AN ANALYSIS OF ALTERNATE CONSUMPTION HYPOTHESES IN SOUTH AFRICA

By

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I wish to declare that this research is my own work with the exception of such quotations or references which have been attributed to their authors or sources.

SUMMARY

The first half of this research is an attempt to provide a solid theoretical foundation of the various theories of the consumption function and the empirical evidence. Both the theoretical foundation and the empirical evidence is wide-ranging, spanning a period of over fifty years, with a discussion on the early Keynesian consumption function through to the influence of the rational expectations approach to economic modelling. The emphasis is both on the macro as well as micro aspects of the consumption function.

The second half of this research considers the nature of the consumption function in South Africa. This is done with the application of time-series data to three particular models that could provide some insight, and answer certain broad questions about the behaviour of consumption in South Africa. More specifically this is achieved through disaggregation by considering demand functions for specific items of consumption.

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INTRODUCTION

For years the consumption function has occupied a major role in economic and econometric analysis. This interest and preoccupation with the consumption function is hardly surprising since consumer expenditure is the largest component of the gross domestic product in most countries. While considerable progress has been made with respect to understanding the consumption function in many developed countries, comparatively little research on aggregate consumer behaviour has been conducted within the context of developing countries and more particularly South Africa.

The initial preoccupation with the aggregate consumption function stemmed from the emphasis on the marginal propensity to consume in the multiplier and also from the business cycle theories of Keynes and the Keynesians. Since then however the study of the consumption function has been gradually 'complicated', especially with the addition of more dynamic elements. There has therefore been a great deal of shifting over the years with regard to both technique and analysis, with the more recent theories of consumption having the benefit of econometric refinements.

It should be borne in mind that the emphasis of the research is not on the testing of hypotheses but rather on estimation. The main objective of this research is to determine how the various categories of consumer expenditure respond firstly to income and then to the introduction of other variables that could affect consumption. Inferences are also made about the range of income elasticities and the marginal propensity to consume.

The design of this research is as follows. The first chapter traces the development of the major theories on consumption, beginning with the absolute income hypothesis through to the development of the rational expectations approach in the late seventies. In this context it will become clear that the theory of the consumption function has undergone a series of

theoretical transformations and refinements. Chapter two reviews some of the extensive empirical research within the context of the competing theories on consumption. While a large part of the empirical evidence spans a period well over fifty years, attempts are made to put emphasis on more recent developments in the field. Chapter three considers the nature and source of data that is to be used for estimation of the consumption function in South Africa in chapter four. Chapter four contains the relevant empirical analysis which has been obtained through the application of regression techniques. This is done through the use of quarterly data for the period 1976 (first quarter) to 1990 (fourth quarter). Chapter five presents the macroeconomic policy implications and the conclusions of the research.

CHAPTER ONE

AN OVERVIEW OF THE LITERATURE ON THE CONSUMPTION FUNCTION

1.1. MICROECONOMIC FOUNDATIONS OF THE CONSUMPTION FUNCTION

The conventional analysis of consumption tends to be focused at a macroeconomic or aggregate level, instead of initially disaggregating consumer behaviour at a micro level. It seems appropriate that a macroeconomic theory which explains consumption should build upon the corresponding microeconomic elements. The intention here therefore, is to point out areas where disaggregated consumption behaviour can produce insights into the discussion on aggregate consumption that is to follow.

That part of microeconomics which is most relevant to aggregate consumer theory can be found in the work of Irving Fisher (1930) which should be appropriate as the starting point of modern consumption theory. In contrast to later theories Fisher's model of savings behaviour has its origins with the microeconomic decisions taken by households. There are two particular characteristics of Fisher's model that have implications for modern consumption theory. Firstly, Fisher focused on savings as a rational process. In this sense households are thought to save purposefully. Secondly, Fisher developed a model in which forward-looking consumers make inter-temporal choices. It should be noted that the consequent treatment of savings by Keynes is in contrast to Fisher's theory. Fisher's work also forms an important basis for explanations of aggregate consumption proposed by Franco Modigliani and Richard Brumberg in the development of the life cycle theory. It has also influenced Milton Friedman in his development of the permanent income hypothesis.

The implications of using such a multi-period model meant that savings cannot be explained

by current income alone. In this sense Fisher chose to treat savings as an alternate 'good' representing future consumption - by foregoing the purchase of goods now, savings could allow a greater purchase of goods in the future. One of the most important choices, and often the most difficult made by a consumer relates to the timing of purchases. Fisher's theory is based upon microeconomic utility maximisation. The utility of a consumer over a given lifetime *(U)* is essentially based upon consumption from birth (C_O) to death (C_T). Utility can therefore be given by the following equation.

$$U=u(C_O...,C_t...,C_T)$$

C_t being the consumption in a particular year *t*.
It should be noted that in the case of the utility function it is only the absolute level of the individual's consumption that is considered.

There are certain implications which flow from this simple equation. Firstly, the present value of consumption over a certain lifetime cannot exceed the present value income over this lifetime. It is however possible to borrow against one's expected future income or to save for future consumption. This implication is reflected in the equation below :

$$\frac{y}{(1+r)} = \frac{c}{(1+r)}$$

Secondly, in determining an optimal allocation of income between present and future consumption, the interest rate plays an important role.

Ackley (1978) points out that the effect of interest rate changes has three possible effects: the income effect, substitution effect and wealth effects. The income effect of an increase in interest rates on the lender's side is positive. A higher interest rate allows a larger total consumption, which consequently increases an individual's lifetime resources. If in a two period context, an individual consumer chooses to decrease consumption in period one,

allowing even greater consumption in period two; the substitution effect comes into play. This is, in fact, at the heart of Modigliani's life-cycle theory of consumption. Although there are various factors that determine an individual's life-cycle of consumption and savings, changes in interest rate levels can modify this pattern further. The third effect of interest changes, which could alter both present and future consumption, is the wealth effect.

1.1.1. The influence of inter-temporal choice

One of the more difficult choices households have to make relate to how consumers arrange their level of consumption through time - an intertemporal decision. Consumption expenditure in the current period is often at the expense of consumption in the future. If one were to relate this algebraically one could adopt the standard way of expressing the consumer's budget constraint in the following way:

$$C_1 + \frac{C_2}{1+r} = Y_1 + \frac{Y_2}{1+r}$$

where consumption in the two periods is related to income in the two periods. Note that consumption in the second period is taken to include accumulated savings, interest (r) on that savings and the income in the second period.

To consider optimal consumption in this two period context one needs to take into account consumer preferences, given by the consumer indifference curve which is measured by the marginal rate of substitution. The consumers optimum consumption in the two periods is such that the marginal rate of substitution (MRS) equals one plus the real interest rate (Mankiw,1991)

$$MRS = 1 + r$$

If one assumes- as Scarth (1988) does- that households are risk neutral, one could take on

a slightly more sophisticated analysis where households will maximise the present value of consumption subject to the following constraints:

$$C_t = Y^d - (A_{t+1} - A_t) - h(A_t / Y^d)$$

Household's consumption is therefore determined by real disposable income (Y_d) minus the real value accumulated liquid assets, minus the transaction costs incurred in trading (Scarth, 1988). Scarth (1988,11) points out that the idea of including transaction costs is in line with Friedman's thinking - that "consumption depends on the liquid-to-total-asset ratio, as well as on the (expected) yield on total wealth". It should be noted however that the above explanations assume static expectations which, given recent rederivation of the consumption function, would appear to be unreasonable.

It is also worth noting here that intertemporal effects play an important role in relation to the theory of durable goods since it is one way in which the static theory of consumer demand could be extended. Part of this analysis will be taken up in the following chapter in a discussion on consumer durables.

1.1.2. Income and Substitution Effects

Distinguishing between the income and the substitution effects is a necessary part of discussing the effects of basic variables such as: present and future prices, current and future income, interest rates and assets; and their likely effect on consumption. Deaton and Muellbauer (1980) provide a useful explanation as to the effects of these basic variables on consumption and offer an equation of a basic budget constraint for a two-period intertemporal model. The latter is applicable when discussing the income and substitution effects. The following equations is proposed by Deaton and Muellbauer (1980) :

$$p_1 q_1 + \frac{p_2}{1+r_2} . q_2 = A_0(1+r_1) + y_1 + \frac{y_2}{1+r_2}$$

where:

q_1 and q_2 - non-durable consumption goods in period 1 and 2 respectively

p_1 and p_2 - corresponding prices in periods 1 and 2

y_1 and y_2 - income in period 1 and 2

A - interest paying financial assets

r - interest rate for borrowing and lending

For the purposes of this discussion only the effects of the changes in r, A and y will be considered.

Changes in interest rates operate in a number of different directions through discounted future prices and total lifetime wealth. However, the magnitude and ultimate direction of these changes depend ultimately on individual household behaviour and income.

Variations in initial asset acquisition have the effect of increasing both current and planned future consumption. The actual effect of changes in *(A)* will depend on the number of periods under consideration and on the type of consumption model one is discussing. Deaton and Muellbauer (1980) point out that if the life-cycle model, for example, is under consideration; *ceteris paribus*, marginal propensity to consume out of assets is likely to increase with age.

1.2. THE SOCIAL AND PSYCHOLOGICAL ASPECTS OF CONSUMER ANALYSIS

Ferber (1973,2), in his survey article on consumer behaviour, highlights the peculiar position of the *ceteris paribus* variables in consumer analysis and, in particular, the treatment of socioeconomic variables. He notes that:

> "Most consumption economists seem to have reacted to the growing popularity and usefulness of interdisciplinary approaches by, if anything, drawing blinkers about their eyes even more tightly lest they be contaminated by other disciplines. Many of

the other studies have not been at the same level of sophistication as some in economics. Nevertheless, they are of great relevance to consumer economics and suggest variables and types of data collection, which may lead to more meaningful analysis."

Baxter (1988,1), contends that one of the most serious deficiencies in economic theory is that often the effect of what he calls "intervening variables " is ignored. Intervening variables are those variables which influence the way in which individuals respond to changes in their environment. He goes on to illustrate this point by making specific reference to the consumption function and by recasting the utility function to include the influence of other consumers on spending decisions. This notion, that consumer preferences are in fact interdependent, has been take up by Duesenberry (1949) and Leibenstein (1976) who used the concepts of social comparison and reference group to more accurately specify the utility function. According to Baxter the utility function may then be expressed as follows :

$$U_i = u\left(W_i, \frac{W_i}{\bar{W}_{r_1}}, \frac{W_i}{\bar{W}_{r_2}}, \ldots \frac{W_i}{\bar{W}_{r_n}}, G_c, P \right)$$

where:

U_i - total utility from consumption by individual *i*

W_i - money wages of individual *i* (individual income constraint)

$\frac{W_i}{\bar{W}_{r_1}}$ - money wages of individual *i* relative to the average wage of individual in group r

G_c - the portion of government expenditure that has an influence on the utility derived from consumption.

P - general price level (affecting the purchasing power)

Expressing utility in this way is appropriate both from a theoretical and empirical standpoint. It is appropriate theoretically since utility is a concept that is not value-free and one cannot look at the consumer or utility-maximising behaviour in a vacuum.

1.2.1. Filling in the gaps

The conventional neo-classical theory of consumer behaviour includes a dynamic element in the form of time into the analysis and this is relevant when one considers the path of consumer spending and changes in this path. Relevant also is the particular pattern that personal income follows over an individual's lifetime - the life cycle. While most of the relevant literature pertains to age and the life cycle of income, there are however other influences such as the influence of the family life cycle on consumption expenditure that should be considered. Examining the various stages of family development could make an important contribution towards explaining the differences in certain categories of consumer expenditure.

Early studies on the changing pattern of consumer behaviour can be attributed to Engel (1857), who attempted to show what happens to individual consumption of different goods as income increased. It has been found necessary to expand the theory to include the effects of household size as well as household composition. Other studies, such as the one conducted by Brown and Deaton (1972), draw on the various models of consumer behaviour by paying attention to how an individual consumer purchases a large number of homogeneous goods. They do, however, point out that one of the missing links in their survey is the integration of the household budget study and the time-series approach.

Earlier discussion on the revision of the utility function pays attention to the influence of social comparisons on consumer behaviour. Baxter (1988) highlights other socio-psychological factors that may well influence consumer choice, such as product and brand selection; the way in which information about particular consumer goods is communicated and the effects of advertising and social comparisons.

1.2.2. Reconciling microeconomics with macroeconomics

It has often been said that what is true for the whole is not necessarily true for its parts. The uneasiness of a transition from microeconomics to macroeconomics is a problem that invariably confronts a discussion of this nature. Apart from the obvious problems of aggregation that might occur, micro-level influences are difficult to translate into macro-level consequences. Despite this however, the importance of the preceding micro-level analysis cannot be denied. Some of the major works on the consumption function have been inevitably influenced by micro-foundations, and the discussion therefore has theoretical significance. The adoption of this alternate approach to analysing consumer behaviour which - by its very nature - has strong microeconomic influences, can provide us with a more coherent framework.

1.3. THE ABSOLUTE INCOME HYPOTHESIS

While Fisher's theory on savings may have been an effective point of departure for the discussion, most of the literature on the consumption function seems to have its genesis in Keynes' *General Theory*. Since the Keynesian consumption relation focuses on observed income as the driving force behind consumption, it is often referred to as the absolute income hypothesis (AIH). Perhaps, the best way to convey the Keynesian viewpoint on consumption is by examining the following statement :

> " The fundamental psychological law, upon which we are entitled to depend with great confidence both a priori from our knowledge of human nature and from the detailed facts of experience , is that men are disposed, as a rule and on average, to increase their consumption as their income increases, but not by as much as their income increases." (Keynes, 1936, 96)

This well known explanation implies that the Keynesian relationship between consumption and income has important implications for the propensity to consume. More specifically one can derive the following propositions from Keynes's analysis: the marginal propensity to

consume (MPC) out of current income is positive but less than one; the marginal propensity to consume is less than the average propensity to consume (APC). The MPC is most likely to fall when income rises.

In essence, Keynes proposed real consumption expenditure as a stable function of income, the stability of the relationship being embodied in the concept of the marginal propensity to consume. Given a linear consumption function, one can derive the following equation:

$$C = a + bY$$

C and Y representing real consumption and real income respectively, a is the autonomous component of consumption, while b represents the MPC. Accompanying the concept of MPC is the average propensity to consume (APC)

Algebraically APC can be defined as follows:

$$APC = \frac{C}{Y}$$

However, this simple version of the consumption/income equation has many shortcomings. Aside from the omission of other variables that might be included in the equation, the model runs into trouble when tests of time-series and cross-section data are conducted (to be discussed further in chapter two). Despite the obvious shortcomings of the AIH, later re-evaluations of the *General Theory* uncovered aspects relating to the income/consumption relation that were at first neglected. In this regard Fisher (1983) points to two aspects that have particular relevance to a modern wealth hypothesis: a) price-induced wealth effects b) interest-induced wealth effects. In relation to this Keynes referred to windfall changes in capital values. An important mechanism that could bring about these changes in wealth, were variations in the interest rate. The propensity to consume would, therefore, be affected in the short term by changes in the value of one's financial assets due to interest rate

changes. However, as Patinkin (1976) points out, Keynes considered these effects on consumption to be temporary in nature, failing to develop a theoretical framework. Consequently the Keynesian treatment of the consumption/wealth relationship remained too inadequate to make any useful contribution to the wealth-consumption analysis since it was omitted as one of the determinants of consumption, thereby rendering an incomplete specification (Pesek and Saving,1967).

It soon became clear to economists that this simple version of consumption as espoused by the *General Theory* was lacking in a solid theoretical foundation. Any theory that simply relied on income as the sole determinant of consumption would soon run into trouble once the role of savings in increasing wealth was recognised.

However, it was the empirical studies of the late 1940s and early 1950s that challenged the credibility of the AIH. The apparent contradiction of evidence between cross-sectional and long-run time series data - coupled with the demonstration by Kuznet that the hypothesis did not support the proposition that MPC<APC- that gave rise to the formulation of further theories on the consumption function .

1.4. THE RELATIVE INCOME HYPOTHESIS

The first challenge to the Keynesian consumption function came from Duesenberry (1949) who attempted to derive a theory on consumption that was in accordance with earlier empirical studies. While attempting to reconcile the apparent discrepancy between cross-section and time-series data, Duesenberry suggested that an individual's propensity to consume depended on an individual consumption relative to others and on past consumption levels. In other words, the relatively poor tended to consume a greater percentage of their income than those that were richer.

Duesenberry's utility function differs slightly from the one discussed above. The function

takes on the following form:

$$U = u\left(\frac{c_0}{R_0},\ldots,\frac{c_t}{R_t},\ldots,\frac{c_T}{R_T}\right)$$

where:

R is the weighted average of the rest of the population's consumption (Branson, 1979).

The equation implies that utility only increases if an individual's consumption rises relative to average consumption. This leads us to Duesenberry's first proposition on consumption mentioned above: that consumers base their consumption not on an absolute level but relative to the rest of the population. The consumption behaviour of individuals is therefore interdependent. The demonstration effect, as it is often called, asserted that those in the upper income groups "demonstrate" a high standard of living which lower income groups try to emulate. This attempt "to keep up with the Joneses" implies that those earning relatively lower incomes often consume most of their incomes and sometimes dissave.

Duesenberry's second proposition, the ratchet effect, attempted to explain the short-run nonproportionality of the income-consumption relationship in terms of the irreversibility of consumption decisions over time. In espousing a habit-persistence version of consumption, Duesenberry based his proposition on a fundamental psychological postulate that "it is harder for a family to reduce its expenditure from a high level than for a family to refrain from making high expenditures in the first place" (Duesenberry; 84-85). The effect of the proposition can be embodied in the following mathematical formulation where the APC depends on the ratio of current disposable income (Y) to the highest income attained previous to the year t ie. peak level income (Y_0):

$$\frac{C}{Y} = a + c\frac{Y}{Y_0}$$

1.4.1. Implications of the hypothesis

While for many economists the relative income hypothesis (RIH) does not represent a major departure from the Keynesian consumption function, Duesenberry's explanation of the income/consumption relation has a few notable implications.

As the demonstration effect points out, when income increases along the long-run C/Y trend (assuming a relatively stable distribution of income) , there is no reason to expect changes C/Y. Furthermore if, as a result of the economy going into a recession, income falls below a constant C/Y trend, a new short-run consumption function develops, upon which C and Y move until income recovers to maintain the trend level. The significance of this is that if income dropped, consumption decreased less than the rise of income along the trend (Branson, 1979). Therefore any cyclical variations due to unemployment or a speedy recovery could be given by a short-run consumption function. The ratchet effect, in reconciling the apparent contradiction between short-run and long-run data therefore adding a dynamic element to the theory of consumption.

A further implication of the RIH was the central role accorded to socio-economic and psychological variables and how it relates to the consumer's decision-making process. Consumption decisions were based on learning and habit formation, with adjustments over time as inevitable. Social comparisons therefore have the effect of propelling the consumer forward to pursue a higher standard of living and higher social standing (Baxter,1988).

1.4.2. Shortcomings of the hypothesis

Despite the important contribution the RIH made to the understanding of the income/consumption relationship, it was never really successful. One of the major flaws of the theory as Tobin (1975, 78) points out was that "it ignored the essential intertemporal nature of the consumption-saving choice".What the theory failed to explain, was that, if in

an attempt "to keep up with the Joneses" consumers maintained a high consumption level in the current period, the only way to sustain this social status in periods to come is a high consumption level in the future. The consumer would then have to play the balancing act between future expectations of income and the time preference in equilibrating current consumption and future consumption.

Other shortcomings of the theory include complications that may well arise from the use of inter-dependent utility functions. As the demonstration effect implies one individual's utility function is a function of another. In many ways, like the AIH that preceded it, the RIH has been regarded as an incomplete specification of the consumption/income relationship. On a methodological level it has also been argued that the RIH and the habit persistence theory (to be discussed below) were relegated to virtual oblivion in the realm of consumption theories, not because they failed to make the correct predictions, but because they did not fit in with neoclassical preconceptions (Hodgson, 1988).

It should further be noted that Duesenberry later accepted a distributed lag formulation of the consumption function that was more in line with permanent income theory, instead of a formula that relied on past peak income. He acknowledged that a formulation that relied on a moving average of past incomes was analytically advantageous.

1.4.3. Consumer behaviour and habit persistence

The question of habit-persistence and lags in relation to consumption was developed by Brown (1952), who stressed consumer behaviour as being dependent on previously acquired habits and customs. Consumers react in a slow and continuous manner to changes in income and this produces an "inertia" in their behaviour. Brown went on to argue that the most suitable form of an equation for testing a hypothesis is one that includes previous consumption as an explanatory variable. The function can then be represented as follows:

$$C_t = a + bY_t + dC_{t-1}$$

where previous consumption is the lagged independent variable rather than previous income (Evans, 20). A non-zero value of the coefficient d expresses a behavioural inertia, resulting from the formation of habits. This form of the consumption/income equation is almost identical to the one given by Friedman's permanent income hypothesis. Brown's model is very significant since it represented for the first time a type of auto-regressive or distributed lag model. In fact Brown demonstrated that if his model was recast in a partial adjustment framework with the use of Koyck's distributed lags the life cycle-permanent income model and habit persistence model would be barely distinguishable.

1.5. THE PERMANENT INCOME HYPOTHESIS: M. FRIEDMAN

Friedman's (1957) permanent income hypothesis (PIH) represented a more rigorous approach to explaining consumer behaviour. Based on the Fisherian indifference curve analysis of strictly rational consumer behaviour, Friedman assumed that households have infinite lives, with wants remaining constant over time. Further he assumed that individuals only experience changes in income that are random or temporary in nature. Friedman then used these assumptions to assert that the amount which households will consume each year is dependent on the discounted value of human and non-human wealth as well as on the interest rate. A rational household, in allocating its consumption over time, will do so such that the marginal rate of substitution between the current year's consumption and the following year's consumption is equal to the interest rate (Mayer, 1974).

1.5.1. The basic hypothesis

Friedman proposed to treat income that is actually received - measured income, as the sum of two components: permanent income (Y_p) and transitory income (Y_t) such that :

$$Y=Y_p+Y_t$$

Similarly he distinguishes between the permanent, measured and transitory components of consumption as follows :

$$C=C_p+C_t$$

The permanent components of these equations are systematic, while the transitory elements are treated as being random and unrelated to the permanent component. Given the above equations the PIH can be formally stated as follows:

$$C=kY_{p,t} \qquad \text{where} \quad k = k\ (i,w,u)$$

This relationship denotes that permanent consumption (C_p) is a constant proportion of permanent income with the constant of proportionality depending on the interest rate (i), the ratio of non-human wealth to permanent income (w), and other economic and demographic factors affecting k (u).

1.5.2. Friedman's treatment of windfall gains and losses

One of the more controversial assumptions of the PIH however is the assertion that there is a zero correlation between transitory income and transitory consumption. This independence between the transitory components of income and consumption means that unexpected windfall gains will be saved and not spent. Therefore the MPC out of transitory income is zero. It should be pointed out here that Friedman's definition of income is simply expenditure on non-durable goods. Durable goods are considered as a component of savings since a durable good is consumed over a lifetime, and only a small component of the service rendered by the good is consumed in a single year. Tobin (1975) sites two particular reasons why the assumption is questionable and one should instead expect a

positive correlation between transitory consumption and transitory income. Firstly, he contends that if an individual faces a temporary decline in income and dissaves to smooth consumption levels out, this would invariably require a stock of wealth or sufficient borrowing capacity. Some individuals are lacking in this respect. Secondly, he maintains that one of the reasons for households temporarily increasing the labour supply is the desire to increase temporary consumption.

1.5.3. Measuring permanent income

To test the hypothesis one would have to go further than the formal statement of the PIH given above. Since permanent income is essentially a theoretical concept, the question of how to measure it arises. Friedman suggested that permanent income is a measure of the weighted average of measured income, both current and past, with the weights declining exponentially. Algebraically the equation will take the following form:

$$Y_{p,t}=\lambda[Y_t+(1-\lambda)Y_{t-1}+(1-\lambda)^2Y_{t-2}+\ldots+(1-\lambda)^nY_{t-n}+\ldots]$$

The following restriction applies $0 < \lambda < 1$. There are advantages associated with using this particular algebraic form, ie. the converging geometric series. One of these is that the more recent values of measured income become more important.

Since the notion of permanent income is - as Fisher (1984) suggests - a forward looking concept which is not directly observable, one is faced with the difficulty of finding an appropriate proxy for such an expected variable. Apart from the weighting scheme proposed by Friedman, another way in which the role of expectations can be included is by using a distributed lag model which assumes that permanent income as being based on past levels of income. A well known formulation is the Koyck distributed lag model. One needs to note however, that one of the serious drawbacks of using this particular form is the high probability of serial correlation which is likely to affect either the short-run or long-run

estimates of the propensity to consume. Fisher (1984) also suggests that the choice of an estimating method, whether it be the reduced or structural form, may affect the propensity to consume.

1.6. LIFE-CYCLE HYPOTHESIS: MODIGLIANI AND ASSOCIATES

The life-cycle hypothesis (LCH) has arguably been the most widely accepted of consumption theories. Developed by Richard Brumberg and Franco Modigliani (1954), and later by Albert Ando and Franco Modigliani (1963) out of the approach taken on by Friedman, the LCH turned out to be a very flexible and useful model. The LCH is very much in the spirit of Fisher's work as it draws on his theory of savings and interest, while at the same time filling the gaps left by areas ignored by Fisher's approach. In essence an individual is assumed to fully consume his/her lifetime income by spreading consumption evenly over earning and retirement years.

1.6.1. The Basic Life-cycle Hypothesis

A good place to start with the LCH is with the a discussion of the Modigliani-Brumberg model. Faced with the challenge of forming a unified model of savings and consumption behaviour, that combined all the macro and the micro evidence presented by earlier literature, Modigliani and Brumberg sought to provide an explanation of consumer behaviour based on the micro foundations of consumer choice. Up to this time, the analysis of the consumption function coupled with the empirical finding that each new theory brought had, as Modigliani and Brumberg put it, added "less to our understanding than to the existing confusion" (Modigliani and Brumberg, 1954, 389).

Modigliani and Brumberg started with a model that explained the utility function of the individual consumer. A consumer's utility is assumed to be a function of his/her own aggregate consumption in current and future periods, during which an individual will

maximise utility, subject to the present value of total resources acquired over a productive life. An individual of age t will then maximise utility in the following way:

$$u=u(c_t,c_{t+1}...c_L,a_{L+1})$$

were L is the lifetime income and a_{L+1} are bequests to one's heirs.

There are certain restrictions which Modigliani and Brumberg apply to derive a simpler version of their basic model. Firstly, the utility function like the one presented above is assumed to be homogeneous. Secondly, the utility function assumes that an individual does not expect or desire to leave any bequests. Combining these two assumptions it can be shown that the total consumption of an individual of age T, in a particular year t, will be proportional to the present value of all resources that accrue to him over the individual's life:

$$C_t^T=\Omega_t^T v_t^T$$

where Ω_t^T is the proportionality factor . The proportionality factor itself depends on the form of the utility function, the age of the individual presently and on the rate of return on assets. It does not depend on total resources .

1.6.2. Examining the Permanent Income and Life-cycle Hypothesis

The initial paper by Modigliani and Brumberg on the LCH dwelt at great length on empirical tests. It is interesting to note that the LCH described by Modigliani and Brumberg (1954,406) has much in common with the PIH - " ... a household whose current income unexpectedly rises above the previous 'accustomed' level... will save a proportion of its income larger than it was saving before the change and also larger than is presently saved by the permanent inhabitants of the income bracket into which the household now enters".

The LCH (like the PCH) assumes that there is no correlation between y_t and y_p ; however the LCH states that over periods to come y_t may be added to y_p, depending on the yield of investment, which would have the effect of raising permanent consumption. Ferber (1974) notes that another difference between the two theories is that Friedman's estimation of wealth is based on the flow of current and past incomes as a proxy for y_p, while Modigliani on the other hand assigns important roles to current income and non-human net worth when estimating household resources. The central hypothesis of both theories is that the proportion of permanent income that is saved by the consumer is independent of income in a particular period.

1.6.3. The Ando-Modigliani Approach to the Life-cycle Hypothesis

Ando and Modigliani's specific contribution to the LCH of consumption was to postulate a theory in which the age of the household would assume increasing importance . More directly, they attempted to mould the consumption-wealth relationship into a form that was amenable to empirical testing, by taking into account "life-cycle" variables that would affect the income/consumption relationship over time.

Initially Ando-Modigliani concentrated on laying out the effect of the life-cycle hypothesis for individual consumption and for cross-section differences in consumption (Modigliani and Ando, 1960). The hypothesis rested on the notion that individual consumption in a certain time period C_t, depended on the current labour income or non-property income Y_t, his expected income Y_t^e, and his accumulated wealth or net worth A . The following mathematical formulation was used to test the hypothesis:

$$C_t = a_1 Y_t + a_2 Y_t^e + a_3 A_{t-1}$$

One of the major problems in trying to test the equation was finding a suitable measure of expected income. Earlier treatment of the problem was to use a distributed lag formulation

(see Friedman's PIH). Ando and Modigliani, however, wanted to accommodate short-run cyclical variations in the income/consumption relationship. As a result Ando and Modigliani (1963) sought to develop a new measure of expected income by aggregating the expected income of the economy Y_t^e, with the weighted average of the expected income of those employed y_t^e, and those unemployed, y_t^{eu}.One will then arrive at the following formulation:

$$Y_t^e = E_t Y_t^e + (L_t - E_t) y_t^{eu}$$

were L_t is the total workforce and E_t are those in employment.

1.6.4. Criticisms of the Standard Permanent Income and Life-cycle Hypothesis

For years the PIH and LCH were hailed as major breakthroughs in the theory of the consumption function and remained unchallenged in this realm. However closer examination of the standard versions of both these theories reveals certain shortcomings. While the LCH and PIH make certain assumptions about individual consumption behaviour, it assumes that the family unit has a definite and conscious vision of its economic future and that this is held with a certain degree of certainty.

In gaining a picture of the rational allocation of income over time, the existence of the liquidity constraints that consumers face is not considered. Ackley (1978) points out that it is quite fictitious to believe that future earnings can be converted to present resources. The same view applies to assets which have been acquired through past saving and which can not readily be liquidated to finance current dissaving. The presence of such liquidity constraints could suggest that consumption during such periods of dissaving is more closely

bound by current income that these theories imply[1]. A further criticism of the LCH, in particular, that Ackley (1978, 570) draws attention to is that the theory presents not only "an oversimplified concept of individual behaviour but rather it lacks recognition that consumption and savings are forms of social as well as individual behaviour". Furthermore, social pressure to earn or save neither remain constant over time nor are they the same in different communities.

1.6.5. Extensions of the Life-cycle Hypothesis

The traditional LCH has been extended to include the effects of interest rates, uncertainty and social security . Aggregate implications of including social security into the LCH is of fundamental importance to developed economies, since social security represents an important form of savings. Much of the discussion and literature on social security, however, has had more to do with savings than consumption .

The first implication of social security is that retirement benefits that are provided by a publicly funded programme will reduce national savings and will therefore result in a reduction in capital formation (Feldstein,1983).The rationale behind this view was that wealth in the form of social security is a perfect substitute for accumulated savings. Another effect, according to Feldstein (1976), was that social security induces the aged to reduce their supply of labour, since it provides transfer payments to older people who retire. The effect of social security was that it increases personal savings for the aged. However, the net effect of social security on savings of the non-aged was theoretically indeterminate. Feldstein (1976) pointed out that the important implication of his analysis was not that income had fallen but that it was the reduction in welfare which resulted from the distortion

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[1]Modigliani (1985) did come to recognise the effect that liquidity constraints would have on his life cycle model. Certain imperfections in the credit market as well as the fact that future income earning prospects may be weak which lead him to conclude that households may be prevented from "borrowing as much as they require to carry out the unconstrained optimal consumption plan" (Modigliani, 1985, 14).

of savings.

This view has been challenged by Barro (1974;1976) when he considered the effect of overlapping generations. Barro contends that generations which receive benefits from this type of pension plan, will then increase the amount of bequests to their descendants by the full amount of the increased benefits. Thus there will be no change in national savings. However, as Hadjimatheou (1987) points out, differences in both approaches arise out of the different time horizons attributed to the consumer. Barro takes a cross-generational view with an infinite horizon while Feldstein, in keeping with the life cycle model, assumes that consumers have finite horizons.

1.7. CONSUMPTION AND UNCERTAINITY

Uncertainty is present in almost all decisions; its role ranges from being relatively minor to very important. The issue of uncertainty assumes its greatest importance when one considers decision-making in the context of intertemporal choice. The inclusion of uncertainty and its incorporation into the income/consumption relationship represents a departure from earlier theories which chose to neglect the concept altogether. In their original paper, Modigliani and Brumberg introduced the concept of uncertainty within the context of the motive for savings, ie. the precautionary motive as a means of insuring for future uncertainty and the need to have equity in certain kinds of assets. Some of the subsequent literature on consumption and savings has attempted to quantify the impact of uncertainty - Juster and Wachtel (1972), Juster (1973), with more recent work on the effect of uncertainty being done by Zeldes (1989), Deaton (1991) ,and Carroll (1994).

The approach adopted by Juster and Wachtel (1972) and Juster (1973) was to directly tackle the issue of uncertainty in a way that was "both relevant and operational", by taking into account two types of uncertainty. The first view was a conventional one, where consumers can accumulate cash balances via increased savings if they expect their money

income to fall. The effects can be represented empirically by using the unemployment rate and changes in the unemployment rate to measure changes in the degree of consumer uncertainty with respect to the receipt of future money income (Juster and Taylor, 1975).

The second approach was to understand the dimensions of uncertainty with respect to the effects of inflation on saving. Based on the work of George Katona, higher rates of savings were thought to result from an increasing pessimism regarding future inflation rates. One of the reasons consumers become increasingly uncertain about the future is due primarily to the downward inflexibility of money rates (Juster, 1973).

Subsequent literature on uncertainty looked at the extent to which current consumption is influenced by predictable changes in income. Much of the literature reveals that uncertainty does have an important effect since consumers with a certain degree of income uncertainty have, *ceteris paribus*, a lower current consumption. Savings will then serve as the "buffer-stock" against this type of uncertainty (Carroll,1994).

1.8. THE INTEREST RATE AND CONSUMPTION

Any discussion on consumption would not be complete if it did not consider the effects of interest rate changes in the choice between consumption and saving. Generally an increase in the interest rate has two opposing effects. The first effect is that the interest rate raises the rate of return on savings, thereby producing a substitution effect that favours increased savings and less consumption. The second effect favours an income effect, towards less saving and increased consumption, because it is easier to accumulate money for a later stage. Standard empirical work on the interest rate hinged on estimations of the interest elasticity of savings.

While the importance of the interest rate in determining consumption decisions has been generally accepted among economists, its quantitative importance has been open to

question. Keynes (1936) himself while virtually discarding the importance of short run effects of the interest rate, did recognise that in the long run consumption habits could change considerably due to the interest rate changes. In fact he also went on to recognise the importance on interest-induced wealth effects.

Permanent income models of consumption, due primarily to their derivation from microeconomic analysis, considered the interest rate to be among the main variables that determine the average propensity to consume. However, a major portion of the work done on the role of the interest rate and its influence on aggregate consumption was done in the context of the life cycle model. This is ironic since Modigliani and Ando (1963) ignored the potential importance of the interest rate changes, by holding the interest rate constant. Subsequent empirical work done on the life cycle hypothesis does consider the complexities involved in the inclusion of the interest rate - Yaari (1964), Wright (1967), Weber (1970). Weber (1970) examined the relationship between consumption and the rate of interest under the assumption that individuals maximise utility over a multiperiod horizon. He found that the income effect of a change in the interest rate was greater than the substitution effect. When the rate of interest increased, consumers were given an opportunity to maintain the same level of consumption in the future with less saving today. Consequently consumers were inclined to increase current consumption in response to an increase in the interest rate.

Results on the actual effect of interest rates on consumption are conflicting and unclear, although there is general agreement that there are influences of interest rates on consumption. Literature pertaining to consumer expenditure and the interest rate often looks particularly at expenditure on consumer durables and its sensitivity to interest rate changes. In fact expenditure on consumer durables is treated as a saving and investment rather than as consumption (Hamburger, 1967). Later work, regarding the role of interest in the consumption function, examined its effect with regard to taxation and saving - Kotlikoff (1984). Kotlikoff argued that the full effect of tax-induced interest rate changes depended among other things on how a government can make adjustment to its fiscal

instruments given its budget constraints. This in turn will have direct relevance to savings behaviour. Furthermore, one of the central questions in macroeconomics has been to examine the elasticity of intertemporal substitution as a major factor in determining how savings and consumption responds to the real interest rate (Hall,1989) . If it could be shown that the elasticity of intertemporal substitution would have positive effects then this would mean that the deadweight loss from the taxation of interest was important and that the burden of government debt was not.

1.7. WEALTH AND CONSUMPTION

The advent of the 1960s saw a great deal of literature both theoretical and empirical, being concentrated on wealth and consumption. It can be argued that wealth became the major focus of attention after the development of the life cycle - permanent income hypothesis which emphasised intertemporal utility maximisation and therefore gave a certain amount of prominence to the role of wealth. While Keynes did recognise the influence of wealth as one of the important factors in determining short-run consumption behaviour, the development of newer models and tests made the role of wealth more complicated. Empirical work done by Spiro (1962), Ando and Modigliani (1963) and Ball and Drake (1964) concluded that the inclusion of wealth was consistent with time-series data. A common theme in many of the theories was an emphasis on the effect of consumption and the discrepancy between the actual and the desired stock of wealth.

Meyer (1980), when introducing wealth into a macro model is careful in his use of a beginning-of-period specification of wealth in the consumption to avoid double-counting of resources available to households and also because the ultimate effect of savings in the LCH is to postpone consumption in current periods and transfer resources to other periods. Some of the more direct formulations of the wealth hypothesis use as their point of departure, the aggregate utility function (Ball and Drake, 1964). Wealth, therefore, acts as a "buffer stock", keeping the consumer on a desired consumption path. Other models, such

as Deaton's (1972), used a quadratic log function which includes a term which represented the discrepancy between expected wealth and desired wealth. The model generated was then a modified version of the life cycle hypothesis in which permanent income, permanent wealth and total available resources affect expenditure. It should be noted that the Deaton study found that broadly defined wealth effects did exist for non-durable consumption.

The conventional and more formal models on consumption concentrated for the most part on the direct role of wealth and consumption, with only a passing reference to the effects of liquid assets and capital gains. The inclusion of the real balance and wealth effects, and the way in which their influence changes the value of wealth, is important in completing a macroeconomic model on consumption and if one wants to consider the magnitude of the effects of monetary and fiscal policy. It is this particular area of literature that has for some time been the subject of protracted and continuing debate between "Keynes and the Classics". While it is not the purpose of this discussion to enter into the debate, it is however useful to note those portions of the debate that are relevant here.

The debate in essence revolves around what actually constitutes net wealth: is it inside money or outside money? Fisher (1984) in providing a neat summary of the debate begins with the work of Pesek and Savings (1967), who argued that inside money is actually net wealth (any changes will therefore affect consumption) and that, in a mixed inside-outside money economy, the proposition that money is non-neutral is incorrect. In particular, Pesek and Savings distinguished between : a) the price-induced wealth effect and b) the interest-induced wealth effect. Branson (1979) notes that in this respect the inclusion of real wealth in the consumption function is important from a historical point of view. Keynesian claims that the classical model was inconsistent when the liquidity-trap was considered was especially refuted by the Pigou effect.

On a broader level there are a number of "wealth-orientated" matters that revolve around the LCH and the net wealth debate. Barro (1974) argued that intergenerational linkages

provided wealth effects given the overlapping nature of generations. He went on to argue that government bonds will "be perceived as net wealth only if their value exceeds the capitalised value of the implied stream on future tax liabilities" (Barro, 1974, 1095). Barro contended, that if these intergenerational linkages were sufficiently strong, one could expect some important implications for government policy ie. for a social security programme (this has the effect of changing the relative disposable incomes between young and old) and for large government deficits. Empirical work regarding Barro's debt neutrality hypothesis and its implications for the consumption function has yielded conflicting results. A later paper by Gale and Scholz (1994) rejected the life cycle view that "bulk of wealth might be acquired not by intergenerational transfers, but instead be accumulated from scratch by each generation to be consumed eventually by the end of life" (Modigliani,1988, 16). They estimated that, based on information of *inter vivos* transfers, wealth and related items, intended transfers accounted for 20 percent of wealth in the U.S.A..

After noting various aspects of the debate highlighted above, Owen (1986) argues from Mishan (1958) that one can identify two broad wealth effects :

- asset expenditure effect - the greater wealth holdings the less further savings is required, other things being equal, current expenditure is positively related to wealth holdings.
- cash-balance effect - if there are unexpected of exogenous changes in money balances this could lead to excess money holdings which in turn affect expenditure and the acquisition of other assets.

1.10. RATIONAL EXPECTATIONS AND THE CONSUMPTION FUNCTION

For most of the late 1960s and early 1970s work on consumption was largely dormant. But with the arrival of the rational expectations revolution, there was a resurgence of interest in consumption. The rational expectations hypothesis presented a substantial challenge to the LCH and the PIH; however, as Gilbert (1991) points out this challenge arose from the need to adapt the rational expectations hypothesis (REH) to consumption rather than from

any direct conflict of empirical evidence. The advent of rational expectations also coincided with an unusually turbulent time for many Western economies. A major consequence of this was the inadequacies in the forecasting performance of many macroeconomic models and, consequently, a failure in the performance of the typical consumption function. In this sense the rational expectations assumption was to have implications for forecasting as well as policy making.

In 1976 Lucas provided a now famous and profound critique of econometric policy models that consisted of a set of structural equations. One of these equations included the consumption function. Lucas's very significant criticism was that there is no such thing as a consumption function. While a structural relationship might exist between permanent income and consumption, the consumption function asserts that there is a structural relationship between observed income and permanent income (Hall, 1989).This relationship was however, not stable.

Hall's seminal paper on rational expectations and consumption

The rational expectations view sought to combine the consumers' decision with the assumption that individuals optimally use all relevant information available to them when forming expectations about the future. At the heart of this approach was the development of the concept and the measurement of expectations and wealth. Hall (1978) was one of the first economists to derive the implications of rational expectations for consumption, by testing the Lucas critique. Applying the permanent income-life cycle hypothesis to the rational expectations assumption, Hall stated that changes in consumption were not predictable and involved a random walk. Forecasting errors will then result only if the individual received new information between the current period and the subsequent period. If there was any adjustment due to the acquisition of new information or past error, this was quick. This assumption represented a departure from the tradition that subscribed to the habit persistence view of consumption or to the view that, due to adjustment costs, changes to new circumstances take a considerable amount of time (Hadjimatheou, 1987).

Hall's basic idea was embodied in the Euler equation which described the optimising behaviour of the consumer. This was done by identifying the equality of the marginal rate of substitution between consumption in the current period and consumption in the subsequent period to the relative price of the two (Hall,1989). The Euler equation could then be expressed in the following way under conditions of uncertainty (Hall,1989):

$$E_t \sum_s \left(\frac{1}{1+\delta} \right)^s u(c_{t+s})$$

$$\text{s.t.} \quad \sum_s \left(\frac{1}{1+r} \right)^s (c_{t+s} - w_{t+s}) = A_t$$

where E_t = mathematical expectation conditional on all information in t

σ = rate of subjective time preference

r = real rate of interest, a constant over time

$u(.)$ = one-period utility function, strictly concave

c_t = consumption

w_t = earnings from sources other than savings

A = assets apart form human capital

It is assumed that w_t is stochastic and forms the only source of uncertainty, a consumer would then choose in a given period t, consumption c_t so that, given all the information available, expected lifetime utility can be maximised (Hall, 1989). Based on the assumption of a constant real interest rate consumers can take into account available information in each period concerning current and future earnings as well as any unpredictable element that may result from changing expectations about future earnings and financial assets. A consumer would then decide on the appropriate level of current consumption. It should be noted that if there were any known changes in the real interest rate then the same result would be realised with only minor adjustments. Hall did point out however that changes in the interest rate affected the elasticity of substitution between the present and the future.

Another way to represent the same idea was expressed in the original paper by Hall (1978), which predicted that consumption expenditure followed a random walk with trend.

Mathematically this could take the following form:

$$C_t = (1+\gamma)C_{t-1} + \bar{\epsilon}_t$$

where C_t is real consumption, γ is a constant parameter term and $\bar{\epsilon}_t$ is white noise. Hadjimatheou (1987) noted that there were certain testable implications in expressing consumption expenditure in this way : no observable variable in the current or previous periods should "show any predictive power for the next period's consumption expenditure". If one were to follow on from this proposition and use the basic equation proposed by Friedman (1957) and if one were to assume that rational expectations were formed of Y_p, then bC_{t-1} (where $b = (1 + y)$) is the best predictor available for $Y_{p,t}$:

$$C_t = kY_{p,t}$$

Meullbauer (1982), provided an important insight into what he terms the "surprise" consumption function by looking into the nature of $\bar{\epsilon}_t$. He cautioned that Hall's equation was open to question since there are certain implicit assumptions made that were subject to theoretical objection. In particular, he highlighted the following points which Hall failed to consider : i) an extreme form of rational expectations was unrealistic; ii) agents constantly revised beliefs; iii) since consumers tended to be liquidity constrained, their consumption was likely to be bound by current income and asset and not by life cycle wealth; iv) real interest rates and prices were not constant; v) real interest rates were probabilistic.

A major part of the literature on the rational expectations hypothesis with regard to the analyses of consumption has been confined to the development of testable consumption theories. A review of the vast amount of literature that therefore arose will be confined to a discussion in chapter two.

CHAPTER TWO

EMPIRICAL EVIDENCE

2.1. INTRODUCTION

The study of the aggregate consumption function is one of the areas in macroeconomics that has produced considerable empirical evidence. The exact nature of the research into the consumption function has been varied, with the use of different measures for income and consumption. It is also worth noting that most of the empirical evidence presented on the consumption function has been conducted within the context of advanced industrialised countries, particularly using USA and UK data. Before delving into the tests of consumption, it would be useful to examine some general problems experienced in the estimation of consumption functions.

The first obvious problem emerges when one considers the choice of an appropriate data series. While income data presents little difficulty, the choice of the relevant consumption variable does. Theoretically, one can define consumption as the sum of expenditure on "non-durable" consumer goods as well as the value of the flow of services on "durable" consumer goods (Thomas,1993). It is the inclusion of expenditure on durable goods that has been the subject of considerable debate. Some economists have argued that part of the expenditure on durable goods represents a saving. Other aspects of the debate centre around classification. There are goods which are regarded as non-durable, but which possess the attributes of a durable good.

Another problem that arises relates to the estimation of the consumption function from aggregate time series data. It should not be surprising that a theory that begins with the individual would involve problems of aggregation. For example the Keynesian consumption

function was originally formulated to explain the theory of the individual consumer. Generally the treatment of such a problem depends on the effects of aggregation on estimation.

The following analysis will focus not only on the development and accumulation of research into the nature of the consumption function, but will also draw on the theoretical implications resulting from the empirical evidence.

2.2. EARLY EMPIRICAL EVIDENCE ON THE KEYNESIAN CONSUMPTION FUNCTION

2.2.1. Confirmation of the Absolute income hypothesis

When tests of the typical Keynesian consumption function were performed, there were initially two kinds of empirical data that provided good fits for the estimation of the function. Aggregate time series data of consumption and income between the two World Wars and the use of cross-sectional households data at first impression, confirmed the psychological law at a micro level. Real consumption turned out to be a stable function of real income and, invariably, the marginal propensity to consume (MPC) was found to lie between zero and unity.

Evidence of post-World War 2 data, however, cast doubt on the Keynesian consumption function. In fact, it was this very failure of the empirical consumption function that led to the development of new theories and a flood of empirical investigations into the exact nature of consumption.

To understand the failure of the Keynesian consumption function, one needs to note that its primary purpose was realised only in the short run.

2.2.2. Refuting the Absolute income hypothesis

Evidence presented by Davies (1952) and Brady and Friedman (1947) tended to suggest that the typical Keynesian consumption function was shifting upwards over time. Using annual United States (USA) data from the period 1929-1940, Davies' prediction - while yielding good statistical fits - suffered from problems of spurious correlation and non-stationary regressors (Thomas,1989). The resulting underpredictions were a clear indication that the stable relationship between consumption and income had seized to exist, while there was the tendency for the consumption function to shift upwards. Relevant too is the work of Brady and Friedman (1947) which inclined to suggest that, while cross section budget studies for any specific year tended to confirm the Keynesian consumption function, evidence presented from a series of budget studies over a period of years found that with the MPC remaining fairly constant, the intercept tended to shift upwards over time.

Perhaps the most important piece of evidence against the AIH can be found in the work of Kuznets (1942). His findings indicated that there was no tendency for the APC to fall over a long period of time. In measuring the ratio of consumption to national income, Kuznets found that the APC had actually remained fairly constant at 0.9 during this period of time. These findings, concerning the long run consistency of the APC, were confirmed in later study by Goldsmith (1955). In particular, Goldsmith detected cyclical variations in the consumption-income ratio, which fell during a boom period and rose during recessions. Consumption, which rose and fell respectively, tended to do so proportionately less than income.

Thus it was evident by the late 1940s that the mounting evidence against the simple consumption function had produced a clear contradiction. Wallis (1979) drew attention to three empirical points. Firstly while long run time series studies rejected the hypothesis that the consumption-income ratio tended to fall with rising income, cross-section budget studies

provided support for the hypothesis. Secondly, there was also a tendency for cross-section studies to produce smaller B's than time series studies. One might be led to conclude from this that "cross-section estimates could be notionally unidentified with the short term relating to a moment in time" (Wallis,1979,6). Thirdly, there was also a tendency for the aggregate consumption-income ratio to fluctuate from year to year, even though it might tend to be constant in the long run.

Apart from the incomplete specification of the income-consumption relationship, perhaps the most glaring shortcoming of the AIH from an empirical point of view was "that the summation over a heterogeneous population might introduce the problem of heteroscedasticity into the (frequent) regression results reported..." (Fisher, 1984,51).

2.3. THE RELATIVE INCOME HYPOTHESIS

An analysis of the RIH as proposed by Duesenberry, would lead to two major branches in the theory, one that focuses on the cross-section characteristics of a consuming population and the other which emphasises the time series aspect.

2.3.1. Evidence on the distribution of income

The conclusions reached by the RIH (discussed in chapter one) assumed that the distribution of income remained unchanged, while the aggregate income in an economy changed. However the most important implication of the RIH - from an empirical point of view - is the consideration of the effects of changes in the personal distribution of income on the propensity to consume.

Earlier literature by Keynes tended to argue that the more equal the distribution of income the higher the marginal propensity to consume. Part of this view was, however, challenged by Blinder (1975) who found that this was only applicable in so far as it applied to

individuals or a group of homogenous individuals. By using various measures of income inequality, Blinder found that equalising income distribution might lead only to a slight decrease in aggregate consumption. Nevertheless he generalised that because of the "tenuous connection between theoretical constructs and observed facts" (p.447), conclusions reached could only be tentative. A further study done by Della Valle and Oguchi (1976) was also inconclusive. They did however find evidence to support the AIH proposition that a more equal distribution of income resulted in higher levels of consumption. The Della Valle and Oguchi study was conducted using data from ten OECD countries. Subsequent studies, however, have found evidence to the contrary, with much of the indecisiveness in the empirical literature arising from different specifications of the consumption function.

2.4. THE PERMANENT INCOME HYPOTHESIS

2.4.1. Friedman's tests

Friedman tests of the permanent income hypothesis were based largely on cross-section data. As Thomas (1993,262) noted, Friedman's work could be described as a " classic in its procedure for formulating an hypothesis on the basis of existing data, and generating predictions from that hypothesis which can be tested against further data". Mayer (1972) however, upon examining every test presented by Friedman, was quick to point out that much of Friedman's testing and subsequent explanations tended to neglect the more controversial aspects of his theory, such as the proportionality assumption and the assertion that there was a zero correlation between transitory income and consumption. He further maintained that much of Friedman's testing of his theory was done to show that " two coefficients differ in the direction predicted by the permanent income theory" rather than to provide a stringent testing of the theory (Mayer, 1972, 60)

2.4.2. The implications of Friedman's formulation for empirical testing

Apart from the concept of permanent income, which is at the heart of Friedman's theory, it would also be appropriate to dwell briefly on consumer assets and its treatment in so far as actual data is concerned. One of the implications, pointed out by literature on this particular area, was the potential for specification bias if actual consumption takes the form of the purchase of consumer durables, part of which is intended for consumption in future periods. This bias was inherent in the estimates of the weight of current income when permanent income is determined. The implication of this bias may well be that if an individual experienced an unanticipated windfall in income, which induced the purchase of consumer durables in the absence of any adjustment in consumption data, consumption would then appear to have taken place. If this was so, Darby (1974) calls attention to an alternate way of specifying consumers' expenditure:

$$C_t = k_1 + k_2 y_{pt} + k_3 y_{rt} + v_t$$

where v is the sum of e and the disturbance in the inventory adjustment. Darby's empirical findings were that y was significant particularly when long lags occur, with this significance decreasing when one moved more towards a measure of consumption that was in keeping with the original theory.

2.4.3. A closer look at the lag formulation

While Friedman's empirical approximations of y yielded fairly satisfactory results, it soon became clear that this formulation was extremely cumbersome for a more detailed econometric analysis. The application of the Koyck transformation provided a simpler alternative. Fisher (1983) points out however that there are several econometric problems with the Koyck lag formulation. The first problem is that of serial correlation, which is likely to affect the short run and long run estimates of the propensity to consume. The second

problem centres around estimates of the propensity to consume which may affect the structure of adjustment or the structure of a larger econometric model.

In dealing with the first problem Zellner and Geisel (1968) showed a number of different ways in which a distributed lag model can be estimated by presenting results based on the simple permanent income model with varying stochastic specifications. In particular, they considered four assumptions regarding the disturbance term. In each of these assumptions the disturbance term ϵ_t was distributed normally and independently, with a constant variance. The initial part of their study presents maximum likelihood estimates of the parameters under different assumptions, with their results suggesting that their assumptions were strongly supported by the data. The rest of the paper was devoted to developing a Bayesian approach to estimating the function. Under an alternate set of assumptions they found that the simple permanent income, which had a strongly correlated disturbance term fitted the data well, suggesting a " regularity which could be explained systematically rather than stochastically" (Bridge,1971,58). From this study one might infer that the simple permanent income hypothesis alone was an insufficient explanation of aggregate consumption.

If the lag structures proposed by Friedman and Koyck are too rigid and the alternate form proposed by Friedman of a seventeen year lag is too long how do more flexible structure such as the Almon or Pascal lags perform? Particularly relevant here is the work of Boughton (1976) who found a very short lag using the Pascal lag formulation. Boughton's work was also important in other respects. He found that there was a non-proportionality in the short-run US consumption function that was unexplained and that if there were different consumer goods included in the aggregate, this might require a different functional form.

It should be noted here that, although the distributed lag version of the PIH became a standard way of implementing it empirically, literature on rational expectations has raised

doubts as to its validity. Blinder (1981) in his attempt to determine the influence of temporary taxes on consumer expenditure developed a model that was consistent with rational expectations.This amendment led to a nonlinear consumption function.

2.4.4. Cross-section estimates of the Permanent Income Hypothesis

The most notable and the most voluminous cross-section evidence emanated from the works of Friedman (1957) and Mayer (1972). In his seminal work *A theory of the consumption function* Friedman presents a number of tests performed through a disaggregation of rural and city households; occupational characteristics, and households along racial lines. The results of these tests are consistent with his theory. Farrell (1959) argued that although Friedman's cross-section evidence is consistent with his theory, this "does not go very far towards confirming the hypothesis."

Due to the fact that Mayer (1972) found time-series analysis a highly problematic way of evaluating theories based on wealth because of the inconclusiveness of the tests, he proposed that cross-section data provided a means by which households could be analysed by certain "observable characteristic correlated with permanent income". By considering various occupations in thirty one countries he came to the conclusion that there was a negative correlation between permanent income and the propensity to consume. (The mean income of various occupations was used as a measure of the propensity to consume.) Of course one could not rely on occupation solely as an indicator that a higher income results in a lower propensity to consume and he, therefore, considered other variables that may well have an influence on the consumption function. Of the eighteen variables considered he concluded that only two variables; wealth and cultural and psychological factors could be used to explain why the proportionality hypothesis had failed in his occupational test.

2.4.5. Permanent income and the effect of windfall income

Evidence on the lack of effect of unexpected transitory income on current consumption has received mixed support from empirical tests. It is necessary at the outset to deal clearly with the time horizon to which consumers hold their expectations. One can generally assume that a consumer with a relatively longer horizon will be less likely to respond to transitory changes in income than an individual with a relatively shorter horizon (Fisher,1984). A related issue is the length of the horizon in relation to the question of proportionality. Friedman's finding tended to favour a three year time horizon with proportionality. Hajimatheou (1987) noted that these findings were however challenged by Liviatan (1963), Holbrook (1967), Landsberger (1971) and, later by Bhalla (1979). Bhalla examined Indian data based on the rural areas and found that there was an upper limit of three years and non-proportionality.

Direct tests performed on windfall income provided evidence that was more interesting. In an initial test of the assumption of a zero correlation between transitory income and permanent income, Bodkin (1959) found that the MPC out of windfall income exceeded the MPC out of regular income. Friedman, however, went on to argue that Bodkin's treatment of anticipations and wealth was questionable. In a later paper, Bodkin and Bird (1965) came to the conclusion that there was no distinct difference between the two propensities. Subsequent studies on the assumption reached conclusions from different directions. An interesting time series study performed by Darby (1972) showed that, when a consumer was able to allocate transitory income among money, financial assets and durable goods, there was an inverse relationship between the fraction going into durable goods and the ratio of transitory assets to permanent income.

Fisher (1983) proposed that one can broadly reach the conclusion that the PIH passes the windfall test. However, the evidence for the most part appears to be contradictory and inconclusive. Furthermore, Ferber (1974) draws our attention to an interesting point - the

type of data used is likely to have a substantial effect on empirical estimates of the marginal propensities to consume - by citing how Taubman (1968) found different estimates of the marginal propensity to save for U.S data depending on the type of saving series he used.

2.5. THE LIFE-CYCLE HYPOTHESIS

2.5.1. Initial tests by Modigliani and Associates

The initial empirical verification on the LCH was performed by Modigilani and Ando (1963) who set out to test and estimate the aggregate consumption function using the following equation:

$$C_t=\alpha'_1 Y_{Lt}+\alpha'_2 Y^e_{Lt}+\alpha'_3 A_{t-1}$$

Initially they sought to determine a priori estimates of the order of magnitude for these coefficients so that the reasonableness of the regression estimates could be judged. However, before they could embark on a statistical analysis, a method of measuring Y^e had to be decided. The measures used by Modigliani and Ando were as follows:

Hypothesis 1

$$Y^e_{Lt}=\beta Y_{Lt}$$

with $\beta \approx 1$

Hypothesis 11

$$Y^e_{Lt}=(\beta_1-\beta_2)Y_{Lt}+\beta_2\frac{L_t}{E_t}Y_{Lt}$$

They concluded that their results generally supported the basic hypothesis, particularly the

role of assets. Nevertheless there were some difficulties however when it came to the estimation of individual influence on wealth, income and expected non-property income. This meant that their final equation involved a regression of aggregate consumption C_t, on aggregate current non-property income Y_{Lt}, and the aggregate net wealth on the consumer A_{t-1}. Furthermore the estimates were subject to simultaneous bias, and Ando and Modigliani saw no way in which to overcome this problem. Despite this the most important finding that came out of their empirical study was that for annual US data for the period 1929-1959, A_{t-1} was a significant determinant of C_t.

2.5.1. The composition of income

One of the more interesting features of many post-Keynesian formulations of the consumption function was the distinction between two types of income - wages and profit. Hadjimathoeu (1987) noted that this line of thinking was taken up by Kaldor (1956) and expanded by Pasinetti (1962). Furthermore, the distinction of income into the two types has had considerable influence on empirical estimates particularly in the context of the life-cycle hypothesis. Both Modigliani and Ando (1963) and Modigliani and Tarantelli (1975) differentiated between disposable labour income and disposable property income, with the latter using annual Italian data to present empirical estimates using both the Kaldorian model and the life cycle hypothesis. Empirical estimates on the Italian data suggested that the propensity to consume out of property income was much higher than the propensity to consume out of wages. This result was inconsistent with the Kaldorian hypothesis.

Other studies which broke income down into various components were also conducted in the context of savings - Stone (1964) and Taylor (1971) (both quoted from Hadjimatheou (1987)).

2.5.2. The modified versions of the Life-cycle Hypothesis

Many interesting studies have been conducted of the LCH within the life-cycle-permanent income framework, particularly with the advent of the rational expectations revolution. Fisher (1984) cites a few of the studies undertaken in this area since the late 1970s. Of interest here are two particular studies. Drazen (1978) found that, although the long-run savings ratio (*s/y*) to be constant in the US, this may have been an unrealistic view given demographic changes eg. increased life expectancy and the growth in human capital. This view was supported when he found that the *s/y* ratio rises if corrected for new human capital. In further studies, Mirer (1979,1980) found that the elderly who were thought to dissave fairly rapidly in this stage of their lives, did not. Although these conclusions were implied rejections of the LCH. a more important conclusion one might be inclined to arrive at is the need for greater modification of this version of the LCH due to perceptions of increased risks at later ages (Fisher, 1984).

A paper written by Burbridge and Robb (1985) which was part of a broader research programme to examine savings, consumption and wealth accumulation behaviour of individuals around retirement ages in the context of the life-cycle model, found conflicting yet interesting evidence. Their results suggested that there were significant differences in wealth accumulation across major household types. 'Blue-collar' households on average tended to decumulate after retirement, while 'white-collar' households did not.

A larger and more more complex empirical micro study was conducted by Ando and Kennickell (1987) on Japanese and United States data. The life cycle behaviour of households at a micro level received " only very marginal support". Dealing then with the aggregate implications of their findings, it was found that household savings behaviour was influenced by the population growth rate and technological progress which in turn influenced aggregate income and the demographic structure. They, too, concluded that a number of modifications which took into account the "multi-dimensional motivations of

individuals and households and their responses to serious uncertainties they must face especially at old age" were necessary (Ando and Kennickell,1987,215).

The Modigliani-Tarantelli study of the consumption function in a developing country - Italy, showed that the major consumption function models provided a reasonably good approximation of consumption and savings behaviour in such a country. It may however be disputed that Italy is a developing country at all, but rather resembles a more advanced western economy.

Song (1981) used the major models tested in the Modigliani-Tarantelli study and developed a consumption function for a poorer less developed country (LDC) such as Korea, which was characterised by low per capita incomes, a relatively large rural sector and rapid industrialisation and urbanisation. The study provided some interesting results. It was found that the basic consumption models, proposed to explain consumption and saving behaviour in developed countries, provided a good approximation in LDCs. He did find though that the consumption/savings behaviour of rural workers differed from that of urban workers. The degree of habit persistence was also found to be lower in Korea than Italy; but this was expected to increase as the economy developed.

2.6. EVIDENCE ON THE INCLUSION OF THE WEALTH VARIABLE

2.6.1. The wealth variable

The earliest suggestion on the inclusion of the wealth variable in the consumption function can be traced back to the work on Keynes in the *General Theory*. Keynes however did not consider systematically the importance of the wealth variable in relation to the propensity to consume. With the LCH the wealth (W) variable assumed an important role in time series estimation since it served to balance income variations over time. One of the early empirical problems however was the lack of adequate data. Often this meant that if wealth data were

not available, researchers would have to rely on liquid assets (L) as a proxy variable or construct a series from past data on savings. Townsend (1976) includes the real stock of net liquid assets held by the private sector as an explanatory variable in the estimation of a non-durable consumption function. The inclusion of the new variable was found to be statistically significant. Evans (1969) however has challenged the use of liquid assets as a proxy for wealth. He found a very low correlation between $\frac{L}{Y}$ and $\frac{W}{Y}$.

2.6.2. The treatment of liquid assets

Zellner, Haug and Chau (1965) conducted a well known time series study of USA data in the context of the permanent income model. The aim of the paper was to examine the role of habit, inertia, expectations and wealth in the consumption function. To obtain their estimates, they used non-linear ordinary least squares and two-stage least squares estimation procedures. The conclusion reached was that no evidence for habit persistence or inertia in consumption over and above that already accounted for by expectational effects (Bridge,1971). Zellner *et al* (1965, 580) were however able to conclude that " imbalances in consumer liquid assets holdings exert a statistical and economically significant influence on consumption expenditures".

Questions have also been raised about the inclusion of money or liquid assets in a specification of the consumption function. In a survey conducted by Grice (1981), he argued that, for a better part of the postwar period in the UK, the supply of liquid assets were demand-determined, the reason for this being that authorities were more concerned about controlling the interest rate than the money supply. Grice pointed out two particular reasons as to why liquid assets should not be used in the consumption function. The first of these was that it was possible for particular interest rates to affect liquid assets without there being any corresponding effect on consumption. Secondly, he found no reasonable basis for the exclusion of other forms of financial wealth that were not included in the official definition of wealth.

Ferber (1974) draws our attention to two conflicting results received from cross-section studies: Fisher (1963) reported that liquid asset holdings do influence durable goods expenditure, while another study on cross-section US data by Cragg and Usher (1970), using a multinominal extension of a linear logit model, found that a liquid asset variable was not significant in influencing car purchases.

Trying to reach a conclusion as to the significance of liquid assets on consumers' expenditure is problematic. In surveying the empirical literature on the role of liquid assets on the consumption in the 1950s and 1960s, both Evans (1969) and Ferber (1974) reach different conclusions. While Evans (1969,44) is inclined to infer that there is little reason for the inclusion of liquid assets as an important part of wealth in the consumption function, Ferber (1974,201) on the other hand found that the " weight of the evidence so far ... is in favour of including a liquid asset variable".

Recent literature on the subject is not particularly forthcoming .In his survey of the recent literature Hajimatheou (1987) suggested that through casual observation and econometric evidence a fair proportion of the population was bound by credit constraints. The likely effect of such constraints will depend on factors such as: the distribution of income and wealth, the income profile of the population, fluctuations in income and monetary policy.

In relation to aspects of liquidity, Miskin (1976) developed a model which was able to determine the effects of consumer illiquidity on the desirability of holding assets. He was able to produce evidence to show that the composition of a consumer's balance sheet is important with respect to spending decisions. He found that " increased consumer liabilities are a major deterrent to consumer durable purchases and increased financial asset holding a powerful encouragement" (Miskin, 1976, 642). His findings indicated that monetary policy could have a powerful impact on the purchase of consumer durables.

Associated studies conducted on liquid assets refer to capital gains. Bhatia (1972)

developed a model to consider the effects of capital gains on aggregate consumption , by allowing for a distributed lag effect on capital gains. Basing the model on the permanent income approach, Bhatia concluded from time-series regression estimates for the period 1948-1964 that both accrued and realized capital gains affected consumption expenditure. He also found that the lag effect of capital gains on consumption appeared to be considerably longer than that of income.

Another angle to the consideration of liquidity and liquid assets was given by Pissarides (1978) who argued, in the context of permanent income -life-cycle hypothesis, that an asset's degree of liquidity was associated with transaction costs because of market imperfections. Pissarides argued that individuals take this into account when they plan an optimal consumption path which is based on lifetime resources and is dependent on the composition of the individual's portfolio of assets. Pissardes' analysis led to a number of interesting conclusions. The first of these was that individuals' holding assets in the form of wealth will react to changes in income and interest rates, depending on their present holding of debt. Secondly, Pissarides argued that within the permanent income -life cycle framework, consumption was more sensitive to current income than within Keynesian theory. Owen (1986) pointed out that in Pissarides' model, liquidity was jointly determined with consumption rather than being an exogenous determinant. He argued therefore that to talk of liquidity effects on consumption can be misleading.[1]

2.7. THE INFLUENCE OF THE PRICE LEVEL AND THE INFLATION RATE

An early study carried out by Branson and Klevorick (1969) on quarterly US data during 1955-1965 supported the hypothesis of money illusion, and found a direct relationship between real consumption and the price level. Their study showed a significant and positive

[1]Interestingly enough Owen (1986) notes, that despite the theoretical and empirical interest in the influence of the various aspects of an individual's portfolio on expenditure, none of the studies seem to adopt an approach of integrated decision-making. He points out that an ideal framework for analysis would be one that integrates expenditure and portfolio behaviour.

coefficient for the price level variable with per capita consumption as the dependent variable. It should be noted that this finding is contrary to an analysis conducted by Tobin (1947) who asserted that, if money illusion were present, an inverse relationship between real consumption and the price level will be realised. Hadjimatheou (1987) observed that the Branson and Klevorick study was supported by Craig (1974).

With many of the Western-type economies experiencing high and persistent inflation during the 1970s, a great deal of research was devoted to determining the effect of not only the price level but, now more importantly the effect of high rates of inflation on consumer behaviour. A significant paper in 1972 by Juster and Wachtel attempted to distinguish between the effects of anticipated and unanticipated inflation. The study focussed on determining whether an index of expected inflation increases was equal to the change in the consumer price index. Using quarterly US data for the period 1953-1971, they found that high inflation does tend to reduce US consumption expenditure. The more important conclusion from the study was realised in the context of inflation-induced uncertainty effects. The study found that, while unanticipated increases in the inflation rate had a strong positive effect on savings, anticipated inflation led to an increase in spending on non-durable goods and services and a decrease in spending on durable goods and services.

These conclusions reached by Juster and Wachtel ran into conflict with the inferences reached in a later study by Springer (1977). The latter set out to determine the effects of expected inflation on the two main categories of consumer expenditure - durable and non-durable. He also took the analysis further by distinguishing between the two effects an increase in the inflation rate could have - a substitution effect and an income or uncertainty effect. To determine the nature and significance of these effects Springer ran separate regressions for the non-durable and durable categories of these goods and used two alternative ways of measuring expected inflation. One was an objective measure based on an adaptive expectations and the other a subjective measure based on surveys.

The conclusions drawn from the use of these two alternative measures are interesting, since they both have a significant but opposite effect on consumers' expenditure on non-durable goods. While the results obtained from the surveys are consistent with the findings of Juster and Wachtel, the positive coefficient was not consistent with the proposition that psychological uncertainty and pessimism have a negative effect on purchase of durable consumption goods. Conversely, the negative coefficient obtained from the objective measure turned out to be consistent with the argument that increases in the expected inflation rate depress the 'mood' and sentiment of consumers. When consumer durables are used as a dependent variable, these results are reversed. Hadjimatheou (1987,134) draws our attention to the fact that "the whole exercise highlights the likelihood that the adoption of different measures of expectations could produce quite contradictory results".

The Deaton (1977) approach represented another way of interpreting the inflation effects by formulating a disequilibrium model of consumption which provided for the inclusion of anticipation errors. If these errors were not present, then the equilibrium consumption function could be thought to provide an adequate explanation of the data. It was assumed that the expected inflation rate was constant so that changes in the APS would then depend on the actual inflation rate.

The underlying consumption function, derived and used for estimation by Deaton, was based on the basic permanent income hypothesis. By using quarterly USA data for the period 1954-1974 and UK data for 1955-1974, Deaton was able to find evidence to justify his specification. For both the UK and USA Deaton found that changes in the APS were positively related to the inflation rate. His findings go further to lead him to deduce that expected rates of inflation are sensitive to changes in the actual rate of inflation. He concludes therefore that there is good cause for an extended model that will allow for the possibility that the desired consumption income ratio could be affected by inflation. One should be cautious to resolve from this, however, that variations in the APS in many Western economies during these periods could be attributed to accelerating inflation in the 1970s and decelerating inflation in the 1980s. There have been other factors that operate indirectly but that have an equally potent effect through consumer wealth (Thomas,1993).

Fairly recent views on the relevant evidence leads one to the conclusion that inflation effects have on the whole been present. Sturm (1983) and Wachtel (1980) found positive relationships for inflation and savings.

2.8. EMPIRICAL EVIDENCE ON THE RATIONAL EXPECTATIONS VIEW

With the Lucas critique ushering a new era in the study of the consumption function, there was a resurgence of empirical work which sought to apply the theory of rational expectations to the consumer. With the application of the permanent income- life cycle hypothesis as the correct approach to explaining how consumers divide their consumption between present and future periods, Hall (1978) tested his assumptions on quarterly USA data for the period 1948-1977. Specifically, Hall sought to test whether any variable, aside from current consumption, should be of any value in predicting future consumption. Hall came to the conclusion that consumption whether it was lagged by two periods or whether disposable income was lagged, was not able to significantly explain current consumption. He found however that the additional explanation provided by the inclusion of lagged stock prices was significant. It would seem that Hall's results imply a rejection of the pure LCH, but Hall did point out that his results were consistent with a version of the hypothesis that was slightly modified to take into account delays between changes in permanent income and corresponding changes in consumption.

One of the more important implications of the Hall study was the underlying assumption that the real rate of interest could be treated as a constant. Further Hall (1988) examined the elasticity of intertemporal substitution as an important determinant of the response of saving and consumption to the real interest rate. His findings suggested that there was no evidence to conclude that, based on data for the USA for the better part of the twentieth century, aggregate consumption revealed an intertemporal elasticity of substitution with important positive values.

2.8.1. Tests of Hall's findings

Hall's conclusions were disputed in an earlier paper by Flavin (1981) on the basis that consumption was found to be 'excessively volatile' when compared to the theoretical prediction. Flavin in fact showed that, with slight alterations in the way in which the alternate hypothesis was specified, one could reject the permanent income-rational expectations hypothesis and the strict optimisation hypothesis using the tests proposed by Hall and his data sets. In reply Hall (1989) pointed out that Flavin's work was subject to the criticism that "the stochastic process of income is as a result of the interaction of all the actors in the economy and is not a deep structural characteristic of the consumer alone' (Hall, 1989, 158).

In a more direct criticism of Hall's (1978) model, Gilbert (1991) pointed out that while focusing only on the covariance of changes in consumption with variables such as lagged information, Hall failed to recognise that within the rational expectations- permanent income hypothesis framework there could also be implications for the covariance of current income and consumption. In essence Hall's model failed to take into account a reasonable assumption that, due to the pattern of income changes over time, consumption could be less variable than income. Also in criticism of Hall, Campbell and Deaton (1989) stated " if permanent income really is smoother than measured income, there is remarkably little sign of it in aggregate data... We believe that the reason consumption is so smooth is that the permanent income theory is false". One of the ironies that Gilbert (1991) draws our attention to is that the PIH was formulated to explain the smoothness of consumption. Presumably it is the combination of the PIH and REH that leads one to this ironic conclusion.

A study by Campbell and Mankiw (1989) indicated that for USA data two types of consumers could be found. The first type of consumer which was described in the Hall model was one whose consumption was primarily determined by permanent income. The

second type of consumers was described as the "rule of thumb" consumers whose consumption was determined by current income. The aim of the study was to develop a model that was consistent with previously observed empirical standards - "the sensitivity of current consumption to current income, the lack of sensitivity of consumption to real interest rates and the fact that periods when the APC is high are typically followed by periods of rapid growth in income" (Thomas, 1993, 277). In relation to Hall's model, Campbell and Mankiw supported the notion of the forward-looking consumer who does not engage in inter-temporal substitution in response to interest rate changes.

Early papers by Daly and Hajimatheou (1981) and Davidson and Hendry (1981), based on quarterly UK data, rejected Hall's conclusions and showed that "lagged values of income and liquid assets, as well as consumption lagged by more than one period, contributed significantly to explaining current consumption" (Hajimatheou,1987,155). Hadjimatheou also draws our attention to two other studies, one by Cuddington (1982) on Canadian data and another by Johnson (1983) on Australian data. The Cuddington study obtained results that were similar to the two previous studies mentioned above by the inclusion of additional variables such as lagged values of real money balances, real net private wealth, real gross national expenditure and the unemployment rate. The inclusion of such variables helped to improve the predictability of future consumption after current income was taken into account. The Johnson study produced less favourable results. It was found that in the context of the rational expectations-life cycle hypothesis that neither consumption lagged more than one period nor lagged values of income appeared to be significant. However the inclusion of variables such as lagged changes in the unemployment rate and lagged values of the neo-Ricardian measure of income were found to be significant (Hadjimatheou,1983).

Thomas (1993) suggested that one of the reasons Hall's version of the LC-PH was rejected by UK data and only partially accepted by US data was the existence of liquidity constraints. Hall and Miskin (1982) did try to make provision for the inclusion of liquidity

constraints into an empirical model. In their study on the stochastic relation between income and consumption, Hall and Miskin divide their population into two classes of consumers. The first type of consumer has a consumption that is determined by an Euler equation and the second type of consumer has a consumption that increases as income increases due to liquidity constraints.

2.9. ERROR CORRECTION MODELS OF CONSUMPTION

2.9.1. The Davidson *et al* study

In 1978 a highly influential paper by Davidson, Hendry, Srba and Yeo presented a challenge to the conventional wisdom of earlier theories as well as a contrast to the rational expectations- life cycle hypothesis. In essence this approach sought to use variables that were directly observable without resorting to the role of expectations as a possible explanation. In other respects the Davidson *et al* study represented an attempt at combining and formalising a range of econometric techniques that were developed during the 1970s. Pokorny (1990, 139) in a brief analysis of the techniques used in the study stated that the study represented "a set of guiding principles which constitute a generalised statement of 'good practice' ".

The studies of Davidson *et al* (1978) and Hendry and Ungern-Sternberg (1980) dealt with the argument over whether price changes have a direct effect on consumption or whether its works indirectly through the wealth effects. The initial study arose out of a dilemma that had confronted earlier investigations of the relationship between income and non-durable goods in the United Kingdom. Earlier studies had reached vastly different conclusions regarding lag structures and the short-run marginal propensities to consume. In particular, the paper by Davidson *et al* aimed to provide an alternate approach to modelling consumer expenditure which (i) could better explain the UK relationship between income and consumption that was consistent with the data, (ii) was better able to explain some of the

previous models and empirical findings, (iii) exhibits parameter stability overtime and (iv) conforms to steady-states postulates of economic theory (Hadjimatheou,1987).

To emphasise the issues at hand and resolve some of the conflicts highlighted above, the initial paper concentrated on and drew from the empirical studies of Hendry (1974), Ball *et al* (1974) and Wall *et al* (1975). Taking the model of Wall *et al* which was of the following form:

$$\Delta C_t = \alpha_0 + \alpha_1 \Delta Y_1 + \alpha_2 \Delta Y_{t-1}$$

where ΔC_t and ΔY_t are the quarterly changes in consumption and income respectively. The aim was to show why a model which was statistically preferred had rather peculiar economic properties. There were two properties in particular that were strange: (i) the equation above had no static equilibrium solution and (ii) changes in income which bring about adjustments in consumption had already taken place.

To reconcile the conflict between statistical and economic criteria, Davidson *et al* applied the error correction approach. A state of equilibrium would result in the following relationship:

$$c_t = k_t + y_t$$

If on the other hand one observes a state of disequilibrium, which is normally the case, then the following relationship between income and consumption arises:

$$c_t = K^* + \beta_1 y_t + \beta_2 y_{t-1} + a_1 c_{t-1} + v_t$$

If a restriction is imposed such that $\beta_1 = -\beta_2 + \gamma$ and $a_1 = 1 - \gamma$ then the above equation becomes:

$$\Delta_1 c_t = K^* + \beta_1 \Delta_1 y_t + \gamma(y_{t-1} - c_{t-1}) + v_t$$

Allowing for seasonally unadjusted quarterly data and additional regressors, one could now formulate an equation that was ready for basic specification :

$$\Delta_4 c_t = b_1 \Delta_4 y_t + b_2 \Delta_1 \Delta_4 y_t + b_3 (c-y)_{t-1} + w_t$$

The the above equation can be interpreted using the simple "feedback" theory. Consumers will generally plan to spend in any quarter what they spent in the same quarter of the year before; however, this quantity will have to be adjusted by a proportion of their annual change in income and by whether that change was itself increasing or decreasing. Finally, these together determine the short run consumption decision which would have had to be adjusted through a feedback from the previous C/Y ratio, which in turn would have brought about a coherence with the long-run target $C_t = KY_t$ (Davidson *et al*,1978).

The study used UK data from the period 1958 - 1970, keeping the data of the subsequent period 1971 - 1975 for " post-sampling" predictions. There was however one particular problem with the estimation. There were consistent over predictions of consumption during that period while at the same time it had been noted that there was a steady increase in the propensity to save in the UK. This meant that the above equation had to be further extended to allow for the effects of inflation by the addition of price variables.

2.9.2. Criticisms of the study

Thomas (1993) expressed certain reservation about the Davidson *et al* study which bear mentioning here. The first of these criticisms was that, although the equation for estimation was rigorously derived, the price variables were simply added on at the end to resolve the forecasting problem. Secondly, it was only when it became apparent that there was a forecasting problem that the effects of inflation were considered. As Thomas (1993) clearly

points, out there are inherent dangers in adopting such an approach. If a model was to be assessed, then the correct approach would be to test it against data that was not used in its formulation.

2.9.2. The Hendry and Ungern-Sternberg paper

The paper by Hendry and Ungern-Sternberg (1981) chose to extend the above model further as well as to resolve some of the criticisms. The first addition to the model was the allowance to take into account the effects of any deviation of the wealth-to-income ratio from its steady-state level. This was done by adding a third correction mechanism, i.e. the integral control mechanism. The second addition was a redefinition of the personal disposable income variable, Y to take into account the inflationary effects on wealth. Y was redefined to reflect capital losses on monetary assets.

The empirical part of the paper began with a re-estimation of the Davidson *et al* equation for a shorter time period 1962 - 1972, with predictions being tested for the time period 1973-1977. The resulting estimation proved to be much less impressive than the Davidson *et al* study, with the parameter values of the price variables $\Delta_1(p_t - p_{t-4})$ changing. Thomas (1993,274) points out that the major significance of the Hendry and Ungern-Sternberg paper is that the inflation rate does not appear to influence the APC as it is normally measured, but it does have an influence via the wealth effect and through a mismeasurement of real income.

2.10. THE ERROR CORRECTION MODELS TAKEN FURTHER

In 1990 Carruth and Henley attempted to deal with the apparent break down of consumption equations that have previously performed well in forecasts of the early 1980s in the UK but that were now unable to deal with the unprecedented increases in consumer expenditure. They attempted to estimate the performance of three equations in predicting

consumption during the latter part of the 1980s : i) the Davidson *et al* equation, omitting the price variable due to its insignificant coefficient; ii) a modified version of the Hendry and Ungern-Sternberg equation which now included the real interest rate variable and total net financial assets; iii) a version of the Hendry and Ungern-Sternberg that was modified by the London Business School using total consumer expenditure (this includes durables) instead of non-durable consumption; it also redefined the wealth variable to take into account housing wealth and net financial wealth.

Of the above equations the London Business School version of the Hendry and Ungern-Sternberg equation yielded the most interesting results. By redefining wealth to include private housing wealth, Carruth and Henley were able to identify what may have been behind the falling APS in the UK - housing equity withdrawal. While housing prices increased quite rapidly in the 1970s and 1980s in the UK, homeowners did not realise any immediate benefit or more particularly any capital gain on that home ownership until the latter part of the 1980 (Thomas,1993). Consequently it had become less difficult to 'withdraw equity' from housing wealth. Subsequent studies by Curry, Holly and Scott (1989) and Carruth and Henley (1990b) also drew attention to housing equity withdrawal as a possible cause of increased consumer expenditure.

2.11. DISAGGREGATED MODELS IN CONSUMER EXPENDITURE

While it is true that the conventional theories of individual demand for goods and services - based on utility maximising assumptions and which associate the rates of consumption to income and price variables - do not apply to consumers in aggregate, there has however been sufficient grounds for developing applied demand analysis in this context. In particular, the survey article of Brown and Deaton (1972) was concerned with enhancing the specification of demand functions and with developing a complete system of demand equations.

2.11.1. The linear expenditure model

Initially, modern demand theory had its roots in the linear expenditure system proposed by Stone (1954). Expenditure on each commodity was specified as a general linear function of total money expenditure and the nominal prices of the goods in particular categories. One of the merits in adopting such an approach was that a complete set of cross price effects could be estimated. However, Gilbert (1991) notes that the conditions imposed by the linear expenditure are fairly restrictive, since they imposed a certain degree of homogeneity and symmetry on the general demand system.

Both Brown and Deaton (1972) and Deaton (1972) also base their models and projections of demand on linear expenditure system. Notwithstanding the limitations of the linear expenditure system, Deaton (1972,155) does make a case in favour of the linear expenditure system. The results tend to be more convincing when Pigou's Law is imposed, as well as the fact that "for individual commodities the linear expenditure system would often be 'safer' as a predictor than the log linear form".

Using time-series data for the United Kingdom from 1954 to 1970, Deaton (1975) used both the log linear model and the linear expenditure model to assess their performance in explaining and predicting the behaviour of almost forty separate commodities. The estimations of a complete set of demand equations provided a useful framework in which the overall consistency of the study could be guaranteed. It also furnished explanations and predictions as to the behaviour of these commodities. In this respect the study was of considerable value to both industry and government in the practical forecasting of demand, while at the same time it raised questions of economic theory and econometric methodology.

2.11.2. Durable goods

It is often the case that when it comes to determining the purchase of consumer durable goods, we are presented with a different type of consumption. The purchase of consumer durables tends to be erratic unlike purchases of nondurables, such as food, that have to be made at regular intervals. Evans (1969) also points out that long lags between income and purchases does not occur, the only lags occurring when there is a previous commitment to repay the purchase of these goods.

One of the most important variables affecting the purchase of consumer durables is the availability of credit- installment credit. Credit allows an individual the opportunity to save after the purchase of a durable good rather than before the purchase. Given the significant role that credit has in the consumption of consumer durables, Evans (1969) suggests that it may be formulated in two ways : the burden theory and the replacement theory. The burden theory states that debt that is contracted as a result of obtaining credit represents a burden that must be repaid at some future point in time. According to this theory, consumer credit contributes to the instability of such purchases over time. The replacement theory, on the other hand, suggests that consumer credit does increase the purchase of durable goods in the long run. The consumption of durable goods tends to be at the expense of other consumer goods or at the expense of savings. Evans (1969) is however critical of the application of the burden theory to the purchase of consumer durables. Liquid assets also play a role in affecting the purchase of consumer durables; nevertheless it has been found that they tend to act as substitutes rather then complements.

Another related and major problem arising out of the treatment of such goods is their intertemporal nature. Brown and Deaton (1972) suggest that one approach to the problem would be to let stocks of goods influence expenditure decisions in the current period. These decisions will then have an affect on future levels of stock. Perhaps one of the most famous models developed with considerable application has been the stock-adjustment model of

Houthakker and Taylor (1970). Extending the model proposed by Stone and Rowe (1957) for durable goods, Houthakker and Taylor base their model on the premise that "current purchases depend on current as well as past values of the variables that determine consumer purchases and that these values are reflected in the current stock of the consumer" (Ferber, 1973).

The interpretation of the stock variable is two-fold. For durable goods, it represents the physical stock of goods built up over time, while for non-durable goods and services, 'stock' is a psychological term representing the accumulation of habits over time. In its simplest form the model can be represented in the following way :

$$q_t = \alpha + \beta s_t + \gamma x_t$$

where q_t is the purchases made in period t, s_t is the stock variable and x_t is income. β represents the stock adjustment parameter; if β takes on a positive value then an increase in stock leads to more purchases and this signifies habitual behaviour. If on the other hand β is negative, increases in stock will place downward pressure on new purchases. There has been considerable empirical application of the model to time series data in the United States, Canada and South Africa, with largely favourable results.

Briscoe (1972) noted that when it comes to explaining the demand for durable goods, classical demand theory required substantial revision. He argued that it was the role of expectations that was likely to influence the direction of changes in demand. Briscoe suggested that in the compilation of consumer confidence indices it was not methodologically sound to reduce the various expectations into a single index. Rather, wealth, confidence and time to buy series are expectations that should stand out on their own since they impact differently on consumer expenditure decisions. He was able to conclude from his study that the separation of various expectations would be a better predictor of certain selected categories of consumer expenditure than aggregate

expectations.

An earlier study by Shapiro and Agvine (1969) of consumer attitudes and expenditure using Canadian data concluded that a composite index of consumer mood (as opposed to a simple mood index) would be a more effective tool for forecasting consumer spending on durable goods. Reservation was however expressed as to the combination of questions used to construct the composite mood index.

Evidence on the role of consumer attitudes in forecasting consumer durable spending in South Africa was presented by Stuart (1979). Generally, the aim of the study was to investigate the predictive value of an index of consumer confidence that was constructed by the Bureau for Economic Research at Stellenbosch[2] . The results revealed that consumer confidence does have a significant influence on durable goods. What was surprising however was the complete lack of correlation between the real disposable income and real spending on consumer durables. Stuart concluded that personal disposable income was more important as a long term predictor than as a short term predictor of consumption expenditure. A later paper by Stuart (1983) found that the role of sentiment was also significant in non-durable spending.

2.11.3. Empirical evidence in South Africa

A paper by van Rensburg (1973) provided detailed statistical information on the various components of private consumer expenditure as well as the methods and sources used in the calculation of the aggregate information in the national accounts. Using data that spanned the period 1947 to 1972, van Rensburg also attempted to highlight certain structural changes that occurred in the post-war economy. He found that, while in the long run private consumption expenditure is closely related to income, there might well be other

[2]The surveys were drawn many from the white sector of the population since it was proposed that they were the main contributors to durable spending.

factors which exert considerable influence in determining the increases in consumption that are associated with increases in disposable income.

Using seasonally unadjusted data for the years 1965 to 1974 and the four basic theoretical models which dominated literature on the consumption function at the time, Contogiannis (1978) estimated which variables would be important in their explanation of consumer's total expenditure as well its various components such as durable, semi-durable, non-durable goods and services. Of the four models used in the tests it was found that two of these models, namely the stock adjustment model and the adjustment/income expectations model, could provide important explanations about the variables that affect the components of consumer expenditure.

It was found that the stock variable was necessary in the explanation of expenditure on durable goods. Other important findings included the fact that disposable income was an important variable in the explanation of total consumption expenditure as well as its various components; durable and semi-durable goods were comparatively sensitive to changes in prices. Loans and advances provided by commercial banks had an affect on total consumption expenditure as well as its various components.

A later paper by Contogiannis (1982) using annual data in the period 1960 to 1972 provided estimates in the context of the Houthakker and Taylor model by disaggregating the various components of total consumer expenditure into fifteen broad categories of goods and services. The results indicated that the consumer was relatively insensitive to economic forces. Income and price elasticities implied by the model were also calculated with a wide range of configurations. On the whole, relatively low price elasticities were calculated which is often an indication of the considerable degree of non-competitiveness in the market at the time.

CHAPTER THREE

DATA COLLECTION

3.1. INTRODUCTION

At the outset it should be noted that data collection goes beyond merely the mechanical recording of data. While data collection itself is nonetheless an integral part of the research at hand, one also needs to be clear about the type and size of a particular sample and also to sort out any definitional or conceptual ambiguities that may exist. Part of the data collection process also includes the preparation and organisation of the data in an appropriate way for estimation.

3.2. TYPES OF DATA

It is interesting to note that Shapiro (1966) in his discussion on income and consumption organises his analysis into two parts. The first part of his discussion was devoted to an analysis of family income and its relation to consumption spending for a given time period. The aim here was to provide insight into the AIH, RIH, PIH "as theories of the individual consumer" and then to apply this to simple cross-section data. The second part of the analysis focussed on the theories in the aggregate by applying it to time-series data. Therefore both cross-section and time-series data are applicable to a study and inquiry into the exact form of the consumption function. The aim of this study is to provide an insight into consumer behaviour in the aggregate and, therefore, time-series data were employed.

While there has been a certain amount of reservation expressed about the use of time series data on aggregate personal savings and disposable income, this type of data has been widely used in estimations of private consumption expenditure and personal disposable

income (Hadjimathoeu,1987). Hadjimatheou does however note that there is a need to complement and extend work based on time series analysis with cross section studies as well as research based on empirical surveys of household observations.

3.3. DEFINING AND CLASSIFYING THE DATA

3.3.1. Problems of definitons

Prior to any quantitative analysis, it is appropriate to define the data used so that any "definitional differences between theoretical variations and their empirical counterparts" can be ironed out (Studenmund, 1992). There is generally very little difficulty in defining and collecting data on income and consumption. This view however does not preclude any critical readings of the descriptions of certain variables or the need to analyse in more detail the income variable, consumption variable and the various components of consumption. In this respect, van Rensburg (1974) provids a detailed analysis of the various categories of consumer expenditure with particular reference to South Africa.

3.3.2. The income variable

Generally the relevant income variable that is used in empirical work is personal disposable income. Wallis (1979) states two particular reasons for this : firstly the variable is constructed so that when an individual determines the scale of consumption he/she has net income in mind; secondly, allowances are made for the absence of money illusion (assuming that no widespread money illusion is expected to exist among consumers).

3.3.3. The consumption variable

Private consumption expenditure is a measure of the final consumption expenditure of households as well as private non-profit organisations. The South African Reserve Bank

(SARB) notes that the South African national accounts indicate consumption expenditure of only resident households. This is a particularly important element within the South African context, given the constant influx of migrant workers from neighbouring countries who find employment in South Africa. A relatively significant portion of purchases on consumer goods and services are made by such workers.

Private consumption expenditure includes three classifications:

- Expenditure can be arranged according to the category or nature of the item purchased. For instance services are distinguished from goods with further distinctions made between durable, semi-durable and non-durable goods.
- Consumption expenditure is classified according to the object and purpose for these goods and services.
- Consumption expenditure can also be classified according to the type of economic activity that different industries engage in when they produce certain commodities.

3.4. SOURCES OF DATA AND ITS ACCURACY

Data on consumption expenditure and income are not difficult to access. Generally the major source for this type of data is the *South African Reserve Bank (SARB) Quarterly Bulletin* which publishes detailed data on the various categories and components of consumption expenditure at both constant and current prices.

However, there are problems that do arise with the calculation of certain important categories of consumer expenditure (SARB Quarterly Bulletin, June 1991). The problems encountered are unique to the specific categories. The extent to which these problems affect the particular data and the accuracy of a particular estimation is not certain. It has, nevertheless been widely accepted that while there is little problem in accessing data for economic research, the quality of such data is often in question. Not withstanding this, it is assumed that one of the best sources for data of this nature is the *SARB Quarterly*

Bulletin.

One the shortcomings of using this type of data is that there is a portion of activity in the economy that goes unrecorded. The informal or hidden economy encompasses a wide range of income-generating and consumption related activities, which by the very definition of the informal economy are not recorded in the national accounts. During the period under consideration for the purposes of this study there was considerable growth in this sector of the economy. Hartzenburg and Leiman (1992) suggest that the national accounts are underestimated as a result of the informal sector by approximately 12%. It is important, too to realise the link between the informal and formal sectors, since income-generating and consumption activities in the informal sector often cross over to the formal sector or vice versa.

3.5. COLLECTION OF DATA FOR ESTIMATION

A quarterly data series for the fifteen year period 1976 to 1990 will be used. This data was seasonally unadjusted. The first step at disaggregating total consumption was to make a distinction between total consumption (C), durables (C_d), semi-durables (C_{sd}), non-durables (C_{nd}) and services (C_s). The next step was a further disaggregation of goods into twenty-one categories for specific items of expenditure.[1] Definitions of these different categories can be found in various issues of the *SARB Quarterly Bulletin.*

All variables are expressed in millions of rands at 1985 prices. Personal disposable income (Y_d) is used as the income variable. Change in personal disposable income (ΔY_d) was also considered. The total consumer price index was used as the price variable for the different components of total consumption expenditure.

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[1]I am truly grateful to the South African Reserve Bank for providing me with unpublished quarterly data for these various categories of goods.

The three month bankers' acceptance rate -expressed in percentages- was used as the interest rate variable (r). Installment sale credit (IS) is considered as part of credit that is extended to the domestic private sector .The liquid asset variable (LA) was defined as all money, demand deposits, and savings held by the domestic private sector. The accumulated sum of spending from a specific reference point is used as a proxy for the stock variable. The variable used can be defined as follows : $(S_a)_t = \sum_{i=1972}^{t} (C_a)_i$. This variable was then lagged by one period.[2]

[2] This formulation of the stock variable is based on the one developed by Ball and Drake(1963).

CHAPTER FOUR

ESTIMATION

After careful review of the major theories of consumption, together with the vast literature of empirical evidence it was decided to narrow down the estimation to three particular models that could provide some insight, and answer certain broad questions about the behaviour of consumption and the variables that may affect consumer's expenditure in South Africa.

4.1. THE MODELS

Model A

$$C_t = a_0 + a_1 Y_t$$

This model is the elementary Keynesian consumption function.

Model B[1]

$$C_t = b_0 + b_1 Y_t + b_2 C_{t-1} + b_3 V_t \qquad (1)$$

where :

C - consumption expenditure

Y - personal disposable income

V - a vector of other explanatory variables

This model is an expression of the partial adjustment/adaptive expectations formulation of

[1]The derivations of models B and C are similar to those of Contogiannis (1982).

the consumption function.[2] This model can be derived by introducing a partial adjustment mechanism into the following equation :

$$C_t^* = a + bY_t \qquad \text{(i)}$$

C_t^* being the desired level of consumption.

The adjustment function is :

$$C_t - C_{t-1} = k_1(C_t^* - C_{t-1}) \qquad 0 < k_1 < 1 \qquad \text{(ii)}$$

This means that individuals do not adjust immediately to their desired level of consumption for various reasons such as inertia.

If equations (i) and (ii) were combined the following equation is derived:

$$C_t = k_1 a + k_1 b Y_t + (1 - k_1)C_{t-1}$$

This is equivalent to equation (1).

Model C

$$C_t = d_0 + d_1 Y_t + d_2 S_{t-1} + d_3 V_t \qquad (2)$$

This model is based on the stock adjustment model introduced Stone and Rowe (1954) and Houthakker and Taylor (1970). In this model, consumption expenditure is viewed as the sum of replacement expenditure to offset the depreciation of the stock of consumer goods during period t and net investment:

$$C_t = D_t + \Delta S_t \qquad \text{(i)}$$

It is assumed that the replacement expenditure is a constant proportion of the stock of consumption goods, lagged by one period:

$$D_t = pS_{t-1} \qquad \text{(ii)}$$

It is assumed that net investment is a constant fraction of the difference between the desired stock of consumption goods and the stock at the end of the last period:

$$\Delta S = q(S_t^* - S_{t-1}) \qquad 0 < q < 1 \qquad \text{(iii)}$$

The desired stock is determined by factors such as income, interest rates and money supply:

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[2]This model was included because under certain assumptions it is compatible with three major theories of consumption -the PIH, the LCH and the RIH (Modigliani,1975).

$$S_t^* = a + bY + cX_t \qquad \text{(iv)}$$

By applying some mathematical manipulation the following equation is obtained:

$$C_t = qa + qbY_t + qcX_t + (p - q)S_{t-1}$$

This is equivalent to equation (2).

It is important that the interpretation of the stock variable (S_{t-1}) is understood since it differs for two broad categories of consumption expenditure. For durable goods, it represents the physical stock of goods built up over a period of time. In the case of non-durable goods, stock represents a psychological phenomenon - the accumulation of consumption habits. The coefficients of the stock variable can be expected to be negative for durable goods and positive for non-durable goods.

4.2. ESTIMATION PROCEDURE

Consumption expenditure functions are always expressed in real terms. Therefore, total consumption expenditure and the various other explanatory variables used in the estimation such as income and liquid assets, were deflated by the relevant consumer price index.[3] The different components of consumption expenditure were deflated using the relevant price deflator for the various broad categories of goods ie. durable, semi-durable, non-durable, and services.

All regressions were estimated using the estimation technique of Ordinary Least Squares (OLS). In choosing a functional form initially both the linear and double log forms were considered. It was decided to use the double log form based on the underlying economic theory and because the individual regressions coefficients can be interpreted as the elasticity values. Every regression included a constant term. Due to the nature of the data, it was

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[3]Evans (1967) argues that deflating income by an index that measures its purchasing power over consumer goods and services makes substantial differences to the results than if the GNP deflator were used.

decided to use three seasonal dummy variables to account for seasonal variation in the data. These were included in every equation.

After carefully considering the economic theory underlying each model, a large number of regressions were initially estimated. As a rule, explanatory variables which consistently produced an estimated coefficient smaller than the standard error of the coefficient were not included in the regression, with a few exceptions. All estimates were tested at the 5% critical level unless otherwise stated.

4.3. DISCUSSION OF THE ESTIMATES

MODEL A

Tables 1 to 5 report the results of regressions run along the lines of model A. The high significance of the estimated seasonal dummy variables in all but a few cases showed a strong seasonal pattern of consumption existing in the various quarters. Consistent exceptions to this seasonal variation were reflected in the consumption of personal transport equipment, petroleum and gasoline products and rent. This would largely be due to the fact that the consumption of such products are not influenced by seasonal factors.

The Durbin-Watson d test of initial estimates (not reported here) indicated the existence of serious positive serial correlation thereby rendering the OLS estimators inefficient. The Cochrane-Orcutt iterative procedure was used to rid the equations of the positive serial correlation (Johnston,1984).

Durable goods

The estimated coefficient of income proved to be statistically non-significant for all categories of durable goods. There was also an unexpected negative sign for the category

of other durable goods. While the coefficient for income was non-significant in the case of furniture and household appliances as well as personal transport equipment, its estimated coefficient was greater than it standard error. However, in the case of the general category of durable goods and recreational and entertainment goods the income coefficient had a standard error that was greater than the estimated coefficient.

The $\bar{\bar{R}}^2$ although comparatively low in this in this category of goods in the model was in fact higher than expected, given the non-significance of income. This can largely be attributed to the highly significant estimated coefficients for the seasonal dummy variables.

Semi-durable goods

The estimated coefficient of income was statistically significant in the case of the aggregate category of semi-durable goods and recreational and entertainment goods. The income variable for clothing and footwear, household furnishing, textiles and glasswear and motor-car tyres, parts and accessories was statistically significant only at the 10% critical level. However, in the case of recreational and entertainment goods the income variable has an unexpected negative sign with a standard error greater than the estimated coefficient.

The adjusted R^2 coefficient was comparatively high but here again a large part of this can be attributed to the existence of seasonal variation in the various quarters. It should also be noted that, although there were instances of positive serial correlation, this was not as serious as in the case of durable goods.

Non-durable goods

The estimated coefficient of income confirmed statistical significance at the 5% critical level for the aggregate category of non-durable goods, food, beverages, tobacco and household

consumer goods, while statistical significance could be confirmed at the 10% critical level for household fuel and power, recreational goods and entertainment goods. Contrary to expectations, the sign of the income variable for medical and pharmaceutical products was negative. It was also statistically significant. The only exception to the statistical significance of the income variable in this category of goods could be found in the case of petroleum products.

Services

The estimated coefficient of income confirmed significance for the aggregate category of services and transport and communication services . Statistical significance could be proved at the 10% critical level for rent and recreational, entertainment and educational services. However, in the case of medical services and miscellaneous services the income variable was statistically non-significant although it did have an estimated coefficient greater than its standard error. The income variable for household services was statistically non-significant. Furthermore the income variable for household services had a negative sign.

MODEL B

Tables 6 to 10 report the estimates obtained from model B. The latter introduces a consumption function in which consumption depends on the consumption of the previous quarter and, as pointed out earlier, is therefore a test which is consistent with a number of hypothesis. One should be cautioned at the outset of the dangers of using the Durbin-Watson statistic as a test for serial correlation when a function such as this includes a lagged dependent variable. This is due to the fact that the Durbin-Watson statistic is now biased towards accepting the hypothesis of no serial correlation and, therefore, fails to detect the presence of serial correlation. This of course introduced some bias in the reported results. The alternative in such a case would be to use Durbin's h test, which involves adjusting the Durbin-Watson d statistic to test for first-order serial correlation in the presence of a lagged

dependent variable. Due to the fact that the software package used did not accommodate for such a test, the Durbin h statistic was not calculated.

Attempts to introduce the relevant consumer price indices proved to be statistically non-significant with the exception of a few categories of durable goods mentioned below.

Durable goods

In all cases the lagged dependent variable was highly significant, while the income variable was statistically non-significant particularly in the cases of the aggregate category of durable goods, furniture and household appliances, and personal transport equipment. The introduction of the price variable was statistically significant in the case of personal transport equipment .The price variable was statistically significant at the 10% critical level in the case of furniture and household appliances. It was non-significant in the case of other durable goods but the estimated coefficient was greater than the standard error. The price elasticities for these goods were however much lower than expected. This was largely due to the introduction of a composite price index on durable goods .

Attempts to introduce the liquid assets variable into this model were unsuccessful with either a negative sign or a standard error greater than its estimated coefficient.

Semi-durable goods

The income variable remained statistically significant in all but two instances - motor-car tyres, parts and accessories, and miscellaneous goods. The inclusion of a variable, representing installment sales credit, statistically improved the equation for the aggregate category and proved to be statistically significant at the 10% critical level. This variable was also statistically significant at the 5% critical level for the motor-car tyres, parts and accessories.

In general the lagged dependent variable was highly significant for all categories of semi-durable goods, particularly in the case of semi-durable miscellaneous goods -a category that includes goods for personal care (tooth brushes, shaving equipment), other personal goods such as handbags and clocks, and writing and drawing equipment . Presumably the consumption of such goods exhibits strong signs of inertia.

Non-durable goods

In this category income remained a significant variable with the exception of household consumer goods. Changes in personal disposable income was statistically significant at the 10% critical level in the case of petroleum products, and at the 5% critical level in the case of recreational and entertainment goods. For the aggregate category, installment sales credit was statistically significant.

The lagged dependent variable was highly significant in all categories, particularly in the case of food, beverages and tobacco; household fuel and power; and medical and pharmaceutical products. This clearly indicated strong signs of inertia in the consumption of these products.

Services

Changes in personal disposable income was statistically significant for the aggregate category, miscellaneous services and recreational, entertainment and educational services. The introduction of a lagged liquid assets variable was statistically significant at the 10% critical level for the aggregate category and rent, and at the 5% critical level for miscellaneous goods, although it was statistically non-significant in the case of recreational services (result not disclosed here).

The coefficient of the interest rate variable had a negative sign when introduced into the

equation for rent. It was also statistically non-significant although it did have an estimated coefficient that was greater than its standard error. The estimated coefficients of the lagged dependent variable were statistically significant in all cases, suggesting that habit persistence could play an important part in the consumption of these services.

The short run and long run income elasticities

One can identify the coefficient of income (b_1) as the short run income elasticity. The long run income elasticity implied by the model is calculated in the following way :

$$\frac{b_1}{1 - b_2}$$

The long-run elasticity for income for the total consumption category is very close to unity with wide variations for the various categories of goods and their individual components. An analysis of the various categories indicates wide variations between the long-run and short-run elasticities, with no particular pattern that is clearly distinguishable. The income elasticities of certain categories of goods and services are pointed out below:

Other durable goods - This category is a mixture of a number of durable goods, including items such as jewellery, watches and precious stones. There is a wide difference between the short-run and long-run elasticities, which vary between 0.34 to 2.90. These differences could reflect, among other things, the fact that permanent income is an important concept here and that the degree of adjustment towards long run values is different.

Motor-car tyres, parts and accessories - This category includes aspects that are associated with the operation of personal transport equipment and therefore possess an element of durability. It is then not surprising that the goods in this category have a high long-run income elasticity of 2.08 when compared to the short-run elasticity of 0.11.

Non-durable goods - Generally the goods in this category have an income elasticity below 1; this is indicative of the necessity of such items. The only exception in this category can be found in recreational and entertainment goods. The short-run and long-run elasticities

range between 0.38 and 2.02. This could be explained through the heterogeneous groupings in the category which include items that are regarded as both luxuries and necessities.

Miscellaneous services- This category includes various services such as expenditure in restaurants, cafes and hotels, package tours, and legal and financial services. The short-run and long-run elasticities vary widely between 0.03 and 2.28. This suggests that certain services in this category could be classified as luxuries.

It is interesting to note that, with the exception of the category for household services, there appeared to be no inferior goods. A further disaggregation of the various categories could however reveal this.

The short-run and long-run marginal propensities to consume (MPC) for all categories of goods is reported in Table 17. Estimates of the mpc both in the short run and in the long run are important since, as Intriligator (1978) points out, measurements of the MPC illustrate an econometric study that combines the theory of the consumption function and the appropriate data with econometric technique. Due to the nature of this particular model both short-run and long-run estimates of the MPC can be calculated.

The aggregate category of total consumption reflects a very high long run MPC that was equal to unity. The mpc for the various categories of goods tends to vary directly with its durability, while that for the different services lies in the region between the MPC for semi-durable goods and non-durable goods. It should also be noted that the short-run MPC for durable goods is high when compared to that for non-durables and services. This is in fact confirms Friedman's proposition that the short-run effect of income is relatively high in the case of durable goods, this being due mainly to transitory changes in personal disposable income.

MODEL C

Tables 10 to 15 give the estimates obtained from Model C. The estimated coefficient of the stock variable for total consumption was highly significant. A positive sign was also indicated for this variable. The inclusion of a liquid asset variable was statistically significant at the 10% critical level.

Initial estimates (not reported here) showed a Durbin-Watson statistic that indicated the presence of positive serial correlation. Here again the Cochrane-Orcutt iterative procedure was used to get rid of the positive serial correlation.

Durable goods

The estimated coefficient of the stock variable for the aggregate durable category had a negative sign .This variable was also statistically significant. The category for personal transport equipment also had a statistically significant stock variable. A negative sign was also observed. This means that stock has exerted a downward influence on these goods and that they are subject to net inventory effects. In the case of recreational and durable goods, the stock variable did produced a negative sign. The stock variable was statistically non-significant with a standard error that was greater than the estimated coefficient.

Furniture and household appliances produced a stock variable that was statistically significant at the 10% critical level. The stock variable had a positive sign. This indicates that this category of goods is habit-forming as opposed to having net inventory effects. The miscellaneous category for other durable goods has a positive sign for the stock variable. This variable was statistically non-significant.

The inclusion of a variable for installment credit sales[4] proved to be statistically significant at the 5% critical level for the aggregate category, furniture and household appliances, and personal transport equipment. In both cases this variable was statistically more significant than the income variable.(The income variable was statistically non-significant.)This implies that the acquisition of credit has important consequences for the consumption of such goods. Such an implication is quite plausible, since consumer credit can stimulate consumer expenditure on these types durable goods.

It should also be noted that the $\bar{\bar{R}}^2$ when compared to the previous model has increased in the case of the aggregate category for durable goods, and household furniture and household appliances. This could to a large extent be attributed to the inclusion of the stock variable, which seems to be necessary as an explanation of consumer expenditure on durable goods.

Semi-durable goods

All the goods in this category appeared to have significant stock variables with a positive sign, suggesting that the habit-forming element is present in the consumption of these goods. (Statistical significance in the case of clothing and footwear could only be established at the 10% critical level). Miscellaneous goods category displayed a particularly high level of habit formation and this was consistent with the results in model A.

The exception to the positive sign was the category that included household furnishing, textiles and glassware. The estimated coefficient for this variable was non-significant. The inclusion of the liquid asset variable for miscellaneous goods turned out to be statistically significant at the 5% critical level.

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[4]Attempts were made to change the definition of credit to include all loans and advances to the domestic private sector, this however proved to be unsuccessful with a non-significant estimate being produced each time.

Non-durable goods

Estimates of the stock variable proved to be statistically significant at the 5% critical level in the case of food; beverages and tobacco; household fuel and electricity; and household consumer goods. The variable was statistically significant at the 10% critical level for the aggregate category and petroleum products. In particular the relatively high estimated coefficient for food and beverages and household fuel and electricity is not surprising since these goods display strong consumption habits. Attention should also be drawn to the fact that the income variable in the case of household fuel and electricity and petroleum products has now become statistically non-significant.

Services

All categories of services (with the exception of medical services) display highly significant estimated coefficients for the stock variable, particularly categories such as rent and transport and communication services. Changes in disposable income is significant in the case of the aggregate category. The significance of the price variable could also be established at the 5% level in the case of rent, transport and communication services, and recreational, educational and entertainment services. The relatively high coefficients for the price variables particularly in the case of transport services and rent are worth noting.

In general it should be noted that estimates obtained from this model are short-run in nature. Long run effects can only be estimated when the explicit depreciation rate is taken into consideration and when stocks have reached their desired level.

4.4. CONCLUSIONS THAT HAVE EMERGED ON ESTIMATES

In this chapter empirical estimates of the various models under investigation have been presented. It would be useful to look at certain conclusions that have emerged in order to

gain a fuller understanding of the variables that affect consumers' expenditure in South Africa.

Personal disposable income is an important variable in explaining consumption expenditure for the various categories of goods. Exceptions to this however were found in certain categories of durable goods. Furthermore, there is a strong seasonal pattern of consumption present in the various quarters for all categories of goods (with the exception of a few goods mentioned above).

While it did appear that personal disposable income was not an important variable in the consumption of durable goods, installment credit was an important variable in explaining the consumption of furniture and household appliances and personal transport equipment. It also seems that the stock variable is necessary in the explanation of consumer durable goods, particularly in the case of total durable goods consumption and personal transport equipment.

There was no particular model that allowed for the testing of liquid assets as a variable that might affect consumption expenditure. However the inclusion of the liquid asset variable for certain categories of goods indicated that liquid asset holdings might be an important variable in explaining the consumption of services and certain categories of durable goods. While certain categories of durable goods, semi-durable goods and services indicated that consumers were relatively sensitive to changes in prices, a more adequate testing of the effect of changes in prices on consumption expenditure needs to be achieved.

As mentioned earlier the method of estimation used in this empirical analysis was the method of least squares (OLS). The parameter estimates obtained through ordinary least squares are based on the premise that u_t (error term) is uncorrelated with any of the variables in the estimated equation. However, this is generally not the case since income and consumption are not independent of one another. This type of problem that arises is known

as simultaneity bias or least-squares bias. One of the ways of solving this bias is to use an alternative estimation procedure such as two-stage least squares. Evans (1969) has, however, pointed out that in the consumption function biases, arising from simultaneity and from the inclusion of the distributed lag variable (mentioned earlier) could counteract each other to a certain extent.

A further word of caution with regard to the estimates. For some time econometricians have taken comfort and blindly accepted the structural stability of econometric relationships. However Smit and Wesso (1988) have pointed out that due to the changing economic and political climate in South Africa - econometric relationships have become increasingly unstable.

SYMBOLS USED IN THE TABLES

C_T	total consumption
C_D	durable goods
C_{furni}	furniture and household appliances
C_{pte}	personal transport equipment
C_{durec}	recreational and entertainment goods (durable)
$C_{duother}$	other durable goods
C_{SD}	semi-durable goods
C_{cloth}	clothing and footwear
C_{texti}	household textiles, furnishings and glassware
C_{tyres}	motor-car tyres, parts and accessories
C_{sdrec}	recreational and entertainment goods (semi-durable)
C_{sdmis}	miscellaneous goods (semi-durable)
C_{ND}	non-durable goods
C_{food}	food, beverages and tobacco
C_{fuel}	household fuel and power
C_{cons}	household consumer goods
C_{ndmed}	medical and pharmaceutical products (non-durable)
C_{ndrec}	recreational and entertainment goods (non-durable)
C_{petro}	petroleum products
C_S	services
C_{rent}	rent
C_{house}	household services
C_{medse}	medical services
C_{recse}	recreational, entertainment and educational services
C_{transe}	transport and communication services
C_{misse}	miscellaneous services

4.5. REPORT OF ESTIMATES

MODEL A[1]

Table 1 : Total Consumption

Constant	Income	X_1	X_2	X_3	$\bar{R}^2$	S.E.	D.W.
0.16 (0.44)	0.977 (12.92)	0.09 (3.35)	-0.08 (-3.14)	0.04 (1.63)	0.787	0.065	1.85

Table 2 : Durable Goods

Dependent Variable	Constant	Income	X_1	X_2	X_3	$\bar{R}^2$	S.E.	D.W.
C_D	6.54 (4.81)	0.101 (0.73)	-0.18 (-5.47)	-0.15 (-6.25)	-0.14 (-5.54)	0803	0.086	2.06
C_{furni}	4.82 (2.82)	0.085 (1.07)	-0.34 (-5.47)	-0.27 (-4.90)	-0.23 (-4.12)	0.848	0.080	2.16
C_{pte}	4.47 (2.21)	0.213 (1.03)	0.05 (1.06)	0.008 (0.22)	0.04 (1.01)	0.691	0.127	2.21
C_{durec}	5.04 (2.69)	0.054 (0.98)	-0.20 (-4.42)	-0.21 (-5.98)	-0.19 (-5.18)	0.700	0.115	2.36
$C_{duother}$	5.36 (3.07)	-0.034 (-0.19)	-0.37 (-8.66)	-0.34 (-10.80)	-0.34 (-10.23)	0.867	0.112	2.33

[1] The numbers in parenthesis are the values of student's ratio. $\bar{R}^2$ is the coefficient of determination adjusted for degrees of freedom; SE is the standard error of the regression; DW is the Durbin-Watson statistic

Table 3 : Semi-durable Goods

Dependent Variable	Constant	Income	X_1	X_2	X_3	$\bar{R}^2$	S.E.	D.W.
C_{SD}	7.67 (15.55)	0.052 (1.68)	-0.22 (-22.51)	-0.15 (-21.96)	0.18 (-24.68)	0.972	0.026	2.11
C_{cloth}	7.35 (13.53)	0.036 (1.26)	-0.32 (-24.60)	-0.15 (-18.92)	0.25 (-24.67)	0.948	0.033	2.13
C_{texti}	4.71 (5.06)	0.146 (1.61)	-0.18 (-8.35)	-0.18 (-11.32)	-0.18 (-10.57)	0.900	0.058	2.53
C_{tyres}	5.78 (4.62)	0.063 (1.59)	-0.01 (-.063)	-0.01 (0.67)	-0.0006 (-0.03)	0.918	0.069	2.25
C_{sdrec}	3.46 (3.00)	0.236 (2.04)	-0.16 (-5.79)	-0.25 (12.17)	-0.24 (10.84)	0.882	0.072	2.22
C_{sdmis}	6.30 (10.40)	-0.019 (-0.47)	-0.13 (13.31)	-0.11 (-16.36)	1.121 (15.76)	0.977	0.026	2.01

Table 4 : Non-durable Goods

Dependent Variable	Constant	Income	X_1	X_2	X_3	$\bar{R}^2$	S.E.	D.W.
C_{ND}	8.96 (34.11)	0.020 (1.99)	-0.03 (-7.13)	-0.04 (12.46)	0.04 (-12.58)	0.988	0.013	2.47
C_{food}	8.36 (16.79)	0.044 (1.98)	-0.02 (-2.22)	-0.03 (-4.42)	-0.05 (-5.92)	0.953	0.030	2.62
C_{fuel}	5.62 (10.33)	0.066 (1.37)	0.004 (-0.39)	0.042 (4.95)	0.10 (11.00)	0.957	0.031	2.54
C_{cons}	5.57 (10.57)	0.053 (1.69)	-0.16 (-7.91)	-0.14 (-9.16)	-0.14 (-8.64)	0.899	0.055	2.40
C_{ndmed}	6.90 (10.57)	-0.128 (-2.09)	-0.17 (-11.89)	-0.12 (-11.61)	-0.13 (-11.48)	0.932	0.040	2.25
C_{petro}	6.72 (9.52)	0.021 (0.29)	-0.009 (-0.53)	-0.008 (-0.65)	-0.008 (0.62)	0.850	0.045	1.45
C_{ndrec}	5.52 (4.65)	0.030 (1.34)	0.033 (1.09)	-0.07 (-3.26)	-0.07 (-3.29)	0.895	0.080	1.81

Table 5 : Services

Dependent Variable	Constant	Income	X_1	X_2	X_3	$\bar{R}^2$	S.E.	D.W.
C_S	6.74 (5.49)	0.129 (1.92)	-0.03 (-2.61)	-0.02 (-2.94)	-0.003 (-0.03)	0.967	0.031	1.95
C_{rent}	5.44 (4.31)	0.190 (1.50)	0.05 (1.77)	-0.01 (-0.748)	0.03 (1.26)	0.823	0.082	2.58
C_{house}	6.37 (12.01)	-0.038 (-0.70)	0.004 (-0.34)	-0.01 (-1.11)	-0.01 (1.42)	0.772	0.033	2.09
C_{medse}	5.34 (3.89)	0.116 (1.19)	0.04 (1.54)	-0.08 (-4.05)	-0.02 (1.26)	0.894	0.079	2.54
C_{recse}	6.58 (5.82)	0.036 (1.32)	-0.04 (-1.62)	-0.03 (-1.69)	0.02 (1.43)	0.704	0.070	1.85
C_{transe}	4.59 (4.47)	0.258 (2.85)	0.04 (1.83)	-0.02 (1.69)	0.02 (1.43)	0.936	0.059	1.98
C_{misse}	8.23 (6.67)	0.143 (1.18)	-0.16 (-5.47)	0.005 (0.24)	0.028 (1.24)	0.924	0.078	2.06

MODEL B

Table 6 : Total consumption

Constant	Income	IS	Lagged Dependent variable	X_1	X_2	X_3	$\bar{R}^2$	S.E.	D.W
0.03 (0.20)	0.058 (1.61)		0.944 (27.63)	-0.141 (12.49)	-0.055 (-8.83)	-0.066 (-8.58)	0.983	0.017	2.15
0.69 (1.61)	0.045 (1.19)	0.021 (1.71)	0.871 (16.10)	-0.139 (-12.34)	-0.056 (-9.11)	-0.067 (-8.86)	0.983	0.016	2.05

Table 7 : Durable Goods

Dependent Variable	Constant	Income	Prices	Lagged Dependent Variable	X_1	X_2	X_3	$\bar{R}^2$	S.E.	D.W.
C_D	0.60 (0.76)	0.058 (0.56)		0.882 (12.20)	-0.331 (-8.04)	-0.115 (-3.50)	-0.157 (-4.45)	0.783	0.086	2.07
C_{furni}	0.75 (0.73)	0.059 (0.70)		0.831 (10.49)	-0.585 (-13.85)	-0.165 (-5.16)	-0.252 (-7.69)	0.832	0.080	2.17
C_{furni}	0.23 (0.25)	0.19 (0.73)	-0.157 (-1.46)	0.817 (9.51)	-0.568 (-10.07)	-0.168 (-5.12)	-0.244 (-6.57)	0.830	0.081	2.14
C_{pte}	-1.40 (-0.67)	0.308 (1.07)	-0.504 (-1.97)	0.790 (9.23)	0.083 (1.16)	0.009 (0.201)	0.055 (0.94)	0.654	0.128	2.18
C_{durec}	-2.37 (-2.46)	0.410 (3.86)		0.731 (11.35)	-0.289 (-4.83)	-0.207 (-5.68)	-0.141 (-2.56)	0.725	0.102	1.84
$C_{duother}$	-2.15 (-0.90)	0.346 (1.24)	-0.086 (-1.08)	0.881 (13.92)	-0.604 (-7.22)	-0.330 (-7.99)	-0.304 (-5.08)	0.861	0.110	1.89

Table 8 : Semi-durable Goods

Dependent Variable	Constant	Income	I.S.	Lagged Dependent Variable	X_1	X_2	X_3	$\bar{R}^2$	S.E.	D.W.
C_{SD}	-0.07 (-1.24)	0.016 (1.94)		0.902 (16.93)	-0.387 (-17.51)	-0.126 (-12.31)	-0.219 (-17.00)	0.967	0.026	2.17
C_{SD}	0.60 (1.09)	0.066 (1.25)	0.025 (1.52)	0.837 (12.31)	-0.381 (-17.96)	-0.126 (-13.05)	-0.218 (-17.91)	0.974	0.025	2.06
C_{cloth}	1.50 (1.92)	0.048 (1.98)		0.860 (11.61)	-0.534 (-18.97)	-0.120 (-8.78)	-0.313 (-19.34)	0.945	0.033	2.06
C_{texti}	-1.44 (1.97)	0.293 (2.97)		0.790 (10.41)	-0.319 (-8.24)	-0.174 (-8.20)	-0.183 (-7.38)	0.901	0.055	2.43
C_{tyres}	-0.46 (-0.52)	0.111 (0.79)	0.069 (1.84)	0.797 (10.63)	-0.007 (-0.21)	0.003 (0.12)	0.017 (0.58)	0.925	0.065	2.19
C_{sdrec}	-2.33 (2.53)	0.423 (3.45)		0.718 (8.73)	-0.321 (-6.49)	-0.293 (-11.26)	-0.232 (-7.72)	0.887	0.068	2.19
C_{sdmis}	-0.29 (-0.74)	0.067 (1.16)		0.957 (23.11)	-0.229 (-12.62)	-0.106 (-11.11)	-0.113 (-9.48)	0.975	0.026	2.28

Table 9 : Non-durable Goods

Dependent Variable	Constant	Income	ΔY_d	I.S.	Lagged Dependent Variable	X_1	X_2	X_3	$\bar{R}^2$	S.E.	D.W.
C_{ND}	0.14 (0.88)	0.026 (1.79)			0.968 (32.73)	-0.086 (-4.46)	-0.057 (-10.79)	-0.055 (-8.50)	0.987	0.014	2.49
C_{ND}	0.62 (1.65)	0.065 (1.53)		0.072 (1.84)	0.911 (21.51)	-0.085 (-90.48)	-0.056 (-10.66)	-0.056 (-8.72)	0.988	0.010	2.50
C_{food}	-0.85 (-0.24)	0.097 (1.57)			0.905 (17.70)	-0.066 (-3.70)	-0.057 (-5.22)	-0.064 (-4.75)	0.951	0.029	2.56
C_{fuel}	-0.43 (-1.03)	0.081 (1.39)			0.926 (18.59)	0.085 (5.80)	0.146 (10.77)	0.151 (11.53)	0.953	0.031	2.45
C_{cons}	-0.16 (-0.32)	0.122 (1.10)			0.850 (10.52)	-0.284 (-7.51)	-0.118 (-5.60)	-0.144 (-5.77)	0.891	0.055	2.35
C_{ndmed}	-0.43 (-1.03)	0.089 (1.24)			0.926 (18.59)	0.085 (5.80)	0.146 (10.77)	0.151 (11.53)	0.918	0.041	2.47
C_{petro}	-0.11 (-0.83)	0.165 (1.59)	-0.119 (-1.53)		0.775 (8.30)	-0.015 (-0.70)	-0.002 (-0.14)	-0.014 (-0.74)	0.847	0.043	1.92
C_{ndrec}	-2.69 (-2.01)	0.386 (2.34)	-0.245 (-1.85)		0.809 (11.33)	-0.025 (-0.56)	-0.141 (-4.51)	-0.090 (-2.43)	0.901	0.073	1.87

Table 10 : Services

Dependent Variable	Constant	Income	ΔY_d	r	L.A.	Lagged Dependent Variable	X_1	X_2	X_3	$\bar{R}^2$	S.E.	D.W.
C_S	-0.99 (-1.90)	0.23 (2.55)	-0.134 (-2.06)			0.852 (15.85)	-0.025 (-1.37)	-0.008 (0.69)	0.018 (1.16)	0.966	0.030	1.90
C_S	-0.51 (-0.26)	0.053 (0.80)			0.114 (1.64)	0.858 (15.04)	-0.019 (-1.10)	-0.001 (-0.14)	0.029 (2.10)	0.966	0.030	1.99
C_{rent}	-2.17 (-1.71)	0.178 (1.02)		-0.028 (-1.06)	0.255 (1.39)	0.705 (6.90)	0.052 (1.11)	-0.030 (-1.02)	0.041 (1.10)	0.871	0.076	2.36
C_{house}	1.45 (1.82)	-0.044 (-0.96)				0.832 (10.83)	-0.014 (-0.93)	-0.022 (-1.73)	-0.01 (-1.08)	0.751	0.033	2.05
C_{medse}	-2.34 (-2.21)	0.332 (2.43)				0.852 (12.17)	0.102 (2.67)	-0.097 (-3.40)	0.142 (4.60)	0.895	0.075	2.46
C_{recse}	-3.60 (-2.23)	0.527 (2.48)	-0.413 (-2.66)			0.769 (9.67)	-0.039 (-1.07)	0.026 (1.05)	0.024 (0.744)	0.933	0.074	1.86
C_{transe}	-2.36 (-2.95)	0.350 (3.29)				0.846 (15.63)	0.053 (1.79)	-0.024 (-1.10)	0.052 (2.13)	0.934	0.057	1.80
C_{misse}	-1.75 (-2.00)	0.518 (3.85)	-0.413 (-2.66)			0.769 (9.67)	-0.127 (-2.87)	0.175 (5.64)	0.039 (1.01)	0.925	0.074	1.86

MODEL C

Table 11 : Total Consumption

Constant	Income	L.A.	$\sum_{i=1972}^{t-1} (C_a)_i$	X_1	X_2	X_3	$\bar{R}^2$	S.E.	D.W.
5.98 (12.31)	0.031 (1.26)		0.259 (7.69)	-0.080 (-12.16)	-0.069 (-14.47)	-0.067 (-13.09)	0.983	0.016	1.98
5.27 (7.89)	0.033 (1.23)	0.099 (1.41)	0.234 (6.34)	-0.082 (-12.26)	-0.071 (-14.46)	-0.068 (-13.21)	0.983	0.016	2.06

Table 12 : Durable Goods

Dependent Variable	Constant	Income	L.A.	Price	IS	$\sum_{i=1972}^{t-1}(C_a)_i$	X_1	X_2	X_3	$\bar{R}^2$	S.E.	D.W.
C_D	8.92 (5.43)	0.028 (0.22)			0.809 (3.84)	-0.773 (-3.28)	-0.182 (-5.73)	-0.141 (-6.16)	-0.141 (-5.17)	0.822	0.077	1.97
C_D	-0.57 (-0.16)	0.062 (0.54)		-0.626 (-2.36)		-0.092 (-2.09)	-0.198 (-5.82)	-0.162 (-5.79)	-0.134 (-4.90)	0.858	0.085	1.96
C_{furni}	-3.17 (-0.54)	0.047 (0.40)		-0.728 (-1.99)	0.307 (1.63)	0.991 (1.27)	-0.377 (-12.53)	-0.266 (-12.56)	-0.257 (-11.56)	0.880	0.075	2.11
C_{pte}	-1.22 (-0.22)	0.217 (1.06)	0.795 (1.46)			-0.250 (-1.06)	0.037 (0.74)	0.004 (0.10)	0.042 (1.09)	0.650	0.126	2.24
C_{pte}	6.22 (3.11)	0.180 (0.90)			0.952 (3.57)	-0.944 (-3.38)	0.065 (1.34)	0.019 (0.54)	0.056 (1.47)	0.704	0.126	2.12
C_{durec}	-4.58 (-1.41)	0.215 (1.03)	0.807 (2.63)			-0.026 (-0.68)	-0.026 (-0.28)	-0.225 (-2.61)	-0.254 (-4.66)	0.662	0.155	2.11
$C_{duother}$	5.63 (2.99)	0.032 (1.36)				0.004 (0.86)	-0.379 (-8.86)	-0.337 (-10.90)	-0.351 (-10.60)	0.806	0.112	2.33

Table 13 : Semi-durable Goods

Dependent Variable	Constant	Income	L.A.	Price	$\sum_{i=1972}^{t-1}(C_a)_i$	X_1	X_2	X_3	$\bar{R}^2$	S.E.	D.W.
C_{SD}	4.34 (5.62)	0.053 (1.41)			0.028 (4.40)	-0.221 (-22.00)	-0.158 (-21.62)	-0.189 (-24.12)	0.971	0.025	2.1
C_{SD}	2.70 (1.29)	0.053 (1.32)		-0.149 (-1.96)	0.483 (2.04)	-0.223 (-22.15)	-0.158 (-21.15)	-0.188 (-24.26)	0.971	0.025	2.15
C_{cloth}	5.41 (4.86)	0.009 (1.17)			0.166 (1.76)	-0.325 (-24.18)	-0.182 (-18.69)	-0.252 (-24.10)	0.945	0.034	2.14
C_{cloth}	1.64 (0.38)	0.011 (1.20)		-0.316 (-1.14)	0.647 (1.30)	-0.330 (-23.88)	-0.183 (-19.07)	-0.251 (-24.36)	0.945	0.034	2.11
C_{texti}	4.84 (5.08)	0.150 (1.64)			-0.015 (-0.71)	-0.185 (-8.24)	-0.185 (-11.31)	-0.185 (10.60)	0.890	0.059	2.55
C_{tyres}	0.09 (0.07)	0.307 (2.38)			0.289 (2.98)	-0.157 (-3.95)	-0.269 (-11.66)	-0.235 (-9.45)	0.874	0.077	2.14
C_{sdrec}	1.67 (1.69)	0.173 (1.84)			0.280 (4.01)	-0.179 (-7.76)	-0.185 (-11.09)	-0.180 (10.03)	0.903	0.055	2.31
C_{sdmis}	0.16 (0.68)	0.020 (0.84)	0.287 (2.72)		0.266 (5.94)	-0.132 (-12.50)	-0.120 (-15.30)	-0.121 (-14.71)	0.977	0.025	2.08

Table 14 : Non-durable Goods

Dependent Variable	Constant	Income	$\sum_{i=1972}^{t-1} (C_a)_i$	X_1	X_2	X_3	$\bar{R}^2$	S.E.	D.W.
C_{ND}	8.95 (36.65)	0.025 (1.29)	0.006 (1.34)	-0.033 (-6.53)	-0.044 (-12.02)	-0.047 (-11.77)	0.987	0.013	2.41
C_{food}	8.78 (23.70)	0.067 (2.04)	0.048 (3.14)	-0.020 (-2.61)	-0.041 (-7.13)	-0.048 (-7.65)	0.976	0.021	2.06
C_{fuel}	3.50 (4.95)	0.039 (0.52)	0.229 (6.32)	-0.010 (-0.57)	0.045 (3.35)	0.087 (6.00)	0.911	0.043	2.21
C_{cons}	3.70 (3.70)	0.050 (1.06)	0.195 (2.76)	-0.168 (-7.68)	-0.139 (-8.76)	-0.141 (-8.24)	0.899	0.054	2.10
C_{petro}	5.11 (3.80)	0.007 (0.10)	0.144 (1.31)	-0.008 (-0.45)	-0.014 (-1.15)	-0.012 (-0.92)	0.827	0.046	1.35

Table 15 : Services

Dependent Variable	Constant	Income	Price	ΔY_d	$\sum_{i=1972}^{t-1} (C_a)_i$	X_1	X_2	X_3	$\bar{R}^2$	S.E.	D.W.
C_S	4.24 (4.42)	0.139 (1.17)			0.234 (8.06)	-0.003 (-0.10)	-0.015 (-0.74)	0.020 (0.87)	0.884	0.056	0.77
C_S	2.72 (2.27)	0.202 (1.64)		-0.131 (-1.96)	0.310 (5.63)	-0.031 (-2.65)	-0.016 (-1.71)	-0.005 (-0.552)	0.969	0.029	2.01
C_{rent}	1.18 (0.93)	0.175 (1.30)			0.397 (5.63)	0.052 (1.57)	-0.017 (-0.73)	-0.028 (-1.09)	0.879	0.077	2.30
C_{rent}	-5.58 (-1.61)	0.152 (1.19)	-0.873 (-2.07)		1.422 (2.84)	0.044 (1.40)	-0.017 (-0.78)	-0.315 (1.29)	0.886	0.075	2.44
C_{medse}	0.79 (0.25)	0.559 (1.79)		-0.276 (-1.63)	0.011 (0.45)	0.047 (1.60)	-0.065 (-2.64)	0.017 (0.74)	0.905	0.078	2.56
C_{transe}	0.628 (0.48)	0.228 (2.55)			0.388 (3.83)	0.032 (1.47)	-0.022 (-1.41)	0.025 (1.45)	0.944	0.056	1.88
C_{transe}	-5.38 (-2.02)	0.219 (2.68)	-0.859 (-3.00)		1.348 (3.96)	0.030 (1.54)	-0.020 (-1.40)	0.030 (1.95)	0.952	0.052	2.12
C_{recse}	3.06 (2.25)	0.067 (0.43)	-0.195 (-1.95)		0.344 (3.49)	-0.028 (-0.73)	-0.033 (-1.32)	0.037 (1.23)	0.676	0.068	1.21

MODEL B

Table 16. Income elasticities

	Short-run	Long-run
C_T	0.06	1.03
C_D	0.05	0.50
C_{furni}	0.12	0.70
C_{pte}	0.30	1.46
C_{durec}	0.41	1.52
$C_{duother}$	0.34	2.90
C_{SD}	0.10	1.08
C_{cloth}	0.04	0.34
C_{texti}	0.29	1.38
C_{tyres}	0.11	2.08
C_{sdrec}	0.42	1.50
C_{sdmis}	0.06	1.55
C_{ND}	0.06	0.81
C_{food}	0.09	0.95
C_{fuel}	0.08	1.08
C_{cons}	0.12	0.81
C_{ndmed}	0.09	1.21
C_{ndrec}	0.38	2.02
C_{petro}	0.16	0.74
C_S	0.23	1.55
C_{rent}	0.17	0.61
C_{house}	-0.04	-0.30
C_{medse}	0.33	2.22
C_{recse}	0.51	0.98
C_{transe}	0.35	2.27
C_{misse}	0.03	2.28

MODEL B

Table 17. Marginal propensity to consume

	Short-run	Long-run
C_T	0.031	1.00
C_D	0.018	0.10
C_{furni}	0.005	0.02
C_{pte}	0.010	0.05
C_{durec}	0.005	0.01
$C_{duother}$	0.004	0.02
C_{SD}	0.018	0.17
C_{cloth}	0.007	0.04
C_{texti}	0.006	0.03
C_{tyres}	0.006	0.05
C_{sdrec}	0.008	0.03
C_{sdmis}	0.008	0.42
C_{ND}	0.005	0.37
C_{food}	0.022	0.39
C_{fuel}	0.004	0.02
C_{ndmed}	0.002	0.33
C_{petro}	0.004	0.03
C_S	0.011	0.34
C_{rent}	0.028	0.14
C_{medse}	0.006	0.15
C_{recse}	0.008	0.11
C_{transe}	0.010	0.20
C_{misse}	0.011	0.39

CHAPTER 5

POLICY RECOMMENDATIONS AND CONCLUSIONS

5.1. THE SOUTH AFRICAN CONTEXT

Estimated econometric models can be important and very useful in the formulation and in the evaluation of economic policy. In this context, an analysis of consumer expenditure as the largest component of Gross Domestic Product (GDP) together with identifying those factors that have influence are important for both monetary and fiscal policy. For instance, in 1978 private consumption expenditure made up 49.2% of GDP, while in 1988 this figure has gradually crept higher (at the expense of gross domestic fixed investment) to 55.7% (Bureau for Economic Research, 1989).

Generally, measures to curb or encourage private consumption expenditure in South Africa have taken various forms over the fifteen year period under consideration. For example, in 1984 consumer spending due to brisk demand increased at a rate that threatened the balance of payments. Hence, the authorities introduced drastic indirect measures to curb demand and cool down the economy. These policy measures included a rise in the prime rate which was aimed at allowing the exchange rate to find its unimpeded market related level; interest rates were allowed to increase rather sharply coupled with further increase in the price of petrol. From time to time more stringent requirements with respect to hire purchase requirements and other types of consumer credit have also been introduced. These measures were introduced mainly to reduce negative savings and to curb the demand of consumer durable goods. On the other hand, factors such as bracket creep and high inflation rates have tended to slow down and erode growth in real personal incomes. Much of this was reflected in consumption behaviour as spending and saving came under pressure.

Well-known Keynesian policies advocate the use of government policy to stimulate aggregate demand through it various components, such as consumption and via the multiplier. Monetary policy, on the other hand, has a major impact either through the interest rate or liquid asset (real balance) effects.

5.2. USING MACROECONOMIC POLICY TO INFLUENCE PRIVATE CONSUMPTION EXPENDITURE

5.2.1. The disaggregated approach and policy making

The classification and disaggregation of private consumption expenditure into various categories of goods and services provide a useful framework for consumer demand and welfare analysis as well as in the formulation and implementation of measures that call for stimulation or restraint on particular categories of goods and services (van Rensburg , 1973). Such measures include changes in personal income taxes, consumption taxes, such as VAT, hire-purchase contracts, interest rates, consumer credit and import regulations.

Pertinent to this discussion and important, too, is the consideration of the different income elasticities (see table 16) as well as price elasticities on the various goods. Quantitative estimates of the demand parameter for the various categories of goods and services can be valuable to both public and private decisions. This type of information can aid in the forecasting of future or potential markets, merchandise planning and advertising. For instance, estimates of income elasticities can be used to translate projections of average income growth rates into growth rates of demand for particular goods and services. It is worth noting that all the categories of goods and services under consideration (with the exception of one) could either be classified as having income elastic or demand inelastic.

5.2.2. The influence of inertia in consumption behaviour

Estimates and tests which were obtained from model B are consistent with both an adaptive expectations and partial adjustment mechanism. In particular, there is virtually no evidence to invalidate the behaviour of habit persistence among South African consumers during the period under investigation.

The different theories on the consumption function offer different perspectives on how consumers will behave in aggregate, therefore policy implications will differ depending on which theory is adopted. Consider the following example in which there is an attempt to expand incomes : this could result in the South African Reserve Bank increasing the money supply. The effect of this policy in the short run would be an increase in incomes and a decrease in interest rates. According to the PIH, a change in measured income would cause an increase in permanent income. Consumers in the following period will then exhibit behaviour based upon this higher level of permanent income. Eventually, measured and permanent income will come together at a particular value and will be maintained.

Analogous results can be derived (with slight variations) from the RIH and LCH. The common thread that brings all these theories together is that they recognise the influence of past consumption behaviour on present consumption behaviour. Therefore in the scenario discussed above, the effect of monetary policy would be to stimulate a process that will lead to long run adjustment. The role of inertia in consumer behaviour has a powerful influence on the way in which economic variables behave. Ignoring this fact in the formulation of economic policy could lead to misleading results.

5.2.3. Revisiting the multiplier

The intention of the AIH in many respects is to provide a basis for the mechanism of the multiplier. The introduction of lags in consumer behaviour means that one needs then to

revise the multiplier mechanism. In essence what this means is that any delays will interrupt the reactions of income to autonomous demand and disable the application of discretionary economic policy.

Brown's habit persistence version of the consumption function revives the notion of the short-term multiplier whereas the Friedman's PIH goes even further to adopt a more critical approach, leading to an affirmation of the multiplier's overall instability (Henin, 1986). Related to this argument as well is the distinct formulation of a process in which expectations are formed and how this in turn will influence the multiplier process.

5.3. CONSUMPTION AND MONETARY POLICY

For some time now, there has been debate as to whether and to what extent monetary policy affects economic activity through it influence on consumption. The major instruments at the disposal of monetary policy are reserve requirements and the interest rate. It can be argued that consumption is one of the most important means through which these instruments can be used to affect (whether this be directly or indirectly) the level of output, employment, prices and the aggregate level of money demand .

On the other hand, the critics of monetary policy have proposed that the impact of monetary policy on spending decisions in the economy is so subtle that it seems not to exist. More particularly the influence of monetary policy on total spending - often by changing the value, volume and composition of financial assets holdings - is regarded as too weak or indirect a mechanism to be relied upon (Schlesinger, 1961). Recent views however suggest that the effectiveness of monetary policy relative to fiscal policy has increased through the inclusion of real assets as a determinant of consumer demand. Asset values are primarily affected by the interest rate. Expansionary monetary policy will have the effect of reducing the interest rate which, in addition to having effects on investment, will increase the value of real assets and stimulate consumption (Branson, 1979).

Modigliani (1971) proposes that it is primarily through the wealth effect that consumption is affected by monetary policy. It can be shown in the Modigliani analysis that the introduction of wealth in the consumption function and the recognition of the feedback of consumption on wealth via savings have unusual implications[1]. With the introduction of wealth in the short-run consumption function, monetary policy can affect aggregate demand not only through the conventional way of investment but also through the market value of assets and consumption.

To a certain extent, trying to infer how monetary policy and more especially how changes in the money supply affect changes in money income depends on which school of thought is the most influential at the time. Tobin and Swan (1969) in considering this issue find that there is little evidence to support the view that there is a simple and direct relationship between income and money. In fact if money demand is sensitive to interest rates, short-run fluctuations in income can be due to non-monetary as well as monetary causes. This, of course, leaves room for a Keynesian interpretation where fiscal policy and exogenous changes in private consumption expenditure as well as monetary factors come to affect income (Tobin and Swan, 1969).

5.4. THE IMPORTANCE OF CREDIT

Results from Model C suggest that one of the major determinants of the purchase of certain categories of consumer durables, viz., furniture and household appliances and personal transport equipment, is consumer instalment credit.

Consumption expenditure on consumer durables goods is the most volatile component of consumer demand. Furthermore patterns of durable goods consumption tend to be cyclical.

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[1]Modigliani in his paper on consumer spending and monetary policy provides a powerful analysis on the effects of monetary policy on income and how this works through a rich and complicated set of linkages. The framework for his analysis is the Federal Reserve-MIT-Penn Model.

Therefore the manipulation of hire-purchase credit requirements ie. consumer instalment credit, can affect the growth of consumer demand for these particular goods, thereby heightening the cyclical pattern of durable good purchases. Other related factors that will affect this cyclical pattern are changes in the minimum deposit rate on new installment purchases, the minimum monthly payment and the lagged stock of consumer hire purchase debt. In 1986 and early 1989 stringent hire purchase regulations (especially on motor-cars and households appliances) was one of the factors that contributed to a decline in real consumer spending during these periods.

What has become clear is that this category of consumers can be influenced for anti-cyclical purposes through monetary policy. If, for instance, the domestic economy needs stimulation, installment credit sale requirements can be eased in an attempt to encourage demand for these goods.

While results from the models in question did not indicate the interest rate as being a variable that affects private consumption expenditure, the influence of the interest rate is often realised through the availability of credit. This affects the purchases of cars and houses. Interest rates on consumer credit for such goods tend to be normally high and rigid, with the demand for credit tending to be relatively inelastic.

5.5. CONSUMPTION AND FISCAL POLICY

5.5.1. Influence of the marginal propensity to consume on policy decisions

It has become quite clear from the estimates of models A to C that disposable income is an important variable in explaining total consumption and the various categories of consumption expenditure.

The effectiveness of the balanced budget multiplier lies in the claim that the MPC must differ in various sectors of the economy. If this is so, then a transfer of income to consumers with a high MPC, which is financed by taxes upon those who have a low MPC will generate

an expansion of income throughout the economy (Shaw, 1977).

Let us assume that the primary determinant consumption is income (as in model A) and that the government needs to raise revenue for its own expenditure through a lump sum tax. The net effect of such action will be an increase in aggregate expenditure, due to the fact that the increase in government expenditure is greater then the induced fall in consumption. However it should be noted that while the government spends all the tax revenue, only a part of this is financed through a reduction in consumption while the rest will be financed through savings. Thus as long as the MPC is less than one, the net effect of such action will be to increase the equilibrium level of national income.

One additional observation of Shaw's analysis is worth noting : the expansion of income which comes about due to this type of fiscal change is equal to the increase in government expenditure. This means that an increase in income is independent of the value of the MPC.

5.5.2. The influence of fiscal policy more closely considered

There is little doubt as to the importance of the consumption function in fiscal intervention and policy. In fact the use of fiscal policy ties in with the Keynesian analysis in which the consumption function is central to the issue of national income determination. The potency of fiscal policy to influence personal disposable income and thereby consumption expenditure is realised if the marginal propensity to consume out of disposable income is high and fairly stable. Notwithstanding this is only true to the extent that one subscribes to the simple Keynesian consumption function. Other explanations for consumer behaviour (models B and C) tend to weaken the case for fiscal policy. For instance, if one were to assume that consumption is determined by permanent income rather than disposable income, any effort to bring about a counter cyclical fiscal change in personal disposable income is likely to have very little effect (Shaw, 1977).

5.5.3. The influence of taxation

There are two types of taxes that should be considered : a tax imposed on income as a whole, which will then affect both consumption and savings, and a tax on consumption alone.

Consider for instance the effect of a temporary change in income tax. One of the standard prescriptions for counter cyclical fiscal policy is the raising of income taxes in periods of inflation and lowering them during periods of recession. As pointed out in the foregoing discussion, the effectiveness of such action depends on whether consumption is determined by permanent income or transitory income. Mayer (1979) points out that if consumption depends more on permanent income, then a temporary decrease in tax during a recession consumption is likely to be stimulated only by the amount of tax saved multiplied by the yield on investing this saving multiplied by the marginal propensity to consume. Temporary taxes may however have an effect on the purchase of durable goods.[2]

The effects of indirect taxes e.g. sales tax, can not be analysed under the conventional Keynesian model since one needs to consider aspects such as incidence, price illusion and tax-induced price changes. It is generally assumed that sales taxes tend to be regressive and that individuals in the lower income brackets demonstrate a higher marginal propensity to consume. Shaw (1977), in offering an explanation of this, states that part of income tax is paid from savings while a consumption tax must fall almost entirely on consumer outlays, thereby exerting a greater deflationary impact. A progressive tax on consumption, on the other hand, tends to be more equitable than a tax on current income (Modigliani, 1985).

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[2]Okun (1971) conducted an study to estimate the extent to which consumption was directly curbed by an added personal income tax (personal tax surcharge). He disaggregates consumption into various broad categories of goods , finding that there was considerably strong demand for cars during this period and a much weaker demand for goods in other consumption categories.

This is due to the fact that this type of tax, affects permanent income and is an incentive to savings.

5.5.4. The effect of borrowing and the burden of public debt

The issue of the way in which a government chooses to finance its expenditure will affect aggregate demand and ultimately consumer expenditure depends on whether one supports the traditional Keynesian view or the New Classical one.

Keynesian theory tended to exaggerate the dependence of consumer on current income receipts as a source of liquid cash; and hence it relied fairly heavily on the premise that consumer spending could be closely controlled through fiscal policy by adjustments in taxes and transfer payments. It is well known that one now needs to take a longer term perspective on consumption and savings behaviour by using their budget constraint to adjust their choice between consumption now and in the future. The application of this approach to government policy is dependent on the expectations that current policy generates about future real income after tax (Tobin and Buiter, 1985).

The new classical theory asserts that the way a government chooses to finance its debt - whether it be through the issue of bonds or through taxation - makes no difference to aggregate demand and its composition. Tobin and Buiter (1985) point out that this Ricardian equivalence doctrine has serious implications for government finance policy. For instance, if the economy is in a situation of underemployment disequilibrium, a shift in policy from tax finance to debt finance is not expansionary. Neither consumption nor aggregate demand will increase at current prices and consequently there will be no increase in output, real income and employment.[3]

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[3]Tobin went on to reject the neutrality propositions of the new Ricardian theorists as being so unrealistic that it would be foolish to base policy upon them.

For the most part the Ricardian equivalence doctrine has fallen into disrepute with some economists- Tobin and Buiter (1985) and Modigliani (1985). This conclusion is reached on the proposition that, if private savings and consumption are controlled by life cycle considerations, this should be independent of the government budget position and therefore private wealth should be independent of the national debt (Modigliani, 1985).

5.5.5. Fiscal policy and expectations

Consumers' expectations of fiscal policy in the future may have effects on current aggregate demand. Allowing for such expectational effects could have considerable implications for reliable measurement of fiscal stance as well as for the predictability of the influence of fiscal policy on aggregate demand (Stevenson et al, 1988). As discussed in a preceding chapter, initially expectations were modelled around an adaptive expectations view. However with the advent of the rational expectations hypothesis, consumers are thought to be forward looking. Even forward looking consumers with very short time horizons, current consumption and income can be affected by expectations in future fiscal policy.

Let us assume that through fiscal policy government wants to increase it spending or to reduce taxes in order to bring income to a higher level. If consumers are able to predict such a change in the future, they are then able to consider the consequences of this 'shock' for future incomes and current wealth. The impact will not be immediate; incomes will rise suddenly to an intermediate level and then gradually until such time that a new equilibrium level of income is reached when the policy is implemented (Stevenson et al, 1988). The forward looking consumer is not caught off guard when it comes to fiscal action.

Deciding which of the two instruments of economic stabilisation is more potent is generally difficult. Put very simply, monetary policy has the effect of making consumers more liquid in a way that does not add directly to their incomes or wealth, while fiscal policy on the other hand tries to enhance the consumers' income and wealth without increasing their

liquidity (Okun,1983). In recent years monetary policy has had a significant influence on consumption through the market value of securities and bonds. (This is apart from its impact through the cost and availability of installment sales credit.)

5.6. CONCLUSION

The preceding discussion and this research highlights the importance of consumer expenditure - at both a theoretical and empirical level - as one of the largest components of gross domestic product. The general aim and purpose of this research is to provide some indication of the variables that are important in the explanation of total consumption behaviour, and its various components, in the context of three consumption models that would best explain the behaviour of consumers in South Africa. It is evident that the use of disaggregated data by considering consumer demand functions for specific items of consumer expenditure provided substantial tests of these competing hypotheses. While the estimates do have certain implications for fiscal and monetary policy at this stage, these should only be regarded as suggestive.

Directions for further research

While the present study attempts to provide a coherent framework for the examination of consumer behaviour in South Africa, it is by no means complete. Attempts to add a model that tested for the liquid assets proved unsuccessful; however, the inclusion of the liquid assets variable as a possible determinant of consumption could be one of the factors behind the consumption in certain categories of goods and services This would mean recasting the liquid asset variable in a way that is more appropriate for estimation. Another important and much neglected area of research into the consumption function, particularly in South Africa, is the application of cross-section or budget studies. This type of study, where one observes the behaviour of household units at different levels of income at a given point in time, would be of considerable relevance in a heterogeneous society such as South Africa.

Although the present study did attempt to disaggregate consumption expenditure into twenty-one categories of various goods and services, a further disaggregation of consumption expenditure for very specific items of goods and services could provide more powerful tests. A further area of study that could also contribute to a complete and comprehensive approach would be to adopt a more general framework where consumption features as part of a wider macroeconomic model.

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