operation of deposit insurance schemes, which may help to explain the pattern of adoption of such schemes internationally. Insurance schemes generally work best when they cover a large number of small independent risks.³⁶ Jones and Nguyen (2005) suggest that the increased consolidation of the US banking system,

35. Available evidence on applications for foreign bank entry suggests that entry by way of branch is preferred to that of a subsidiary. In the 64 countries for which World Bank (2007) data were available and which permitted both branch and subsidiary entry, there were 416 applications for entry by branch compared to 115 by subsidiary in the period 2001–2006. (However, there were 15 countries where even though both types of entry appeared to be permitted, all applications were for entry as a subsidiary.) In Australia (where branch entry effectively precludes retail deposit-taking), the corresponding figures were 11 and 3.

36. This prompts the question of whether countries with high bank concentration are less likely to have in place an explicit deposit insurance scheme – a possibility which could also reflect the outcome of lobbying pressure by small banks in a less concentrated sector for introduction of such schemes (which are generally perceived to be to their relative advantage). There is a significant negative correlation between concentration ratios and the existence of deposit insurance schemes. However, Demirgüç-Kunt, Kane and Laeven (2007) have undertaken a detailed study of the determinants of introducing deposit insurance. They consider the role of a range of institutional, economic and social factors relevant to the political decision-making process, and while they do not include concentration *per se*, they find (contrary to expectations) that the relative importance of small banks delays the introduction of deposit insurance.

even though it remains relatively unconcentrated by international standards, poses threats for the viability of the US deposit insurance scheme.

Concentration in banking markets poses three potential problems for failure management and deposit insurance schemes. First, will a deposit insurance scheme be able to survive the failure of a large bank with a significant share of the deposit market? Second, is it possible to design a suitable funding mechanism (premium structure) for the scheme when the banks involved vary dramatically in terms of their size and range of activities and consequently in their risk-taking?³⁷ Third, will prudential regulators be able to arrange an orderly exit of a large complex banking organisation in financial distress or will they adopt a too-big-to-fail approach, thereby potentially distorting competitive conditions and inducing excessive risk-taking? These challenges are heightened when multinational banks are significantly involved in the domestic banking sector.

On the first issue, the essential problem is that (unless large banks are more risky than small banks) for larger banks demands upon the insurance fund are likely to involve less frequent, but larger claims. Jones and Nguyen (2005) suggest that expected losses arising from the hypothetical failure of one of the five largest US banks in 2003 would have exhausted the Bank Insurance Fund's reserves and imposed significant demands upon the banking industry and/or the taxpayer to meet the shortfall. However, as they note, the critical issue in this regard is the availability of liquidity to the Fund to meet required payouts to depositors, with access to credit from the government or central bank. If overall risk in the banking system is unaffected by concentration, the average premium rates required over a long horizon to meet deposit insurance claims will be unaffected. Higher concentration will make the Fund's reserve balance potentially more volatile, including periods of negative value, but that is of significance only if governments are unwilling to guarantee the Fund's liabilities (which may be the case) or if premium rates are increased significantly following a failure to rapidly return the fund balance to some desired target value. A more important consideration is whether governments will respond to the impending failure of a large bank by adopting a too-big-to-fail approach (considered below), which in effect overrides the normal operations of a deposit insurance scheme.

On the second issue, the inherent difficulties in designing a suitable premium structure for a concentrated banking sector were considered in the report of the Australian *Study of Financial System Guarantees* (Davis 2004). Concentration *per se* was less of an issue than sometimes thought for several reasons. The exposure of an insurance fund to large banks could be reduced by imposing a low maximum limit on individual deposits covered. Also, the balance sheet structure of the large Australian banks, involving significant wholesale and offshore funding, together with

37. This problem also occurs when funding for the prudential regulator comes from levies on supervised institutions, as in the case of APRA. In Australia, a levy involving two components, both proportional to assets but with one component capped, has been adopted with a view to capturing those regulatory resource costs that are of a fixed nature and those that are related to institutional size and complexity.

the system of *depositor preference* would mean that insured depositors (and thus the fund) would have sufficient recourse to bank assets ahead of other non-depositor creditors. Concentration may affect the temporal clustering of claims on the fund, but unless this is viewed as a problem for the fund's solvency (because of absence of government backing of the fund), it does not have substantial implications for the determination of premiums.

Far more important is the third issue of whether the regulatory authorities are able to effectively manage the orderly exit of a large bank in financial distress. Difficulties here can lead to a situation in which too-big-too-fail status becomes anticipated, generating competitive advantages for the institutions concerned and encouraging excessive risk-taking. Having in place clear guidelines for the protection (and exposures) of bank customers and arrangements for dealing with a failed bank are important components of preventing this problem. The recommendations of the Australian Council of Financial Regulators for creating a Financial Claims Compensation Scheme are a step in the right direction warranting prompt implementation – as argued by the Australia-New Zealand Shadow Financial Regulatory Committee (ANZSFRC 2006).

However, allowing foreign bank branches to compete in retail deposit markets would require further consideration of depositor protection arrangements for their customers. Australian depositor preference arrangements and protection under the proposed compensation scheme would not apply, and Australian depositors may not be covered under the deposit insurance arrangements of the home country.

8. Conclusion

A growing body of evidence from empirical cross-country studies suggests that the relationships between banking concentration and bank size on the one hand, and financial stability, competition, bank efficiency and performance on the other, are complex and depend upon multi-faceted aspects of regulatory policy and institutional arrangements. Those latter features include *inter alia* regulatory and political attitudes towards, and mechanisms for, dealing with possible failures of large complex financial institutions. Theoretical studies also point towards complex relationships between financial sector structure and financial stability, which need to be better understood. There should, though, be no presumption that either high concentration or suppression of bank competition promote financial stability.

Consequently, the optimal design of bank merger policy, including allocation of responsibilities, assessment criteria and processes, is not a simple task. Any consideration of changes to existing policy needs to involve a cost-benefit analysis that takes into account the impact and desirable settings of a wide range of other interrelated policy instruments. In Section 7 of this paper, some of those interrelationships were examined in the Australian context of the four pillars merger policy. These included restrictions on foreign bank branches operating in domestic retail markets, interrelationships between Australian and overseas depositor protection arrangements and failure resolution mechanisms for large banks.

Changing merger policy, such as replacing the four pillars policy with some alternative merger evaluation process, does not imply that the new process would lead to approvals of mergers between large Australian banks. The brief review of empirical evidence in Section 4 suggests that it is difficult to identify private and social benefits from further increases in the size of large banks, although technological change in banking and telecommunications may be rapidly depreciating the relevance of that evidence. Design of a new policy approach would also need to take into account the lack of reliable information available about potential benefits and costs of mergers, and the incentives that the policy process gives to large financial institutions (both domestic and potential foreign entrants) to both contemplate mergers and expend substantial resources on lobbying for desired outcomes.

Given those complications, it might be suggested that the four pillars policy has the virtues of low administrative cost, simplicity and a degree of certainty. While the available evidence does not appear obviously inconsistent with this ban on mergers being socially optimal, it is not conclusive nor does it allow that assertion to be tested. Meanwhile ongoing changes in global banking indicate that a substantial review is required.

Global banks are increasingly engaging in cross-border takeovers and entry into domestic retail and commercial banking markets. The major Australian banks are potential takeover targets. Any serious takeover offers by foreign banks could be expected to trigger a political reassessment of the merits of the four pillars policy, if only on the grounds that all alternatives for change in control of a major Australian bank should be considered before approval is granted. Undertaking a considered and substantial review of bank merger policy arrangements, including their interrelationships with other settings of regulatory policy, seems preferable to the possibility of a hurried policy response to (or possibly unwarranted denial of) a foreign bank takeover proposal.

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