1) ***Cross-sectional evidence***: this was evidence coming from surveys about households at a given point of time. For example a sample of 1000 consumers in 1934. The results from this evidence were:

   a) Richer households consumed more than poorer ones ⇒ *MPC > 0*

   b) Richer households saved more than poorer ones ⇒ MPC < 1.

   c) Richer households saved larger fractions of their income ⇒ APC ↓ asY ↑.

   d). The correlation between current income and current consumption was found to be very strong (this was found during the Great Depression).

   Therefore according to this evidence it seemed that the Keynesian Consumption Function was a good representation of consumers' behaviour.

2) ***Time series evidence***: in 40s new pieces of evidence about aggregate consumptions were found by Simon Kuznets (a Nobel prize winner). He created a set of data from the US national accounts from 1869 to the 1940s on aggregate Y and C. According to the Keynes Consumption Function aggregate consumption should grow more slowly than income. This is because as Y increases, C also increases but proportionately less than income. Moreover as income increases APC should decrease. Kuznets found that the ratio C/Y was very stable in long time series data. This implies that C grew at the same rate as income and as income increased APC did not fall.

Therefore we have two different pieces of evidence giving very different results. The difference between the two was that the first one was cross-sectional in detail (they looked at a snapshot of the economy at a point) whereas Kuznet's study was of a time series nature (it looked at the economy over many points in time). *So the evidence seemed to indicate that there were two consumption functions: a short-run consumption function which seemed to conform to Keynes's conjectures and a long-run consumption function in which the APC was basically constant.* This is known as the ***Consumption Puzzle***.

We can see how this looks with the following graph:

denominator increase by the same amount and so $\frac{C}{Y}$ should remain constant.

The Random Walk Hypothesis of Consumption

This is due to Robert Hall (1978). The idea is to consider the Permanent Income/Life Cycle Hypothesis under uncertainty once we include the idea of rational expectations (people use all available information to forecast future variables like income) in the analysis.

If PIH-LCH is correct and consumers have rational expectations, then consumption should follow a ***random walk***: *changes in consumption should be unpredictable*.

A change in income or wealth that was anticipated has already been factored into expected permanent income, so it will not change consumption. Only unanticipated changes in income or wealth that alter expected permanent income will change consumption.

Consider first a basic model of PIH-LCH under certainty.

Assume that $r = 0$ (real interest rate is zero for simplicity) and there is no discounting. Assume that the representative consumer lives for *T* periods.

A consumer chooses consumption in each period to maximise the sum of his per period utility over his lifetime given by:

$$U(C_1) + U(C_2) + ... + U(C_T) \qquad 12)$$

subject to his lifetime budget constraint:

$$C_1 + C_2 + ... + C_T = W_0 + Y_1 + Y_2 + ... + Y_T \qquad 13)$$

where W_0 is the initial wealth and Y is income.

Assume that: per period utility function is: $U(C) = C - \frac{a}{2}C^2$ where $a > 0$ is a constant (this is a quadratic utility function).

From the two period model we know that optimal choice of consumption over two different period of time is where: $MRS = 1 + r$, where *MRS* is Marginal Rate of Substitution between consumption in the two different periods.

Since $r = 0$ the condition here becomes: $MRS = 1$.

The MRS between consumption in two different periods, like C_1 and C_2 for example, is given by:

$$\frac{dU(C_1)/dC_1}{dU(C_2)/dC_2}$$

The numerator is the marginal utility of C_1 and the denominator is marginal utility of