MONETARY POLICY AND AGRICULTURAL LENDING BY PRIVATE SECTOR FINANCIAL INSTITUTIONS

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THE AGRICULTURAL ECONOMICS RESEARCH UNIT
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The Agricultural Economics Research Unit (AERU) was established in 1962 at Lincoln College, University of Canterbury. The aims of the Unit are to assist by way of economic research those groups involved in the many aspects of New Zealand primary production and product processing, distribution and marketing.

Major sources of funding have been annual grants from the Department of Scientific and Industrial Research and the College. However, a substantial proportion of the Unit's budget is derived from specific project research under contract to government departments, producer boards, farmer organisations and to commercial and industrial groups.

The Unit is involved in a wide spectrum of agricultural economics and management research, with some concentration on production economics, natural resource economics, marketing, processing and transportation. The results of research projects are published as Research Reports or Discussion Papers. (For further information regarding the Unit's publications see the inside back cover). The Unit also sponsors periodic conferences and seminars on topics of regional and national interest, often in conjunction with other organisations.

The Unit is guided in policy formation by an Advisory Committee first established in 1982.

The AERU, the Department of Agricultural Economics and Marketing, and the Department of Farm Management and Rural Valuation maintain a close working relationship on research and associated matters. The heads of these two Departments are represented on the Advisory Committee, and together with the Director, constitute an AERU Policy Committee.

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PREFACE

The AERU recognises the importance of finance to the New Zealand agricultural sector. Hence, the Unit has been increasing steadily its efforts in studying the finance resource and its interaction with the agricultural sector.

In the past few years two reports specifically on the subject of farm finance have been published by the AERU. The first was Research Report No. 114 by J.G. Pryde and S.K. Martin; this report reviewed the New Zealand rural credit system. The second was Discussion Paper No. 69 written by Glen Greer; this paper reviewed finance data availability and data requirements of institutions associated with farm finance.

The present paper written by Mr R.L. St Hill, lecturer in the Department of Agricultural Economics and Marketing at the College, reports the results of analyses of the relationships between monetary policy and lending to the agricultural sector by private sector financial institutions. It is interesting to note that the analysis has been somewhat constrained by a lack of data on the flow of loans, that is, an inability to identify net new lending each quarter as well as the pattern of repayments. Nevertheless, the paper makes a valuable contribution to our understanding of the financial sector.

The paper constitutes a revised and expanded version of a paper presented by Mr St Hill at the New Zealand Branch Conference of the Australian Agricultural Economics Society held at Wellington in August 1983.

P.D. Chudleigh
Director

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1. INTRODUCTION

1.1 Objectives of the Study

Over a decade ago the Committee of Inquiry into Lending to Farmers (1972:19) reported that "the evidence submitted to us indicated that there has been reasonable availability of loan finance for creditworthy borrowers." In the mid-1970s Bayliss and Bayley (1975:6) concluded that "farmers' borrowing requirements have been well catered for by financial institutions." More recently, respondents to a survey of farmer opinion (Pryde and McCartin, 1983) did not regard availability of finance as an important factor limiting expansion of farm output. Although the cost of finance was regarded as the chief limiting factor its availability was ranked ninth out of twenty possible limiting factors.

It is the purpose of this Discussion Paper to report results of a preliminary investigation into relationships between monetary policy and lending to the agricultural sector by private sector financial institutions in New Zealand. Specifically, the objective of the study was to test the hypothesis that private sector financial institutions do not alter their portfolio compositions at the margin when the monetary policy stance becomes more restrictive. If the empirical results suggest that the hypothesis is true it could be tentatively concluded that changes to a more restrictive monetary policy stance are not biased in favour of, or against, agriculture in the sense that this sector bears a lesser or greater than proportional burden of any change in total loans outstanding.

1.2 Background

The agricultural sector in New Zealand has always received close attention in economic management. Such attention has usually been fairly obvious in fiscal policy implementation as in the case of the Supplementary Minimum Prices Scheme. However, agriculture has also received consideration in monetary policy implementation. In particular, lending directives have consistently favoured lending to the agricultural sector because of its overwhelming importance as an earner of foreign exchange. Directives should, in theory, allow the authorities to insulate agriculture against adverse fluctuations in finance availability when the monetary stance is restrictive but their efficacy is hard to determine (Deane, Nicholl and Smith, 1983:

263). Pryde and Martin (1980: 53-54) suggested that direction to lenders and the use of public sector ratios led to a small increase in funds available to the agricultural sector towards the end of the 1970s.[1]

Clearly, the whole question of relationships between monetary policy and agricultural lending is complex. As little is known about such relationships research is needed, especially if the government intends to pursue a more active approach to monetary policy in the future than has been the case in the past (Budget, 1983: 10).

1.3 Outline of the Paper

In Section 2 data on lending to the agricultural sector by private sector financial institutions are presented and discussed. In Section 3 a suggested indicator of the stance of monetary policy is defined. The indicator is used as an explanatory variable in a simple regression model which is outlined in Section 4. Some sectoral analysis is reported in Section 5 and tentative conclusions are drawn in Section 6.

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[1] However, they regarded reduced lending risks associated with guarantee schemes like SMPs as a more important policy factor.

2. DATA ON LENDING TO THE AGRICULTURAL SECTOR

2.1 Definitions

The Reserve Bank made available data on loans outstanding by the major private sector institutions listed in Table 1. Institutions included in this study were the so-called M3 institutions plus life insurance companies. Loans outstanding were classified by term, consistent with the classification adopted in the report of the Agricultural Development Conference 1963-64 (1966). Short-term loans (STL) were defined as the sum of stock and station agents' advances to farmers and sundry debtors plus trading banks' overdrafts for farming. Medium-term loans (MTL) were defined as trading banks' term loans for farming. All other loans were defined to be long-term (LTL) and included trustee and private savings banks' loans, finance companies' loans and life insurance companies' loans for farming. The sum of all these loans (PAG) was used in the regression model in Section 4 and the components (STL, MTL, LTL) were used in the sectoral analysis in Section 5.

Data were collated as at the last reporting date in each quarter for each institution from March 1970 to June 1982. In earlier years some components of LTL were estimated. These components were trustee and private savings banks' loans (March 1970 to June 1978) and finance companies' loans (March 1970 to March 1977). Simple semi-log linear regressions with other components of LTL as regressors were used as a basis for extrapolation in these cases.

Total loans outstanding to the private sector of the institutions included in Table 1 (PC1) was defined as the sum of loans outstanding to the private sector of the M3 institutions (this is the Reserve Bank definition of Private Sector Credit) plus loans and major investments of life insurance companies excluding government securities and cash.

All the data referred to above are tabulated in Appendix 1. It is important to note that data represent stocks of loans to the agricultural sector outstanding at the end of each quarter rather than flows of loans during each quarter. Data on flows of new loans and debt repayments are unavailable for most of the institutions covered by this study. Therefore the analysis concentrates on the share of agriculture in total loans outstanding of the institutions covered rather than the share of new loans which would be a more appropriate measure of portfolio adjustment.

TABLE 1

Institutions Included in the Study

Term of Loan	Type of Loan	Institution
Short	Advances and sundry debtors	Stock and station agents
	Overdrafts	Trading banks
Medium	Term loans	Trading banks
Long	All loans	Trustee and private savings banks
		Finance companies
		Life insurance companies

2.2 The Share of Agriculture in Loans Outstanding.

The share of agriculture in total loans outstanding of the institutions in Table 1 (PAG/PC1) is shown in Figure 1. During the period of study the maximum share was 22.3 per cent (in the December quarter 1970) and the minimum share was 11.1 per cent (in the September quarter 1978). There was a downward trend in the share until mid-1979 but after that time the share increased slightly. Visual inspection of Figure 1 suggests that there is not much volatility in the share in the short term and implies that changes in the proportion of agricultural loans in the portfolios of private sector financial institutions are usually made by marginal increments or decrements.[2]

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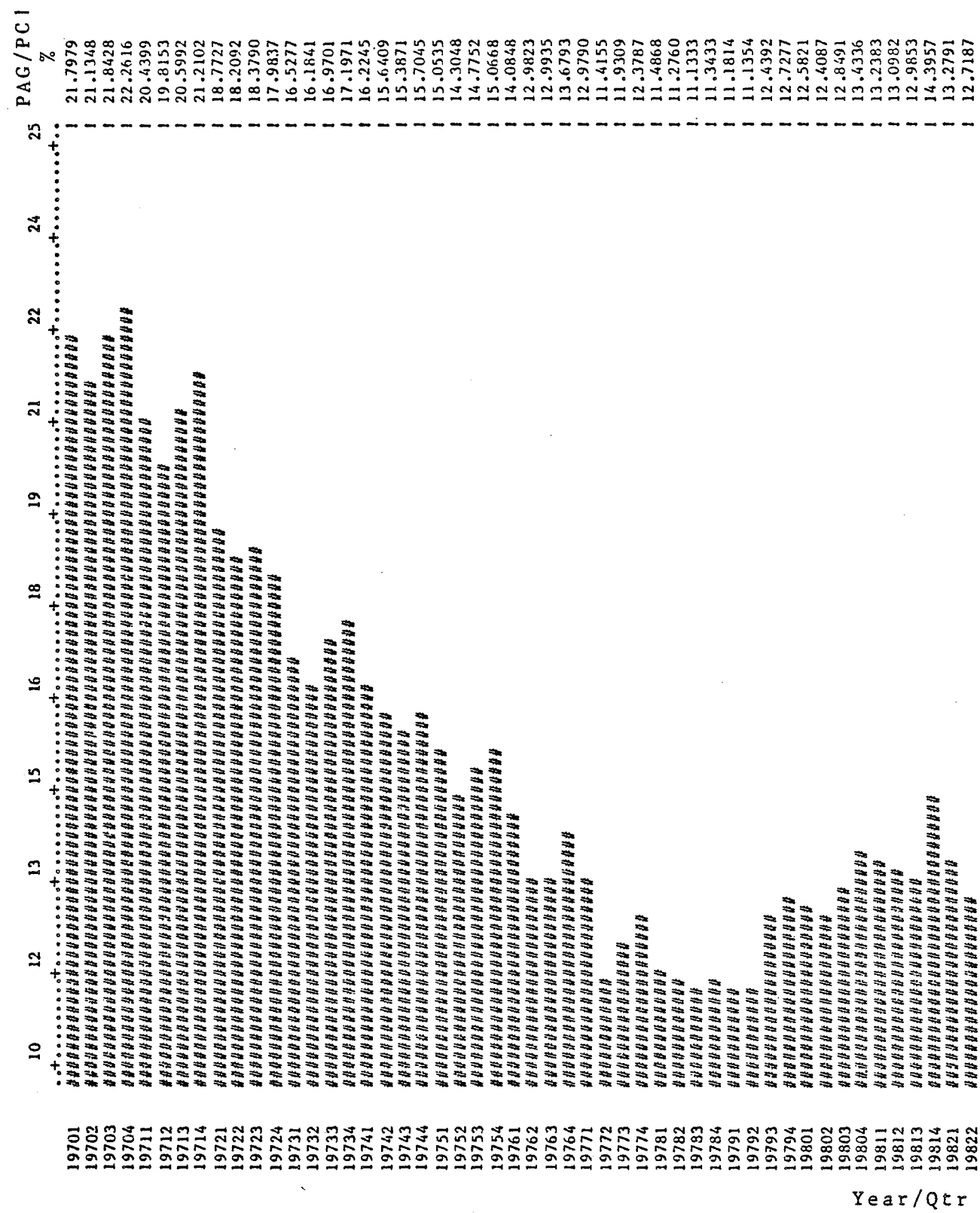
[2] Deseasonalising the share makes very little difference since the seasonal indices computed by the moving average method are all very close to 1.0.

FIGURE 1

The Share of Agriculture in Loans Outstanding of Selected Private Sector Financial Institutions



3. AN INDICATOR OF THE STANCE OF MONETARY POLICY

3.1 Definition of GAP.

An indicator of the stance of monetary policy should reflect not the intended policy but actual monetary conditions (Davis and Lewis, 1978 : 20-22). For example, consider a situation in which the monetary authorities raise the Reserve Assets and Government Security Investment Ratios as part of a tight monetary policy package. Ostensibly the monetary policy stance is restrictive but, if a sudden surge in export receipts occurred and was not sterilised, actual monetary conditions and hence actual monetary policy stance could be permissive. Recognition of this distinction leads to the suggestion that an indicator of relative rates of growth in money supply and nominal transactions might be a useful indicator of the monetary policy stance. In practise the value of nominal transactions is virtually impossible to calculate. Gross Domestic Product (GDP) must be substituted although it should be recognised that GDP measures only transactions involving newly produced goods and services.

The approach taken here was to define a variable, GAP, as the difference between the percentage rates of growth in broadly defined money supply (M3) and nominal GDP. When GAP is zero the stance of monetary policy could be said to be neutral in the sense that it is neither restrictive nor permissive because money supply is growing just fast enough to allow expenditures on GDP to be financed without a change in income velocity of circulation. When GAP is positive the monetary policy stance could be said to be permissive since money supply is growing more rapidly than GDP. Conversely, when GAP is negative the monetary policy stance could be said to be restrictive since money supply is not growing rapidly enough to finance expenditures on GDP without a change in the income velocity of circulation.

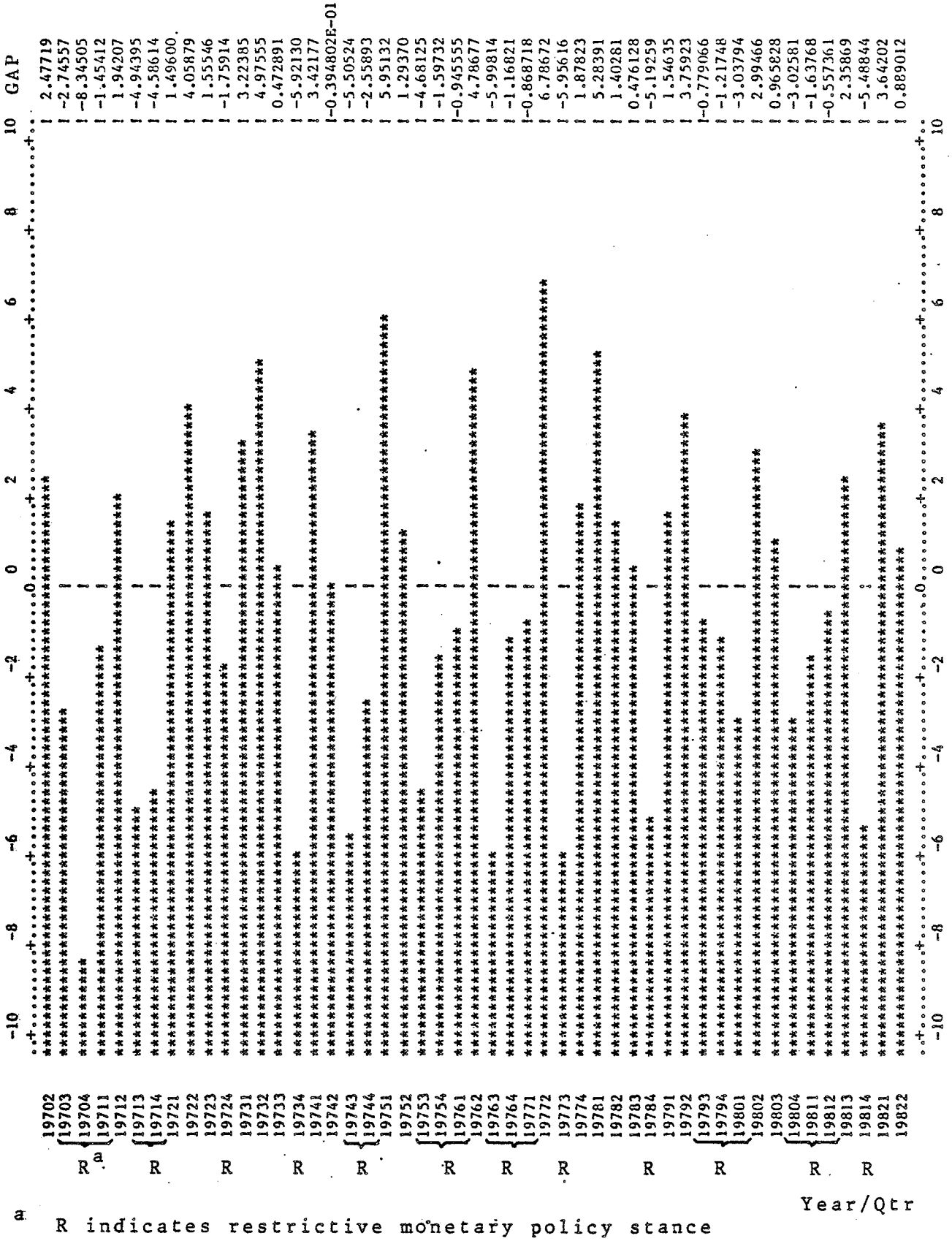
GAP is shown in Figure 2. According to the interpretation above New Zealand experienced "runs" of permissive monetary policy punctuated by shorter "runs" of restrictive monetary policy between 1970 and 1982. Typically the restrictive "runs" were of two or three quarters duration.

3.2 The Velocity of Circulation.

The usefulness of GAP as an indicator of the monetary policy stance depends on the validity of the implicit assumption that the velocity of circulation is constant, at least in the short term. Two approaches were used to examine the validity of this assumption.

FIGURE 2

An Indicator of the Stance of Monetary Policy



[a] R indicates restrictive monetary policy stance

First, an indicator of velocity was defined as the annualised ratio of GDP to average M3 in each quarter, average M3 in turn being defined as the mean of M3 at the beginning and end of each quarter. Velocity defined in this way is the income velocity. In Figure 3 velocity is shown for the time period of the study. It is clear from the Figure that velocity has been remarkably stable. The mean of the series is 2.0 and the coefficient of variation is only 4 per cent. The secular trend estimated by regressing velocity against time was not significantly different from zero (see Appendix 2). On this basis GAP would appear to be a reasonable indicator of the stance of monetary policy.

Second, the correlation coefficient between growth rates of nominal M3 and nominal GDP was computed. If velocity of circulation was constant one would expect this coefficient to have had a value close to unity. This follows from the simple "quantity equation":

$$MV = PY$$

where

M = nominal money supply (M3)
V = velocity of circulation (income velocity)
P = index of the general price level (GDP implicit price deflator)
Y = real income (real GDP)
PY = nominal income

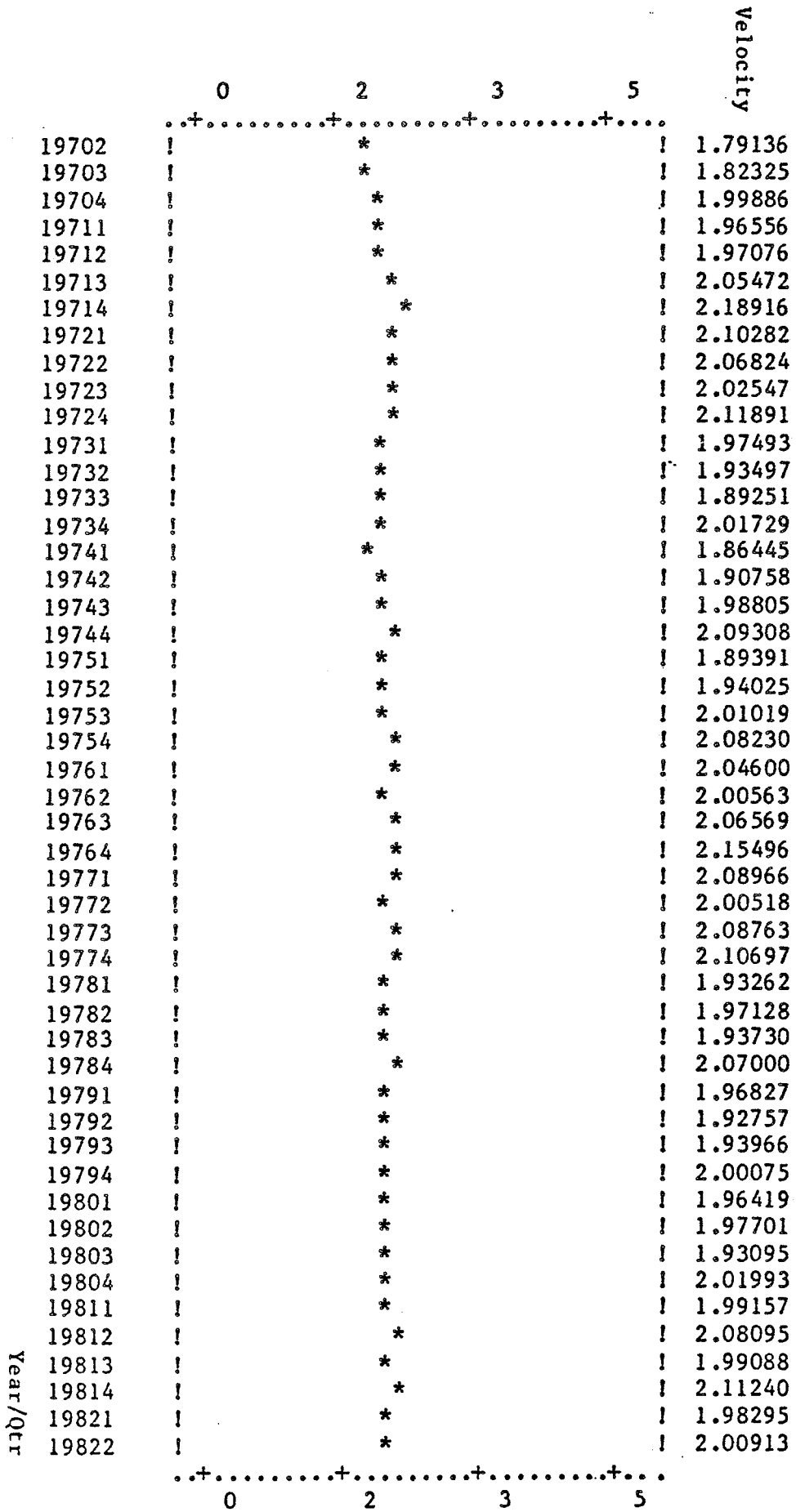
When V is constant we expect that:

$$\frac{\delta M}{\delta t} = \frac{\delta (PY)}{\delta t}$$

Therefore, if V is constant the correlation coefficient between the rates of growth in nominal M3 and GDP should be close to unity. In this case the computed coefficient was 0.69. Because this result is not unambiguously high one must question the validity of the assumption of constant velocity. Final judgement is subjective and the author's judgement was to accept the assumption on the basis of the overall evidence.

FIGURE 3

Income Velocity of Circulation



4. A SINGLE EQUATION REGRESSION MODEL

4.1 Variables Included in the Equation.

To estimate the relationship between the monetary policy stance and the share of agriculture in total loans outstanding of the private sector financial institutions listed in Table 1 a simple single equation regression model was employed. The model is not an "explanatory" model in the sense that the objective was to test a number of hypotheses about economic behaviour. Rather the objective was restricted to examining the statistical relationship between the monetary policy stance and the share of agriculture in total loans outstanding. This led to the inclusion of some variables as regressors, such as a proxy for time, which did not really "explain" anything but which improved the statistical properties of the equation.

The dependent variable was PAG/PC1,[3] the share of agriculture in total loans outstanding. Regressors included PAG/ PC1 lagged by one-quarter, the indicator of the monetary policy stance (GAP), a proxy for time, the weighted average interest rate on trading banks' term loans and three seasonal dummy variables.

Lagged PAG/PC1 was included as a regressor in recognition of the fact that PAG/PC1 does not appear to be volatile over short periods of time (see Figure 1). This variable could be taken as a proxy for inertia in portfolio adjustment. It should be emphasised that because PAG/PC1 is a stock variable its short term stability could mask quite volatile changes in short term gross flows of new lending. Because no flow data are available, at best, gross new lending could be proxied by changes in PAG/PC1 but this is still only a measure of net new lending and provides no information on repayment patterns (Greer, 1983).

GAP was included to enable estimation of the statistical relationship of interest in this paper.

Time (T) was represented by a proxy variable whose value was set at unity for the March quarter 1970 and incremented by one for each quarter thereafter. This variable was included as a means of accounting for a general downward trend in PAG/PC1 between the March quarter 1970 and the June quarter 1979. As mentioned above it is recognised that time does not have any potential as an explanatory variable in the economic sense.

Inclusion of the weighted average interest rate on trading banks' term loans outstanding (I) was dictated mainly by data availability. Ideally, the rate on agricultural loans relative to other loans should be used but interest rate data on agricultural loans are unavailable. One would expect that the lower the relative interest rate on agricultural loans the lower would be PAG/PC1. If the assumption that changes in

[3] Expressed as a proportion rather than as a percentage share.

interest rates on loans to the agricultural sector lag behind changes in other rates can be accepted, then an increase in I would be associated with a fall in PAG/PC1 other things being equal. [4]

The three seasonal dummy variables were included to account explicitly for seasonality in the raw data. (D1 = 1 for March quarter, 0 for all other quarters; D2 = 1 for June quarter, 0 for all other quarters; D3 = 1 for September quarter, 0 for all other quarters).

4.2 Results of the Regression.

Because the dependent variable was expressed as a proportion, predicted values were restricted to values between zero and unity by estimating a logit equation where the dependent variable was $\ln \left\{\frac{(PAG/PC1)}{1-(PAG/PC1)}\right\}$. Coefficients were estimated by ordinary least squares and are reported in Table 2.

At the 95 per cent confidence level all coefficients except that on D3 are significantly different from zero. An F-test on the three seasonal dummy variables jointly indicates that their inclusion in the equation improves its fit.

The Durbin-Watson statistic quoted in Table 2 was not used to test for the presence of first order serial correlation in the error terms. Where a lagged dependent variable is used as a regressor the Durbin-Watson statistic is biased towards 2. Durbin's suggested test based on regressing residuals on lagged residuals and all regressors indicated that first-order serial correlation was not present in the error terms of the estimated equation (Durbin, 1970).

The Wallis d4 statistic was used to test for fourth-order serial correlation in the error term which is always a possibility with quarterly data (Wallis, 1972). This test indicated that the problem was not present.

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[4] In St Hill (1983) the weighted average interest rate on trading banks' overdrafts was used. In this paper the weighted average term loan rate is used because it seems to be a more representative rate.

TABLE 2

Regression Results

Variable	Coefficient	t
Constant	-0.334	2.6
P_{-1}	0.840	12.5
GAP	-0.004	2.0
T	-0.006	2.3
I	0.022	2.6
D1	0.081	4.8
D2	0.060	3.4
D3	0.005	0.4

where: $P = \ln \left\{ \frac{(PAG/PC1)}{1-(PAG/PC1)} \right\}$

coefficient of determination adjusted for degrees of freedom = 0.98
F statistic = 336.4
Durbin-Watson statistic = 2.0
Wallis d4 statistic = 1.8
Number of observations = 49

4.3 Interpretation of the Results

The regressor of interest is GAP. Its coefficient is negative implying that as GAP falls (as the monetary policy stance becomes more restrictive) the share of loans to the agricultural sector rises. This follows from the interpretation below:

$$\Delta \ln \left\{ \frac{(PAG/PC1)}{1-(PAG/PC1)} \right\} \approx \left\{ \frac{1}{(PAG/PC1)} + \frac{1}{1-(PAG/PC1)} \right\} \Delta (PAG/PC1)$$

$$= \frac{\Delta (PAG/PC1)}{(PAG/PC1)\{1-(PAG/PC1)\}}$$

$$= -0.004\ \Delta GAP$$

Therefore:

$$\Delta(PAG/PC1) \approx -0.004 \; \Delta \; GAP \; [PAG/PC1 \; \{1 - (PAG/PC1)\}]$$

Thus if PAG/PC1 is 0.15 (mean of PAG/PC1 in the period of study) and GAP is -3 percentage points (standard deviation of GAP in the period of study) then (PAG/PC1) is approximately 0.002 or 0.2 percentage points. This result is interesting as it indicates that the agricultural sector does not have to do quite as much "belt-tightening" as other sectors in quarters when the monetary policy stance becomes more restrictive. An important implication is that financial institutions as a group restructure their portfolios at the margin in favour of agricultural loans under these conditions. Such portfolio restructuring may be a voluntary, profit-maximising response by financial institutions. If, for example, default risks perceived by financial institutions on some other types of loans increase in periods of restrictive monetary policy then expanding the share of agricultural loans is a rational profit-maximising response to tight monetary policy. It might still be rational to expand the share of agricultural loans even if there is no change in perceived default risks on other types of loans. For example, if interest rates are not market determined and are below appropriate market rates, then rationing of loanable funds on the basis of risk is rational behaviour. Thus if agricultural loans are perceived to be less risky than other types of loans their share in total loans outstanding could be expected to rise when monetary conditions are restrictive.

Although there is no evidence to substantiate directly the hypothesis that institutions do alter their perceptions of risk, agricultural loans are perceived generally by financial institutions to be safer than many other types of loans, but this may be because guarantees such as the Supplementary Minimum Prices Scheme mitigate risk (Pryde and Martin, 1980).

Restructuring of portfolios may not be voluntary. It may be an involuntary response as a result of lending directives or moral suasion[5] by the monetary authorities or as a result of a slow-down in the rate of loan repayments by farmers. Because available data are mostly on a loans outstanding basis (stock) it is difficult to know whether portfolio restructuring is voluntary or involuntary. If it were possible to compile data on new lending and loan repayments (flows) an attempt to assess the nature of restructuring could be made, e.g. a reduction in loan repayments would support the involuntary restructuring argument.

Some comment on the sign of I needs to be made. As in St Hill (1983), where the weighted average interest rate on

[5] Moral suasion is defined in Deane, Nicholl and Smith (1983 : 256) as "a process of consultation and request" between the Reserve Bank and financial institutions.

trading bank overdrafts was used, the coefficient on I is small but significantly different from zero and has a positive sign. Although a positive sign was not expected a priori it is possible that the hypothesis regarding relative interest rates did not hold in the sample period as a result of the combined effects of interest rate regulations and lending directives which operated during parts of the sample period. Also, using I as an indicator of relative interest rates masks differences among institutions. For example, lending to agriculture by trustee savings banks and life insurance companies attracts higher interest rates than lending for housing while, in the case of trading banks, lending to agriculture attracts lower interest rates than other types of lending. Nevertheless, inclusion of I in the equation overcomes the problem of first-order serial correlation in the error terms and I was retained for that reason.

5. SECTORAL ANALYSIS

5.1 The Share of Agriculture in Total Loans Outstanding.

In this section the focus is on the behaviour of shares of components of PAG in PC1 in tight and not-tight quarters. For this purpose each quarter in the period of study was classified as tight or not-tight on the basis of GAP. If GAP was negative then the quarter was classified as "tight" (25 quarters fell into this subset); if GAP was positive then the quarter was classified as "not-tight" (24 quarters fell into this subset). For each subset of quarters the geometric means of component percentage shares were calculated and t-tests applied to establish the statistical significance of differences between them.[6] Results are displayed in Table 3.

Results obtained in the regression exercise are given some further credibility.[7] The percentage share of PAG in PC1 does appear to have been higher in tight quarters on average than in not-tight quarters. However when PAG was disaggregated into its components it was clear that short-term loans (STL) accounted largely for the result. The data were disaggregated even further and it appeared that about three-quarters of the increase in STL was explained by higher loans outstanding on the part of stock and station agents; these loans were, in turn, financed by the agents borrowing from trading banks. Unfortunately, this evidence does not shed much light on the issue of voluntary versus involuntary portfolio restructuring. At best it is very weak evidence that restructuring is involuntary and arises because the flow of loan repayments is reduced in tight quarters. Without information on flows of repayments and new loans the issue is virtually impossible to resolve.

5.2 The Shares of the Household and Other Sectors in Total Loans Outstanding.

For purposes of comparison two further categories of loans were defined. Data for the household sector (HOUS) were compiled. Included in this sector were trading banks' overdrafts and term loans for housing and other personal purposes, trustee savings banks' loans for housing and flats

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6 Variances were also calculated and F—tests applied to establish the statistical significance of differences between pairs. None of the differences were statistically significant at the 95 per cent level. This result was expected given that differences in means were small and/or not statistically significant.

7 Since tight quarters were spread reasonably evenly throughout the entire period of study the possibility of spurious results arising due to trends in shares of agricultural loans outstanding was minimised.

TABLE 3

Shares of Five Categories of Loans Outstanding in Tight and Not-Tight Quarters

Category	Geometric Mean of Shares		
	Tight Quarters	Not-Tight Quarters	Difference
Short-term loans to agriculture (STL)	7.78	7.10	0.68*
Medium-term loans to agriculture (MTL)	0.88	0.85	0.03
Long-term loans to agriculture (LTL)	6.12	5.90	0.22
Total loans to agriculture (PAG)	14.78	13.85	0.93*
Loans to households (HOUS)	29.08	28.13	0.95*
Other loans (OTH)	56.14	58.02	-1.88*
Total loans (PC1)	100.0	100.0	

* Indicates that differences are significant at the 95% confidence level.

and other personal purposes, private savings banks' loans for houses and flats, Post Office Savings Bank's personal loans, finance companies' loans for houses and flats and other personal purposes and life insurance companies' loans on policies. Data for a residual "other" sector (OTH) were calculated as the difference between PC1 and the sum of loans outstanding to other sectors. OTH comprised mainly business loans and local authority securities.

Geometric means for shares of HOUS and OTH were computed. The mean share of HOUS increased in the tight quarter subset by a little more than did PAG. By contrast, the share of OTH fell. Because HOUS and OTH are highly aggregated only brief comment can be made. It seems that in tight quarters business lending (the bulk of OTH) shoulders a disproportionate share of the burden of restrictive monetary policy while the agricultural and household sectors do not have to do as much "belt tightening".

6. SUMMARY AND CONCLUSION

The preliminary research results outlined in this paper indicate that the share of loans to the agricultural sector outstanding by private sector financial institutions has increased at the margin in quarters when the monetary policy stance has become more restrictive.

The analysis raises some issues which have not been resolved. In particular, the issue of whether or not portfolio restructuring is a voluntary or involuntary response to changes in the stance of monetary policy has not been resolved. Nevertheless, the results suggest that when the monetary policy stance becomes more restrictive the agricultural sector bears a less than proportional burden because its share in total loans outstanding rises slightly. Therefore it can be tentatively concluded that changes to a more restrictive monetary policy stance are biased slightly in favour of the agricultural sector.

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APPENDIX 1

LOANS TO THE AGRICULTURAL SECTOR AND TOTAL LOANS OUTSTANDING OF SELECTED PRIVATE SECTOR INSTITUTIONS

	STL	MTL	LTL	PAG	PC1
1970 1	223.1	3.9	205.1	432.1	1982.3
1970 2	206.2	4.1	208.0	418.3	1979.2
1970 3	230.9	4.5	209.1	444.5	2035.0
1970 4	245.1	4.7	208.9	458.7	2060.5
1971 1	241.6	4.6	209.2	455.4	2228.0
1971 2	222.4	4.6	210.7	437.7	2208.9
1971 3	243.5	4.5	210.6	458.6	2226.3
1971 4	257.6	4.4	211.9	473.9	2234.3
1972 1	233.6	4.4	211.1	449.1	2392.3
1972 2	215.6	5.4	214.2	435.2	2390.0
1972 3	225.7	6.3	216.3	448.3	2439.2
1972 4	225.5	7.8	217.3	450.6	2505.6
1973 1	223.1	11.3	219.6	454.0	2746.9
1973 2	217.0	19.2	224.4	460.6	2846.0
1973 3	252.9	28.8	231.0	512.7	3021.2
1973 4	272.9	34.0	234.5	541.4	3148.2
1974 1	299.6	34.8	237.4	571.8	3524.3
1974 2	289.8	37.6	241.6	569.0	3637.9
1974 3	299.0	39.0	243.2	581.2	3777.2
1974 4	305.1	38.5	243.7	587.3	3739.7
1975 1	308.9	37.3	242.8	589.9	3912.7
1975 2	274.8	38.4	244.2	557.4	3896.6
1975 3	304.7	42.4	245.0	592.1	4007.4
1975 4	321.9	48.7	248.9	619.5	4111.7
1976 1	309.3	51.6	249.9	610.8	4336.6
1976 2	263.5	53.6	252.9	570.0	4390.6
1976 3	291.8	57.6	254.9	604.3	4650.8
1976 4	340.8	64.6	261.3	666.7	4873.8
1977 1	360.9	67.0	262.4	690.3	5318.6
1977 2	335.0	72.8	261.8	669.6	5865.7
1977 3	380.3	74.3	272.6	727.2	6095.1
1977 4	412.7	73.1	278.4	764.2	6173.5
1978 1	397.1	70.8	280.9	748.8	6518.8
1978 2	384.0	75.3	288.6	747.9	6632.7
1978 3	399.2	92.6	290.0	781.8	7022.2
1978 4	419.7	107.1	307.5	834.3	7355.0
1979 1	446.7	114.9	309.7	871.3	7792.4
1979 2	437.0	132.6	332.9	902.5	8104.8
1979 3	478.2	140.8	354.7	973.7	7827.7
1979 4	529.8	141.5	364.2	1035.5	8135.8
1980 1	564.4	137.3	375.1	1076.8	8558.2
1980 2	527.3	143.9	401.3	1072.5	8643.1
1980 3	585.4	151.7	428.7	1165.8	9073.0
1980 4	654.1	165.4	456.6	1276.1	9499.3
1981 1	707.4	162.3	472.6	1342.3	10139.5
1981 2	670.7	186.9	521.5	1379.1	10528.9
1981 3	734.2	223.1	556.1	1513.4	11654.7
1981 4	840.6	257.9	599.7	1698.2	11796.6
1982 1	820.8	267.3	610.0	1698.1	12787.8
1982 2	720.2	284.4	629.8	1634.4	12850.4

KEY

1 = March quarter 2 = June quarter 3 = September quarter 4 = December quarter

STL = Short-term loans to the agricultural sector outstanding

MTL = Medium-term loans to the agricultural sector outstanding

LTL = Long-term loans to the agricultural sector outstanding

PAG = Private sector loans to the agricultural sector outstanding

PC1 = Total loans to the private sector by selected institutions outstanding (see Table 1 for a list of institutions)

APPENDIX 2

DESCRIPTIVE STATISTICS : VELOCITY OF CIRCULATION

Mean of series : 2.0 (annualised quarterly data)

Standard deviation : 0.08

Coefficient of variation : 4%

Trend estimated by :

$$\underset{}{Vel} = \underset{(t=80.0)}{1.985} + \underset{(t=0.8)}{0.001T} \qquad R^2 = 0.01$$

where Vel = annualised quarterly income velocity of circulation

T = time (2, 3, 4, ... 50)

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