31E2300 MACROECONOMICS: POLICY

THE DEMAND SIDE, PART 2

"FORWARD-LOOKING BEHAVIOR" AND ITS IMPLICATIONS

BOTH HOUSEHOLDS AND FIRMS ARE FORWARD-LOOKING

- Spending decisions today are influenced by expectations of the future:
  - Households adjust current spending based on expected future income, which, among, other things, allows for *consumption smoothing.*
  - Firms make investment decisions based on expected future profits.

- Recall the concept of present value:
  - Firm Profits:

$$V_t^E = \Pi_t^E + \frac{\Pi_{t+1}^E}{(1+r)} + \frac{\Pi_{t+2}^E}{(1+r)^2} + \cdots = \sum_{i=0}^{T} \frac{1}{(1+r)^i} \Pi_{t+i}^E$$

  - Household Lifetime Wealth:

$$\Psi_t^E = (1+r)A_{t-1} + \sum_{i=0}^{\infty} \frac{1}{(1+r)^i} y_{t+i}^E$$

Resources available at t

PV of expected lifetime labour income, post-tax

FORWARD-LOOKING CONSUMPTION

- Economists believe that households want to "smooth consumption" over time. Why and how?
  - *Why? Assume diminishing marginal utility of consumption*
  - *How? Requires the means to save and borrow against future earnings.*

- Permanent Income Hypothesis (PIH)
  - *Individuals optimally choose consumption by allocating resources (wealth, and present value of income) across their lifetimes.*
  - *Consumption is then forward looking, in contrast to the simplest Keynesian consumption function: that is, it depends on r, A_0, expected future income and taxes.*
  - *PIH predicts that consumption will be smoother than income.*

    (Why? Among other things, consumers save when earning income and draw on savings when retired)

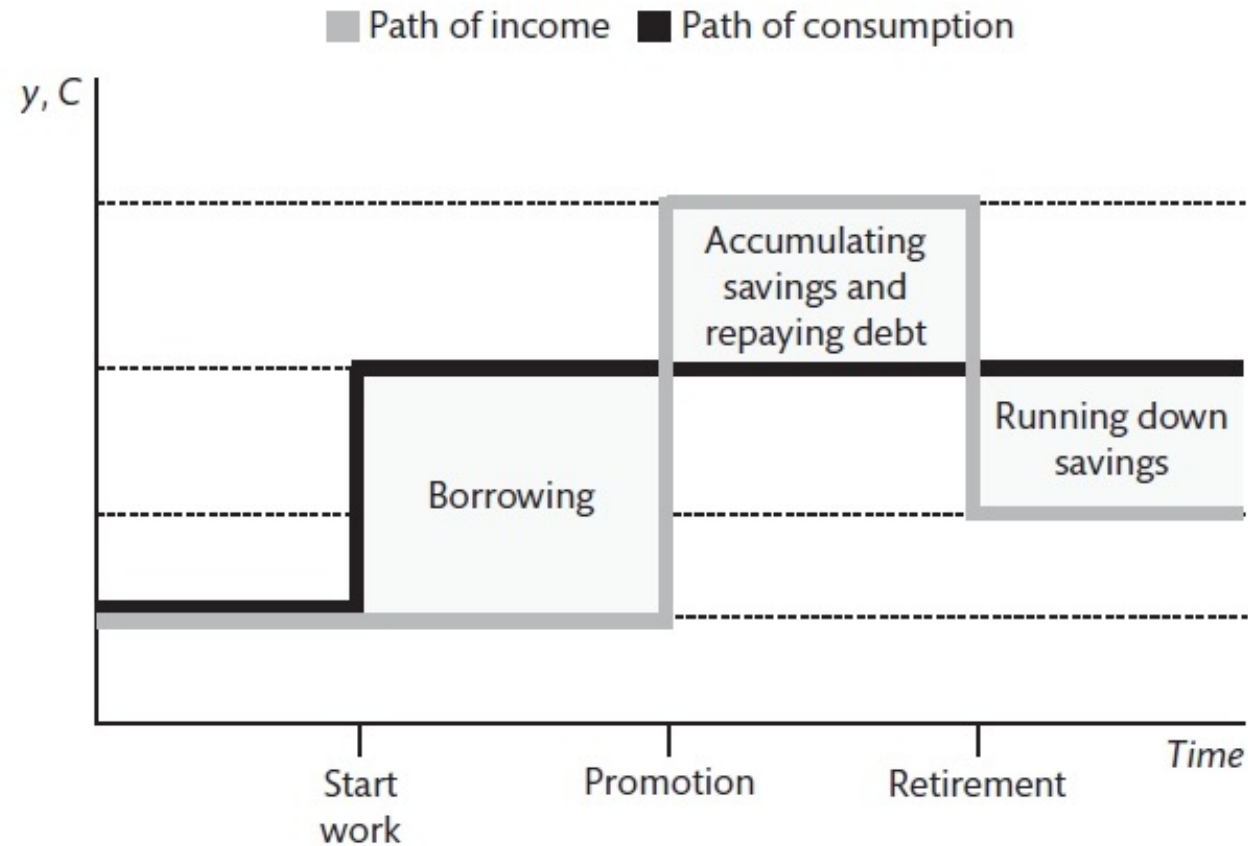# Modelling:

Consumption smoothing behaviour:

Figure 1.7 The permanent income hypothesis over the life cycle.

THE PIH

- The household chooses a path of consumption to maximize its lifetime utility:

$$V_t^E = U(C_t) + \frac{U(C_{t+1}^E)}{1+\rho} + \frac{U(C_{t+2}^E)}{(1+\rho)^2} + \ldots$$

- It does so subject to a budget constraint, namely, that the present value of consumption be less than or equal to the present value of its resources:

$$\Psi_t^E = (1+r)A_{t-1} + \sum_{i=0}^{\infty} \frac{1}{(1+r)^i} y_{t+i}^E$$

- Choosing U(C)=ln(C), assuming $\rho = r$ and solving leads to PIH consumption function:

$$C_t = \frac{r}{1+r} \Psi_t^E$$

Can you derive this? (Make sure you can!)

- The consumer consumes a constant fraction of their expected lifetime wealth (Ψ_t^E), that is, they borrow/ save to maintain this level of C_t for all t.

- What are the implications for, say, tax policy? Does it matter, for example, if a tax cut is temporary or permanent?

PIH IMPLICATIONS

- Predictions of the PIH:

1. Anticipated changes in income should have no effect on consumption when they occur

2. Unanticipated changes should affect consumption as permanent income (Ψ_t^E) needs to be recalculated

- 'Excess sensitivity': C_t changes with anticipated changes in income.
- 'Excess smoothness': C_t changes too little with a change in Ψ_t^E.

- Why PIH might fail:

1. Credit constraints: Inability to smooth consumption by borrowing

2. Impatience: Reluctance to save for consumption smoothing

3. Uncertainty about future income, which leads to precautionary savings above the level predicted by the PIH.

EXCESS SENSITIVITY

Figure 1.8 The consumption response of PIH and credit-constrained households to an anticipated rise in income.
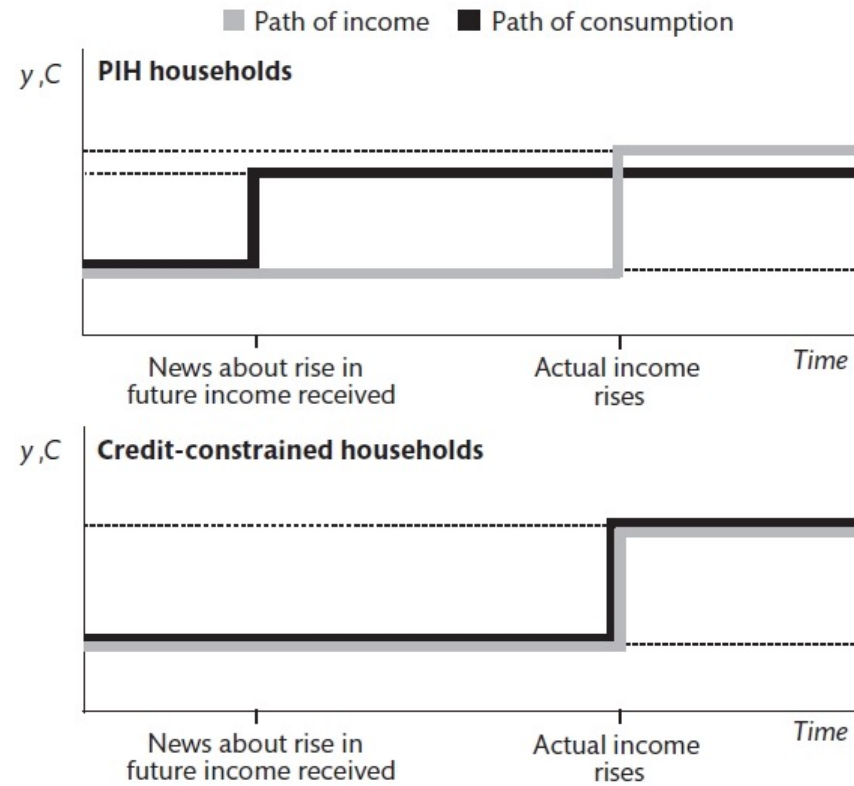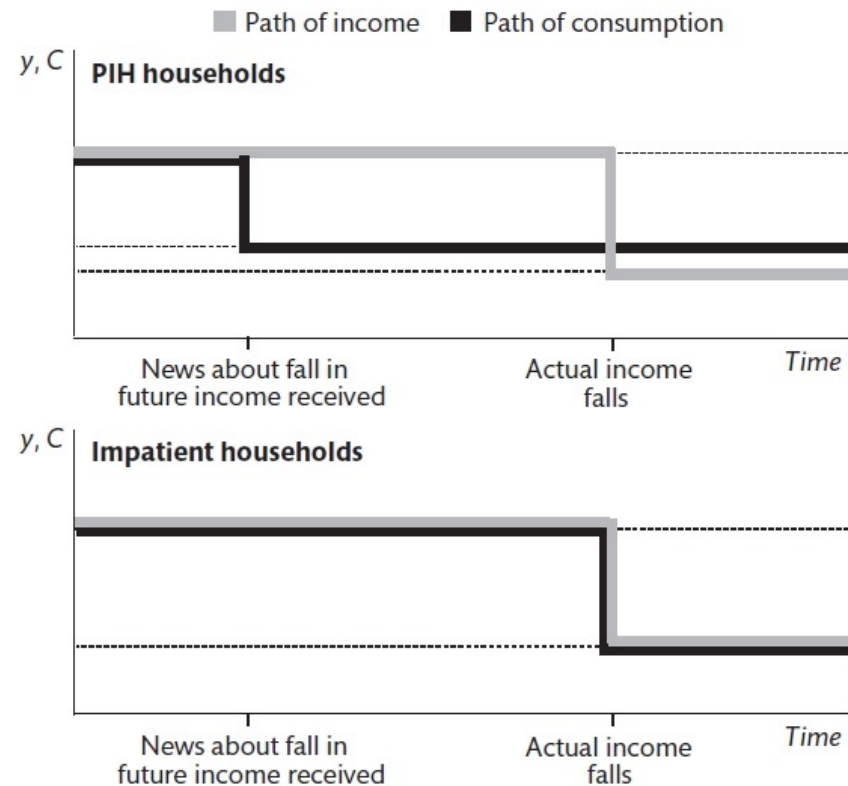
PIH households can increase C by borrowing, as soon as the news arrives.

Credit-constrained households cannot do so, and can only increase C when actual income rises.

EXCESS SMOOTHNESS

Path of income ■ Path of consumption

PIH households

News about fall in future income received

Actual income falls

Time

Impatient households

News about fall in future income received

Actual income falls

Time

Figure 1.9 The consumption response of PIH and impatient households to an anticipated fall in income.

PIH households start saving as soon as the news arrives, allowing for smooth consumption when income falls.

"Impatient" households do not do so, so consumption falls when income falls. Note: This is more than the usual "impatience," but related to the behavioral notion of "present bias."

FORWARD-LOOKING INVESTMENT

Tobin's q-theory of Investment:

$$q = \frac{MB \text{ of investment}}{MC \text{ of investment}} = \frac{Pf_K}{\delta + r} \qquad (marginal\, q\ model)$$

- $q = 1$ *(MB=MC):* *Investment is optimal*
- $q > 1$ *(MB>MC):* *Firms should increase investment*
- $q < 1$ *(MB<MC):* *Firms should disinvest*

- q is higher if:

    i. *Output price (P) is higher*
    ii. *Marginal product of capital (f_K) is higher*
    iii. *Interest rate (r) is lower*
    iv. *Depreciation rate (δ) is lower*

TOBIN'S q

- Marginal q is often difficult to measure (f_K is usually unknown).

- Therefore, the 'average Q' model is used to operationalize this theory, where:

$$Q = \frac{Market\ value\ of\ firm}{Replacement\ cost\ of\ capital}$$

- Stock market value is forward-looking and indicates how well the firm is able to implement the investment.

- If Q>1 (market value > replacement cost of firm), then the firm should invest and vice versa.

- In reality, credit constraints and uncertainty also help explain firm investment behaviour, not just Tobin's q or Q.

What does this assume about the efficiency of stock markets?

WHAT DOES ALL THIS MEAN FOR OUR IS CURVE?

- Recall that both slope and shift of IS affected by size of multiplier:

$$= \frac{1}{1 - MPC\ (1-t)}$$

- *Under PIH, temporary income shocks don't change permanent income much, so MPC is small and multiplier is close to 1.*

- *Under PIH, permanent income shocks should be associated with MPCs close to 1, and (very) large multipliers*

- *Credit constraints and impatience both mean multiplier will exceed 1 even for temporary shcocks.*

- And observe that the *Interest sensitivity of consumption and investment* will also affect the IS curve. (How?)

WHAT ELSE WOUJLD CAUSE THE IS CURVE TO SHIFT?

Consumption: PIH predicts that changes in expected lifetime wealth (Ψ_t^E) shifts the IS. The empirical literature suggests:

i.   *Role of Uncertainty: ↑ unemployment → ↑ precautionary savings → IS shifts leftwards*

ii. *Housing Price Boom: If home equity loans obtainable → Credit constraints relaxed → IS shifts rightwards;*

   If home equity loans unobtainable → ↑ mortgage downpayments → IS shifts leftwards

iii. *Financial innovation or deregulation → ↑ household access to credit → IS shifts rightwards*

OTHER IS CURVE SHIFTERS

Investment: Tobin's q predicts that the following factors will shift the IS curve rightwards:

i.   *Increase in prices (P)*

ii.   *Increase in the marginal productivity of capital (f_K)*

iii.   *Reduction in the depreciation rate (δ)*

The average Q equation highlights the role of expected future profits as a shift factor for the IS curve:

*↑ Stock market value→ ↑ Firm value relative to replacement cost →
↑ Fixed Investment → IS shifts rightwards*