CONSUMPTION

Most prominent work on consumption:
- 1. John Maynard Keynes: consumption and current income
- 2. Irving Fisher and Intertemporal Choice
- 3. Franco Modigliani: the Life-Cycle Hypothesis
- 4. Milton Friedman: the Permanent Income Hypothesis
- 5. Robert Hall: the Random-Walk Hypothesis

1. Keynes’s Conjectures

1. $0 < MPC < 1$

2. $APC$ falls as $Y$ rises
   $APC = \text{average propensity to consume}$

3. $C = f(Y)$ only

The Keynesian Consumption Function

$$C = \bar{c} + cY$$

$c = MPC$
**Early Empirical Successes**

- Households with higher incomes:
  - consume more
    \[\Rightarrow \text{MPC} > 0\]
  - save more
    \[\Rightarrow \text{MPC} < 1\]
  - save a larger fraction of their income
    \[\Rightarrow \text{APC} \downarrow \text{as } Y \uparrow\]
  - \(S/Y = 1 - C/Y\) rises as \(Y\) rises
- Strong correlation between income and consumption

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**Later: The Consumption Puzzle**

\(C/Y\) is stable in long time series data.

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**2. Basic two-period model (Fisher)**

Consumer: \(\max u(c_1, c_2)\)
Subject to intertemporal budget constraint

- Period 1: the present
- Period 2: the future
- Notation:
  - \(y_1\) is income in period 1
  - \(y_2\) is income in period 2
  - \(c_1\) is consumption in period 1
  - \(c_2\) is consumption in period 2
  - \(s = y_1 - c_1\) is saving in period 1
    \((s < 0 \text{ if the consumer borrows in period 1})\)
The intertemporal budget constraint

- Period 2 budget constraint:
  \[ C_2 = (Y_1 - C_1)(1+r) + Y_2 \]

- Rearrange:
  \[ \frac{C_1}{1+r} + \frac{C_2}{1+r} = \frac{Y_1}{1+r} + \frac{Y_2}{1+r} \]

What is the slope?

The intertemporal budget constraint

What is the slope?

Consumer preferences

What is the slope?
How $C$ responds to changes in $Y$

- If today’s income rises, consumption will rise both today and tomorrow.

How $C$ responds to changes in $r$

- **Income effect**
  If consumer is a saver, the rise in $r$ makes him better off, which tends to increase consumption in both periods.

- **Substitution effect**
  The rise in $r$ increases the opportunity cost of current consumption, which tends to reduce $C_1$ and increase $C_2$.

- Both effects \( \Rightarrow \uparrow C_2 \).

  $C_1$: ambiguous
In Fisher’s theory, timing of income is irrelevant.

Example: If consumer learns that her future income will increase, she can spread the extra consumption over both periods by borrowing in the current period.

However, if there are borrowing constraints, consumption may behave as in the Keynesian theory even though she is rational and forward-looking.

Borrowing constraint: \( C_1 \leq Y_1 \)

If \( Y_2 \) rises, may not be able to increase \( C_1 \).

Consumer optimization when the borrowing constraint is binding.

D: unconstrained choice

E: constrained
1 vs 2: Keynes vs. Fisher

- **Keynes:**
  \[ C = f(Y) \]

- **Fisher:**
  \[ C = f(Y_1, Y_2, r) \]

3. Life-Cycle Hypothesis (Modigliani)

- Income varies systematically over the phases of the consumer's "life cycle".
- Saving allows the consumer to achieve smooth consumption.

- The basic model:
  \[
  \begin{align*}
  W & = \text{initial wealth} \\
  Y & = \text{annual income until retirement (assumed constant)} \\
  R & = \text{number of years until retirement} \\
  T & = \text{lifetime in years}
  \end{align*}
  \]

- Assumptions:
  - zero real interest rate (for simplicity)
  - consumption-smoothing is optimal

Life-Cycle Hypothesis

- Lifetime resources = \( W + RY \)

- To achieve smooth consumption
  \[
  \begin{align*}
  C &= (W + RY) / T \\
  C &= \alpha W + \beta Y
  \end{align*}
  \]

\[
\begin{align*}
\alpha &= (1/T) = \text{MPC out of wealth} \\
\beta &= (R/T) = \text{MPC out of income}
\end{align*}
\]
**The Life-Cycle Hypothesis**

- **Wealth**
- **Income**
- **Saving**
- **Consumption**
- **Dissaving**
- **Retirement begins**
- **End of life**

**Implications of the LCH**

LCH and the consumption puzzle:

- APC \( \rightarrow \frac{C}{Y} = \alpha \left(\frac{W}{Y}\right) + \beta \)

- Rich households W/Y low
- Poor households W/Y high

- APC falling cross-sectionally

- Over time, aggregate wealth and income grow together \( \rightarrow \) APC stable.

**4. Permanent Income Hypothesis (Friedman '57)**

PIH : \( Y = Y^p + Y^t \)

- permanent income \( Y^p \)
  (average income people expect to earn in their life)
- transitory income \( Y^t \)

- Consumers save & borrow to smooth consumption in response to transitory shocks

- The PIH consumption function:
  \( C = \alpha Y^p \)
  \( \alpha \) = fraction of permanent income that people consume per year.
PIH

- PIH → APC = C/Y = αY(T) / (Y(T) + Y(P))
- Rich (poor) households Y(T) high (low)
- Then APC falling cross-sectionally
- Over time, Y(T) negligible, which implies a stable APC.
- Can solve consumption puzzle

3 vs 4: PIH vs. LCH

- In both, people try to achieve smooth consumption in the face of changing current income.
- LCH: current income changes systematically throughout life cycle.
- PIH: current income is subject to random, transitory fluctuations.
- Both can explain the consumption puzzle.

5. The Random-Walk (Hall, 1978)

- Based on Fisher & PIH, in which forward-looking consumers base consumption on expected future income.
- Hall adds the assumption of rational expectations.
The Random-Walk Hypothesis

- If PIH is correct and consumers have rational expectations, then consumption should follow a random walk.
  - Anticipated Y changes will not change C.
  - Only unanticipated changes in Y or W that alter expected permanent income will change C.

**IMPLICATION** → Only unexpected policies will have real effects.

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**Chapter summary**

- Keynes suggested that consumption depends primarily on current income.
- Recent work suggests instead that consumption depends on
  - current income
  - expected future income
  - wealth
  - interest rates
- Economists disagree over the relative importance of these factors and of borrowing constraints and psychological factors.