UNIT 7 CONSUMPTION AND ASSET PRICES

Structure

7.0 OBJECTIVES

After going through this Unit you should be able to explain

- the Fisherian idea of consumption as an outcome of households' intertemporal choices;
- the Life-cycle hypothesis of Modigliani and Brumberg and the Permanent Income hypothesis of Friedman;
- the Random Walk Hypothesis of Hall; and
- the asset price determination through the Consumption Asset Pricing Model (CAPM).

7.1 INTRODUCTION

In Economics, there exist close links between the current economic variables and their past and future values. As you have seen in Block 2 (on Economic Growth), past state often determines the current state, just as the current state determines the future. But there is also a link from future to the present. Future of course is often unknown. However, expectations about future variables sometimes influence the current economic decisions. In other words, the decision making process of an economic agent is often 'inter-temporal' in nature — involving different periods of time. Consumption and savings are two prime examples of such inter-temporal decision making.

How does a household decide upon how much to consume today and how much to save? Keynes identified current income as the prime determinant of current consumption. In its simplest form, a Keynesian consumption function can be represented by the following linear equation:

$$C_t = \bar{C} + cY_t, \bar{C} > 0, \ 0 < c < 1, \qquad ...(7.1)$$

where C_t is current consumption and Y_t is current income. Notice that one important feature of this consumption function is that the *average propensity to consume* (C_t / Y_t) falls as income rises.

Early empirical studies using cross-sectional household data found evidence in support of decreasing average propensity to consume: it was found that richer households (with higher Y_t) indeed consumed a lower fraction of their income. However, in 1940s Simon Kuznets using long run time series data on aggregate consumption and income found that the average propensity to consume remained more or less constant, even though aggregate income increased substantially over the period under consideration. This apparent puzzle led to the development of a number of theories of households' consumption behaviour, all of which focus on the intertemporal nature of consumption expenditure. The following section discusses some of the important theories from this literature.

7.2 CONSUMPTION AS INTERTEMPORAL CHOICE

One of the earliest works that depicts households' consumption expenditure as an outcome of households' intertemporal optimization exercise is that of Irving Fisher (1930). The Fisherian idea can be easily explained in terms of a two period model of consumer optimization. Let us assume that each member of a household lives for exactly two periods[1] and let C_1 and C_2 denote his consumption during the first and the second period of his life respectively. The person derives utility from both period's consumption and his preferences are represented by the utility function $U(C_1, C_2)$. Let Y_1 and Y_2 be the income of the individual in the two periods respectively. Out of his first period income, the person consumes C_1 and saves the rest ($S_1 = Y_1 - C_1$) to earn an interest income $(1+r)S_1$ in the next period. In Fisher's model, the only purpose of savings is future consumption. Accordingly, consumption during second period is equal to $C_2 = Y_2 + (1+r)S_1$.

By re-arranging the terms in $C_2 = Y_2 + (1+r)S_1$, we find that $\frac{C_2}{1+r} = \frac{Y_2}{1+r} + S_1$.

Since $S_1 = Y_1 - C_1$, we have $\frac{C_2}{1+r} = \frac{Y_2}{1+r} + (Y_1 - C_1)$ or $C_1 + \frac{C_2}{1+r} = Y_1 + \frac{Y_2}{1+r}$.

Thus the intertemporal budget constrain is given by

$$C_1 + \frac{C_2}{1+r} = Y_1 + \frac{Y_2}{1+r} \equiv \hat{Y}(\text{say}) \qquad \text{... (7.2)}$$

The left hand side of the intertemporal budget constraint denotes the present discounted value of the total consumption expenditure of the person, while the right hand side measures the present discounted value of his total life-time income ($\hat{Y}$). The person decides on the levels of C_1 and C_2 by maximizing his utility $U(C_1, C_2)$ subject to his intertemporal budget constraint. Notice that the optimization exercise of the household defines the current consumption as a function of the present discounted value of life time income ($\hat{Y}$) as well as the rate of interest (r) on saving[2].

[1] The time periods can be broadly defined so that the first time period covers his entire youth and the second one covers his entire old age.

[2] Strictly speaking, the rate of interest r is the 'expected' future rate of interest (which is expected to prevail in period 2). We are assuming here that future is certain and known.

In Fig. 7.1 we depict the optimal consumption choices. We measure C_2 on x-axis and C_1 on y-axis. The intertemporal budget constraint intersects the x-axis at point $(1+r)Y_1 + Y_2$ because when $C_1=0$ in (7.2) we have $C_2 = (1+r)Y_1 + Y_2$. Similarly, we find that $C_1 = Y_1 + \frac{Y_2}{1+r}$ when $C_2=0$.

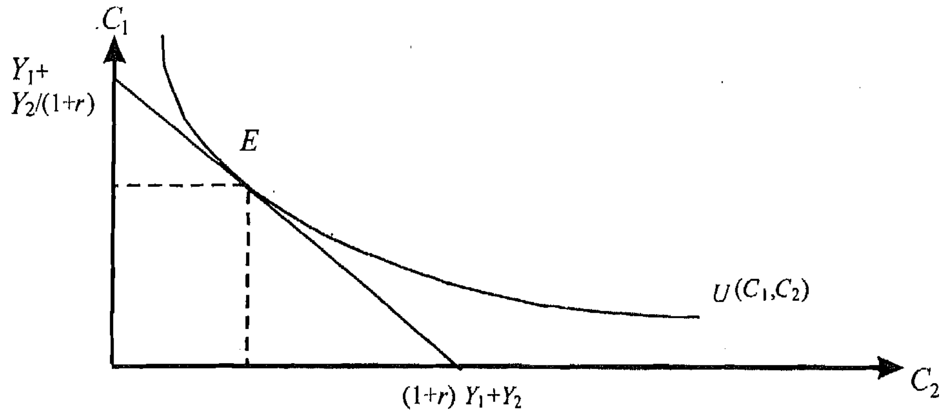

Fig. 7.1: Intertermporal Utility Maximisation

It is now easy to analyze the impact of a change in current income (Y_1) on current consumption (C_1). Under the assumption that consumption in both periods are normal goods (i.e., associated with positive income effects), an increase in current income, ceterisparibus, increases the life-time income and hence both C_1 and C_2 will increase.

The impact of a change in the interest rate (r) on current consumption is more ambiguous. Note that an increase in *r* implies a decline in the relative price of future consumption in terms of current consumption.[3] Such a change in the relative price is typically associated with two effects: (i) an income *effect*, which in this case will lead to an increase in consumption in both the periods (since a decline in the price level implies the choice set of the consumer becomes broader), and (ii) a substitution *effect*, which in this case will lead to a fall in current consumption (since a decline in the relative price of future consumption implies that people will substitute current consumption by future consumption). The overall effect on an increase in r on current consumption depends on the relative strength of the two effects. In ceterisparibus an increase in *r* leads to an increase in C_1 if the income effect dominates the substitution effect; on the other hand, an increase in *r* leads to a decrease in C_1 if the substitution effect dominatesthe income effect. In this context also note that in so far as $S_1 = Y_1 - C_1$, an increase in the rate of interest would also imply higher or lower savings depending on the relative strength of the income and the substitution effect.

This Fisherian view of looking at consumption as an outcome of an intertemporal optimization exercise on the part of the households came to play a key role in the

[3] This is because for the same amount of current consumption foregone (in the form of savings), one will now get higher amount of future consumption.

development of the subsequent influential theories of consumption, which are: (a) the *life-cycle* hypothesis of Modigliani and Brumberg (1954), and (b) the permanent income hypothesis of Friedman (1957). Both these theories attempt to explain the empirically observed discrepancy between the cross-sectional and time series evidence on the relationship between the average propensity to consume and the income level.

7.2.1 Life Cycle Hypothesis

To explain the life-cycle and permanent income hypotheses, let us extend the two period model that we have just discussed to a T-period model where each person lives for *T periods* (where $T \geq 2$). The utility function of the representative member of the household is again given by $U(C_1, C_2, C_3, \ldots\ldots, C_T)$. For expositional simplicity let us assume an additive utility function of the form:

$$U(C_1, C_2, C_3, \ldots\ldots, C_T) = u(C_1) + u(C_2) + \ldots\ldots + u(C_T) = \sum_{t=1} u(C_t). \quad \ldots (7.3)$$

The utility function (7.3) is well behaved in the sense that marginal utility is positive (in symbols $u' > 0$) and increases at a decreasing rate (implies that the second derivative is negative, $u'' < 0$). For simplicity let us also assume that the rate of interest is zero[4] so that the intertemporal budget constraint of the household now becomes:

$$\sum_{t=1}^{T} C_t = A_0 + \sum_{t=1}^{T} Y_t, \quad \ldots (7.4)$$

where $Y_1, Y_2, \ldots\ldots, Y_T$ are the incomes of the household in periods 1,2,.....,*T* respectively and A_0 is the amount of initial level of wealth stock of this household. Maximization of utility subject to the intertemporal budget constraint will yield a Lagrangian function of the form:

$$L = \sum_{t=1}^{T} u(C_t) + \lambda\left(A_0 + \sum_{t=1}^{T} Y_t - \sum_{t=1}^{T} C_t\right), \quad \ldots (7.5)$$

where λ is the associated Lagrangian multiplier. First order conditions for optimization yield:

$$u'(C_t) = \lambda \text{ for } t = 1,2,\ldots,T, \text{ where } u'(C_t) \text{ is the marginal utility in period } t.$$

The above condition implies that $u'(C_1) = u'(C_2) = \cdots\cdots = u'(C_T) = \lambda$, and therefore $C_1 = C_2 = \ldots\ldots = C_T$. Hence from the intertemporal budget constraint (7.4) we obtain

$$C_t = \frac{A_0}{T} + \frac{1}{T}\left(\sum_{t=1}^{T} Y_t\right) \text{ for all } t. \quad \ldots (7.6)$$

[4] Having a positive rate of interest will not have any effect on the subsequent analysis.

The term within the parenthesis in the right hand side of (7.6) is the average value of the total life-time income of the individual. The optimization exercise indicates that consumption in any period is determined the individual's total life-time income. Let us denote the latter by $\hat{Y}$. Then consumption at any point of time t is equal to $(A_0 + \hat{Y})/T$. This phenomenon, whereby the individual divides his total life-time resources equally among each period and consumption at different points of time are spread evenly over the entire time horizon is called ***consumption smoothing.***

At any particular point of time t, the actual income of that period Y_t may exceed or fall short of the average life-time income $(\hat{Y}/T)$. Given initial wealth, since current consumption depends only on the average life-time income, therefore any change in current income will have an effect on current consumption ***only to the extent that it impacts upon the average life-time income.*** To be more precise, suppose at some time period, say $t = \hat{t}$, current income rises by an amount Z for some reason. The corresponding increase in average life-time income is equal to Z/T and as a result, consumption at period $t = \hat{t}$ increases only by the amount Z/T. By the same token, if the current income at some period rises by an amount Z and the income at some subsequent period falls by the same amount, so that the average life-time income remains unchanged, then current consumption does not change in any period.

Notice that while changes in current income have limited impact on the consumption of that period, current income plays a crucial role in determination of current savings. Recall that savings at any time period t is defined as $S_t = Y_t - C_t$.

By using the result obtained at (7.6) we get $S_t = Y_t - \frac{1}{T}\left(\sum_{t=1}^{T} Y_t\right) - \frac{A_0}{T}$. ... (7.7)

An interpretation of (7.7) is that savings is high when current income is high relative to the average life-time income. It is this idea which forms the basis of Modigliani-Brumberg's life-cycle hypothesis.

According to Modigliani and Brumberg, income varies systematically over the life-time of an individual and savings allow people to smoothen consumption over their life-time, even when incomes in different periods are not equal. In other words, people maintain an even stream of consumption over their life-time by saving more during high income periods and saving less during the low income periods.

The life-cycle hypothesis postulates that an individual typically has an income stream which is low during the beginning and towards the end of one's life, and high during the middle years of one's life. This is because productivity of a person is typically low during the early and the late years of his life, and productivity is at the peak during the middle years. On the other hand, consumption at every period remains the same at $C_t = \frac{A_0}{T} + \frac{1}{T}\left(\sum_{t=1}^{T} Y_t\right)$. The typical income and consumption stream over the life-time of the individual is represented by Fig. 7.2. We observe from Fig.7.2, that during the early periods of one's life, an individual dissaves (by running down his initial wealth, and/or by borrowing); he saves during the middle periods of his life and dissaves again during the later years by running down his accumulated wealth.

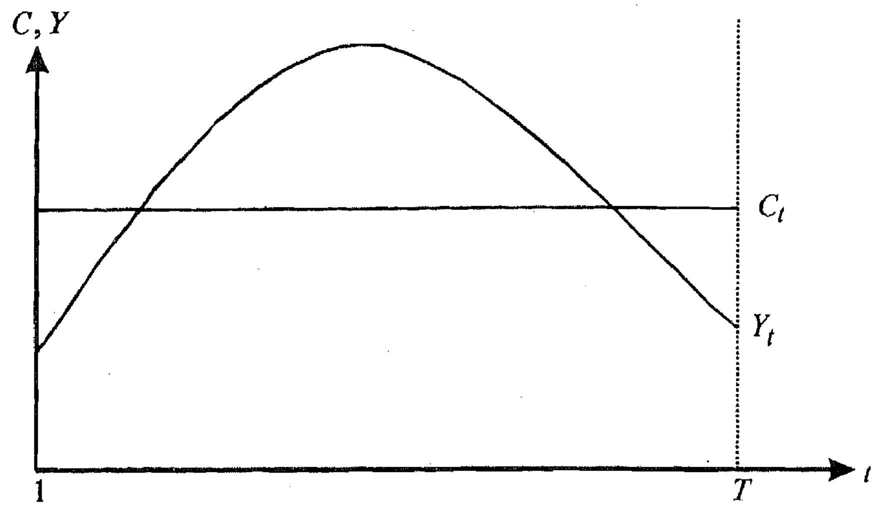

Fig. 7.2: Consumption Stream over Lifetime

Given that consumption and savings are postulated to behave in this manner over the life-cycle of a person, it is now easy to see how this hypothesis can explain the apparent disparity between cross-sectional and aggregate time series data on consumption behaviour. When one is looking at the cross-sectional data for a particular point of time, it is likely that in a randomly selected sample of households (which are classified according to income), the high income category will contain a higher-than-average proportion of people belonging to middle phase of their life cycle, and the low income category will contain a higher-than-average proportion of people belonging to either the early or the late phases of their life. Since during the middle phase, people have a higher average propensity to save (i.e., a higher S_t / Y_t ratio) and correspondingly a lower average propensity to consume (i.e., a lower C_t / Y_t ratio), the cross-sectional data will reflect a lower propensity to consume for the high income category compared to the low income category.

At this point it is important to note here that current consumption $C_t = \frac{A_0}{T} + \frac{1}{T}\left(\sum_{t=1}^{T} Y_t\right)$ depends not only on the life-time income of the individual, but also on the initial stock

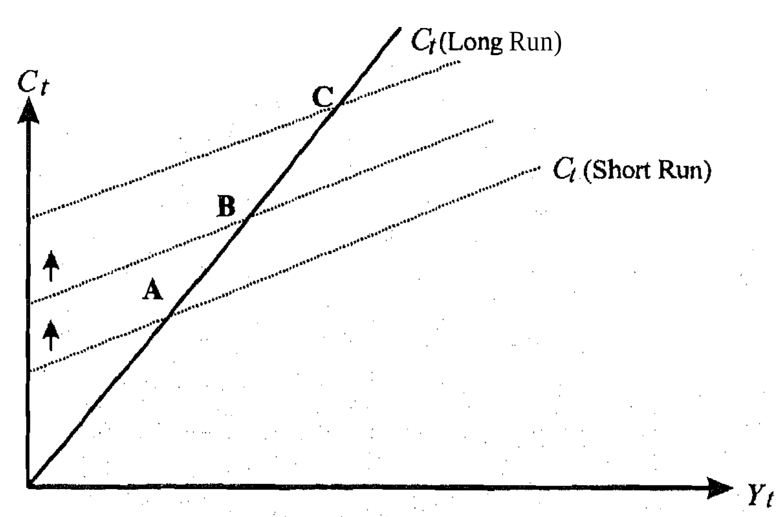

Fig. 7.3: Short run and Long run Consumption

of asset A_t. In the short run (or at any particular point of time) the asset stock remains constant, In Fig. **7.3** we diagrammatically depict the above relationship between C_t and Y_t. We measure C_t along the vertical axis and Y_t along the horizontal axis. We get an upward sloping line (slope less than unity) with a positive intercept, as shown in Fig. **7.3.** However, when we are looking at the time series data where income is increasing over a long period of time, then the stock of asset (which is positively correlated to the level of income) is also increasing. Thus the intercept term on the line will keep on increasing. In other words, the short run C_t line will keep shifting upward over time (see the dotted line in Fig. **7.3).** Hence if we are examining the long run consumption data to determine the long run relationship between C_t and Y_t, we will observe points like **A,** B, C along successive short run consumption lines. In other words, the long run consumption function will be steeper, where C_t is proportional to Y_t, as shown in Fig. 7.3. Note that along the long run consumption line, the average propensity to consume (C_t / Y_t) remains constant.

7.2.2 Permanent Income Hypothesis

Friedman's permanent income hypothesis provides an alternative explanation to the apparent discrepancy between cross-sectional and time series data on consumption. The peimanent income hypothesis is also founded on the Fisherian theory of consumption as an intertemporal choice. However, unlike the life-cycle hypothesis, Friedman does not postulate that income follow a regular pattem over the life cycle of an individual; he instead argues that individuals experience random and temporary changes in their income from time to time. Accordingly, Friedman views the current income in any period (Y_t) as consisting of two components: *permanent income* $\left(Y_t^P\right)$ and *transitory income* $\left(Y_t^T\right)$. Permanent income is that part of the income which we expect to prevail over the long run. Friedman interprets this as the long run average income of the individual, i.e., $Y_t^P = \frac{1}{T}\left(\sum_{t=1}^{T} Y_t\right)$. Transitory income is any random deviation from this average, i.e., $Y_t^T = Y_t - \frac{1}{T}\left(\sum_{t=1}^{T} Y_t\right)$. A positive transitory income implies that the current income exceeds the permanent income; a negative transitory income implies that the current income is less than the permanent income. Since $C_t = \frac{A_0}{T} + \frac{1}{T}\left(\sum_{t=1}^{T} Y_t\right) = \frac{A_0}{T} + Y_t^P$, i.e., current consumption of the household depends only on the permanent income, any increase in the transitory part of the current income, which leaves the permanent income unchanged, will have no impact on the level ofcurrent consumption.

Let us now see how Friedman's permanent income hypothesis solves the apparent puzzle in the consumption data. According to Friedman's hypothesis, the average propensity to consume (C_t / Y_t) depends on the ratio of permanent to current income Y_t^P / Y_t. Thus when current income temporarily rises above the permanent income the average propensity to consume falls; the opposite happens when current income temporarily falls below the permanent income. Now when we are looking at cross-sectional data of different households at any point of time, typically the high income group will contain some people with a high transitory income, who will have a lower propensity to consume than the average. Similarly the low income group will contain some people with a low transitory income, who will have a higher propensity to consume than the average. As a result, we will observe a falling average propensity to consume as we move from the lower to the higher income group. On the other hand, when we are considering long run time series data, the random fluctuations tend to even out so that any increase in income in the log run reflects a permanent increase in the average income level. Hence in the log run time series data we are likely to observe a constant average propensity to consume.

Check Your Progress 1

1) Explain the Fisherian idea of consumption as an intertemporal choice. What are the impact of a change in income and a change in the interest rate on current consumption?

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2) What is the puzzle in the consumption data that has been identified by Kuznets? How do the Life-cycle hypothesis and permanent income hypothesis solve this puzzle?

7.3 CONSUMPTION UNDER UNCERTAINTY: RANDOM WALK HYPOTHESIS

In our discussion so far we have assumed that people know their average life-time income (or the permanent part of the income) with certainty. What happens if there is some degree of uncertainty with the permanent income as well? Obviously. in the presence of uncertainty, people's expectation about the future becomes important. We can extend the logic of the permanent income hypothesis to argue that in the presence of uncertainty, individuals maximize their *expected* utility subject to the constraint that the sum of total *expected* consumption cannot exceed the total value of the *expected* life-time income. In other words, the objective function of a consumer is now given by

$$E[U] = E[u(C_1)] + E[u(C_2)] + ... + E[u(C_T)] = \sum_{t=1}^{T} E[u(C_t)] \quad ... (7.8)$$

which he maximizes subject to ihe constraint

$$\sum_{t=1}^{T} E(C_t) = A_0 + \sum_{t=1}^{T} E(Y_t) . \quad . (7.9)$$

Note that since Future is uncertain, the expectation of people about future comes to play an important role, and therefore how people form their expectation also becomes important for the decision making process. You have earlier been introduced to the rational expectation hypothesis in Block-3. According to the rational expectations theory the outcomes do not differ systematically from what people expected them to be. The extension of the permanent income hypothesis in the presence of uncertainty combined with the assumption of rational expectation led to the theory of 'random walk consumption", as expounded by Robert Hall (1978).

Hall argued that if individual's consumption indeed depended on their expected average life-time income, and if people had rational expectations, then changes in consumption over time will be unpredictable, i.e., consumption will follow a 'random walk'. The intuition behind this result is simple: if the life-time income is expected to change at some future point of time and people have this information, then they will use this information optimally (under rational expectation) and will therefore immediately adjust their consumption over different time periods (consumption smoothing) *so* that current consumption would not change at the time when the actual income changes. Current consumption can change only if there are surprises in the life-time income, which were not anticipated. To put it differently, current consumption *can* only change due to events which are unpredictable and as a result changes in consumption would also be unpredictable.

Theoretically it is easy to see how this hypothesis follows from the above formulation of individual's maximization problem, As we saw in (7.6) and (7.7) the individual maximizes $\sum_{t=1}^{T} E[u(C_t)]$ subject to $\sum_{t=1}^{T} E(C_t) = A_0 + \sum_{t=1}^{T} E(Y_t)$. Since the individual is taking his decision at time $t=1$, under rational expectations, all his expectations are based on the information available at period 1. **An** optimizing agent will equate his ***expected*** (as of period 1) marginal utilities in different periods. Now in period 1, consumption in period 1 is a certain event; hence $E_1[u'(C_1)] = u'(C_1)$. On the other hand, *expected* (as of period 1) marginal utility at any subsequent period is given by: $E_1[u'(C_t)]$; $t = 2,3,\ldots, T$. Thus the optimality condition implies:

$$u'(C_1) = E_1[u'(C_2)] = E_1[u'(C_3)] = \cdots = E_1[u'(C_T)] \qquad \ldots (7.10)$$

In order to explain *(7.10)* further let us take a quadratic utility function of the form: $u(C_t) = C_t - \frac{a}{2}C_t^2$ for $t = 1,2,\ldots, T$. Then the marginal utility function is linear in C_t, *i.e.*, $u'(C_t) = 1 - aC_t$ for all t. Therefore,

$$E_1[u'(C_t)] = E_1[1 - aC_t] = 1 - aE_1(C_t).$$

Using this in the optimality condition we get:

$$1 - aC_1 = 1 - aE_1[C_2] = 1 - aE_1[C_3] = \cdots = 1 - aE_1[C_T].$$

On simplification,

$$C_1 = E_1[C_2] = E_1[C_3] = \cdots = E_1[C_T] \qquad \ldots (7.11)$$

The above condition implies that expectation as of period 1 about C_2 equals C_1. In more general terms if expectations are formed at any period t about a future period $t+1$, then optimality condition requires that expectation as of period t about C_{t+1} equals C_t, i.e., $C_t = E_t[C_{t+1}]$. Since under rational expectations the actual value of a variable can differ from its expected value only by a random term, this would imply

$$C_{t+1} = E_t[C_{t+1}] + e_{t+1}$$

$$= C_t + e_{t+1}, \qquad \ldots (7.12)$$

where e_{t+1} is a random term whose expected value is zero. If you look carefully, equation (7.12) says that consumption from period t to period $t+1$ would remain unchanged, except for an unpredictable random term. This is precisely the conclusion of the random walk hypothesis. The hypothesis says that changes is consumption over time is unpredictable, because they can only change due to the presence of unpredictable random events.

The random walk hypothesis has important implications from the point of view of policy effectiveness. It implies that any government policy to influence consumption (for example, a tax cut) can work only to the extent that it is not anticipated. For example, if the government announces a tax cut policy today, which will be implemented from next year, then consumers with rational expectations will adjust their consumption today itself, so that consumption would remain unchanged when the tax policy actually becomes operative next year.

7.4 CONSUMPTION AND RISKY ASSETS: CAPITAL-ASSET PRICING MODEL

While analysing consumption under uncertainty in the previous Section, we had implicitly assumed that the source of uncertainty is the households' income. In other words, we had assumed that there was no uncertainty as far as the asset return is concerned: the return to asset (r) was treated as given. (In fact, for simplicity we had assumed that it has a value equal to zero). If the return to asset is non-zero, but the exact return is uncertain then the optimality condition of the individual's utility maximization will include an expected return term as shown below:

$$u'(C_t) = E_t[(1+r_{t+1})u'(C_{t+1})], \qquad \text{... (7.13)}$$

where t is the time period when expectations are formed.

We know from the theorem for statistical expectation (operator E) for two events A and B that $E(AB) = E(A).E(B) + \text{Cov}(AB)$ (where $\text{Cov}(AB)$ is the co-variance between the two events A and B). We can visualize (7.13) as a case of two joint events and write the optimality condition as:

$$u'(C_t) = E_t[(1+r_{t+1})].E_t[u'(C_{t+1})] + \text{Cov}_t[(1+r_{t+1}, u'(C_{t+1})] \qquad \text{... (7.14)}$$

Now suppose there are two assets: i) one with a certain (risk-free) return given by $\bar{i}_{t+1}$, and ii) another with an uncertain risky return with an expected return value equal to $E_t(r_{t+1})$. For the risky asset application of the condition (7.14) implies that

$$E_t[(1+r_{t+1})] = \frac{u'(C_t) - \text{Cov}_t[(1+r_{t+1}, u'(C_{t+1})]}{E_t[u'(C_{t+1})]},$$

i.e., $$1 + E_t[r_{t+1}] = \frac{u'(C_t) - \text{Cov}_t[(1+r_{t+1}, u'(C_{t+1})]}{E_t[u'(C_{t+1})]} \qquad \text{.. (7.15)}$$

For the risk-free asset, the return is certain and therefore is uncorrelated to C_{t+1}. In other words, for the risk-free asset $\text{Cov}_t[(1+\bar{i}_{t+1}, u'(C_{t+1})] = 0$. Hence for the risk-free asset, the condition (7.14) implies that

$$1 + \bar{i}_{t+1} = \frac{u'(C_t)}{E_t[u'(C_{t+1})]}. \qquad \text{... (7.16)}$$

Comparing (7.15) and (7.16) we get:

$$E_t[r_{t+1}] = \bar{i}_{t+1} - \frac{\text{Cov}_t[(1+r_{t+1}, u'(C_{t+1})]}{E_t[u'(C_{t+1})]}. \qquad \text{.. (7.17)}$$

The condition (7.17) gives us a way of determining the optimal (or equilibrium) expected return of a risky asset. Note that a higher value of C_{t+1} implies a lower value of $u'(C_{t+1})$. Therefore a positive co-variance between r_{t+1} and C_{t+1} implies a negative co-variance between r_{t+1} and $u'(C_{t+1})$. Hence (7.17) implies that the higher is the correlation between r_{t+1} and C_{t+1}, the greater is the required expected return on a risky asset compared to the return from the risk-free asset. To put it differently, the greater is the covariance between r_{t+1} and C_{t+1}, the higher is the premium that an asset must offer relative to the risk-free rate. This model of determination of expected return of risky assets is known as the Consumption Capital Asset Pricing Model (CAPM).

Check Your Progress 2

1) Describe the Random Walk Hypothesis of consumption. What is the implication of this hypothesis from the perspective of government policy?

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2) Explain the Consumption Capital Asset Pricing rule for a risky asset.

7.5 LET US SUM UP

The present unit viewed consumption in a dynamic set up and introduced you to the problem of intertemporal utility maximization. In this context it discussed the issue of consumption and savings when more than one time periods are considered. The Fisherian idea that consumption is an outcome of household's intertemporal optimization exercise has been explained in the unit.

Empirical studies involving cross-section data find that richer households consume a smaller fraction of their income compared to poorer households. However, studies based on time series data show that the proportion of consumption in income has remained more or less the same although household income has increased manifold, This apparent discrepancy has been attempted to be resolved through life-cycle hypothesis and permanent income hypothesis. According to the life cycle hypothesis the short run consumption function shows a declining average propensity to consume (APC) while the long run consumption function exhibits constant APC due to increase in asset base. On the other hand, the permanent income hypothesis explains the discrepancy in terms of permanent income and transitory income.

In the presence of uncertainty actual consumption behaviour may be difficult to predict. In this situation consumption may follow a random pattern. This theory of consumption, known as the Random Walk Hypothesis, has been explained here. Finally, in the presence of uncertainty the price of the risky asset may follow a specific pattern which has been explained in the discussion on the CAPM model.

7.6 KEYWORDS

Average Propensity to Consume It is defined as the ratio of total consumption (C) to total income (Y). Thus APC = $\frac{C}{Y}$

Ceteris Paribus It means 'every thing else remaining the same'.

Consumption Smoothing Even though the income of an individual changes across time periods, he divides his life time resources equally among each **period** and consumption at different points of time are spread evenly.

Expected Utility The total utility expected to be derived from the future income stream.

Intertemporal Decision A decision which involved more than one time period.

Permanent Income That part of the current income that is expected to remain stable over the long run.

Rational Expectations The hypothesis that expectations sf people on the whole is unbiased.

Transitory Income That part of the current income which is a deviation from permanent income.

7.7 SOME USEFUL BOOKS

Branson, William H., 1989, ***Macroeconomic Theory and Policy*** (3rd Edition), Harper and Row, chapter 12.

Romer, David, 2001, ***Advanced Macroeconomics*** (2nd Edition), McGraw-Hill, chapter 7.

7.8 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

1) Read Section 7.2 and write your answer.

2) Read Section 7.2 and write your answer.

Check Your Progress 2

1) Read section **7.3** and **write** your answer.

2) Read section 7.4 and write your answer.