SOME TESTS OF COMPETITION IN THE AUSTRALIAN HOUSING LOAN MARKET

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Research Discussion Paper
9202

February 1992

Economic Research Department

Reserve Bank of Australia

ABSTRACT

In this paper we investigate the degree of competition in the market for housing loans by examining a new data set, the asset composition of individual banks. We construct a Herfindahl index of concentration in this market, and estimate a model of conjectural variations to examine the reactions of each bank to changes in the value of loans made by other banks. Certain forms of competition are nested within this framework. Our findings lead us to decisively reject the hypotheses of perfect competition and perfect collusion. We are unable to reject the hypothesis that this market can be characterised as a Cournot oligopoly.

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1. INTRODUCTION

One of the primary purposes of deregulating the Australian financial system in the 1980s was to make banking a competitive industry. The Campbell committee of inquiry made this quite clear in its final report:

> "...the committee is confident that with the adoption of its recommendations, a strongly competitive environment will in due course become firmly established and artificial market imperfections will be of limited significance." (p. 532)

There has been much recent debate about whether this purpose has in fact been achieved. Milbourne and Cumberworth (1990) argue that entry barriers in branch banking may retard competition and hence lead to above-normal profits. However, they find wholesale margins to have generally fallen since deregulation, due possibly to increased competition from new domestic and foreign banks. Harper (1991) argues that banks still enjoy a degree of oligopoly power in the market for deposits. Valentine (1990), on the other hand, argues that deregulation has made Australian banking competitive, as well as efficient in the technical sense.

The evidence brought to bear by these studies is almost entirely descriptive. In contrast, we present econometric evidence on this question. We do so by estimating a monthly model of conjectural variations for individual Australian banks, i.e. the reactions by each bank to the value of loans made by other banks. This model is estimated for owner-occupied housing loans, the only category for which the relevant data are available, over the period May 1986 through December 1990. The model lets us test three hypotheses: that Australian banking is competitive, collusive, or oligopolistic.

Studies of competition in banking in other countries have been numerous. Recent studies of Canadian banking include Nathan and Neave (1989) and

Shaffer (1990). They find evidence in favour of competition. Studies by Evanoff and Fortier (1988) and Shaffer (1989) find evidence of competitive behaviour in US banking, while Berger and Hannan (1989) and Hannan and Liang (1991) find evidence that incumbent banks have market power. Gilbert (1984) surveys the literature on market structure in the US banking industry. Studies which use a conjectural variations framework to estimate the degree of competition in industries other than banking include Sullivan (1985), who investigates the cigarette industry in the United States, and Gollop and Roberts (1979) who examine the coffee roasting industry, also in the United States.

In Section 2 we describe the data that we use in this study, and present some elementary measures of concentration. In Section 3 we motivate the use of the conjectural variations framework. Section 4 presents the results and Section 5 concludes.

2. DATA ISSUES

All studies in applied industrial organisation face a common problem: how to define the industry under consideration. This is not as easy as it seems. Banks are multi-product firms, which not only take deposits and make loans but deliver several other services, e.g. insurance, funds management, corporate advice, trading in foreign exchange markets, management of property trusts, and no doubt many others. Since banks compete, in part, not just against each other but against merchant banks, insurance companies and other providers of financial services, a case can be made for examining competition not just between banks but in the financial services industry as a whole. However, this is impractical because the necessary data do not exist.[1]

Data on lending by individual banks are available on reporting forms submitted by each bank to the Reserve Bank. These forms contain certain disaggregated data on the bank's assets and liabilities. This is potentially useful information because recent discussions of Australian banking have

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[1] One could also argue that banks compete against building societies in the market for home loans. However, this issue is difficult to deal with in practice because many building societies became banks during our sample period.

asserted that "retail" banking is less competitive than "wholesale" banking, the former being done primarily at bank branches, the presence of which constitute an (alleged) barrier to entry. Retail banking is essentially lending for housing plus personal loans. However, reliable data on the latter have been available only since January 1989. We therefore use the housing loan market as a proxy for retail banking and construct a monthly series of housing loans by individual banks. To obtain a measure of the real value of loans, we deflate these data by a housing price series. The Appendix contains details of data sources and construction.

Most analyses of competition start with some measures of concentration. Figure 1 plots the concentration of Australian banking assets as measured by the Herfindahl index. This index is defined as

$$H = \sum_{i=1}^{n} s_i^2 \qquad 0 \le H \le 1 \qquad (1)$$

where s_i is the share of each bank in the market. $H=0$ is the limiting case of an infinite number of firms with zero share of the market, while $H=1$ when there is a monopoly. $1/H$ gives the number for "equal sized firm equivalence", so that, for example, $H=0.25$ is equivalent to the existence of four banks of equal size.

Figure 1 shows that the concentration ratio has had its ups and downs since the early 1980s. The big rise in 1982/83 was associated with the merger of the Bank of New South Wales with the Commercial Bank of Australia in October 1982 to form Westpac Banking Corporation, and the merger of the National Bank of Australasia with the Commercial Banking Company of Sydney in January 1983 to form the National Australia Bank. The introduction of new banks - both foreign and converted building societies and merchant banks - in the mid 1980s led to a decline in concentration. The recent takeover of the State Bank of Victoria by the Commonwealth Bank in January 1991 has led to an increase in concentration.

Figure 2 plots the concentration of housing lending over sample period May 1986 to December 1990. This is the period of the deregulated market for housing loans that we use in the estimation of our model. As Figure 2 shows, concentration in loans for housing gradually diminished over the period. (The

Figure 1: Herfindahl Index -
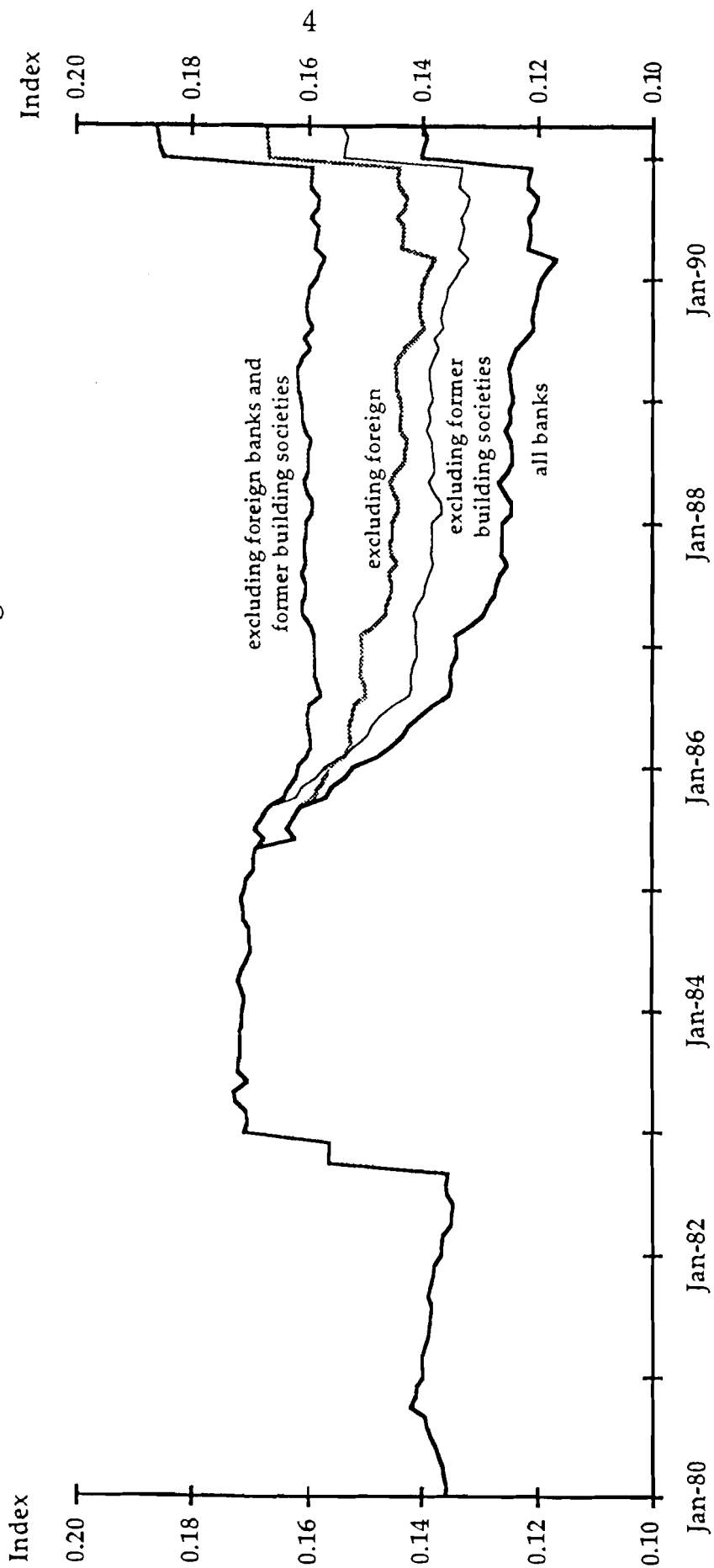Concentration of Australian Banking Assets

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Figure 2: Herfindahl Index -
Housing Lending by Australian Banks

Index

0.20

0.18

0.16

0.14

0.12

0.10

excluding foreign banks and former
building societies

excludes former building
societies

excludes foreign banks

all banks

Index

0.20

0.18

0.16

0.14

0.12

0.10

May-86

May-87

May-88

May-89

May-90

5

6
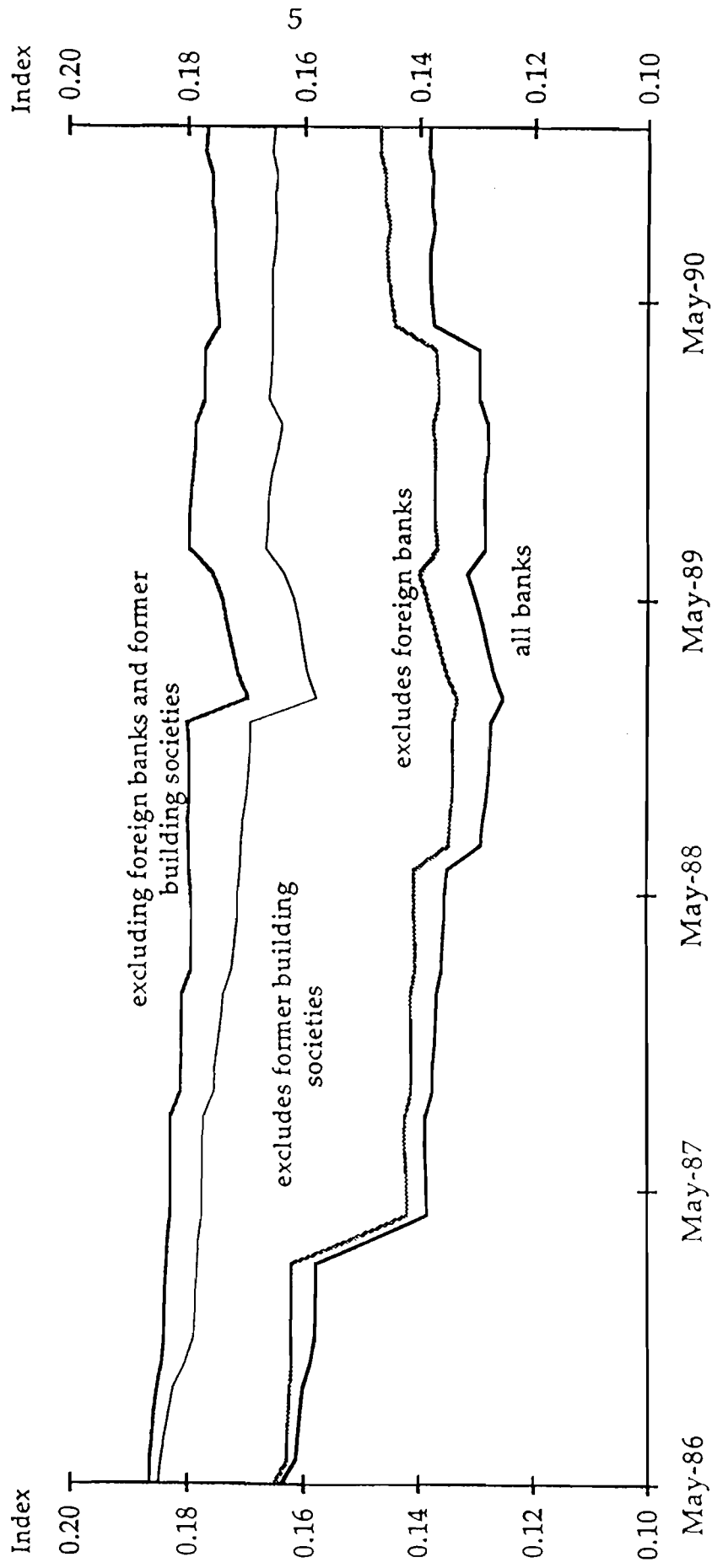
relatively large fall in March 1987 was due to the United Permanent Building Society becoming National Mutual Royal Bank.) Figure 2 also shows the relative unimportance of foreign banks in the market for housing loans. The average value for H is 0.14.

3. THE CONJECTURAL VARIATIONS MODEL

Figure 2 presents a *prima facie* case that the housing market is only reasonably competitive, with the equivalent of only seven equal sized banks in the market. However, conventional measures of concentration, such as the Herfindahl index, are flawed as indicators of competition because they take no account of the behaviour of the firms (banks in our case) under consideration. Substantial competition can exist in industries with only a few competitors, e.g. the Australian airline industry appears to be very competitive (at present), with only two firms. On the other hand, Ausubel (1991) finds huge monopoly profits in the United States credit card industry, where there are over 4000 firms!

This point has been well-known for many years to economists working in applied industrial organisation, but it seems to have escaped the notice of many participants in the current debate on the state of Australian banking. The conjectural variations approach (introduced by Bowley 1924) takes into account the behaviour of firms in estimating the degree of non-competitiveness in an industry.

Specifically, consider an n firm industry where each firm chooses its output q_i to maximize its profits Π, defined as revenues less costs,

$$\underset{q_i}{Max}\ \Pi = P(Q)q_i - C_i(q_i) \tag{2}$$

where P is the industry price (charged by all firms) and Q is industry output.

The first order conditions for this problem are

$$P(Q) + q_i \frac{dP(Q)}{dq_i} - \frac{dC_i}{dq_i} = 0 \qquad (3)$$

where dC_i/dq_i is the marginal cost of the i'th firm.

Note that

$$Q = \sum_{j=1}^{n} q_j \qquad (4)$$

and that

$$\frac{dP(Q)}{dQ} \frac{dQ}{dq_i} = \frac{dP(Q)}{dQ} \sum_{j=1}^{n} \frac{dq_j}{dq_i} = \frac{dP(Q)}{dQ} \left(1 + \sum_{j \neq i} \frac{dq_j}{dq_i} \right). \qquad (5)$$

Thus the quantity produced by firm i, q_i, affects total production in the market directly and indirectly through its effect on the price, P.

The first order conditions can be re-written as

$$P(Q) + q_i \frac{dP(Q)}{dQ} \left(1 + \sum_{j \neq i} \frac{dq_j}{dq_i} \right) - \frac{dC_i}{dq_i} = 0. \qquad (6)$$

Define

$$\alpha_i \equiv \sum_{j \neq i} \frac{dq_j}{dq_i}. \qquad (7)$$

This is the sum of the reactions of all of the other firms in the market to a change in the quantity produced by firm i, as perceived by that firm. With banks, the relevant quantity is the real value of loans in any specified period.[2]

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[2] A limitation of our approach is that the conjectural variations framework assumes that firms compete by varying quantities. In the case of housing loans by banks other forms of competition may also be relevant. Although data for housing loan rates do not appear to vary greatly between banks, they might still compete on price, e.g. by offering lower rates to new borrowers (for a limited time) or by competing on fees. They also compete, to an extent, by offering different products, e.g. fixed versus floating rate mortgages.

Several interesting special cases can be derived:

(i) $\alpha_i = -1$, for all firms. In this case, each firm sets price equal to marginal cost, i.e. perfect competition prevails in the industry. Each firm perceives that any increase in its output will be exactly offset by its competitors, so that industry output (and therefore price) is exogenous to each firm.

(ii) $\alpha_i = -1 + 1/s_i$, where s_i is the market share of the i'th firm. Here, the reactions are such that each firm tries to maintain a stable market share. This is the case of perfect collusion, or a cartel between the firms. In this case, there is effectively just one firm in the industry, which acts as a profit-maximising monopolist. Substitution of $\alpha_i = -1 + 1/S_i$ into (6) yields

$$P(Q) + Q\frac{dP(Q)}{dQ} - \frac{dC_i}{dq_i} = 0. \tag{8}$$

This is the profit maximising condition for a monopolist, i.e. marginal revenue (which is greater than price) equal to marginal cost.

(iii) $\alpha_i = 0$. In this case, each firm conjectures that its competitors will not (in aggregate) respond to any change in its output. This is the case of a Cournot oligopoly.

Of course, in empirical applications, none of these special cases is likely to arise exactly. The degree of competition can be measured by the adjusted Herfindahl index:

$$\hat{H} = \sum_{i=1}^{n} s_i^2(1+\alpha_i) \qquad 0 \le \hat{H} \le 1. \tag{9}$$

Thus, both the degree of concentration and behaviour determine the measure of competition in the industry. When there is perfect competition ($\alpha_i = -1$, for all i), then $\hat{H} = 0$, regardless of the degree of concentration. In the case of perfect collusion ($\alpha_i = -1+1/s_i$, for all i), then $\hat{H} = 1$, again regardless of the degree of concentration. Only in the case of Cournot oligopoly ($\alpha_i = 0$, for all i) do the unadjusted and adjusted Herfindahl indices coincide.

The econometric problem is to estimate the parameters α_i. However, some specification issues need to be resolved before estimation can proceed. That

is, there are factors other than conjectural variations influence the amount of lending done by banks. The most obvious of these are the return on the loan and the cost of funds, for which we use the relevant housing loan interest rate, and the 90 day bank accepted bill rate, respectively. These interest rates are lagged one period. We also include a constant, eleven seasonal dummy variables and a dummy for the new reporting forms introduced in January 1989. An additional dummy is introduced to account for ANZ's takeover of National Mutual Royal Bank in April 1990.

The theory is also entirely static.[3] In practice, however, the response of banks to changes in lending by other banks need not occur in the same period. We specify our model so that banks respond to the loans made by their competitors in the previous period (month, in this case).

Obviously, we cannot include every bank, no matter how small, in the model, so we exclude all banks with a market share of less than ten per cent. This leaves us with five banks in the housing loan market: the Commonwealth (CBA), Westpac (WBC), National Australia Bank (NAB), ANZ, and State Bank of Victoria (SBV). Furthermore, since we are not estimating a demand function, the housing interest rate is exogenous in this model.[4] This means that, given the interest rate, the total value of loans is pre-determined. To take account of this, we introduce a "residual bank" (RES), which is defined as the total market less the five banks above.

The housing model to be estimated is set out in equations 10-15. The subscripts $1...6$ refer to CBA, WBC, NAB, ANZ, SBV and RES respectively. Thus, $q_{1,t}$ is the value of housing loans made by the Commonwealth Bank in period t, $q_{2,t-1}$ refers to loans made by Westpac in the previous period etc. The coefficients of main interest are the β_{ij}, $i \neq j$.

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[3] There are many dynamic models of oligopoly in the industrial organisation literature; see Shapiro (1989) for a survey. Thus far, however, their testable implications have not been well developed.

[4] We use each bank's own interest rates for housing in their respective equations, except for SBV and RES, for which we use the CBA rate. In practice, there is very little variation in housing interest rates across banks at any point in time.

$$q_{1t} = \gamma_{10} + \beta_{12}q_{2,t-1} + \beta_{13}q_{3,t-1} + \beta_{14}q_{4,t-1} + \beta_{15}q_{5,t-1} + \beta_{16}q_{6,t-1}$$
$$+ \gamma_{11}r_{1h,t-1} + \gamma_{12}r_{bill,t-1} + \sum_{i=1}^{11} \delta_{1i}D_{it} + \eta_1 DJ89_t + \varepsilon_{1t} \tag{10}$$

$$q_{2t} = \gamma_{20} + \beta_{21}q_{1,t-1} + \beta_{23}q_{3,t-1} + \beta_{24}q_{4,t-1} + \beta_{25}q_{5,t-1} + \beta_{26}q_{6,t-1}$$
$$+ \gamma_{21}r_{2h,t-1} + \gamma_{22}r_{bill,t-1} + \sum_{i=1}^{11} \delta_{2i}D_{it} + \eta_2 DJ89_t + \varepsilon_{2t} \tag{11}$$

$$q_{3t} = \gamma_{30} + \beta_{31}q_{1,t-1} + \beta_{32}q_{2,t-1} + \beta_{34}q_{4,t-1} + \beta_{35}q_{5,t-1} + \beta_{36}q_{6,t-1}$$
$$+ \gamma_{31}r_{3h,t-1} + \gamma_{32}r_{bill,t-1} + \sum_{i=1}^{11} \delta_{3i}D_{it} + \eta_3 DJ89_t + \theta_3 NMR_t + \varepsilon_{3t} \tag{12}$$

$$q_{4t} = \gamma_{40} + \beta_{41}q_{1,t-1} + \beta_{42}q_{2,t-1} + \beta_{43}q_{3,t-1} + \beta_{45}q_{5,t-1} + \beta_{46}q_{6,t-1}$$
$$+ \gamma_{41}r_{4h,t-1} + \gamma_{42}r_{bill,t-1} + \sum_{i=1}^{11} \delta_{4i}D_{it} + \eta_4 DJ89_t + \varepsilon_{4t} \tag{13}$$

$$q_{5t} = \gamma_{50} + \beta_{51}q_{1,t-1} + \beta_{52}q_{2,t-1} + \beta_{53}q_{3,t-1} + \beta_{54}q_{4,t-1} + \beta_{56}q_{6,t-1}$$
$$+ \gamma_{51}r_{1h,t-1} + \gamma_{52}r_{bill,t-1} + \sum_{i=1}^{11} \delta_{5i}D_{it} + \eta_5 DJ89_t + \varepsilon_{5t} \tag{14}$$

$$q_{6t} = \gamma_{60} + \beta_{61}q_{1,t-1} + \beta_{62}q_{2,t-1} + \beta_{63}q_{3,t-1} + \beta_{64}q_{4,t-1} + \beta_{65}q_{5,t-1}$$
$$+ \gamma_{61}r_{1h,t-1} + \gamma_{62}r_{bill,t-1} + \sum_{i=1}^{11} \delta_{6i}D_{it} + \eta_6 DJ89_t + \varepsilon_{6t} \tag{15}$$

The test for competition is that the following restrictions on the model's coefficients jointly hold:

$$\alpha_1 \equiv \beta_{21} + \beta_{31} + \beta_{41} + \beta_{51} + \beta_{61} = -1$$
$$\alpha_2 \equiv \beta_{12} + \beta_{32} + \beta_{42} + \beta_{52} + \beta_{62} = -1$$
$$\alpha_3 \equiv \beta_{13} + \beta_{23} + \beta_{43} + \beta_{53} + \beta_{63} = -1$$
$$\alpha_4 \equiv \beta_{14} + \beta_{24} + \beta_{34} + \beta_{54} + \beta_{64} = -1$$
$$\alpha_5 \equiv \beta_{15} + \beta_{25} + \beta_{35} + \beta_{45} + \beta_{65} = -1$$
$$\alpha_6 \equiv \beta_{16} + \beta_{26} + \beta_{36} + \beta_{46} + \beta_{56} = -1$$

To test for collusion, -1 is replaced by $-1 + 1/s_i$ ($i=1...6$), where $s_1...s_6$ are the shares of each of the six banks in the sample. In the test for Cournot oligopoly the restrictions are that the coefficients sum to zero. These tests involve cross equation restrictions, so we use a systems estimator, iterative seemingly unrelated regressions, to estimate the model.

4. RESULTS

The parameter estimates for three models are presented in Tables 1(a) and 1(b). In one sense, the results are rather unsatisfactory, with only about one-third of the estimated parameters signifcantly different from zero. However, since we do not wish to place any emphasis on the reactions of any particular banks, the individual parameter estimates are of limited interest; rather it is the aggregate variations which are of interest. The estimates in Table 1(b) are disappointing in that most of the estimates on the interest rates are wrongly signed or insignificant. Our guess is that there is a lot of noise in the monthly data that is not captured by our specification. Possibly, a more elaborate supply function needs to be estimated to capture the variation in monthly lending.

The aggregate variations are the α_i reported in the last column of Table 1(a). These are found by summing the β_i in the relevant column. Thus, the α_i corresponding to the CBA is equal to -0.88, found by summing the coefficients in the column headed β_{i1}. In every case the point estimate of α_i is much closer to -1 (corresponding to perfect competition) than it is to $-1+1/s_i$ (perfect

Table 1(a): Conjectural Variation Parameters
(Standard Errors in Parentheses)

	β_{i1}	β_{i2}	β_{i3}	β_{i4}	β_{i5}	β_{i6}	α_i
q_1		-0.10 (0.03)	0.11 (0.03)	0.34 (0.12)	-0.10 (0.09)	0.02 (0.01)	-0.88
q_2	-0.90 (0.52)		0.13 (0.11)	-0.71 (0.55)	0.67 (0.38)	0.05 (0.05)	-0.47
q_3	-1.56 (0.73)	-0.11 (0.18)		0.41 (0.75)	-0.03 (0.51)	0.003 (0.04)	0.24
q_4	-0.01 (0.12)	-0.08 (0.04)	0.04 (0.03)		0.02 (0.10)	0.01 (0.01)	-0.48
q_5	-0.18 (0.17)	0.08 (0.05)	0.002 (0.04)	0.48 (0.19)		-0.01 (0.02)	-0.52
q_6	1.77 (1.78)	-0.26 (0.44)	-0.04 (0.27)	-1.00 (1.89)	-1.08 (1.26)		0.07

1=CBA, 2=WBC, 3=ANZ, 4=NAB, 5=SBV, 6=RES

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Table 1(b): Other Parameters
(Standard Errors in Parentheses)

	γ_{i0}	γ_{i1}	γ_{i2}	R^2	DW
q_1	0.57 (0.92)	0.02 (0.08)	-0.05 (0.03)	0.67	1.67
q_2	16.52 (2.90)	-1.23 (0.23)	0.17 (0.10)	0.52	1.31
q_3	-4.15 (4.89)	0.56 (0.39)	-0.07 (0.15)	0.38	1.91
q_4	2.79 (0.99)	-0.25 (0.07)	0.07 (0.03)	0.43	2.08
q_5	-4.63 (1.20)	0.32 (0.10)	-0.01 (0.04)	0.65	1.85
q_6	14.94 (11.99)	-2.00 (0.90)	1.00 (0.36)	0.31	1.63

1=CBA, 2=WBC, 3=ANZ, 4=NAB, 5=SBV, 6=RES
Coefficients on dummy variables not reported.

Table 2: Tests for Competition, Collusion and Cournot Oligopoly

Test	Test Statistic	Probability Value*
Competition: $\alpha_i = -1$, $i=1...6$	47.81	0.00
Collusion:[#] $\alpha_i = -1+1/S_i$, $i=1...6$	108.23	0.00
Cournot Oligopoly: $\alpha_i = 0$, $i=1...6$	3.65	0.72

* significance levels at which null hypothesis is rejected.
# 1=CBA, 2=WBC, 3=ANZ, 4=NAB, 5=SBV, 6=RES
$s_1=0.23$, $s_2=0.18$, $s_3=0.11$, $s_4=0.12$, $s_5=0.13$, $s_6=0.23$

collusion). Nevertheless, in every case (except for the CBA), the departure from perfect competition appears to be significant.

This hypothesis is confirmed by the results of the formal tests for competition, collusion and Cournot oligopoly are reported in Table 2. The test statistics are calculated as

$$T * \ln \frac{|\Sigma_r|}{|\Sigma_u|}$$

where T is the number of observations, while $|\Sigma_r|$ and $|\Sigma_u|$ are, respectively, the determinants of the covariance matrices of the errors in the restricted and unrestricted systems. The test statistics are distributed as Chi-squared, with degrees of freedom equal to six, the number of restrictions. The results of the tests are such that we can decisively reject the hypothesis of perfect competition, and even more decisively, perfect collusion in the market for housing loans. However, we are unable to reject the hypothesis that this market can be characterised as a Cournot oligopoly.

In interpreting these results, we note that the standard errors on the conjectural variation parameters are relatively large. Thus, our inability to reject the hypothesis of a Cournot oligopoly might be due to the imprecision of our parameter estimates. However, this imprecision strengthens our rejections of perfect competition and perfect collusion, since large standard errors reduce the likelihood that any hypothesis will be rejected.

Finally, we report calculations of both unadjusted and adjusted Herfindahl indices of concentration, where the market is defined as in the model (the five largest banks plus one residual bank). The unadjusted index is 0.18, while the adjusted index is 0.11. Thus the housing loan market can be characterised as containing about nine banks of equal size, and so appears to be reasonably competitive, but not perfectly so.

5. CONCLUSIONS

We have estimated a conjectural variations model of bank lending for the owner-occupied housing market. We are able to decisively reject the hypothesis that this market is perfectly competitive, as well as the hypothesis that banks collude to form a cartel. We are unable to reject the hypothesis that the market for housing loans is a Cournot oligopoly, although this conclusion could be plausibly challenged on statistical grounds.

Of course, we do not view this paper as the final word on this subject. The imprecision of the parameter estimates on the interest rates indicate to us that more sophisticated supply functions ought to be estimated, as well as perhaps giving greater emphasis to dynamic specifications. Furthermore, banks may well compete in ways we have not modelled, e.g. by price competition, and this needs to be accounted for in a complete study of competition in this market.

Finally, we note that the degree of competition in any market is determined endogenously. If the market for housing loans is not competitive, the interesting issue for policy is to determine why this is the case. Future research needs to examine issues such as barriers to entry, transactions costs and consumer inertia as impediments to the existence of competitive markets.

APPENDIX: DATA SOURCES

(a) Housing Lending

To construct data from May 1986 to December 1990, three consecutive reporting forms were used. All three forms are a statement of banks' liabilities and assets within Australia. Prior to 1989, trading banks submitted a weekly reporting form with categories different to those of the monthly savings bank reporting form. In January 1989, a new reporting form was introduced, which contained more detailed categories of deposit and lending activities. The categories were standardised for trading and savings banks, and they both reported weekly. A third reporting form was introduced in January 1990, but apart from removing the distinction between trading and savings banks, only minor modifications were made.

All housing lending prior to January 1989 was taken from the housing category in the savings bank reporting form. The pre-1989 trading bank reporting forms did not have a category for housing lending, and is thus assumed to be zero. The post-1989 reporting forms showed the amount of total trading bank housing lending was roughly $2.2 billion in January 1989, or about 4 per cent of bank housing. Further details can be found in the Reserve Bank of Australia (RBA) Bulletin, Table B.4, "Lending to Persons", or Table B.14, "Assets - Individual Banks". Previously, trading bank housing lending was classified as "Other Lending", and categorised as "Mainly Business" in RBA Bulletin Table D.4, "Credit to the Private Sector by Financial Intermediaries".

The post-January 1989 reporting form for trading banks and savings banks contain a more detailed breakdown of the category of housing finance for owner occupation; into secured and unsecured lending. We sum these items to provide a consistent series with the pre-1989 reporting forms. However, some savings banks housing loans were reclassified mainly into other personal, but no information on the size of this transfer is available.

One trading bank bought the housing loan portfolio of the Defence Services Home Corporation in January 1989. It was added to the bank's books over a period of months. No adjustments were made to this bank's housing series.

The latest reporting form, introduced in January 1990, removed the distinction between trading and savings banks, and included a new category; non-owner occupied housing finance. This item includes investment lending for housing to persons and business; see RBA Bulletin Table B.4, footnote (b). This item has been excluded from the housing series used in our study, but may have been partly included in the pre-1989 savings bank reporting form category of housing, and partly as "Other Lending". No information on the size of the reclassification is available, but in January 1990, the category was $8.5 billion or 14.1 per cent of housing lending. This category is not included in housing lending in Table B.14, and thus the housing lending series of our study is consistent with Table B.14, "Housing".

(Note that the numbers of the RBA Bulletin Tables quoted above refer to the December 1990 issue but may vary from issue to issue.)

(b) Other Variables

The 90-day bank accepted bill rate is from the RBA Bulletin, Table F.1, "Interest Rates and Yields: Money Market".

Individual bank interest rates for new housing loans to individuals for owner occupation are from internal RBA sources.

Housing prices are from the Real Estate Institute of Australia, *Market Facts*, various issues. Housing prices are a weighted average of the following cities: Sydney, Melbourne, Adelaide, Perth and Canberra. Weights are calculated from "Housing Finance for Owner Occupation, Australia", ABS Cat. No. 5609, on the basis of each city's share of total housing finance.

(c) The Banks in This Study

The major banks in the housing market are as follows:

The Commonwealth Bank of Australia, including
- Commonwealth Savings Bank
- Commonwealth Development Bank

The merger with the State Bank of Victoria occurred in January 1991.

ANZ Banking Group, including
- ANZ Savings Bank
- National Mutual Royal Bank, and
- National Mutual Royal Savings Bank

The National Mutual Royal Bank was acquired by the ANZ in April 1990.

National Australia Bank, including
- National Australia Savings Bank
- Australian Resources Development Bank

The Australian Resources Development Bank was acquired by the National Australia Bank in October 1989.

State Bank of Victoria, including
- Australian Bank, acquired in February 1989

Westpac Banking Corporation, including
- Westpac Savings Bank

The Commonwealth Development Bank and the Australian Resources Development Bank are specialist banks that did not record housing lending. The Australian Bank did record some housing lending on the new reporting forms but not prior to January 1989. Subsequent Australian Bank housing lending was transferred to the books of the State Bank of Victoria. A complete list of all banks as at December 1990 can be found in Table B.14, RBA Bulletin, February 1991.

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