The Life Cycle Hypothesis (LCH) of Consumption Function

In the late 1950s and early 1960s Franco Modigliani and his coworkers Albert Ando and Richard Brumberg related consumption expenditure to demography. Modigliani, in particular, emphasised that income varies systematically over peoples' lives and that saving allows consumers to move income from early years of earning (when income is high) to later years after retirement when income is low. This interpretation of household consumption behaviour forms the basis of his life cycle hypothesis.

The life cycle hypothesis (henceforth LCH) represents an attempt to deal with the way in which consumers dispose off their income over time. In this hypothesis wealth is assigned a crucial role in consumption decision.

Wealth includes not only property (houses, stocks, bonds, savings accounts, etc.) but also the value of future earnings. Thus consumers visualise themselves as having a stock of initial wealth, a flow of income generated by that wealth over their lifetime and a target (which may be zero) as their end-of-life wealth. Consumption decisions are made with the whole series of financial flows in mind.

Thus, changes in wealth, as reflected by unexpected changes in flow of earnings or unexpected movements in asset prices, would have an impact on consumers' spending decisions because that would enhance future earnings from property, labour or both. The theory has empirically testable implications for the relation between saving and age of a person as also for the role of wealth in influencing aggregate consumer spending.

The Basic Hypothesis:

The main reason that an individual's income varies over time is retirement. Since most people do not want their current living standard (as measured by consumption) to fall after retirement they save a portion of their income every year (over their entire service period). This motive for saving has an important implication for an individual's consumption behaviour.

Suppose a consumer expects to live for another T years, has wealth of W, and expects to earn income Y per year until he (she) retires R years from now. What

should be the optimal level of consumption of the individual if he wishes to maintain a smooth level of consumption over his entire life?

The consumer's lifetime endowment consists of initial wealth W and lifetime earnings RY.

If we assume that the consumer divides his total endowment W + RY equally among the T years and wishes to consume smoothly over his lifetime then his annual consumption will be:

$C = (W + RY)/T \ldots (1)$

This person's consumption function can now be expressed as

$C = (1/T)\, W + (R/T)\, Y$

If all individuals plan their consumption in the same way then the aggregate consumption function will be the same as individual consumer's consumption function. To be more specific aggregate consumption depends on both wealth and life-time income.

That is, the aggregate consumption function is

$C = \alpha W + \beta Y \ldots (2)$

where the parameter a is the MPC out of wealth, and the parameter β is the MPC out of income.

Implications:

Fig. 8.10 shows the relationship between consumption and income in terms of the life cycle hypothesis. For any initial level of wealth W, the consumption function looks like the Keynesian function.

But the intercept αW which shows what would happen to consumption if income ever fell to zero, is not a constant, as is the term a in the Keynesian consumption function. Instead the intercept αW depends on the level of wealth. If W increases, the consumption line will shift upward parallely.

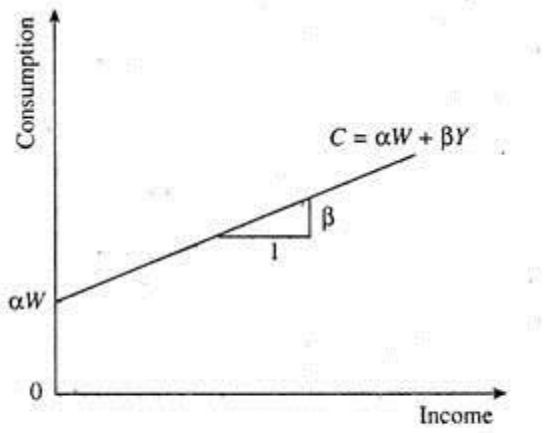

Fig. 8.10: The Life Cycle Consumption Function

So one main prediction of the LCH is that consumption depends on wealth as well as income. This is shown by the intercept of the consumption function.

Solving the Consumption Puzzle:

The LCH can solve the consumption puzzle in a simple way. According to this hypothesis, the APC is:

$C/Y = \alpha (W/Y) + \beta \ldots (3)$

Since wealth does not vary proportionately with income from person to person or from year to year, cross-section data (which show inter-individual differences in income and consumption over short periods) reveal that high income corresponds to a low APC. But in the long run wealth and income grow together, resulting in a constant W/Y and a constant APC.

If wealth remains constant as in the short run the life cycle consumption function looks like the Keynesian consumption function. But in the long run, as wealth increases, say, from W_1 to W_2, the consumption function itself shifts upward, as shown in Fig. 8.11.

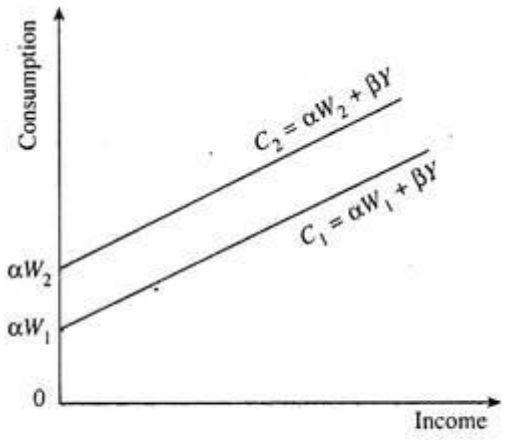

Fig. 8.11: Shift in Consumption Function due to Changes in Wealth

This prevents the APC from falling as income increases. So in the short-run some consumption-income relation (which takes wealth as constant) will not continue to hold in the long run when wealth increases. This is how the LCH solves the consumption puzzle posed by Kuznets's studies.

Effect of an Increase in Labour Income on Consumption:

If wealth increases, an individual's whole consumption function shifts upward. But if income (from labour) increases, there is movement along the same consumption function.

Suppose here

T = 50

R = 30

$\alpha = 0.02$ and $\beta = 0.6$

So, C = 0.02W + 0.6Y.

If W = 1000 and Y = 500, then

C = 20 + 300 = 320.

If W = 1000 and Y = 1000, then C = 20 + 600 = 620

Thus if his labour income is doubled from 500 to 1000, his consumption is less than doubled from 320 to 620 as is shown in Fig. 8.12.

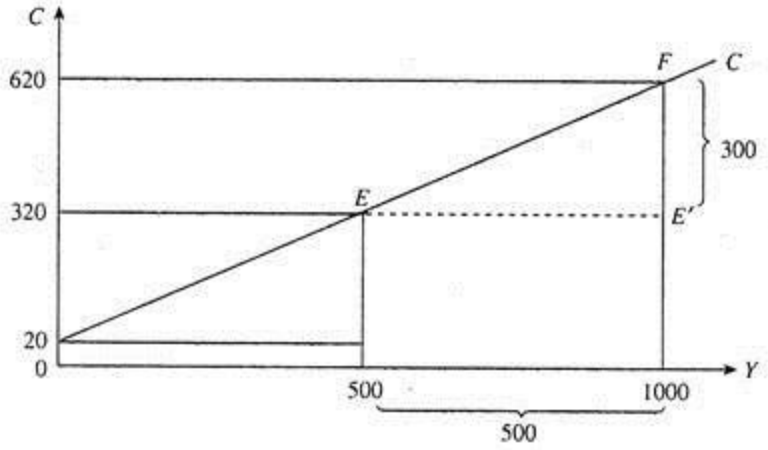

Fig. 8.12: Movement along the Consumption Function

Other Predictions:

Another important prediction of the LCH is that saving varies over a person's lifetime. The LCH to link consumption and saving with the demographic considerations, especially with the age distribution of the population. The MPC out of lifetime income changes with age.

If a person has no wealth at the beginning of his service life, then he will accumulate wealth over his working years and then run down his wealth after his retirement. Fig. 8.13 shows the consumer's income, wealth and consumption over his adult life.

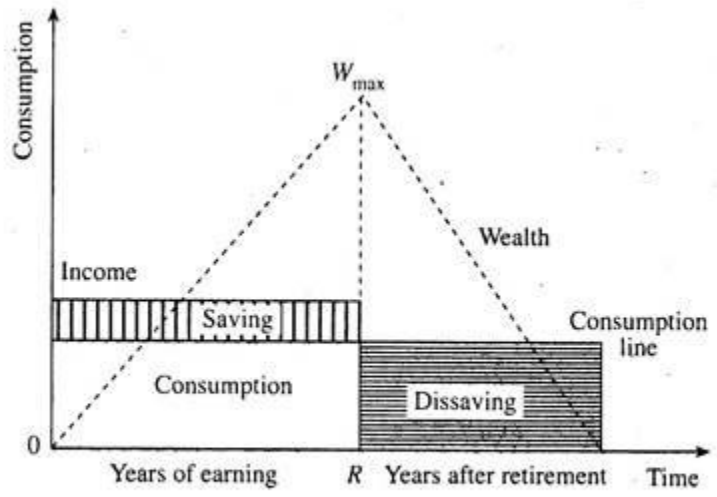

Fig. 8.13: Income, Wealth and consumption over the Adult Life

If a consumer smoothest consumption over his adult life (as is indicated by the horizontal consumption line), he will save and accumulate wealth during his working years and then dissave and run down his wealth after retirement. In other words, since people want to smooth consumption over their lives, the young—who are working—save, while the old—who have retired—dissave.

In the long run the consumption-income ratio is very stable, but in the short run it fluctuates. The LCH explains this by pointing out that people try to maintain a smooth flow of consumption even if their lifetime income flow is uneven, and thus emphasises the role of wealth in the consumption function.'

Economic Significance of LCH:

The LCH states that current consumption is not dependent solely on current disposable income but is related to a person's anticipated lifetime income. For example, a young worker may purchase a durable goods such as a house on the basis of long-term credit as he expects his future income to rise as he moves up a salary scale and gets an increment in basic wage rate. He thus will be able to pay future interest and repayment charges.

In contrast an old worker nearing retirement may limit his consumption from current income in anticipation that his income will fall after retirement. Long-term

consumption may also be related to changes in a person's wealth, in particular the value of his house over time.

The economic significance of the LCH is that in the short run the level of consumption may be higher (or lower) than that indicated by the level of disposable income.

Theory and Evidence: Do Old People Dissave?

Some recent findings present a genuine problem for the LCH. Old people are found not to dissave as much as the hypothesis predicts. This means that the elderly do not reduce their wealth as fast as one would expect, if they were trying to smooth their consumption over their remaining years of life.

Two reasons explain why the old people do not dissave as much as the LCH predicts:

(i) **Precautionary Saving:**

The old people are very much concerned about unpredictable expenses. So there are some precautionary motives for saving which originate from uncertainty. This uncertainty arises from the fact that old people often live longer than they expect.

So they have to save more than what an average span of retirement would warrant. Moreover uncertainty arises due to the fact that the medical expenses of old people increase faster than their age. So some sort of Malthusian process is found to be operating in this case.

While an old person's age increases at an arithmetical progression his medical expenses increase in geometrical progression due to accelerated depreciation of human body and the stronger possibility of illness. The old people are likely to respond to this uncertainty by saving more in order to be able to overcome these contingencies.

Of course, there is an offsetting consideration here. Due to the spread of medical insurance in recent years old people can protect themselves against uncertainties about medical expenses at a low cost (i.e., just by paying a small premium).

Now-a-days various insurance plans are offered by both government and private agencies (such as Medisave, Mediclaim, Medicare, etc.). Of course, the premium rate increases with age. As a result the old people are required to increase their saving rate to be able to fulfill their contractual obligations.

However, to protect against uncertainty regarding lifespan, old people can buy annuities from insurance companies. For a fixed fee, annuities offer a stream of income over the entire life span of the recipient.

(ii) **Leaving Bequests**:

Old people do not dissave because they want to leave bequests to their children. The reason is that they care about them. But altruism is not really the reason that parents leave bequests. Parents often use the implicit threat of disinheritance to induce a desirable pattern of behaviour so that children and grandchildren take more care of them or to be more attentive or obedient.

Thus LCH cannot fully explain consumption behaviour in the long run. No doubt providing for retirement is an important motive for saving, but other motives, such as precautionary saving and bequest, are no less important in determining people's saving behaviour.

Another explanation, which differs in details but entirely shares the spirit of the life cycle approach is the permanent income hypothesis of consumption. The hypothesis, which is the brainchild of Milton Friedman, argues that people gear their consumption behaviour to their permanent or long-term consumption opportunities, not to their current level of income.

An individual does not plan consumption within a period solely on the basis of income within the period; rather, consumption is planned in relation to income over a longer period. It is to this hypothesis that we turn now. And we will see that Friedman's permanent income hypothesis, suggests an alternative explanation of long- run income-consumption relationship.