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THE ROLES OF INFLATION
AND CONSUMER SENTIMENT IN
EXPLAINING AUSTRALIAN CONSUMPTION
AND SAVINGS PATTERNS

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1. INTRODUCTION

In the 1970's marked changes have occurred in the manner in
which Australian households allocate disposable income. Over the
five year period 1973-74 to 1977-78, the median percentage of
income saved was 15.5 per cent compared with a median value of
8.5 per cent for the last five years of the 1960's. On the
consumption side, private expenditure on purchases of new motor
vehicles has fallen continuously as a percentage of household
disposable income from the peak figure of 5.0 per cent in 1971-72
(the figure was 3.5 per cent in 1977-78). Furthermore real prices
of cars have been increasing so that registrations of motor
vehicles have fallen in each year from 1974-75. Purchases of
household durables increased markedly after 1971-72. Growth was
maintained by the introduction of colour television in 1974 and in
1975-76 expenditure on durables peaked at 7.7 per cent of household
income. It has since fallen back to 6.8 per cent in 1977-78.

* Financial assistance was provided from the Economic and Financial
Research Fund of the Reserve Bank of Australia. We are indebted
to Steffen Kasch for carrying out all the computations, and to
John McDonnell for assistance.
The consumption-savings choice of consumers is conventionally modelled, in econometric work, in terms of a lagged response of consumption to income changes. The allocation of total consumption is usually explained in terms of income (or total expenditure) and relative prices. However, it is not apparent that these traditional approaches are sufficient to explain the behaviour of households in recent years. The period from 1971-72 has been one in which households have been faced with a markedly different economic environment from that which had existed for the previous twenty years. In particular, inflation rates have been high and unemployment levels have been increasing continuously.

In recent years researchers, such as Juster and Wachtel (1972b), Juster and Taylor (1975), Deaton (1977), Freebairn (1977) and Howard (1978), have attempted to examine the influence of inflation and economic uncertainty on the consumption-savings choice. Juster and Wachtel (1972a) have also examined the effects on the allocation of consumption. Our paper follows in this tradition. Specifically, we are interested in explaining the allocation of household disposable income in Australia in recent years between saving, expenditure on motor vehicles, expenditure on household durables, and other consumption expenditure. This is carried out by including as explanatory variables measures of actual and expected inflation, actual and expected unemployment, and other measures of consumer sentiment obtained from the household surveys undertaken by the Melbourne Institute of Applied Economic and Social Research and Morgan Gallup Polls. These additional variables are seen as modifying the responses of households to changes in income and relative prices.
The plan of the paper is as follows. Section 2 is devoted to a discussion of the measures of inflation, unemployment and consumer sentiment used and their expected roles in influencing consumption patterns and saving. The full models are presented in section 3 and the empirical results are given in section 4. Finally, in section 5 the findings are summarized and some policy implications are outlined.

2. THE ROLES OF INFLATION, UNEMPLOYMENT AND CONSUMER SENTIMENT VARIABLES

High levels of inflation, high and rising levels of unemployment, and marked changes in other economic variables such as interest and exchange rates are all likely to influence both the consumption-savings choice and the allocation of total consumption. Insofar as consumers aim to maintain a constant ratio of assets to income, high inflation is expected to lead to consumers allocating more income to saving and less to the consumption of non-durables. The uncertainty producing effects of inflation would also tend to increase saving as would consumer adjustment to higher prices for goods and services. On the other hand, insofar as inflation is accompanied by low or negative real interest rates, household may increase consumption, particularly of durable goods. On balance, in terms of the allocation of income considered in this paper, high rates of inflation are likely to increase saving and reduce expenditure on other consumption. The effect on expenditure on household durables and motor vehicles is uncertain.
An increase in inflationary expectations might lead consumers to increase their current purchases of motor vehicles and household durables, particularly if real interest rates are expected to fall. On the other hand, the first two factors mentioned above as causing a positive relationship between actual inflation and saving will tend to produce the same positive relationship between expected inflation and saving.\textsuperscript{1)}

Both qualitative and quantitative measures are available for inflation and inflationary expectations. The quantitative measure used for actual inflation is the four-quarter percentage change in the implicit deflator for personal consumption expenditure. However, insofar as some consumers are unaware of official measures of inflation, it might be more relevant to use a measure of inflation as perceived by consumers. The qualitative measure adopted to measure this is the percentage of consumers in the sample who regard the current level of inflation as a serious problem minus the percentage who think it is not a serious problem.

The quantitative measure of consumers' expectations used is the average over consumers of the rate of price increase expected over the next four quarters.\textsuperscript{2)} The qualitative measure is the percentage of consumers who expect prices to rise over the next year less the percentage who expect them to fall.

The two-way classification of variables, current versus future and quantitative versus qualitative, is again adopted for unemployment. The classification is set out schematically in table 1. The two current measures available are the percentage
<table>
<thead>
<tr>
<th>Nature of Measure</th>
<th>Inflation</th>
<th>Unemployment</th>
<th>General Consumer Sentiment*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantitative</td>
<td>Changes in implicit deflator, $P$</td>
<td>Level of unemployment, $U$</td>
<td>Unfavourable news items, $N$</td>
</tr>
<tr>
<td>Qualitative</td>
<td>Inflation a serious problem now, $ISN$</td>
<td>Unemployment serious now, $USN$</td>
<td>Index of consumer sentiment, $ICS$</td>
</tr>
<tr>
<td><strong>Future</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantitative</td>
<td>Mean price expectations, $PE$</td>
<td>Changes in unemployment, $\Delta U$</td>
<td>Index of consumer sentiment, $ICS$</td>
</tr>
<tr>
<td>Qualitative</td>
<td>Prices likely to increase, $ISF$</td>
<td>Unemployment likely to increase, $USF$</td>
<td></td>
</tr>
</tbody>
</table>

* Two specific sentiment variables used related to whether consumers regard it as a bad time to buy (i) major durables and (ii) a car.
of the workforce unemployed and the seriousness with which consumers view current unemployment. The two "future" measures are the four-quarter change in the percentage of the workforce unemployed and whether consumers expect unemployment to increase or not. Changes in unemployment are used as a proxy for uncertainty about future economic well-being. Another measure of uncertainty used by Juster and Taylor (1975) is the standard deviation of price expectations across consumers. This is also used here.

Expectations of future increases in the level of unemployment will tend to increase saving and reduce all consumption expenditure, including durables. On average, consumers will regard their permanent income as being lower than their current income and adjust expenditure downwards. It is not clear that current levels of unemployment, as opposed to changes in unemployment, should affect the allocation of income markedly other than through the usual income effects.

The additional consumer sentiment variables used may be divided between the general and the specific. The general are the index of consumer sentiment, ICS, constructed by the IAESR, and the different between unfavourable and favourable news items heard by consumers. The ICS is based on five questions which relate to both current and future economic well-being. These general sentiment variables will reflect consumers views not only on inflation and unemployment but on other economic variables such as interest rates and the balance of payments. The ICS is expected to have a positive effect on consumption; unfavourable news items are expected to have a negative effect.
The two specific qualitative variables relate to whether consumers regard it is a bad time to buy (i) major household durables and (ii) a car.

The aims of this paper are conveniently summarized in the headings of Table 1. Firstly, what is the relative importance of inflation, unemployment, general consumer sentiment and specific consumer sentiment in explaining the allocation of household income? Secondly, are expectations about the future more important than current conditions? Thirdly, how useful is qualitative survey data in explaining household behaviour?

These questions are not easily answered. Particular difficulties are that expectations about the future values of a variable depend in part on current levels or changes in the same variable, and the qualitative data are influenced in part by observed quantitative variables. In Defris and Williams (1979), for example, it is shown that the price expectations series is heavily influenced by recent rates of actual inflation; however, wage increases and changes in the money supply were also of some importance. Basically the position taken in this paper is that survey data may provide convenient summary measures of how consumers perceive the state of the economy and their own position in it. For purposes of short-term forecasting, survey data also possesses the advantage of being available several months before official statistics.
3. THE MODELS

Inflation, unemployment and sentiment variables are added to (i) demand equations in which real per capita expenditure on a commodity is expressed as a function of income and relative prices, and (ii) savings functions which depend on income. Lagged effects are allowed for by using either (i) a direct permanent income measure (as in Friedman (1957)), (ii) a lagged value of the dependent variable (as in Brown (1951), Friedman (1957)), or (iii) a lagged dependent variable plus lagged income (as in Houthakker and Taylor (1970)).

To emphasize the allocative nature of the model, the dependent variables are divided by real per capita disposable income. The price index used to obtain real income and real saving is the implicit deflator for personal consumption expenditure. It follows that the dependent variables sum to 100 per cent in each time period.

The variables discussed in section 2 are introduced multiplicatively to the conventional models, that is, they influence the marginal propensities to allocate. The variables enter both lagged and unlagged.

The three models to be estimated may be written in algebraic form as follows

\[
\text{Model } 1: \quad \frac{v_1}{Y} = \alpha_i + \beta_i (1/Y) + \gamma_i \left(\frac{X^*}{Y}\right) + \delta_i \left(\frac{P_i}{Y}\right) + \eta_i X
\]

\[
(i = 1, 2, 3, 4)
\]
Model 2: \[ V_i/Y = \alpha_i + \beta_i (1/Y) + \gamma_i (V_i(-1)/Y) + \delta_i (P_i/Y) + \eta_i X \]

\[ S/Y = \alpha_4 + \beta_4 (1/Y) + \gamma_4 (C_{-1}/Y) + \eta_4 X \]

(i = 1, 2, 3)

Model 3: \[ V_i/Y = \alpha_i + \beta_i (1/Y) + \gamma_i (V_i(-1)/Y) + \delta_i (P_i/Y) + \eta_i X + \xi_i (\Delta Y/Y) \]

(i = 1, 2, 3, 4)

where

\[ V_i = \text{real per capita expenditure on category } i, \]

\[ Y = \text{real per capita disposable income} \]

\[ C = \sum_{i=1}^{3} V_i = \text{real per capita total consumption} \]

\[ S = V_4 = \text{real per capita saving} \]

\[ Y^* = \sum_{i=0}^{n} \lambda_i Y_{t-i-1}, \text{ a permanent income measure} \]

\[ P_i = \text{relative price of good } i (P_4 = 1) \]

\[ X = \text{vector of inflation, unemployment and consumer sentiment variables} \]

In model 1, the permanent income term excludes current income which enters separately. This enables greater flexibility in the lag pattern, and is necessary on theoretical grounds for the savings equation. Notice that in model 1 the only variable which is specific to an equation is relative price. In this sense it is closer to a strict allocative model than are models 2 or 3. \(^6\)

In model 1, lags are confined to income, whereas in models 2 and 3 there are implicit distributed lags on all variables.

The short-run marginal propensities to allocate income are given by \((\alpha_i + \eta_i X)\) in models 1 and 2, and by \((\alpha_i + \eta_i X + \xi_i)\) in model 3. The long-run marginal propensities to allocate income are
given by \((\alpha_i + \gamma_i + \eta_i X)\) in model 1, and by \((\alpha_i + \gamma_i X)/(1-\gamma_i)\) in models 2 and 3. 7) For saving, the short-run response is expected to exceed the long-run response, the reverse is expected for other consumption. The relationship between short and long run responses for household durables and motor vehicles is uncertain a priori. 8)

4. EMPIRICAL RESULTS

The three models were estimated using quarterly seasonally adjusted data for the period 1973(3) to 1978(2). 9) Estimation was by ordinary least squares. For each of the four dependent variables model 2 proved to be superior and results are confined to this model. Model 1 performed almost as well as model 2 in explaining expenditure on motor vehicles, but for other categories the degree of fit was lower and the error properties inferior. Model 2 is a special case of model 3 and the results implied that model 2 was adequate: for consumption categories the coefficient of the change in income term in model 3 was insignificant, for the savings equation this coefficient was virtually identical to that of lagged saving.

In preliminary analysis it was found that the qualitative measure of inflation, ISF, was not a useful measure over the sample period of high inflation. Reported results are confined to the quantitative measure of price expectations, PE. Similarly, after a preliminary analysis, the unemployment figures were used in first-difference form only. The two specific sentiment
variables, namely, those relating to whether it is a bad or
good time to buy a car or major durables, appeared not to exert
a marked influence on actual consumption patterns.

Preferred equations for the different dependent variables
will now be discussed in turn.

(a) Motor Vehicles

The regression results suggest that consumers adjust
expenditure on motor vehicles vary quickly to changes in economic
conditions. The coefficients of lagged expenditure (or permanent
income) tended to be small and insignificant, and all other
variables performed best when entered without a lag. The preferred
equation is given in line 1 of table 2. The findings are that
increases in unemployment tend to depress sales, and inflation
exerts a weak positive effect on sales. Actual inflation performed
better as an explanatory variable than the qualitative measure, ISN.
The point estimates of equation (1) imply that a 1 per cent increase
in the unemployment rate lowers the short-run marginal propensity
to purchase cars by 0.001; an increase in the rate of inflation
of 5 percentage points raises the marginal propensity by a
similar amount.

The relative price term in equation (1), \( p_{mv} \), is significant
at the 5 per cent level. The point estimate implies a short-run
price elasticity of -2.1 and a long-run elasticity of -2.4. There
is no evidence that the model fails to capture the January 1975
cut in sales tax on motor vehicles and its subsequent restoration.
<table>
<thead>
<tr>
<th>Table 2</th>
</tr>
</thead>
</table>

**Allocation of Household Income, Australia, 1973(3) - 1978(2)**

**Motor Vehicles**

1. \[
\frac{MV}{Y} = 0.185 + 8.401 \frac{1}{Y} + 0.1192 \frac{MV}{Y} - 0.5959 \frac{MV}{Y} + 0.0182 \frac{P}{Y} - 0.1064 \Delta U \\
(0.06) \quad (2.32) \quad (0.60) \quad (3.36) \quad (0.93) \quad (1.80)
\]

\[R^2 = 0.6352, \quad h = -0.05\]

**Durables D**

2. \[
\frac{D}{Y} = 4.977 + 3.834 \frac{1}{Y} + 0.5765 \frac{D}{Y} - 6.010 \frac{Pd}{Y} + 0.0692 \frac{P}{Y} - 0.00519 \text{ USN} \\
(2.07) \quad (1.09) \quad (3.88) \quad (2.32) \quad (2.60) \quad (2.54)
\]

\[R^2 = 0.9054, \quad h = 0.13\]

**Other Consumption, OC**

3. \[
\frac{OC}{Y} = 13.186 + 0.8160 \frac{OC}{Y} - 0.1547 \frac{PE}{Y} - 0.04138 \text{ ISN} \\
(2.97) \quad (13.24) \quad (3.63) \quad (3.04)
\]

\[R^2 = 0.9221, \quad h = 0.87\]

4. \[
\frac{OC}{Y} = 12.651 + 0.8474 \frac{OC}{Y} - 0.0866 \frac{PE}{Y} - 0.00748 \text{ USF} + 0.00575 \text{ USN} \\
(2.39) \quad (12.07) \quad (1.68) \quad (1.28) \quad (2.21)
\]

\[R^2 = 0.9026, \quad h = 0.71\]

5. \[
\frac{OC}{Y} = 10.339 + 0.8808 \frac{OC}{Y} - 0.0592 \frac{PE}{Y} - 0.00963 \text{ N} \\
(2.07) \quad (13.08) \quad (1.34) \quad (1.92)
\]

\[R^2 = 0.9064, \quad h = 0.66\]

6. \[
\frac{OC}{Y} = 5.667 + 0.8730 \frac{OC}{Y} - 0.0419 \frac{PE}{Y} + 0.04253 \text{ ICS} \\
(1.12) \quad (13.99) \quad (0.98) \quad (2.60)
\]

\[R^2 = 0.9191, \quad h = 0.38\]

7. \[
\frac{OC}{Y} = 3.755 + 0.8305 \frac{OC}{Y} - 0.04933 \text{ ICS} \\
(0.80) \quad (11.81) \quad (3.33)
\]

\[R^2 = 0.9191, \quad h = 0.51\]

**Saving, S**

8. \[
\frac{S}{Y} = 78.020 - 0.7472 \frac{C}{Y} + 0.1606 \frac{PE}{Y} + 0.02851 \text{ ISN} \quad \frac{S}{Y} = 0.8731, \quad h = -0.03 \\
(12.89) \quad (10.10) \quad (2.75) \quad (1.49) \quad (1.80)
\]

\[R^2 = 0.8660, \quad h = -0.42\]

9. \[
\frac{S}{Y} = 78.268 - 0.7641 \frac{C}{Y} + 0.1098 \frac{PE}{Y} + 0.00726 \text{ USF} - 0.00467 \text{ USN} \\
(11.60) \quad (9.75) \quad (1.83) \quad (0.97) \quad (1.37)
\]

\[R^2 = 0.8968, \quad h = -0.54\]

10. \[
\frac{S}{Y} = 81.935 - 0.8110 \frac{C}{Y} + 0.0743 \frac{PE}{Y} - 0.01422 \text{ N} \\
(15.09) \quad (12.60) \quad (1.53) \quad (2.53)
\]

\[R^2 = 0.8902, \quad h = -0.99\]

* See Table 1 for notation. Expenditure and Income terms are measured in thousands of dollars per capita in 1974-75 own prices; pmy and pd are real price indexes, 1974-75=1.000; all other variables are in percentage terms, as are the dependent and lagged dependent variables. Absolute t-values are given in parentheses.
An announced temporary cut in price such as this would, however, tend to impart an upward bias to estimates of the price elasticity.

Equation (1) is unsatisfactory in that the implied value of the long-term marginal propensity to spend on motor vehicles is too low, although its standard error is very large. For other models and other explanatory variables the long-run marginal propensity to consume was often negative (when evaluated at sample means). Further work is required to capture the peculiar characteristics of the demand for motor vehicles.¹⁰

(b) Household Durables

The behaviour of durable expenditure over the sample period is well explained by model 2 (see equation (2) in table 2). The results are clear cut: inflation exerts a positive effect on durable expenditure and unemployment a negative effect. Both findings are significant at the 5 per cent level. The coefficient of actual inflation, P, implies that a 10 per cent rate of inflation raises the long-term marginal propensity to spend on durables by .016 or 14 per cent compared with a stable price level. The data and regression results suggest that it was the desire to purchase durables as a hedge against inflation that largely accounted for the boom in sales of colour television sets in 1975-76. Interestingly, over the sample period expenditure on household durables as a percentage of disposable income rose most sharply in the financial year 1973-74, a period of rapidly accelerating inflation and before the much higher levels of colour television.
The most appropriate unemployment variable was that measuring consumers concern about current levels of unemployment, USN. The point estimate implies that if all consumers thought the current level of unemployment to be serious the short-run marginal propensity to spend on durables would be 0.010 below that obtained if all consumers thought current unemployment was not a serious problem. The comparable figure for the long run is 0.025.

Again, the relative price term, pd, is significant. The coefficient implies that the short-run and long-run price elasticities of demand, evaluated at sample means, are -0.97 and -2.29, respectively.

(c) **Other Consumption**

Expenditure on other consumption exhibits fewer irregularities than expenditure on household durables and motor vehicles. This was reflected in the much higher coefficients obtained for lagged values of the dependent variable in the equations for other consumption.

Since the relative price index for other consumption is close to unity in all periods, it is absorbed into the constant term. The income reciprocal term was insignificant and has been omitted from the reported equations. The preferred equations are thus akin to a Friedman-type aggregate consumption function where the long-term average and marginal propensities to consume are the same.

Our analysis suggests that other consumption expenditure is influenced by a range of economic phenomena. All the price variables exert a negative effect on other consumption but, unlike
household durables and motor vehicles, the actual measured rate of inflation appears to be less important than price expectations, PE, and the degree of concern expressed by consumers about current levels of inflation, ISN. Equation (3) in table 2 includes (lagged) values of both PE and ISN, and both are significant at the 5 per cent level.

Concern about current employment, USN, exerts a positive influence on other consumption, whereas expectations of a worsening of unemployment, USF, depresses other consumption. These findings are presented in equation (4) in table 2. They can be rationalized in terms of permanent-income type arguments.

Given that other consumption appears to be influenced by a number of variables, it is expected that the summary measures of economic well-being, namely the difference between unfavourable and favourable news items, N, and the index of consumer sentiment, ICS, will be appropriate explanatory variables. This proved to be so. The results are given as equation (5) to (7) in table 2. The ICS and lagged consumption together account for 92 per cent of the variation in other consumption expenditure. The point estimates in equation (7) implies that for an increase in the ICS of 10 percentage points, the marginal propensity to consume increases by 0.010 in the short run and by 0.029 in the long run (the index ranges from 91 to 115 over the period of estimation).

(d) Saving

By definition, the results for saving will be the mirror inverse of those for consumption. The findings for the three categories of consumption are summarized in the first three rows of table 3. The results for saving are expected to most closely mirror
Table 3

Effects of Inflation, Unemployment and General Consumer Sentiment on Consumption and Saving

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Explanatory Variables</th>
<th>P</th>
<th>ISN</th>
<th>PE</th>
<th>AU</th>
<th>USN</th>
<th>USF</th>
<th>N</th>
<th>ICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>MV</td>
<td></td>
<td>+</td>
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</tbody>
</table>

those for other consumption as the latter represents nearly 75 per cent of total disposable income. This proved to be so. In particular, price expectations and unfavourable news items exert a positive effect on saving, and the ICS a negative effect. These results are presented as equations (8), (10) and (11) in table 2. The actual rate of inflation was found to increase purchases of motor vehicles and household durables and to decrease purchases of other consumption. There was some evidence of a weak positive effect of inflation on saving, but as the t-value on the coefficient did not exceed unity, results are not reported. Similarly, concern about current unemployment, USN, influenced consumption categories in different ways, so that the net effect on saving is weak negative (see equation (9) in table 2).

The savings equations presented in table 1 all imply a very high short-run marginal propensity to save of around 0.80 (evaluated at sample means). The estimates of the long-run marginal propensity to save are around 0.14.
5. SUMMARY AND CONCLUSIONS

The main overall finding is that inflation, unemployment and general consumer sentiment have significantly affected household consumption and savings patterns in the 1970's, although real income and relative price effects are more important. Furthermore, the variables introduced in this paper exert disparate effects on types of consumption which are masked when only the aggregate consumption function is considered.

For expenditure on motor vehicles and durables the current inflation rate is relevant, whereas for other consumption and saving, price expectations are more important. Except for motor vehicle expenditure, consumers perception of the unemployment problem was more important than changes in recorded unemployment. Similarly, in the case of other consumption and saving, consumers views on the seriousness of inflation were more important than recorded inflation.

The two general qualitative measures, the index of consumer sentiment and the percentage of unfavourable news items heard, proved to be good summary indicators of short-term savings behaviour.

Finally, our results have the following policy implications. Motor vehicle demand would be increased by a reduction in unemployment and can be stimulated quite markedly by price cuts, either through a reduction in sales tax or tariffs. Expenditure on household durables would also be increased by a reduction in consumers concern
about current unemployment, but not by a lowering of inflation. The factors influencing other consumption and saving are more diverse and relate to how households perceive their current and future economic well-being. A stable price level, a range of employment opportunities, cheap housing finance, and general economic stability would seem to be all that is required in order to lower the average propensity to save!
References


Footnotes

1. The arguments for the relationship between inflation and saving are well known. The most recent summary is contained in Howard (1978).

2. See Defris and Williams (1979) for a more detailed description of the series.

3. Unless otherwise specified all qualitative variables, including unemployment, are of the form "pessimistic percentage less optimistic percentage".

4. See Defris and McDonnell (1976a) for details.

5. A similar approach was used in Williams (1972), where proxies for sentiment variables were assumed to exert a short-run influence on purchases of selected household durables.

6. Unsuccessful attempts were made to estimate a variant of model 1 in which all variables appeared in all equations so that predicted values summed to 100 per cent in all time periods. This involved using sets of relative prices, but the resulting loss of degrees of freedom meant that parameters could not be estimated with any precision.

7. Except for saving in model 2 where it is $\frac{\alpha_4 + \gamma_4 + \theta_4 X}{1 + \gamma_4}$.


9. The data are as presented in the Quarterly Estimates of National Income and Expenditure for the September quarter 1978.

10. The work of Defris and McDonnell (1976b) suggests that more complex lag structures may be necessary than those used here.

11. In earlier work (Defris and Williams (1978)), PE was found to exert a negative influence on saving and P a positive influence. The differences between our results appear to be due to the statistician redefining personal disposable income, and therefore saving, such that tax paid rather than tax payable is now deducted from gross income.