Chapter 6

A Two-Period Model:
The Consumption-Saving Decision and Ricardian Equivalence

Introduction

- **Inter-temporal decisions** (across periods) and their implications on the influence of government deficits.
- An important implication of the models is the Ricardian Equivalence theorem.
- **The Ricardian Equivalence Theorem**: Under certain conditions, the size of the government's deficit is irrelevant. The timing of taxation does not matter for economic activity.
- HH decision is DYNAMIC.

Decisions

Note

Intra-temporal
STATIC (chap 4-5)

c: consumption

N: labor supply

s: equals zero

Inter-temporal
DYNAMIC (chap 6)

c: consumption today

c': consumption tomorrow

s: saving today

Model

- **Two-period model:**
  - **First period: current period.**
  - **Second period: future period.**
- **Real Interest Rate (r) to borrow/lend, i.e., to transfer goods across periods.**
- **r : determines the relative price of future consumption in terms of present consumption = 1 / 1 + r**
- **Consumption-smoothing behavior: important to understand how consumers respond to changes in government policies.**
- **For simplicity, leave out production and investment until chap 7 → income is exogenous, forget the intra-temporal decision.**

Notation

- Use primes to denote next (future) period variables. e.g., c' : future consumption
- Lowercase variables to denote individual level. e.g., c : individual consumption
- Uppercase variables to denote aggregate level. e.g., C : aggregate consumption

Assumptions

- Consumer starts current period with no assets and ends future period with no assets (no bequests).
- Consumer and government can issue bonds.
- All bonds are indistinguishable
  → one interest rate for all bonds.
- No risk associated with holing bonds (no default risk, no risk) → no expectation.
- Bonds are traded directly on the credit market (no need for financial intermediaries, no banks)
  → r on borrowing is the same as r on lending.
- Income is exogenous → forget intra-temporal decision.

Consumer Budget

- **Current period budget:**

$$c + s = y - t$$

$(y - t)$ is disposable income (after-tax income)

$s > 0 \rightarrow$ lender (buys bonds)

$s < 0 \rightarrow$ borrower (sells bonds)

- **Future period budget:**

$$c' = y' - t' + (1+r)\, s$$

Consumer Problem

Max Utility

subject to

- **current period budget and**
- **Future period budget.**

Derivation of the Lifetime Budget

$c + s = y - t$ Current Budget

$c' = y' - t' + (1+r)\, s$ Future Budget

From future budget solve for s

$s = (c'-y'+t')/(1+r)$

Plug into current budget

$c + (c'-y'+t')/(1+r) = y - t$

Rearrange to get the **LIFETIME BUDGET**

$$c + c'/(1+r) = y + y'/(1+r) - t - t'/(1+r)$$

$PV(c) = PV(y) - PV(t) =$ Lifetime wealth

Let **LIFETIME WEALTH (we)** be the RHS of the Lifetime Budget.

Consumer Optimization

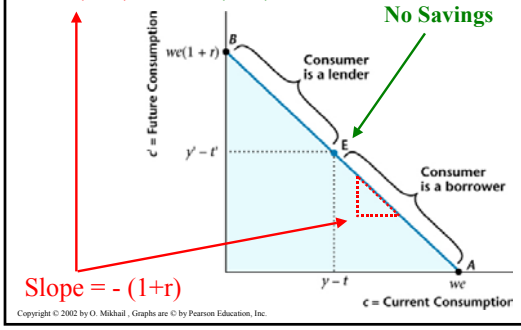
Given: r, y, y', t and t'

Choose: c, c' and consequently s

Figure 6-1 Consumer's Lifetime Budget Constraint

c' = – (1+r) c + we (1+r)

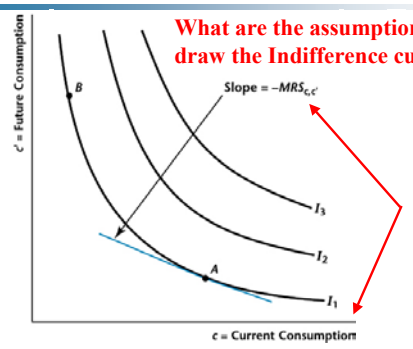
Endowment Point
No Savings



Slope = - (1+r)

Figure 6-2 A Consumer's Indifference Curves

What are the assumptions used to draw the Indifference curves?



consumption not leisure

Table 6-1 Desire for Consumption Smoothing

Table 6.1 **Sara's Desire for Consumption Smoothing**

	Week 1 Coconuts	Week 2 Coconuts	Total Consumption
Bundle 1	5	15	20
Bundle 2	17	3	20
Preferred Bundle	11	9	20

Which assumption made regarding the Utility implies consumption smoothing?

Note that consumption smoothing does not imply equal quantities over each period

Figure 6-3 A Consumer Who Is a Lender

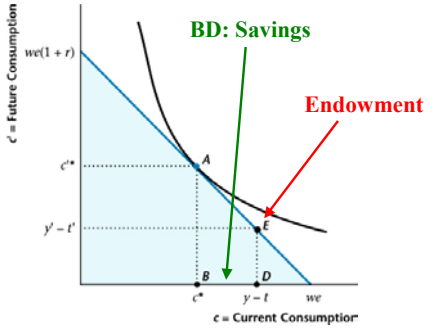
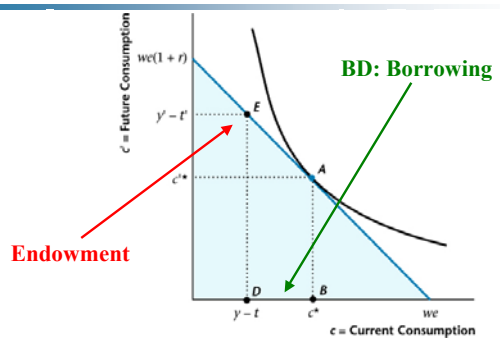


Figure 6-4 A Consumer Who Is a Borrower



THE GAME

Changes in:

- **Current income**
- **Future income**
- **Real interest rate**

GAME I
an Increase in CURRENT Income

GAME I : An increase in CURRENT income

- **Intra-Temporal**: an increase in income (same as an increase in dividend income or a reduction in taxes) → pure income effect → **c ↑ and labor ↓**
- **Inter-Temporal**: What will be the effect on c, c' and s ?

Figure 6-5 The Effects of an Increase in Current Income for a Lender

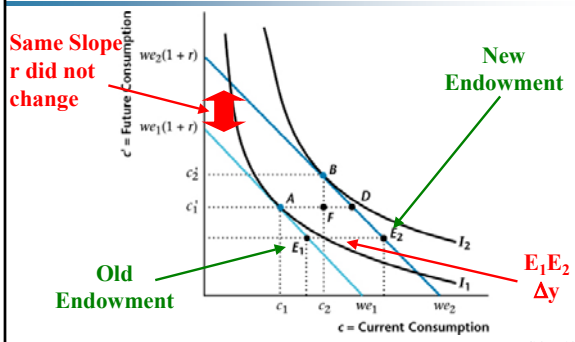


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Figure 6-5 The Effects of an Increase in Current Income for a Lender - Continued

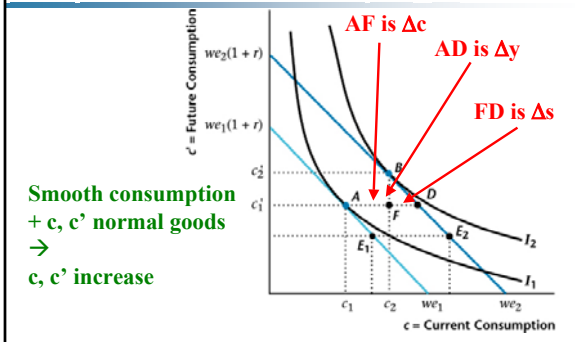

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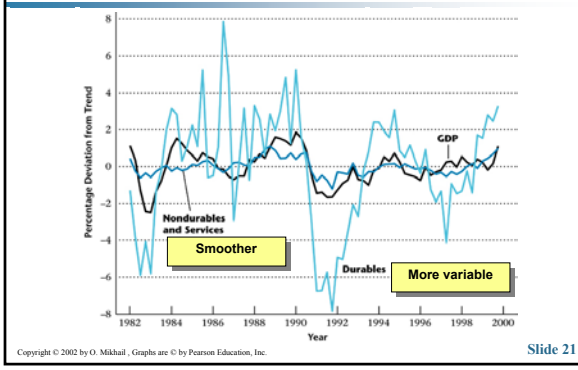
Figure 6-6 Percentage Deviations from Trend in GDP and Consumption, 1982-1999



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Excess Variability of Consumption

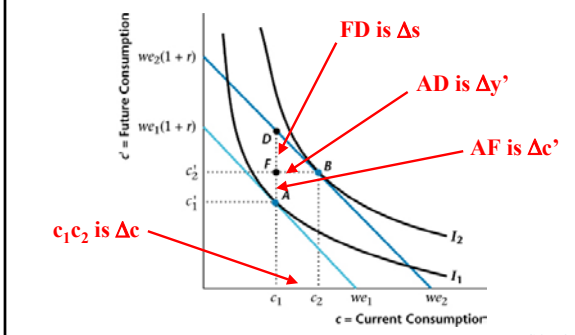
- The observed fact that measured consumption is more volatile than theory appears to predict.
- Proposed reasons:
  - Capital market imperfections
  - Change in market prices

GAME II
an Increase in FUTURE Income

GAME II : An increase in FUTURE income

- **Intra-Temporal** : when it happens, treat it as an increase in current income.
- **Inter-Temporal** : increase present consumption to smooth the consumption pattern, by borrowing.

Figure 6-7 An Increase in Future Income



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GAME III
Temporary vs. Permanent
and
the Permanent Income hypothesis

Permanent vs. Temporary increase in income

Temporary increase in income

- Ex: Winning a lottery.
- Expect to increase current c by small amount.

Permanent increase in income

- Ex: Promotion, salary raise.
- Expect to increase current c by a larger amount.

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Friedman's Permanent Income Hypothesis

A primary determinant for current consumption is permanent income, which is closely related to lifetime wealth.

- Therefore, changes in temporary income have little influence on current consumption. Changes to permanent income have much larger effect on current consumption.
- Do you remember the Keynesian consumption function?

Why Important?

Tax Cut

- If consumers perceive the tax cut to be **temporary** then …..
- If consumers perceive the tax cut to be **permanent** then …..

Model incorporates Temporary vs. Permanent

How?

- **Temporary**: increase in current income.
- **Permanent**: increase in current and future income.

Figure 6-8 Temporary Versus Permanent Increases in Income

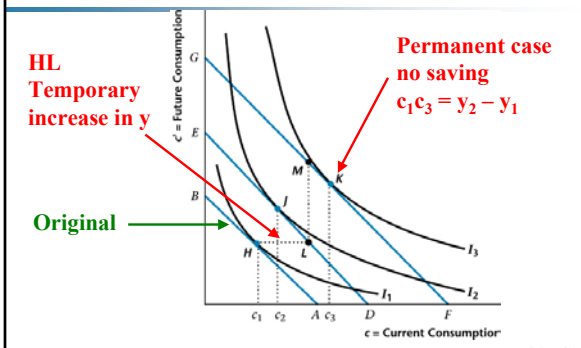

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Figure 6-9 Stock Prices and Nondurable Consumption, 1947-1999

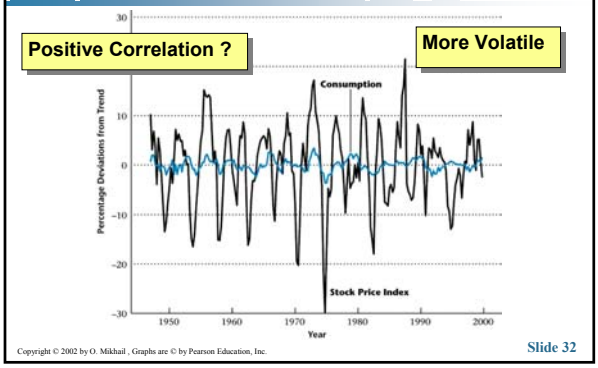

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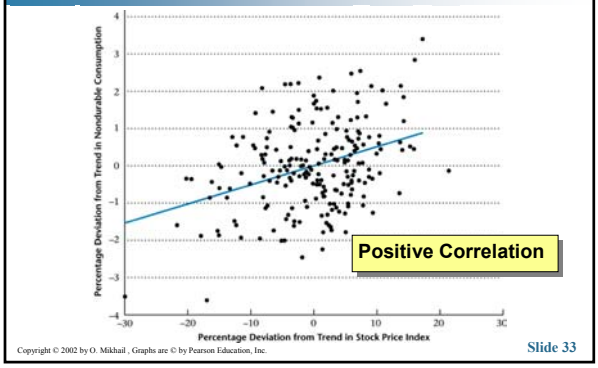
Figure 6-10 Scatter Plot of Percentage Deviations from Trend in Nondurable Consumption Versus Percentage Deviations from Trend in a Stock Price Index



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