Private Consumption in the GCC Countries: An Empirical Investigation (1970-1992)

Yousuf H.J. Mohammad(*)

I. INTRODUCTION

Prior to the 1970s there was a general consensus that the consumption function was well-behaved and followed a systematic path. In this respect, it was believed that the permanent income is the major determinant of consumption decisions. In addition, some other variables can be added to the consumption function to reflect the effects of economic policy on private consumption (e.g. the rate of interest and credit availability).

Since the mid 1970s, however, there have been notable developments in the empirical work dealing with the consumption function. The main conclusion that can be drawn from these developments is that the points of controversy around the behavior of private consumption outweigh the points of agreement. In this respect, empirical works before the mid seventies (e.g. Wright 1969, Modigliani & Bruberg 1954 and Friedman 1957) were concentrating on proving that private consumption does not depend entirely on current income, but rather it is mainly determined by individuals' expectation of life time income (e.g. the permanent income). In contrast, empirical studies during the last twenty years have been concentrating on questioning the permanent income hypothesis itself.

(*) Department of Economics College of Administrative Sciences Kuwait University March 1996
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For example, Hall (1978), Flavin (1981) and Blinder and Deaton (1985) in three major empirical studies concluded that current consumption is significantly sensitive to changes in expected income. This implies that current consumption is sensitive to past income (which is normally taken as a basis for forecasting future income). This conclusion simply implies that the permanent income hypothesis is not necessarily the ideal form to explain consumption behavior. This is because it implicitly assumes, in contrast to the previous conclusion, that changes in consumption can not be predicted.

Based on the above discussion, it follows that a study of the behavior of private consumption must not rely entirely on one particular hypothesis. Rather, it would be more fruitful to consider all major consumption theories and view them as alternative hypotheses that should be empirically tested. In this respect, it should be noted that empirical tests of different consumption hypotheses could prove them all correct. The reason for that stems from the fact that different consumption hypotheses take income - albeit with different definitions - as the main determinant of consumption.

Following the above reasoning, this study analyzes the behavior of private consumption in the GCC countries over the period 1970-1992 in an attempt to answer the following questions: (a) Did private consumption in the GCC countries behave in accordance with any known consumption hypothesis? (b) What were the major determinants of private consumption in the GCC countries, and why? (c) Were there policy variables that affected the behavior of private consumers in these countries, in a way that helps policy makers understand why people consume more and save less, or simply, why people do not save out of current income?

The objective of this study is to specify and estimate the consumption function that is relevant to explain the behavior of private consumption in the GCC countries over the period 1970-1992. In addition to this major objective, the study also aims to examine the possible effects of the interest rate - as a policy variable - on private consumption and, hence, on private saving. Moreover, it is aimed at ascertaining whether private consumption in the GCC countries followed a Random-Walk behavior over the same period.

The main hypothesis we seek to test here is whether private consumers are rational when they make decisions about consumption and asset accumulation. They are rational in the sense that they correctly read

and use available information. Because the policy maker represents a major source of information, one would expect policy variables - i.e. the interest rate in our case - to affect consumer decisions. In this respect, if the interest rate is distorted - as it is the case in the GCC countries - private consumers will ignore its signals. This implies that the interest rate in the GCC countries will have no significant effect on consumers' decisions concerning consumption, saving, and asset accumulation.

The analytical approach we follow - as it is fully described in section III -is based on a constructed model of Intertemporal Choice. This model is assumed throughout this study to form the basis for all known consumption hypotheses. Also, this model is believed relevant to tracing individuals' decisions about consumption. This is true in the sense that individuals are expected to regularly adjust current consumption according to their valuation of permanent income and its determinants.

The remaining part of this paper is divided as follows: Section II presents the macro-economic picture of private consumption in the GCC countries over the period 1970-1992. Section III discusses the theoretical framework that consists of a model of intertemporal choice and the relevant consumption hypotheses amenable to empirical testing. Section IV reports the main econometric tests and results. Finally, section V presents the main conclusions and policy implications.

II. THE MACROECONOMIC PICTURE

The mid 1970's witnessed sudden and large increases in per capita income in the GCC Countries due to what was commonly referred to as the "oil boom". In 1974 the price of oil was pushed up to $11.22 per barrel after a long period of stagnant prices (i.e. $2.11 per barrel over the period 1964-1973).[1] The dramatic rise in oil revenues was reflected in the growth rates of both real per capita disposable income and real per capita consumption, as governments spread the newly acquired wealth to the people of these countries.

In contrast, over the period 1983-1992 the oil market experienced a persistent decline in oil prices and consequently oil revenues of the GCC governments fell sharply. This in turn was reflected in reduced government spending leading to lower economic activity. Table (1) below shows the annual compound growth rates for both per capita disposable income and per capita consumption in the GCC Countries for the period 1970-1992.

TABLE (1): ANNUAL COMPOUND GROWTH RATES FOR PER CAPITA DISPOSABLE INCOME AND PER CAPITA CONSUMPTION IN THE GCC COUNTRIES (1970 - 1992)+

COUNTRY	1970-1982	1982-1992
Bahrain	5.6 (6.5)	-1.1 (-0.1)
Kuwait	1.3 (7.7)	-5.7 (-7.8)
Oman	8.6 (24.6)	1.9 (-2.4)
Qatar	16.3 (16.6)	-7.5 (-6.5)
Saudi Arabia	7.1 (18.0)	-6.3* (-7.4)*
UAE	1.2 (2.7)	-4.4 (-4.7)

+) **Calculated by estimating a semi-log trend function of the form:** $\chi_t = \chi_o e^{rt}$ **or in log form:** $L_n \chi_t = a + rt$.
The compound growth rate is: $r = [\text{anti-}l_n\ r\text{-}1]\ 100$.

*) **Using data for the period 1983 - 1989.**

Note: Figures in parentheses are the compound growth rates for per capita consumption.

Figures in table (1) indicate that, in all GCC Countries, real per capita disposable income and real per capita consumption experienced positive and substantial compound growth rates during the period 1970-1982. However, the period 1983-1992 witnessed compound growth rates for consumption and income (in real term) that were negative. It is also noted that over the two time periods growth rates of real consumption were greater than the corresponding growth rates for real income. These growth

patterns for real income and real consumption have two important implications as far as the analysis in this study is concerned:

(i) The remarkable fall in both income and consumption growth after 1982 (i.e. the end of the oil boom) would imply that the GCC Countries have experienced certain shifts in their consumption behavior over different time periods (i.e. before, during, and after the oil boom).

(ii) The empirical fact that consumption growth exceeds income growth seems to indicate that the elasticity of consumption with respect to income exceeds unity and/or the average propensity to consume is positively correlated with income over time. If this proves to be true, it will be wrong to assume that consumption behavior in the GCC Countries behaves according to known and commonly accepted consumption hypotheses.

Consequently, before modeling consumption behavior in the GCC Countries, it is necessary to test the validity of the above two propsitions in order to correctly specify the appropriate consumption functions for these countries.

According to economic theory, the propensities to consume (average and marginal) are expected to decline, in the short-run, as income increases. In the long-run, however, the propensities to consume tend to stabilize.[2] This implies that the income elasticity of consumption tends to be smaller than one in the short-run and close to one in the long-run.

Examining table (2), which lists the average propensity to consume (apc) in the various GCC Countries, it clearly reveals that the average propensity to consume is very low and not stable over time. In addition, as figures (1) to (6) show, there were marked increases in the apc's of Kuwait, Oman and Saudi Arabia during the oil boom period (1974-192). In contrast, for Bahrain, Qatar, and United Arab Emirates their apc's were relatively stable over the entire period (1970-1992). However, table (2) and figures (1) to (6) do not clearly indicate whether the apc's in the GCC Countries have increased with the increase in real per capita income. If this proves to be true, it would suggest that the behavior of private consumption expenditures in the GCC Countries does not conform to economic theory.

TABLE (2)
AVERAGE PROPENSITY TO CONSUME (APC)
IN THE GCC COUNTRIES (1970 - 1992)

	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	United Arab Emirates
1970	0.400	0.147	0.083	0.210	0.155	0.435
1972	0.400	0.142	0.115	0.210	0.127	0.436
1974	0.339	0.130	0.106	0.221	0.092	0.427
1976	0.340	0.187	0.252	0.204	0.116	0.436
1978	0.407	0.213	0.259	0.196	0.202	0.427
1980	0.366	0.314	0.327	0.205	0.310	0.397
1982	0.444	0.387	0.395	0.237	0.423	0.401
1984	0.404	0.389	0.357	0.251	0.545	0.390
1986	0.336	0.318	0.270	0.243	0.507	0.336
1988	0.410	0.339	0.309	0.257	0.481	0.381
1990	0.415	0.397	0.242	0.259	0.496*	0.362
1992	0.445	0.321	0.257	0.259	_	0.399

*** Using 1989 data.**

- Not available.

In order to test the above proposition, the apc was regressed against per capita income. The results (as shown in table 3) and discussed below are inconclusive:

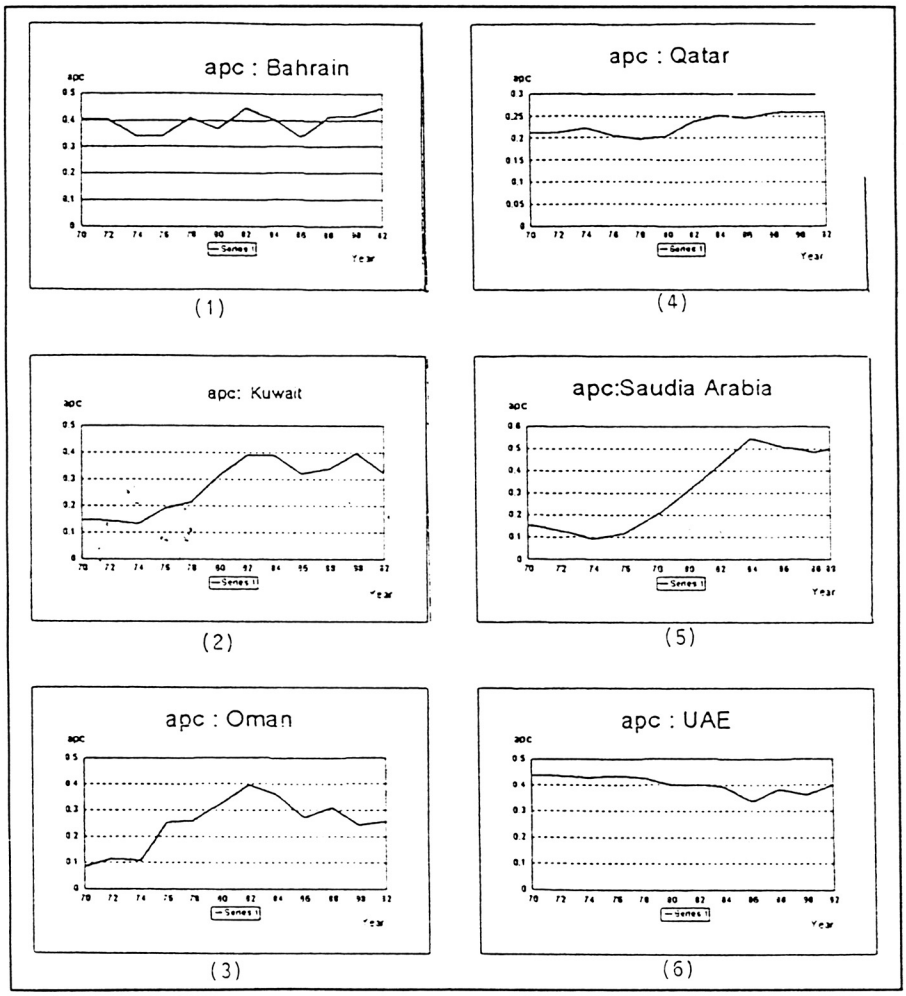
1. For all GCC Countries as a group we cannot reject the null hypothesis that c_1 = zero. That is, statistical evidence does not support the hypothesis that changes in per capita income had significant effects on the apc's. It is noted that, according to economic theory one would expect the value of c_1 during the period 1974-1982 (i.e. the oil boom period) to be negative and significantly different from zero. Our data,

however, does not lend support to this expectation for the GCC Countries as a group and for Bahrain and Qatar as two individual cases.

2. The behavior of the apc in Kuwait and Saudi Arabia seem to follow the prediction of economic theory. The coefficient c_1 is negative and significantly different from zero. In contrast, there seems to be a strong statistical evidence that the apc has increased with the increase in per capita income in Oman and UAE.

Figures (1) - (6)

Average Propensity to Consume (apc) in the GCC Countries (1970-1992)



The patterns of the marginal propensity to consume (mpc) and the elasticity of consumption with respect to income lead to similar conclusions. On the one hand, the value of the mpc for Kuwait and Saudi Arabia (i.e. table 4) is smaller than the apc (i.e. table 2). Also, the elasticity of consumption with respect to income is smaller than one (0.411 and 0.725, respectively). This again suggests that consumption behavior in Kuwait and Saudi Arabia did conform to economic theory during the period 1970-1992. On the other hand, data for Oman and UAE reveal that the average propensity to consume was smaller than the marginal propensity to consume and the elasticity of consumption with respect to income was greater than one.

TABLE (3): BEHAVIOR OF APC IN THE GCC COUNTRIES (1970-1992)

$$(C / Y) = c_0 + c_1 Y + e$$

Country (Sample period)	c_0	c_1	R^2	D.W.
Bahrain (1970-1992)	0.4738 (8.943)	-0.00001 (-1.489)	0.320	1.58
Kuwait (1970-1992)	0.3861 (4.959)	-0.00001 (-1.761)	0.695	2.07
Oman (1970-1992)	0.0463 (0.559)	0.00004 (2.543)	0.831	1.74
Qatar (1970-1992)	0.4738 (8.943)	-0.00001 (-1.489)	0.320	1.579
Saudi Arabia (1970-1989)	0.4526 (2.828)	-0.00002 (-1.791)	0.940	0.981
United Arab Emirates (1970-1992)	0.3436 (13.142)	0.000003 (2.448)	0.232	1.96
All GCC (1970-1973)	0.1719 (2.585)	0.000004 (1.294)	0.470	1.63
All GCC (1974-1982)	0.2956 (6.721)	-0.0000001 (-0.265)	0.521	1.79
All GCC (1983-1992)	0.4032 (9.463)	-0.00003 (-1.138)	0.554	2.16
All GCC (1970-1992)	0.2843 (9.377)	0.000002 (1.339)	0.499	1.93

*** Figures in parentheses are t values..**

TABLE (4)
THE MPC AND ELASTICITY OF CONSUMPTION WITH RESPECT TO INCOME IN GCC
1970-1992)

Country	Income Elasticity of Consumption	Marginal Prospensity to Consume (MPC)
All GCC	1.068	0.190
Bahrain	0.941	0.313
Kuwait	0.411	0.072
Oman	1.953	0.415
Qatar	1.075	0.020
Saudi Arabia	0.725	0.089
United Arab Emirates	1.160	0.451

III. THEORETICAL FRAMEWORK

III. 1. The Life Cycle Model

The macro-economic picture of private consumption in the GCC countries, as it is shown in section II, opens the question of whether private consumption behaves according to any of the conventional consumption hypotheses. The prime objectives of these hypotheses are to test the long-run proportionality of consumption and disposable income, and to test for the stability of the propensities to consume in the long run. The findings of section II do not give a clear-cut indication that the propositions of proportionality and stability were valid in the GCC Countries over the period 1970-1992. This would imply that consumer expenditure in these countries did not follow a systematic behaviour.

It follows that a study of the behavior of private consumption in the GCC Countries is best undertaken within a theoretical framework that is different from the conventional hypotheses. The proposed framework should meet two basic requirements:

(i) Provide an explanation of the dynamic behavior of private

consumption in the short-run. This would require the relaxation of the strong assumption of the absolute income hypotheses that individuals make consumption decisions regardless of what happened in the past and/or what would happen in the future. In other words, the proposed theoretical framework is based on the life-cycle hypothesis.

(ii) Emphasize the role of the interest rate as another variable (other than income) in explaining the behavior of private consumption.

Consumption can be viewed as a decision to spend income (or parts of income) now as opposed to holding income to finance expenditure in the future. In this respect, the theory of consumption can be expressed as a theory of "intertemporal choice.". This theory is simply a representation of the trade-off between current and future consumption (i.e. saving). It follows that an individual's consumption decision is a kind of intertemporal allocation of income, and not a decision at a point in time as suggested by the absolute income hypothesis. This allocation decision is undertaken within a time span that is extended to the whole life of the consumer. In other words, when individuals make consumption decisions they will be affected by the expected lifetime income and not just by the current income. Accordingly, the individual's utility function can be stated as:

$$U = u\,(C_1, C_2, C_3, \ldots C_T) \qquad (1)$$

where: U is utility, C is consumption, and the life time starts from year 1 to year T.

Equation (1) is simply the life time utility function that allows for "substitutability and complementarity between consumption levels in different periods,..." (Deaton 1992, 4). The consumer will always aim at maximizing (1) subject to his budget constraint. In this respect, the consumer will try to adjust his consumption level every time period in accordance with the past, current and expected future levels of income.

Since the utility function (1) is a function of intertemporal choice, the related budget constraint ought to be the life-time income constraint. This is certainly not the current income. According to Deaton (1992) the life-time income of a consumer consists of labor income (Y) and returns on the current stock of assets.[3] This current stock of assets (A_t) is expected to change in the next period such that:

$$A_{t+1} = (1+r)\,(A_t + Y_t - C_t) \qquad (2)$$

where: r is the rate of return on assets (or the rate of interest).

Equation (2) implies that the stock of assets in the next period (A_{t+1}) is broken down into two parts: the first part is the current stock of assets plus its expected return, or $(1+r)\,A_t$, and the second part can be called excess income plus its expected return (if any), or $(1 + r)\,(Y_t - C_t)$. If the stock of assets in the end of life time is zero, consumption will be:

$$C_T = A_T + Y_T \qquad (3)$$

or

$$A_T = C_T - Y_T \qquad (4)$$

Using (4) to solve (2) we get:

$$\sum C_t / (1+r)^{t-1} = A_t + \sum Y_t / (1+r)^{t-1} \qquad (5)$$

Equation (5) indicates that the present value of consumption over the life time of an individual is equal to the current stock of assets he owns in addition to the present value of his labor income over his life time.

If individuals followed a behaviour similar to that described by equation (5), one would expect consumption to occur at constant rates which, in turn, would be equal - or close - to the expected average consumption over the life cycle (Modigliani 1986, 312). This also implies that individuals will continuously adjust their consumption levels over time taking into consideration the expected life-time income and the expected stock of life-time assets. Figure (7) is an illustration of this adjustment process undertaken by a hypothetical consumer. The figure indicates that labor income (Y) is constant throughout the years of working life (say 60 years) and zero throughout the years of retirement. According to equation (5), consumption rates are also constant over life-time (say 70 years).

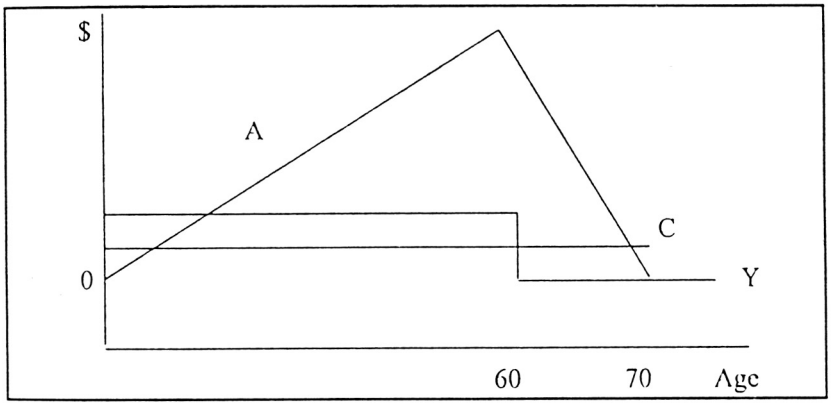


Figure (7)

Following the above simple representation of the life cycle model, one could identify the main variables that ought to be considered in a study of consumption behavior. These variables are: consumption, income (with different definitions), saving (as a means of accumulating assets), and the interest rate (as a return on assets). In what follows we will consider the main relationships among these major variable within the framework of different consumption hypotheses.

III.2. Consumption and Income:

The life cycle model, as presented by equation (5) and figure (7), can be taken as a basic framework for all known consumption hypotheses. This will be true if one realizes that the different consumption hypotheses take consumption as a positive function of income, even though income is viewed differently by each hypothesis.

1. The Absolute Income Hypothesis:

The implicit assumption of this hypothesis is that the accumulated stock of assets will have no impact on consumption decisions. Moreover, this hypothesis gives no clear indication that individuals accumulate assets for precautionary motives related to future consumption. Accordingly, current consumption is a positive and stable function of current income: $C_t = f(Y_t)$

2. The Relative Income Hypothesis:

Equation (5) and figure (7) indicate that individuals adjust - or ought to adjust - consumption levels over time in order to maintain a certain standard of living throughout the life cycle. One way to undertake this adjustment process is to take into consideration, as suggested by Duesenberry (1949), Modigliani (1949), and Modigliani & Bruberg (1954), not only the current level of income, but also the highest peak value of previous income.[4] Brown (1952) generalized this proposition and argued that current consumption is always influenced by current income and consumption in the previous period, which in turn, depends on previous income. Therefore, the conventional relative income hypothesis can be stated as:

$$C_t = f(Y_t, C_{t-1})$$

3. The Permanent Income Hypothesis (PIH):

Basically, the life cycle and permanent income hypothesis are very

similar. In the former, consumption is determined by permanent income that is defined as the annual value of lifetime resources. However, the PIH is not concenrned with the relationship between consumption and different forms of resources (i.e. wealth). Rather, the model is a good explanation of the dynamic behavior of consumption over the short run (Deaton 1992, 76). The PIH takes permanent consumption (C^P) as a proportional function of permanent income (Y^P):

$$\mathrm{C_t^P} = \eta \mathrm{Y_t^P}$$

Where η is the factor of proportionality. The magnitude of η will depend on a number of resource-based variables such as human capital, real rate of interest, and individual's valuation of current and future consumption. In this respect, the following expectations will emerge:

(i) Transitory income (Y^T) will be either saved and/or spent on durable goods. This would imply a weak correlation between transitory income and consumption. Over the life span, transitory income is expected to be positive in some periods and negative in others, and consequently, will not have a significant impact on consumption.

(ii) It is expected that the marginal propensity to consume out of permanent income will be positive and greater than the marginal propensity to consume out of transitory income (Laumas & Laumas 1976).

(iii) Permanent income will be smoother than current income. Such an expectation stems from the fact that permanent income does not depend on income in one particular year, rather it depends on income over a number of years, perhaps the life time.

Based on the foregoing discussion, a number of econometric models can be specified in order to test the different consumption hypotheses for the GCC Countries:

$$C_t = a_0 + a_1 Y_t + \varepsilon_1 \quad (6)$$

$$L_n C_t = b_0 + b_1 L_n Y_t + \varepsilon_2 \quad (7)$$

$$C_t = \beta_0 + \beta_1 Y_t + \beta_2 C_{t-1} + v \quad (8)$$

$$C_t = k_0 + k_1 Y_t^P + w_1 \quad (9)$$

$$C_t = \gamma_0 + \gamma_1 Y_t^P + \gamma_2 Y_t^T + w_2 \quad (10)$$

$$C_t = C_{t-1} + \sum_{j=1}^{4} C_{t-j} + w_3 \qquad (11)$$

$$C_t = \sum_{i=1}^{2} C_{t-i} + \sum_{j=1}^{4} Y^P_{t-j} + w_4 \qquad (12)$$

Where: L = Logarithm

C = Consumption

Y = Income

Y^P Permanent Income

Y^T = Transitory Income

A number of analytical comments about the above specifications are noteworthy.

1. Equation (6) will be estimated primarily to measure the marginal propensity to consume out of current income, while equation (7) will be used in estimating the elasticity of consumption with respect to current income.

2. Equation (8) is a form of the relative income hypothesis. This form is used in order to estimate the speed with which consumers adjust their current consumption level to its desired level. The speed of adjustment will depend on the value of the partial adjustment coefficient (β_2).

3. In equations (9) and (10), an adaptive expectation approach is utilized to generate values of the unobservable permanent and transitory incomes (i.e. Y^P and Y^T). If permanent income is taken as a «weighted sum of current and past levels of income» (i.e. Deaton 1992, 107), then, it will be rational to generate a time series for permanent income, which is also taken as the expected value of future income, by estimating a distributed lag function of past income with geometrically declining weights. Friedman (1957) suggests that permanent income in period t may be estimated as follows:

$$Y^p_t = \lambda Y_t + \lambda (1-\lambda) Y_{t-1} + \lambda (1-\lambda)^2 Y_{t-2} + \ldots \qquad (13)$$

Such an approach is useful in the sense that it gives higher weights to current income than previous income. Which, in turn, is consistent with consumers' behavior. if the value of λ is unity, or close to unity, it will be insignificant to differentiate current income (Y_t) from permanent income (Y^p_t), and the Absolute Income Hypothesis would not be a mis-specificaiton.

Evans (1969) suggests estimating λ using the following equation:

$$C_t = h_0 + h_1 Y_t + h_2 C_{t-1} + \varepsilon_t \qquad (14)$$

where: $\lambda = 1 - h_2$

Using GCC annual data for 1970 - 1992, equation (14) is estimated to be:

$$C_t = -12.314 + 0.0719 Y_t + 0.781 C_{t-1}$$

$$(4.840) \qquad (18.682)$$

$$R^2 = 0.891 \qquad F = 537.3 \quad D.h = 1.277$$

Such an estimate gives a value of $\lambda = 0.219$. It follows that, for the GCC as a group, we cannot reject the hypothesis that current income is different from permanent income and, therefore, there is an indication that the Absolute Income Hypothesis is a mis-specification of consumption function.

4. Equations (11) and (12) give an empirical representation of the Random-Walk Hypothesis (RWH) which express the rational expectation consumption behavior. The RWH indicates that the best guess about future consumption is the current consumption, because, the latter is based on the latest assessment of permanent income. According to our earlier specification, the measurement of permanent income embodies all available information at the time of forming expectations. The main hypothesis we seek to test by estimating equations (11) and (12) is that current consumption is orthogonal to lagged consumption and lagged income. We note that up to four periods lagged values of these variables are used.

III.3. Consumption and the Interest Rate

Equation (5) shows that the interest rate is expected to play an important role in the consumer's decisions with respect to consumption and asset accumulation (or saving). On the one hand, the interest rate affects the consumer's decision to substitute current (future) consumption for future (current) consumption. On the other hand, the interest rate influences the decision to hold particular types of assets. It also affects the expected return on assets and their prices.

However, the overall effect of the interest rate on consumption (and saving) has been subject to controversy. Before Keynes, there was an agreement that the interest rate is the main determinant of saving. In

contrast, Keynes argued that changes in the interest rate have no significant impact on consumption behavior. Similarly, Kuznets (1946) indicated that saving rates proved to be stable in the long run irrespective of changes in the interest rates. More recently, the works by Deaton (1985 and 1992) and Campbell and Mankiw (1989) lent empirical support to Keynes' proposition that the interest rate has no significant effect on consumption. However, Freidman (1957) suggested that the interest rate will be a major determinant of the marginal propensity to consume if current income is replaced by permanent income in the consumption function. The reason for that stems from the fact that the interest rate affects non-labor income which, in turn, represents a major component of the permanent income (refer back to subsection III.2).

It follows from the above discussion, that the relationship between the interest rate and consumption is theoretically unsettled and, therefore, is left to be empirically determined. In this respect, Wright (1969) and Heien (1972) proved empirically that consumption is negatively and significantly affected by the interest rate in the developed countries. While, Weber (1977) found the interest rate in these countries to positively affect consumption. This implies that the relationship between consumption and the interest rate is an empirical issue. This would require that, before conducting an empirical investigation, the interest rate must be introduced into a well-behaved consumption function.

Referring back to equation (5) it can be concluded that the overall effect of the interest rate (r) on consumption is a mixture of a number of conflicting effects as follows:

1. An increase in the interest rate will make future consumption less costly (cheaper) than current consumption. This is a "substitution effect" that implies that future consumption replaces current consumption and, consequently, current saving increases.

2. An increase in the interest rate reduces the present value of the expected accumulation of assets over the life cycle, and, therefore, consumers are expected to sacrifice current consumption in order to assure a reasonable (an acceptable) level of consumption in the future.

3. An increase in the interest rate would encourage consumers to keep or raise current consumption. This is because higher interest rates would result in increases in the expected returns on assets in the future.

The net effect of these three possible and conflicting effects of the interest rate on consumption will depend on the efficiency of the financial markets, monetary policy and local values and customs. This point will be discussed later in the context of the GCC countries.

The interest rate (r) can be introduced into the consumption function by using equation (9). This equation implies, as mentioned earlier, that the value of the coefficient of proportionality (η) between current consumption and permanent income will depend on a number of variables of which the rate of interest is the most important. If η is taken as the marginal propensity to consume out of permanent income (Pourgerami & Ghouri 1991, 27), equation (9) can be re-expressed to include both permanent and transitory income such that:

$$C_t = \eta Y_t^P + \gamma_2 Y_t^T \qquad (15)$$

where: η can, also, be taken as a linear function of the interest rate as follows:

$$\eta = \delta + \phi \; r_t \qquad (16)$$

Substituting (16) into (15) we get:

$$C_t = \delta Y_t^P + \gamma_2 Y_t^T + \phi Y_t^P .r \qquad (17)$$

Equation (17) implies that the interest rate implicitly affects consumption, i.e. through permanent income. This equation will be estimated and the results will be compared to those obtained from an alternative formulation which introduces the interest rate explicitly into the consumption function as presented below in equation (18).

$$C_t = \eta Y_t^P + \gamma Y_t^T + v.r \qquad (18)$$

IV. ESTIMATION RESULTS

The data employed in the empirical investigation represents the annual observations of real private consumption and real disposable income (both at 1980 prices). In order to take population into consideration the two variables were converted into per capita real private consumption and per capita real disposable income. The nominal interest rate (the annual lending rate) was adjusted for the inflation rate. The latter was taken as the relative change in the GDP deflator (base year 1980 = 100). Because the GCC economies are small and open, and because it is difficult to construct a time series for the interest rates in these countries, the

domestic interest rates were replaced by the London Inter-Bank Offer Rate. Data was taken from IMF's "International Financial Statistics," (1994).

The time series for permanent and transitory incomes were generated in the way described in the previous section using equation (13) and by taking an estimated value for λ that is equal to 0.219 (see equation 14). Data was taken from: IMF's "International Financial Statistics" except data on income taxes (that is required to calculate disposable income) that was taken from: IMF's "Government Finance Statistics Yearbook." (1994).

The estimated equations are as follows:

$$C_t = a_0 + a_1 + Y_t + \varepsilon \qquad (6)$$

$$C_t = \beta_0 + \beta_1 Y_t + \beta_2 C_{t-1} + v \qquad (8)$$

$$C_t = \gamma_0 + \gamma_1 Y_t^P + \gamma_2 Y_t^T + w_2 \qquad (10)$$

$$C_t = \alpha_0 + \alpha_1 C_{t-1} + \alpha_2 C_{t-2} + \alpha_3 C_{t-3} + \alpha_4 C_{t-4} + w_3 \qquad (11')$$

$$C_t = h_0 + h_1 C_{t-1} + h_2 C_{t-2} + h_3 Y_{t-1} + h_4 Y_{t-2} + h_5 Y_{t-3} + h_6 Y_{t-4} + w_4 \qquad (12')$$

$$C_t = \delta_0 + \delta_1 Y_t^P + \delta_2 Y_t^T + \delta_3 Y_t^P .r + u_1 \qquad (17')$$

$$C_t = g_0 + g_1 Y_t^P + g_2 Y_t^T + g_3 .r + u_2 \qquad (18')$$

The results are shown in tables (5) to (11). The method of estimation is ordinary least squares (OLS). The variables that are included in all equations and shown in the tables of results are:

C = Real Per Capita Consumption.

Y = Real Per Capita Disposable Income.

Y^P = Real Per Capita Permanent Income.

Y^T = Real Per Capita Transitory Income.

r = Real Interest Rate.

The main results can be summarized as follows:

1. In most equations included in tables (5), (6), and (7) the autonomous consumption (i.e. the constant term) is statistically insignificant. Because these equations represent conventional consumption hypotheses, this result implies the existence of a long-run consumption relationship in the GCC Countries.[5]

2. As it is expected, according to the theoretical framework in the previous section, conventional consumption hypotheses proved to be valid as far as the GCC data is concerned. Basic statistics (i.e. the R^2, t-ratio, F-ratio, D.W. statistic and D.h. statistic) indicate that equations (6), (8), and (10) (i.e. the absolute Income Hypothesis, the Relative Income Hypothesis, and the Permanent Income Hypotesis, respectively) are statistically significant. Having found that all conventional consumption hypothesis hold in the GCC Countries is not a surprise, simply because (as it is shown in the previous section) all hypothesis take consumption as a function of income, even though income is defined differently in each particular case.

3. The marginal propensity to consume out of current income is very low in all GCC countries. It ranges from a minimum value of 0.1911 in Kuwait to a maximum value of 0.451 in the united Arab Emirates (i.e. equation 6 in table 5). One explanation for this result is these countries have very high per capita income. Moreover, consumption expenditures are strictly directed to consumption goods while durables tend to capture a large fraction of income in these countries.

4. The marginal propensity to consume out of permanent income (γ_1 in table 7) is greater than the marginal propensity to consume out of transitory income (γ_2 in table 7), except in Oman and UAE. The coefficient of transitory income is, however, positive and significantly different from zero, meaning that consumers in the GCC Countries allocate part of their transitory income for consumption. The majority of citizens in the GCC countries are employed by the public sector, this is less so in Oman and UAE.

5. The results in tables (5), (6), and (7) explain one particular side of the behavior of consumption in the GCC Countries, that is, the degree of responsiveness of consumers to changes in income (either labor income or income generated by the accumulated stock of assets). However, individuals are expected to make expectation about future consumption. Such expectations will be affected by the predictions made for life-time (future) income.

The best guess about future consumption is based on current consumption which, in turn, depends (in part) on past consumption. This implies that consumption follows a random-walk behavior, and if the

consumer uses all available information about past consumption (and consequently past income) his expectation will be rational. This is the idea of the Random-Walk Hypothesis that is represented by equations (11') and (12'). If this hypothesis proved to be true, one would expect that the value of the coefficient of one period lagged consumption to be unity (or close to unity), while the coefficients of all other lagged variables included in equations (11') and (12'), to be equal to zero.

The results represented in tables (8) and (9) show that the estimated coefficients of the one-period lagged consumption are close to unity and significantly different from zero in all the GCC Countries. Coefficients of additional lagged consumption or income are statistically insignificant meaning that consumption in the GCC Countries follows a random-walk behavior.

6. The results in tables (10 and (11) indicate the real interest rate had no significant impact on consumption in the GCC Countries over the period 1970-1992. Again, the exception is Oman, where the real interest rate positively affected consumption. This implies that consumers in Oman made favorable expectations as for future income (non-labor income in particular) and, therefore, raised current consumption. It follows that, the income effect of the interest rate in oman outweighs the substitution effect.

The interest-insensitive consumption behavior is expected to reduce the effectiveness of both monetary and fiscal policies in the GCC countries. Credit restrictions represent the major source of distortion for the interest-consumption relationship. Individuals are expected to take credit availability into consideration when they revise and adjust the current level of consumption in light of permanent income. If credit is restricted, individuals would have to liquidate part of their assets in order to maintain a certain level of current real consumption (especially in the time of inflation). Our empirical evidence does not rule out this possibility in the GCC countries where credit restrictions are eminent.

V. CONCLUSIONS

This paper represents an attempt to test consumption hypoteses in the GCC countries over the period 1970-1992, by employing a theoretical

framework that is based on a life cycle model, or what is referred to as "A Model of Intertemporal Choice".

The main findings reveal that both the adaptive expectations permanent income hypothesis and rational expectations random walk hypothesis fit the GCC data reasonably well. This simply implies that the best guess about current consumption in these countries is the last period consumption because it is based on the latest assessment of permanent income. In this respect, permanent income is expected to embody all available information at the time of forming expectations (i.e. the current period).

The results also indicate that the real interest rate has no significant effect on private consumption in the GCC countries. It follows that interest-insensitive consumption behavior in high income countries (i.e. the GCC countries) implies that individuals are unwilling to significantly alter their consumption path to benefit from the return on financial assets. In the GCC context these findings indicate that individuals in these countries do not respond to changes in the interest rate when they make consumption decisions. The main reason for this could be that the observed rate of interest does not correctly reflect the actual cost of holding money. In the GCC countries, as it is the case in most developing countries, the interest rate is distorted for many reasons such as: (a) Institutional rigidities that govern the determination of the discount and interest rates. (b) Distorted money and financial markets which offer a limited range of alternative assets. Under such conditions, physical assets represent the most common form of wealth accumulation.

Because private consumption in the GCC countries is insensitive to interest rate changes, the policy maker in these countries can not use one of the main policy tools available, i.e. the rate of interest. Moreover, because individuals are unwilling to benefit from the expected returns on interest bearing assets (i.e. do not respond to changes in the rate of interest) policy makers in the GCC countries are expected to face difficulties in their attempt to develop efficient financial markets. There is no doubt that this represents a major obstacle for other efforts such as privatization in these countries.

TABLE (5)
ABSOLUTE INCOME HYPOTHESIS: GCC COUNTRIES (1970-1992)
$C_t = a_0 + a_1 Y_t + \varepsilon_1$ **Eq. (6)**

	Constant	Y_t	R^2	F	D.W.
All GCC	414.41 (0.653)	0.2786 (11.036)	0.927	1700.2	2.039
Bahrain	1381.0 (5.055)	0.1911 (7.684)	0.867	137.3	1.255
Kuwait	2010.4 (1.153)	0.1371 (1.959)	0.689	46.6	1.780
Oman	-728.69 (-2.047)	0.4145 (6.375)	0.727	20.4	1.904
Qatar	92.83 (0.254)	0.228 (11.021)	0.973	706.6	2.657
Saudi Arabia	-4.763 (-0.003)	0.3949 (3.245)	0.828	91.4	1.450
UAE	-937.11 (-1.432)	0.451 (15.877)	0.948	383.3	2.071

- Figures in parentheses are t values.

TABLE (6)
RELATIVE INCOME HYPOTHESIS: GCC COUNTRIES (1970-1990)

$$C_t = \beta_0 + \beta_1 Y_1 + \beta_2 C_{t-1} + V \qquad \text{Eq. (8)}$$

	Constant	Y_t	C_{t-1}	R^2	F	D.W.
All GCC	-92.12 (-0.577)	0.0953 (6.164)	0.7185 (16.429)	0.895	556.4	1.791*
Bahrain	414.92 (1.212)	0.1875 (4.166)	0.3599 (2.593)	0.739	28.3	1.712
Kuwait	-33.75 (-0.035)	0.0586 (1.929)	0.7510 (5.520)	0.646	18.2	1.820
Oman	-228.86 (-2.531)	0.2113 (2.218)	0.4342 (2.040)	0.875	66.6	1.401
Qatar	-225.01 (-1.287)	0.1843 (10.875)	0.2710 (3.915)	0.968	285.5	1.634
Saudi Arabia	-1395.8 (-2.734)	0.2175 (3.712)	0.9060 (10.008)	0.854	52.5	2.367
UAE	-939.86 (-1.688)	0.4676 (14.151)	0.4149 (6.677)	0.946	176.4	1.467

- figures in parentheses are the t values
* D.h (for individual countries D.W. is replaced for D .h because of the small sample size).

TABLE (7)
PERMANENT INCOME HYPOTHESIS: GCC COUNTRIES (1970-1992)

$$C_t = \gamma_0 + \gamma_1 Y_t^P + \gamma_2 Y_t^T + w_2 \qquad \text{Eq. (10)}$$

	Constant	Y_t^P	Y_t^T	R^2	F	D.W.
All GCC	-1246.7 (-0.682)	0.4946 (9.586)	0.1244 (2.908)	0.974	243.7	1.798
Bahrain	-273.06 (-2.074)	0.5044 (0.973)	0.4397 (16.760)	0.962	2537.7	1.755
Kuwait	-11187 (-2.3091)	0.7716 (3.645)	0.1532 (1.575)	0.803	40.7	2.099
Oman	-538.37 (-2.173)	0.1388 (2.175)	0.8586 (4.768)	0.960	242.0	1.590
Qatar	-117.81 (-1.057)	0.2676 (12.453)	0.2591 (16.118)	0.984	612.2	2.521
Saudi Arabia	3484.6 (0.498)	0.5283 (4.707)	0.2761 (1.803)	0.971	285.3	1.537
UAE	721.44 (2.491)	0.3527 (21.869)	0.4160 (15.106)	0.966	284.8	2.032

- figures in parentheses are the t values

TABLE (8)
RANDOM WALK HYPOTHESIS: GCC COUNTRIES (1970-1992)
$C_t = h_0 + h_1C_{t-1} + h_2C_{t-2} + h_3C_{t-3} + h_4C_{t-4} + w_3$ Eq. (11′)

	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE	All GCC
C_{t-1}	.9094 (9.310	.9312 (4.88)	.9490 (4.536)	.9011 (3.49)	1.0795 (4.436)	1.0051 (5.09)	1.038 (11.83)
C_{t-2}	-.049 (-.637)	0.120 (.550)	-.440 (-1.71)	0.002 (0.58)	-0.646 (-1.27)	-.412 (-1.21)	0.326 (0.63)
C_{t-3}	-.362 (-.465)	-.249 (-1.14)	-.987 (-2.32)	-0.009 (-.36)	-0.631 (-1.14)	.353 (1.03)	-0.308 (-.48)
C_{t-4}	-.169 (-.218)	.203 (.913)	-.555 (1.47)	-0.019 (-.782)	0.428 (1.48)	-.216 (-.999)	-0.074 (-.79)
Constant	1111.6 (2.791)	6911.5 (1.759)	200.31 (1.703)	1093.1 (1.79)	949.22 (1.37)	1288.6 (1.96)	258.3 (1.29)
R^2	.921	.654	.941	.937	0.978	.763	.965
F	52.4	8.5	72.1	149.2	163.9	12.39	897.7
D.W.	1.638	1.690	1.955	1.778	2.235	2.074	1.986*

***D.h value**
Figures in parentheses are t values.

TABLE (9)

RANDOM WALK HYPOTHESIS: GCC COUNTRIES (1970-1992)

$$C_t = h_0 + C_{t-1} + h_2C_{t-2} + h_3Y_{t-1} + h_4Y_{t-2} + h_5Y_{t-3} + h_6Y_{t-4} + w_4 \quad \text{Eq. (12')}$$

	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE	All GCC
C_{t-1}	0.9327	0.8939	0.8654	0.9787	0.9520	0.8954	0.8050
	(4.238)	(2.972)	(2.651)	(3.433)	(3.490)	(2.211)	(8.091)
C_{t-2}	0.1185	0.1322	0.0151	0.9768	-0.1005	0.689	0.0529
	(0.275)	(0.424)	(0.043)	(0.938)	(-.387)	(1.846)	(0.534)
Y_{t-1}	-0.4003	0.2325	-0.0849	0.0994	0.1098	0.5783	0.0591
	(-0.859)	(1.392)	(-.343)	(0.378)	(0.9133)	(2.893)	(1.405)
Y_{t-2}	-0.0410	-0.0390	-0.1647	-0.2966	0.0359	-0.5136	0.0634
	(-0.380)	(-0.194)	(-.530)	(-0.883)	(0.2201)	(-2.181)	(1.099)
Y_{t-3}	-0.0041	-0.0366	0.4537	0.0049	-0.0608	0.1660	-.0155
	(-0.123)	(-0.193)	(1.155)	(0.207)	(-0.366)	(1.043)	(-0.280)
Y_{t-4}	-0.0334	0.1846	-0.1696	-0.0218	0.0195	-0.0829	-0.0329
	(-1.261)	(1.214)	(-0.828)	(-1.023)	(0.157)	(-0.824)	(-0.805)
Constant	447.15	-7859.40	249.95	235.59	-2126.0	1765.9	-312.15
	(3.752)	(-2.217)	(1.129)	(0.864)	(-0.962)	(2.162)	(-1.551)
R^2	0.885	0.659	0.922	0.674	0.978	0.850	0.970
F	20.5	5.2	31.54	5.5	98.1	15.1	679.8
D.W.	1.821	1.502	2.062	1.703	2.091	2.371	1.362*

*** D.h value**

Figures in patentheses are the t values

TABLE (10)
INTEREST RATE EFFECTS: GCC COUNTRIES (1970-1992)

$$C_t = \delta_0 + \delta_1 Y_t + \delta_3 Y_t^P .r + u_1 \qquad \text{Eq. (17)}$$

	Constant	Y_t^P	Y_t^T	$Y_t^P.r$	R^2	F	D.W.
All GCC	-1205.5 (-0.69)	0.4745 (0.09)	0.1344 (3.10)	0.3531 (1.44)	0.974	1634.7	1.916
Bahrain	-247.4 (-1.71)	0.4893 (8.36)	0.4364 (15.41)	0.1612 (0.576)	0.963	240.0	1.743
Kuwait	-10256 (-2.31)	0.7078 (3.55)	0.1663 (1.63)	0.6579 (1.21)	0.815	27.9	2.123
Oman	-525.7 (-2.89)	0.1101 (2.10)	0.8266 (5.14)	1.3724 (2.56)	0.968	194.1	1.816
Qatar	-122.2 (-1.05)	0.2692 (11.10)	0.2598 (15.45)	-0.0201 (-0.13)	0.984	3880.1	2.508
Saudi Arabia	3139.2 (0.47)	0.5095 (4.58)	0.2674 (1.71)	0.4357 (0.80)	0.971	186.1	1.75
UAE	714.7 (2.06)	0.3535 (12.44)	0.4157 (14.17)	-0.0103 (-0.01)	0.962	180.4	2.03

Figures in Parentheses are the t values

TABLE (11)
INTEREST RATE EFFECTS: GCC COUNTRIES (1970-1992)
$C_t = g_0 + g_1 Y_t^p + g_2 Y_t^T + g_3 r_t + u_2$ Eq. (18′)

	Constant	Y_t^p	Y_t^T	r_t	R^2	F	D.W.
All GCC	-896.12	0.4974	0.1266	-4429.4	0.974	1615.1	1.764
	(-0.467)	(9.538)	(2.989)	(-0.704)			
Bahrain	-275.56	0.5045	0.4397	2421.0	0.962	1607.3	1.754
	(-1.819)	(9.720)	(16.343)	(0.035)			
Kuwait	-11521.0	0.8041	0.1493	-4672.4	0.803	164.5	2.085
	(-2.270)	(3.241)	(1.495)	(-0.356)			
Oman	-945.57	0.1736	0.9129	2860.1	0.964	150.8	1.657
	(4.123)	(1.233)	(5.377)	(3.538)			
Qatar	-52.72	0.2825	0.2696	-1505.0	0.984	3954.7	2.083
	(-0.537)	(20.011)	(26.996)	(-1.909)			
Saudi Arabia	-1456.0	0.4980	0.7027	2123.9	0.969	177.6	1.803
	(-0.572)	(12.275)	(7.406)	(0.471)			
UAE	930.33	0.3546	0.4321	-3474.7	0.967	185.6	2.033
	(2.275)	(21.466)	(12.184)	(-0.7318)			

Figures in parentheses are the t values

FOOTNOTES

(1) IMF, International Financial Statistics, Year Book, 1994.

(2) This is based on the notion that the long-run consumption function is linear.

(3) Assets include real assets (e.g. capital goods), financial assets (e.g. bonds and stocks), and monetary assets (e.g. bank deposits).

(4) It is also expected that consumption will depend on the size of an individual's income relative to that of his associates.

(5) It can, also, be stated that because we employ macro data, autonomous consumption is meaningless, i.e. it is meaningless to have negative autonomous consumption simply because at the micro level there is no such thing as zero income.

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Private Consumption in the GCC Countries: An Empirical Investigation (1970-1992)

Yousuf Hasan Jawad Mohammad*

This paper analyzes the behavior of private consumption in the GCC Countries over the period 1970-1992. It proceeds by specifying and estimating different consumption functions for these countries in an effort to answer several questions such as: (a) Did private consumption in GCC Countries behave according to any known consumption hypotheses? (b) What are the major determinants of private consumption? (c) Were there policy variables (i.e. interest rate) that affected the behavior of private consumers in these countries?

The findings reveal that both the adaptive expectations permanent income hypothesis and the rational expectations random walk hypothesis fit the GCC data reasonably well. The results also indicate that the real interest rate has no significant effect on GCC private consumption, since private consumption in these countries is insensitive to interest rate changes, one of the main policy tools normally used by policymakers to influence consumption patterns.

* Chairman, Department of Economics, College of Administrative Sciences, Kuwait University.