

macro

Topic 13:
Consumption
 (chapter 16) (revised 11/19/03)

macroeconomics
fifth edition

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PowerPoint® Slides
 by Ron Cronovich

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Chapter overview

This chapter surveys the most prominent work on consumption:

- John Maynard Keynes: consumption and current income
- Irving Fisher and Intertemporal Choice
- Franco Modigliani: the Life-Cycle Hypothesis
- Milton Friedman: the Permanent Income Hypothesis
- Robert Hall: the Random-Walk Hypothesis
- David Laibson: the pull of instant gratification

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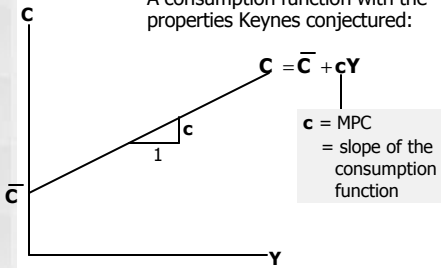
Keynes's Conjectures

- 1.
2. where APC
 = **average propensity to consume**
 = **C/Y**
- 3.

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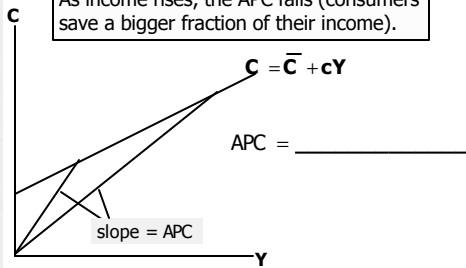
The Keynesian Consumption Function

A consumption function with the properties Keynes conjectured:



The Keynesian Consumption Function

As income rises, the APC falls (consumers save a bigger fraction of their income).



Early Empirical Successes: Results from Early Studies

- Households with higher incomes:
 - $\text{MPC} > 0$
 - $\text{MPC} < 1$
 - $\text{APC} \downarrow$ as $\text{Y} \uparrow$
- Very strong correlation between income and consumption
 - income seemed to be the main determinant of consumption

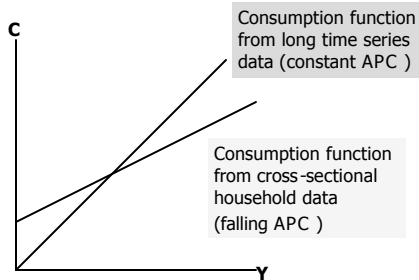
Problems for the Keynesian Consumption Function

Based on the Keynesian consumption function, economists predicted that _____.

This prediction did not come true:

- As incomes grew, the APC did not fall, and **C** grew just as fast.
- Simon Kuznets showed that **C/Y** was very stable in long time series data.

The Consumption Puzzle



Irving Fisher and Intertemporal Choice

- The basis for much subsequent work on consumption.
- Assumes consumer is forward-looking and chooses consumption for the present and future to maximize lifetime satisfaction.
- Consumer's choices are subject to an _____, a measure of the total resources available for present and future consumption

The basic two-period model

- 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 _____
 - ($S < 0$ if the consumer borrows in period 1)

Deriving the intertemporal budget constraint

- Period 2 budget constraint:

$$C_2 = Y_2 + (1+r)S$$

$$= \text{_____}$$
- Rearrange to put **C** terms on one side and **Y** terms on the other:

$$(1+r)C_1 + C_2 = Y_2 + (1+r)Y_1$$
- Finally, divide through by $(1+r)$:

The intertemporal budget constraint

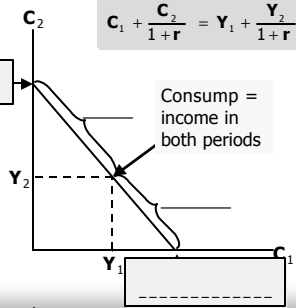
$$C_1 + \frac{C_2}{1+r} = Y_1 + \frac{Y_2}{1+r}$$

present value of _____

present value of _____

The intertemporal budget constraint

The budget constraint shows all combinations of C_1 and C_2 that just exhaust the consumer's resources.

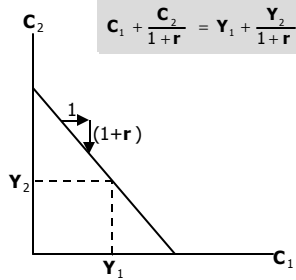


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The intertemporal budget constraint

The slope of the budget line equals _____)

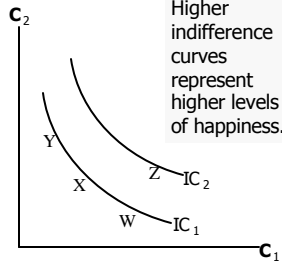


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Consumer preferences

An _____ shows all combinations of C_1 and C_2 that make the consumer _____.

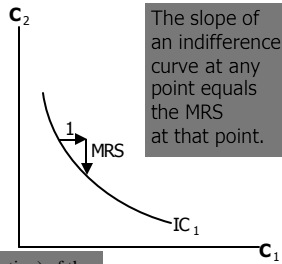


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Consumer preferences

Marginal rate of substitution (MRS): the amount of C_2 consumer would be



The slope of an indifference curve at any point equals the MRS at that point.

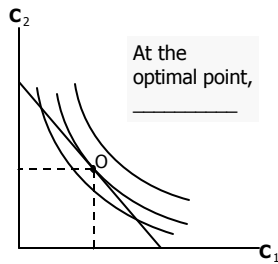
So the MRS is the (negative) of the

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Optimization

The optimal (C_1, C_2) is where the budget line just touches the highest indifference curve.



At the optimal point,

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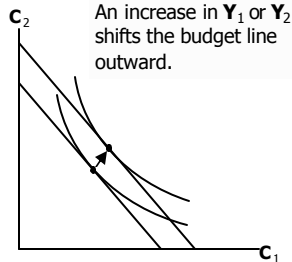
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How C responds to changes in Y

Results: Provided they are both normal goods, C_1 and C_2 both increase,

...

_____.



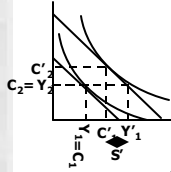
An increase in Y_1 or Y_2 shifts the budget line outward.

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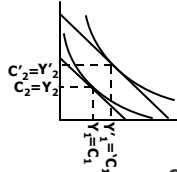
Temporary v. permanent

Temporary rise in income: Y_1 alone



Save part of income: $\frac{C_1'}{Y_1'} < \frac{C_1}{Y_1}$
So _____.

Permanent rise in income: Y_1 and Y_2 equally



C moves with Y: $\frac{C_1'}{Y_1'} = \frac{C_1}{Y_1}$
So _____.

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Keynes vs. Fisher

- Keynes:
current consumption depends only on current income
- Fisher:
current consumption depends only on _____;
the timing of income is irrelevant because the consumer can borrow or lend between periods.

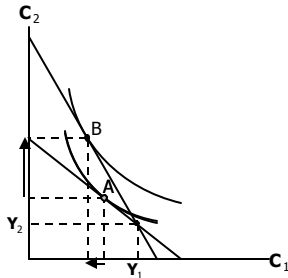
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How C responds to changes in r

An increase in r pivots the budget line around the point (Y_1, Y_2) .

As depicted here, _____.
However, it could turn out differently ...



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How C responds to changes in r

- _____
If consumer is a saver, the rise in r makes him better off, which tends to increase consumption in both periods.
- _____
The rise in r increases the opportunity cost of current consumption, which tends to reduce C_1 and increase C_2 .
- Both effects $\Rightarrow \uparrow C_2$.
Whether C_1 rises or falls depends on the relative size of the income & substitution effects.

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Constraints on borrowing

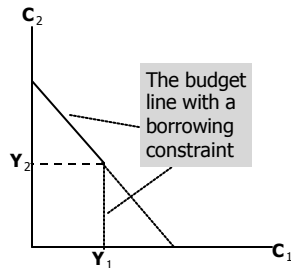
- In Fisher's theory, the timing of income is irrelevant because the consumer can borrow and lend across periods.
- Example: If consumer learns that her future income will increase, she can spread the extra consumption over both periods by borrowing in the current period.
- However, if consumer faces _____ (aka "liquidity constraints"), then she may not be able to increase current consumption and her consumption may behave as in the Keynesian theory even though she is rational & forward-looking

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Constraints on borrowing

The borrowing constraint takes the form:

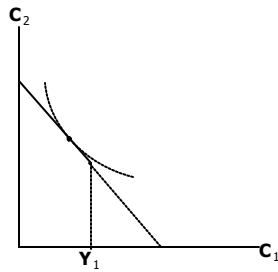


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Consumer optimization when the borrowing constraint is not binding

The borrowing constraint is not binding if the consumer's optimal C_1 _____.

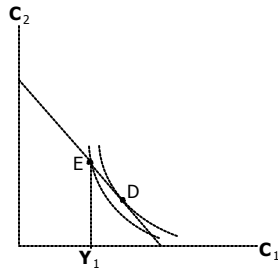


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Consumer optimization when the borrowing constraint is binding

The optimal choice is at point D.
But since the consumer cannot borrow, the best he can do is point E.

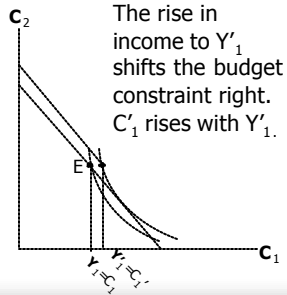


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Suppose increase in income in period 1

So under borrowing constraints, current consumption _____



The rise in income to Y'_1 shifts the budget constraint right. C'_1 rises with Y'_1 .

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The Life-Cycle Hypothesis

- due to Franco Modigliani (1950s)
- Fisher's model says that consumption depends on lifetime income, and people try to achieve smooth consumption.
- The LCH says that _____
_____ over the phases of the consumer's "life cycle,"
and saving allows the consumer to achieve smooth consumption.

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The Life-Cycle Hypothesis

- The basic model:
W =
Y =
(assumed constant)
R = number of years until retirement
T = lifetime in years
- Assumptions:
 - zero real interest rate (for simplicity)
 - consumption-smoothing is optimal

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The Life-Cycle Hypothesis

- Lifetime resources =
 - To achieve smooth consumption, consumer divides her resources equally over time:
 $C = \frac{W}{T}$, or
 $C = aW + bY$
- where
- $a = (1/T)$ is the marginal propensity to consume out of wealth
- $b = (R/T)$ is the marginal propensity to consume out of income

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Implications of the Life-Cycle Hypothesis

The Life-Cycle Hypothesis can solve the consumption puzzle:

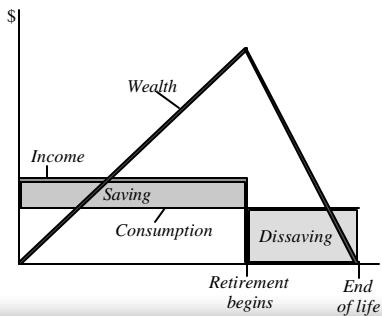
- The APC implied by the life-cycle consumption function is $C/Y =$ _____
- Across households, wealth does not vary as much as income, so high income households _____ than low income households.
- Over time, aggregate wealth and income grow together, causing APC _____.

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Implications of the Life-Cycle Hypothesis

The LCH implies that saving varies systematically over a person's lifetime.



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Numerical Example

- Suppose you start working at age 20, work until age 65, and expect to earn \$50,000 each year, and you expect to live to 80.
- Lifetime income = _____
- Spread over 60 years, so $C =$ _____
So need to save \$12,500 per year.

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Example continued

- Suppose you win a lottery which gives you \$1000 today.
- Will spread it out over all T years, so consumption rises by only $\$1000/T = \16.70 this year.
- So temporary rise in income has a _____.
- But if lottery gives you \$1000 every year for the T years, consumption rises by _____ this year.

The Permanent Income Hypothesis

- due to Milton Friedman (1957)
- The PIH views current income Y as the sum of two components:
_____ Y^P
(average income, which people expect to persist into the future)
_____ Y^T
(temporary deviations from average income)

The Permanent Income Hypothesis

- Consumers use saving & borrowing to smooth consumption in response to transitory changes in income.
- The PIH consumption function:
 $C =$
where a is the fraction of permanent income that people consume per year.

The Permanent Income Hypothesis

The PIH can solve the consumption puzzle:

- The PIH implies
 $APC = C/Y =$
- To the extent that high income households have higher transitory income than low income households, the APC will be _____ income households.
- Over the long run, income variation is due mainly if not solely to variation in permanent income, which implies a _____.

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PIH vs. LCH

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

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The Random-Walk Hypothesis

- due to Robert Hall (1978)
- based on Fisher's model & PIH, in which forward-looking consumers base consumption on expected future income
- Hall adds the assumption of **rational expectations**, that people use all available information to forecast future variables like income.

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The Random-Walk Hypothesis

- If PIH is correct and consumers have rational expectations, then consumption should follow a **random walk**: _____.

- 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.

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Implication of the R-W Hypothesis

If consumers obey the PIH and have rational expectations, then policy changes will affect consumption only if _____.

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The Psychology of Instant Gratification

- Theories from Fisher to Hall assumes that consumers are rational and act to maximize lifetime utility.
- recent studies by David Laibson and others consider the psychology of consumers.

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The Psychology of Instant Gratification

- Consumers consider themselves to be imperfect decision-makers.
 - E.g., in one survey, 76% said they were not saving enough for retirement.
- Laibson: The “pull of instant gratification” explains why people don’t save as much as a perfectly rational lifetime utility maximizer would save.

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Two Questions and Time Inconsistency

1. Would you prefer
(A) a candy today, or
(B) two candies tomorrow?
2. Would you prefer
(A) a candy in 100 days, or
(B) two candies in 101 days?

In studies, most people answered A to question 1, and B to question 2.

A person confronted with question 2 may choose B. 100 days later, when he is confronted with question 1, the pull of instant gratification may induce him to change his mind.

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Summing up

- Recall simple Keynesian consumption function:
$$C = \bar{C} + cY$$
where only current income (Y) mattered.
- Research shows other things should be included:
 - expected future income (perm’t income model)
 - wealth (life cycle model)
 - interest rates (Fisher model)
 - but current income should still be present (due to borrowing constraints)
- Modern policy analysis models allow for all this.

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