Australian Journal of Agricultural Economics, Vol. 22, No. 1 (April 1978), pp. 41-53

RURAL CREDIT POLICY AND BANK RURAL LENDING*

B. J. STANDEN

N.S.W. Department of Agriculture

A model of bank rural lending in Australia for the period 1950/1973 is constructed to measure the effects of various rural credit policies on bank rural advances. Results indicate that rural sector bank deposits did not influence the rural sector's share of advances; Farm Development Loan Fund loans simply replaced overdraft advances; rural borrowers were not discriminated against in periods of tight credit; interest rate concessions induced a greater proportionate reduction in the rural share of advances.

Introduction

Governments in Australia have over many years intervened to establish special credit facilities for farmers. The impact of these various measures on the availability and cost of credit to farmers has been the subject of considerable speculation (see, for example [1]) but few attempts at measurement. This paper describes a quantitative model of trading bank rural lending which identifies and measures the influence of various rural credit policies. The period studied is 1950 to 1973, making the study somewhat historical. Nevertheless some of the policies still operate and identification of some features of bank behaviour, particularly bank reaction to certain types of credit policies, should be useful to policy makers proposing further rural credit measures.

Preliminary Analysis

The primary objective was to construct a model to explain changes between years in the level of bank advances to the rural sector. Annual unit time periods were chosen to suit the data available and to produce the potentially most useful model. Classification of bank advances according to sectors is available only at six-monthly intervals and annual unit time periods probably correspond to the periodicity of rural income, investment and other financial variables.

Advances were measured at annual intervals simply as stocks without identifying newly extended loans, existing loans or repayments of earlier borrowings. Data availability dictated this approach which suited the use of a stock adjustment portfolio model.

The model was developed from the proposition that changes between years in the level of aggregate bank advances (i.e. to all sectors) were supply determined. This hypothesis conveniently simplified modelling

* An earlier version of the paper was presented to a meeting of the Victorian Branch of the Australian Agricultural Economics Society, April 1977. The paper comprises part of the author's Ph.D. thesis written at the London School of Economics from 1973 to 1976. The financial support of the Australian Meat Research Committee in the form of an Overseas Postgraduate Studentship is gratefully acknowledged. Dr P. D. Jonson, now of the Research Department of the Reserve Bank of Australia, provided valuable advice early in the study.

the structure of the market for rural bank advances. Simultaneous equation models deriving from competitive equilibrium concepts became inappropriate.

Various pieces of evidence support the supply hypothesis. The level of aggregate bank advances has not been determined in the past by the simultaneous interaction of supply and demand. The maximum rate of interest that banks can charge on advances, except for some minor categories, has been set by the authorities and changed infrequently. There is some evidence that this administered maximum interest rate has, except for short periods, been set below the market equilibrium. The espoused 'cheap' money policy of the 1950s is one piece of evidence (see, for example, Corden [2]). Another is the rapid expansion of non-bank financial intermediaries, a development to be expected if administered bank interest rates were persistently below equilibrium (see Downing [3, p. 109]).

A paper by Valentine [11] indirectly provides further support for the supply hypothesis. He points out that when the authorities change the maximum overdraft rate the banks are expected to change the rates on all advances by an amount approximately equal to the change in the maximum rate. Hence he accepts that the overdraft rate is exogenous and cannot be used to clear the market for advances. More importantly, Valentine emphasizes the distinction between overdraft *limits* and actual *advances*. He assumes that the banks decide how much to grant in overdraft limits but that borrowers decide their uptake of advances subject to these limits. Banks issue overdraft rights in amounts which seem most likely to yield the change in advances that they desire to see but, because the predictions of the banks need not eventuate, the change in actual advances need not be what the banks desire. Valentine finds considerable empirical support for his model.

The rationale for Valentine's model is that banks fix the amount of new borrowing rights at certain intervals and do not adjust them in between, whatever the accuracy of their initial predictions. The reasonableness of this assumption obviously depends on the length of the interval or unit time period. In Valentine's study, the unit period was three months, and for this period the empirical results seem to support the assumption. However, for periods as long as a year or even six months the assumption would be untenable. Banks will have frequent opportunities to adjust the level of new borrowing rights such that the change in actual advances over an annual period is likely to be at or near the level that they desire. Hence a logical extension of Valentine's approach would seem to be that, over periods of the order of a year, changes in the level of bank advances will be supply determined. Some support for this argument is provided by Goldfeld [4, p. 26] though his comments are made in the American institutional context. For the annual unit periods adopted in the present study, the underlying supply hypothesis therefore appears consistent with the Valentine approach.

Further support was derived for the hypothesis by specifying and estimating a bank advances *supply* equation. This equation, derived from an appropriate theoretical premise and empirical estimation, yielded results which were statistically satisfactory and consistent with the basic premise. Further, this equation was found to be superior to an advances

demand equation which was also constructed with annual unit time periods.

For the advances supply equation bank behaviour was described by a behavioural equation derived from the modified stock adjustment theory of portfolio behaviour used by Goldfeld [4], de Leeuw [7] and Norton *et al.* [8]. With this theory, changes in the banks' holdings of particular assets in any period, ΔA, were explained by variables measuring the banks' stock of funds, the yield on asset A and comparable yields on other relevant assets, short-run constraints on the banks' capacity to make portfolio adjustments, and the stock of assets held by the banks at the end of the previous period. The model can be summarized as:

$$A^d = b_1 + b_2W + b_3r - b_4s \tag{1}$$

$$\Delta A = a(A^d - A_{-1}) + b_5c \tag{2}$$

where A is the asset i.e. advances;
W is bank wealth i.e. funds;
r is the rate of return on A;
s is a vector of yields on alternative assets;
c is a vector of short-term constraints; and
d denotes desired.
All variables are t subscripted.

Substituting (1) into (2) yields the estimating equation

$$\Delta A = ab_1 + ab_2W + ab_3r - ab_4s - aA_{-1} + b_5c. \tag{3}$$

The estimated equation is provided in the Appendix of this paper together with associated statistical results.

The advances demand equation was also based on the modified stock adjustment theory of portfolio behaviour. It was constructed by re-estimating an equation derived by Norton *et al.* in the construction of a Reserve Bank quarterly model of the national economy [8]. The principal change was from quarterly to annual unit periods. Annual changes in the demand for advances were considered a function of variables measuring 'permanent' GNP (a surrogate for wealth), the overdraft rate, the alternative yield on government securities, and several constraints on portfolio adjustment. The estimated equation is provided in the Appendix.

To sum up, sufficient convincing evidence was accumulated to provide substantial support for the supply hypothesis. Acceptance of this hypothesis enabled construction of an equation explaining changes in the rural sector's share of aggregate bank advances.

Factors Determining the Rural Share of Bank Advances

Some Principles

Conceptualizing the procedure whereby banks allocate advances to the rural sector involved an important assumption. It was that banks, at a *primary decision stage*, allocate their funds among different types of financial assets, advances, government securities, cash and money market loans, as described above by the modified stock adjustment theory of portfolio behaviour. At a *secondary decision stage* the banks ration their advances allocation amongst different classes of borrowers. The factors considered in the decision process at this stage are assumed

to be *internal* to the market for advances. That is, the decision is independent of the primary allocation of funds amongst the different types of financial assets. The relevant variables determining the share of advances for the rural sector include the risk characteristics and rates of return offered by different classes of potential borrowers seeking advances. They do not include the return from other financial assets such as government securities.

The rationale for this approach derives from the modified stock adjustment theory of portfolio behaviour itself. The theory seeks to explain adjustments towards an implicit portfolio equilibrium. The factors determining this equilibrium are not part of the model, only the factors which cause shifts in the equilibrium are. These adjustment factors, the yields on alternative assets, although measured as single values, are implicitly associated with various risk elements involved in holding each of the alternative assets. These risk elements are the reason why portfolios are diversified. It seems plausible to argue that a portfolio adjustment equation which seeks to explain adjustments in the allocation of advances between different classes of borrowers has a different risk dimension than an equation which seeks to explain adjustments in the allocation of bank funds between entirely different assets in different financial markets. To attempt to explain both allocations with the one equation would be to confound the dimensions of the explanatory variables. Hence the two-tier decision approach which was adopted in this study.

Variables in the Model

To reiterate, the aim was to explain annual changes in the share that the rural sector received of ordinary bank advances over the period 1950/51 to 1972/73. These advances comprised major trading bank advances omitting the minor categories Term Loans and Farm Development Loans.

The most obvious of the probable influences on trading bank rural lending was the preferential interest rate policy. Adopted in 1956 and maintained with variations until 1973, it required banks to charge farmers a concessional interest rate on rural overdrafts. It is likely that rural overdraft interest rates were in fact reduced by the policy. A conventional wisdom is that banks became less willing to lend to rural borrowers [1, p. 53]. However, for a number of reasons, bank lending might have been insensitive to the imposed rate differential. One reason is that general monetary controls on bank activities and earnings could have accentuated the banks' normal concern with risk spreading and diversification of assets. Any significant retreat from rural lending would reduce this spread and possibly outweigh the prospect of higher returns. Another reason is that banks have been exhorted to act in the 'national interest' and favour rural borrowers. Perhaps the banks acceded. Finally, it has been suggested that the rural sector has been an important source of bank deposits and foreign exchange business. The banks' capacity to compete for this business depends, in part, on their willingness to offer credit. Hence, the income from rural lending depends on more than just the overdraft rate.

Casual observation suggests some validity in these arguments. The

rural sector's share of bank advances was roughly constant until the late 1960s even though the rural interest rate concession varied significantly. Further, the subsequent rapid decline in advances coincided with a declining rural share of bank deposits. On the other hand, the the rapid decline in the rural share of advances also coincided, in 1970, with an increase in the overdraft rate concession for farmers. It also coincided with a rapid deterioration in farm income.

The implications of the above for the specification of an equation to explain the rural share of bank advances were several. First, a variable to measure the impact of the preferential interest rate policy should obviously be included. Second, this variable could be associated with another which measures the rural depositors' contribution to bank deposits. Third, the relevance of some measure of the banks' assessment of the debt repayment capacity/security status of farm borrowers needed testing.

Jarrett and Dillon [6] have argued that banks have been willing to meet seasonal demands for funds even though excess demand still existed and not all requests for funds were met. In the same vein is the hypothesis that banks have been prepared to increase their rural advances for 'carry-on' purposes in years of drought and unexpected price falls. At such times the authorities have usually exhorted the banks to afford favourable consideration to affected farmers. This may have elicited a response. It would also have been in the banks' self interest to ensure that clients were not alienated or that the businesses of existing borrower-clients were not jeopardized for lack of short-term finance. Willingness to extend this credit would probably be conditional on the banks' expecting the increased demand to be short-lived. The Jarrett and Dillon argument is that bank managers require overdrafts to be reduced when incomes rise. In the present study a variable to measure this short-term response by the banks was specified as the deviation of current farm income from recent income levels.

The impact of the Farm Development Loan Fund (FDLF) loans on the rural sector's share of ordinary overdraft advances also had to be considered. The net addition that these loans make to total rural bank advances will be equal to the loans actually disbursed, less any substitution for overdraft advances which would otherwise have been made. At one extreme the banks might seek to maintain a particular (albeit changing) level of rural lending regardless of whether it is as FDLF loans or overdrafts. The other extreme is that bank rural overdraft advances are made completely independently of FDLF loans. This latter possibility is particularly unlikely since the banks have no reason to distinguish between the two types of advances with regard to the goodwill, banking business and deposits they generate for the banks. Neither will the restrictions on the uses for which FDLF loans may be made prevent banks from adjusting their *overdraft* advances to achieve the desired total level of rural advances.

A variable which measured FDLF loans was therefore included in the rural advances equation to measure their impact on ordinary rural advances. The possibility of rural credit disbursed through the Commonwealth Development Bank affecting trading bank advances was also considered, but because the Development Bank is obliged to be a

lender of last resort its rural lending activities were not considered to be of significant influence. Rural advances by the banks from the Term Loan Fund were also considered unlikely to influence the rural share of overdraft lending. Lending from the Term Loan Fund is not restricted to rural borrowers so the banks have no more significant incentive to replace overdraft lending with Term Fund loans in the rural sector than in other sectors.

Jarrett [5] informally classified semi-annual periods between 1949 and 1963 as periods of monetary ease or monetary restraint. He showed that bank lending to the rural sector was more consistent with the stance of monetary policy than it was in any other sector. The results were held to support the argument that banks more readily refuse loan applications from the rural sector than from other sectors during periods of 'tight money'. Jarrett attributed this behaviour to the small average size of rural sector loans and deposits. Allegedly, banks find it easier to refuse small loans in periods of restraint while in periods of monetary ease credit is more readily used in the rural sector. Jarrett's results and conclusion should be surprising since throughout the 1950s and 1960s the monetary authorities directed or requested that export production be exempted from credit restrictions. Even in the severe credit squeeze of 1960/61 the banks were specifically asked to provide appropriate credit for rural industries. Two directly opposing influences on bank rural lending could therefore be suggested. There appeared no way of measuring each but measurement of their net effect was attempted by including in the rural share equation a variable measuring the rate of change in bank total advances.

The Equation

The equation was derived from the modified stock adjustment theory of portfolio behaviour expressed in a slightly unconventional form.

$$(4) \qquad (Af/A)^d = b_1 + b_2 Rf/R + b_3(\overline{Y}-Y)/\overline{Y} + b_4 \overline{Df}/\overline{D} + b_5 FDLF/A$$

$$(5) \qquad \Delta(Af/A) = a\,[(Af/A)^d - (Af/A)_{-1}] + b_6\,\Delta A/A_{-1}$$

where

- Af, A are farm ordinary advances and total ordinary advances, respectively, by the major trading banks;
- Rf, R are the rural interest rate and the maximum overdraft rate respectively;
- Y, Y are 'permanent' and current farm income;
- $\overline{Df}, \overline{D}$ are farm sector and total 'permanent' deposits with the major trading banks;
- $FDLF$ is advances from the FDLF funds;
- d denotes desired.

All variables are t subscripted and ratios are expressed as percentages.

Substituting (4) into (5) and simplifying the notation yields the estimating equation:

$$(6) \qquad \Delta S = CONST + ab_2 IR + ab_3 DEVY + ab_4 DEPR + ab_5 FDLA - aLAGS + b_6 CHAD$$

where

S	is the rural share of total bank ordinary advances (as a percentage);
IR	is the ratio of the rural interest rate to the maximum overdraft rate (as a percentage);
DEVY	is the percentage deviation of current farm income from 'permanent' farm income;
DEPR	is the ratio of farmers' bank deposits to total bank deposits (as a percentage);
FDLA	is the ratio of FDLF bank advances to total bank ordinary advances (as a percentage);
CHAD	is the annual percentage change in total bank ordinary advances.

Data

A detailed explanation of the data is provided elsewhere [10]. The most difficult task was constructing a series for the preferential rural interest rate. Despite the numerous statements and debates over the preferential interest rate policy, the preferential rate has rarely been stipulated publicly. Constructed with information from several sources, but particularly Reserve Bank annual reports, the series used was 0·5 per cent less than the maximum overdraft rate from 1957 to 1960; thereafter 1·0 per cent less except for 1967 (0·5 per cent less) and 1971 and 1972 (1·5 per cent less).

All interest rates measured were for January, i.e. mid financial year period; stocks of the monetary variables measured were at end of June.

'Permanent' farm income was arbitrarily measured as:

$$\bar{Y} = 0{\cdot}2Y + 0{\cdot}5Y_{-1} + 0{\cdot}3Y_{-2}$$

with annual farm income taken from Australian National Accounts. 'Permanent' deposits were similarly measured.

Estimation

The variables *FDLA* and *DEPR* are highly correlated ($r = -0{\cdot}94$). Their significance was estimated separately and then jointly in equations for a sample period extending over 1959/1973, the period for which *DEPR* data are available. (Bank deposits were first classified by industry in 1957.) Equations with and without *FDLA* were estimated for the longer sample period 1951/1973. Both sample periods are two years shorter than the available data series because of the initial data requirements in generating 'permanent' variables.

All the equations were estimated using ordinary least squares. A generalized least squares estimation procedure was also applied to correct parameter estimates for any autocorrelation in the disturbance term of the models. Details of this procedure are provided elsewhere [10, p. 213]. Autocorrelation was not a problem in any of the preferred equations and only *OLS* estimates are provided here in Table 1.

Discussion of Results

The inclusion of both *FDLA* and *DEPR* in the same equation yields estimates with very large standard errors. Nevertheless, various features of the shorter period equations (Equations 7 to 10) tend to suggest

TABLE 1

*Factors Influencing Rural Share of Advances**

(ΔS is the dependent variable)

Equation	*CONST*	*IR*	*DEVY*	*DEPR*	*FDLA*	*LAGS*	*CHAD*	
7	—9·75	0·25	0·05		—0·58	—0·53	—0·09	$\bar{R}^2 = 0{\cdot}772$
	(1·6)	(3·0)	(4·4)		(2·1)	(2·8)	(2·7)	$D\text{-}W = 1{\cdot}71$
8	—11·23	0·25	0·05	0·17		—0·61	—0·09	$\bar{R}^2 = 0{\cdot}757$
	(1·9)	(2·8)	(4·3)	(1·85)		(2·9)	(2·5)	$D\text{-}W = 1{\cdot}30$
9	—15·79	0·30	0·05			—0·47	—0·11	$\bar{R}^2 = 0{\cdot}698$
	(2·6)	(3·2)	(3·7)			(2·2)	(2·9)	$D\text{-}W = 1{\cdot}32$
10	—9·75	0·25	0·05	0·00	—0·58	—0·53	—0·09	$\bar{R}^2 = 0{\cdot}743$
	(1·5)	(2·8)	(4·0)	(0·00)	(0·73)	(2·2)	(2·5)	$D\text{-}W = 1{\cdot}71$
11	1·36	0·07	0·03		—0·64	—0·33	—0·08	$\bar{R}^2 = 0{\cdot}601$
	(0·3)	(1·6)	(3·2)		(1·6)	(2·2)	(3·2)	$D\text{-}W = 1{\cdot}93$
12	—4·01	0·11	0·03			—0·23	—0·09	$\bar{R}^2 = 0{\cdot}567$
	(1·1)	(2·5)	(3·2)			(1·6)	(3·7)	$D\text{-}W = 1{\cdot}74$

* Equations 1 to 4 are for the sample period 1959/1973. Equations 5 and 6 are for 1951/1973. Parameter estimates with absolute values of t statistics exceeding 1·7 are significant at the 5 per cent level.

that *FDLA* is the predominant influence. First, when the variables are included separately (Equations 7 and 8), *FDLA* is statistically more significant than is *DEPR* and contributes to a higher $\bar{R}^2$. Second, when the two are included together (Equation 10) then, regardless of the large standard errors, the estimate for the *FDLA* coefficient remains unchanged while that for *DEPR* becomes practically zero. Finally, the equation including *FDLA* for the period extending back to 1951 (Equation 11) yields an *FDLA* coefficient which is little different from that for the shorter period equations. Farmers' bank deposits (the basis of *DEPR*) must have fluctuated sharply in the 1950s. FDLF lending had not then begun. If the *FDLA* were to represent the joint influence of both variables then a markedly different coefficient would show up for the variable in the longer period equation. Since it does not then, with the other evidence, it is reasonable to accept *FDLA* as the operative variable.

On the basis of this deduction the preferred shorter period equation is the first, i.e. (7). All the parameters of this equation are significant at the 5 per cent level and the implied adjustment lag of just under a year is highly plausible. It is consistent with the six months adjustment lag for aggregate advances (see Appendix) and is well within the range suggested by the Reserve Bank of Australia estimate of 4-5 years for the weighted average life of bank overdrafts [9].

The deduction that *DEPR* is not a significant factor leads to the conclusion that the proportion of bank deposits supplied by the rural sector has had no significant direct influence on the proportion of advances going to the rural sector. Thus the argument that the decline in the rural share of bank advances is attributable to the relative decline in rural sector banking business, especially deposits, is not supported by the results of this study.

Discussion of the *IR* coefficient estimate is postponed until the longer sample period equations are considered. For the longer period, the *IR* coefficient estimates are substantially (but not significantly) lower and the discrepancy has to be explained. The coefficients of the other main variables are little altered by the different sample periods and can be discussed in terms of the shorter period estimates.

The *DEVY* coefficient supports the hypothesis that the banks have provided the farm sector with a larger share of advances in years when farm income has temporarily fallen below the level recently prevailing. There is no way, however, of distinguishing whether this is a response to government exhortations or simply self-interest on the part of the banks. The result suggests that a 20 per cent drop in farm income has been associated with a one percentage point rise in the rural sector's share of bank advances, and conversely.

The coefficient estimate of —0·58 for *FDLA* is highly plausible. It infers that for each one percentage point increase in *FDLA* there has been a reduction, in the short run, of 0·58 of a percentage point in the rural share of ordinary overdraft advances. This result is strong support for the hypothesis that the banks have used the FDLF loans to replace ordinary overdraft advances which in turn have been diverted to other sectors. The extent of this diversion has been, in the short run, about $58 for every $100 extended in FDLF loans. The long-run coefficient

of *FDLA* is $b_5 = -0{\cdot}58/0{\cdot}53$ which approximately equals $-1{\cdot}0$. This result means that within two years the banks have redirected to the non-farm sector ordinary overdraft advances equal in amount to FDLF loans disbursed to the farm sector.

The coefficient of the *CHAD* variable means that the smaller the percentage increase in total bank advances the smaller has been the decline in the rural share of advances. This coefficient is difficult to interpret. As already discussed, the variable was included to represent the stance of monetary credit policy and therefore to measure the banks' reaction to this policy. It could measure the net outcome of (a) the 'Jarrett effect'—the banks accentuating fluctuations in general credit conditions in respect of farmers—and (b) the authorities' exhortations to discriminate in favour of the rural sector. Apart from these two contradictory influences there are possibly others. One is that the variable represents constraints on the banks' capacity to adjust their portfolio. This capacity will be influenced by the rate at which new advances are being made. Adjustments will be more easily made when aggregate advances are increasing rapidly, and conversely. Another is that there could be a tendency in boom times for the banks to find sectors such as housing and personal consumption relatively more attractive. Conversely, in less buoyant periods, farmers with land as security might be relatively more attractive.

Despite these difficulties of interpretation, the results seem to contradict the viewpoint that rural borrowers have been discriminated against by banks in periods when credit has been relatively 'tight'.

Interpretation of the *IR* coefficient requires consideration of Equation 11 which has the same specification as the preferred Equation 7. There is a dramatic fall in magnitude and statistical significance when the estimation period is extended back to include years 1951 to 1958. The parameter change from 0·25 to 0·07 is not, however, sufficiently great to reject the hypothesis that the additional observations came from the same structure with unchanged b_i coefficients.[1] Several causes might produce this change. First, the correlation between *IR* and *FDLA* is greater over the longer period, hence the larger standard errors of the *IR* and *FDLA* estimates. (Dropping *FDLA* in Equation 12 raises the *IR* coefficient to 0·11 which is significant at the 5 per cent level.) Second, the rural interest rate series used for estimation perhaps inadequately represented interest rate concessions made to farmers in the years of the early and mid 1950s, especially between 1952 and 1956 before the preferential interest rate policy was formally introduced. Hence, the variable *IR* may not have measured the real relative interest rate effect as accurately over the long period as it did over the shorter period.

Despite these doubts, the parameter estimate of Equation 11 could not be rejected entirely. Interpretation of the parameter is therefore provided for the two alternative coefficients 0·25 and 0·07 with a clear preference for the former and with the latter serving as a lower limit.

Taking the larger figure and Equation 7 first, the result is that an increase by one percentage point (say from the mean 86·70 to 87·80

[1] See [10, p. 222] for details of Chow Test for change of structure.

per cent) in the interest rate ratio would have increased the rural share of bank advances in the short run from 21·40 to 21·65 per cent. In the long run, the increase in the rural share would have been 0·47 percentage points to 21·87 per cent.

Table 2 sets out the increase in advances which Equation 7 predicts would have been outstanding to rural borrowers in the absence of the policy.

As could be expected, the predicted increases are relatively small for the coefficient equal to 0·07. In only two years since 1960 would the increase have been as great as 10 per cent.

Depending upon the acceptability of the *IR* coefficient estimate, the results provided support for the contention that the preferential interest rate policy was a substantial disincentive to the trading banks making advances to the rural sector.

Conclusions

The model of bank rural lending derived from plausible but debatable hypotheses about trading bank behaviour and the nature of the market for trading bank advances between 1950 and 1973. Interpretations and conclusions are constrained by the conjectural origins of the derived results. Notwithstanding this qualification, the estimated equations identified with a fair degree of credibility the main determinants of the annual changes in the share that the rural sector received of trading bank advances (excluding Term Loan and Farm Development Loan Fund loans) over the study period.

In addition to the variables described above, several others were tested for their possible influence in the model. One was the level of farm income. A number of alternative specifications were considered, including current farm income, 'permanent' farm income, gross farm product and the ratios of these values to corresponding all-sector values. In none of the test equations was the farm income variable found to be significant. One possible explanation for this result is that the banks' distribution of advances between the rural and other sectors has not been restricted in aggregate by the rural sector's capacity to repay.

The parameter estimate for the interest ratio variable was equivocal

TABLE 2

Predicted Rural Bank Advances without the Preferential Interest Policy
(Assuming $ab_2 = 0{\cdot}25$)

At June	With	Without	Percentage increase	At June	With	Without	Percentage increase
1959	459·2	495·9	8·0	1966	576·4	692·9	20·2
1960	473·6	533·6	12·7	1967	646·8	700·5	8·3
1961	450·6	540·7	20·0	1968	771·6	848·2	9·9
1962	479·2	547·7	14·3	1969	752·7	861·9	14·5
1963	473·1	552·3	16·7	1970	791·1	908·4	14·8
1964	471·1	542·1	15·1	1971	788·4	1003·8	27·3
1965	523·5	603·4	15·3	1972	750·2	979·9	30·6
				1973	793·7	1003·7	26·5

but well defined ranges of possible values were identified. The preferred estimate indicated that the interest concessions afforded farm borrowers induced a greater proportionate reduction (than the concession) in the rural share of bank advances. The consequences for the rural sector can only be surmised. The net benefit or loss attributable to the preferential interest rate policy could not be measured using a concept such as consumer surplus because the rural demand for bank advances was not identified. Perhaps the efficiency effects of the policy have been slight, with potential borrowers denied bank advances under the policy simply resorting to 'fringe' lenders. Unfortunately data are not available to test this hypothesis. It is unlikely that the policy induced the same proportionate cutback in the size of bank advances to each aspiring farmer-borrower. Favoured borrowers would have benefited from the concessional interest rate without having the size of their advances reduced or having them reduced in the same proportion as aggregate rural advances. Other potential borrowers would have been forced to use other credit sources when they might have preferred bank credit even at non-concessional rates. Hence, the distributive impact of the policy was probably regressive. The abandonment of the preferential interest rate policy in 1973 could be justified by these effects.

It appears that Farm Development Loan Fund lending does not add to total rural advances the amount of FDLF funds actually disbursed. Within two years the rural sector's share of ordinary *overdraft* advances is reduced to completely offset the uptake of FDLF loans. Such adjustment of their advances portfolio is an eminently reasonable response by the banks and the result calls into question the usefulness of special credit arrangements such as the Farm Development Loan Fund and Term Loan Fund. They might achieve little more for the rural borrower than unconditional releases of Statutory Reserve Deposits although the fixed term nature of the loans provided by the special arrangements is probably advantageous for the favoured sectors. Such behaviour by the trading banks is a factor to be considered in the recent debate over the appropriate form for a National Rural Bank. The allocation of trading bank advances to the rural sector will be different if new credit arrangements are provided through the banks instead of through a separate institution. This is not to suggest that advances will be misallocated.

The results suggest that rural borrowers have not been discriminated against in periods of relatively small increases in bank advances. Further, banks appear to have responded to temporary falls in farm income by increasing rural advances though it is not clear how much of this was due to government exhortation. To the extent that it was a response to government pressure, the phasing out of qualitative controls on the trading banks will have been to the disadvantage of the rural sector.

Substantial changes in credit policies, and the monetary upheavals of recent years, have probably altered the structure of the rural credit market. Certainly the model developed in this study would need checking for its robustness in describing the existing market for trading bank rural advances. Its value lies primarily in the insights it provides into the impact of the types of rural credit policies adopted over the period 1950 to 1973.

References

[1] Bureau of Agricultural Economics, *Rural Credit in Australia*, AGPS, Canberra, 1972.

[2] Corden, W. M., 'Australian Economic Policy Discussion in the Post-War Period: A Survey', *Am. Econ. Rev.* 58 (3): Part 2 Supplement, June, 1965.

[3] Downing, R. I., ed., *The Australian Economy*, Weidenfeld and Nicolson, London, 1973.

[4] Goldfield, S. M., *Commercial Bank Behaviour and Economic Activity*, North-Holland, Amsterdam, 1966.

[5] Jarrett, F. G., 'Credit and Agriculture' in D. B. Williams, ed., *Agriculture in the Australian Economy*, Sydney University Press, 1967.

[6] Jarrett, F. G. and J. L. Dillon, 'Some Aspects of the Rural Credit Market', *Aust. J. Agric. Econ.* 9 (2): 152-68, 1965.

[7] Leeuw, F. de, 'A Model of Financial Behaviour', chapter 13 in J. S. Duesenberry *et al.*, *The Brookings Quarterly Econometric Model of the U.S.*, Rand-McNally, Chicago, 1965.

[8] Norton, W. E., A. M. Cohen and K. M. Sweeny, *A Model of the Monetary Sector*, Occasional Paper No. 3D, Reserve Bank of Australia, Sydney, 1970.

[9] Reserve Bank of Australia, *Credit Facilities for Rural Producers in Australia*, Sydney, 1970.

[10] Standen, B. J., Some Economic Implications of Monetary and Credit Policies on Rural Industries in Australia, Unpublished Ph.D. thesis, London School of Economics and Political Science, 1976.

[11] Valentine, T. J., 'The Loan Supply Function of Australian Trading Banks: An Empirical Analysis', *Aust. Econ. Pap.* 12 (20): 57-69, 1973.

APPENDIX

Estimated bank advances supply equation for period 1950/1973:

$$\Delta ADV = \underset{}{-488} + \underset{(10\cdot6)}{0\cdot613FD} + \underset{(2\cdot2)}{162RAB} - \underset{(1\cdot6)}{210RMA} - \underset{(6\cdot4)}{0\cdot669ADV_{-1}} - \underset{(4\cdot1)}{304D}$$
$$\underset{(3\cdot2)}{}$$

$$\bar{R}^2 = 0\cdot821 \qquad D\text{-}W = 2\cdot18$$

where

ADV is the stock of bank advances at the end of period *t*;

FD is the stock of bank 'free' deposits at the end of period *t*;

RAB is the ratio of the maximum overdraft interest rate and the yield on government bonds in period *t*;

RMA is the ratio of the money market interest rate and the maximum overdraft interest rate in period *t*;

D is 0 for years up to and including 1961, 1 for subsequent years to represent the development of the short-term money market following the crisis of 1960/61.

For alternative specifications and results, and more detailed description of the above equation see [10].

Estimated bank advances demand equation for period 1950/1973:

$$\Delta ADV = \underset{(4\cdot4)}{2175} + \underset{(4\cdot7)}{0\cdot214GNPP} - \underset{(1\cdot9)}{0\cdot182GDB} - \underset{(3\cdot9)}{471RA} + \underset{(0\cdot1)}{8RB} - \underset{(0\cdot4)}{30LAGD} - \underset{(0\cdot4)}{59RED} - \underset{(2\cdot9)}{1\cdot021ADV_{-1}}$$

$$\bar{R}^2 = 0\cdot807 \qquad D\text{-}W = 2\cdot08$$

where:

ADV is the same as for the supply equation except that advances to wool buyers are excluded, being assumed exogenous;

GNPP is a measure of permanent GNP;

GDB is domestic borrowing by the Australian government;

RA is the maximum overdraft rate;

RB is the yield on government securities;

LAGD is a directives variable, representing Reserve Bank qualitative controls, lagged one period;

RED is a variable representing the two occasions when banks have been directed to *reduce* the level of outstanding advances.

Details of alternative specifications and results are provided in [10].