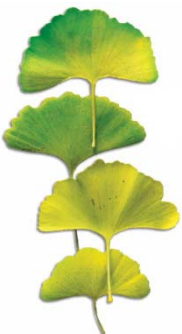


Chapter 5

Applications of Rational Choice and Demand Theories

Chapter Outline

- Using The Rational Choice Model To Answer Policy Questions
- Consumer Surplus
- Overall Welfare Comparisons
- Using Price Elasticity Of Demand
- The Intertemporal Choice Model



Application: A Gasoline Tax And Rebate Policy

- Policy proposal made during the administration of President Jimmy Carter
- Goal: use gasoline taxes to help limit the quantity demanded of gasoline.
 - Tax revenue would then be used to reduce the payroll tax (tax rebate).
- Would consumers buy the same amount of gasoline as before if the tax is rebated?

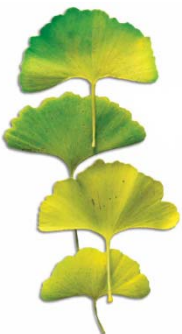
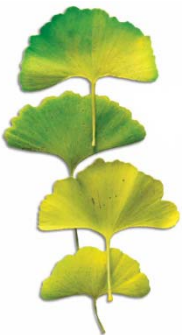
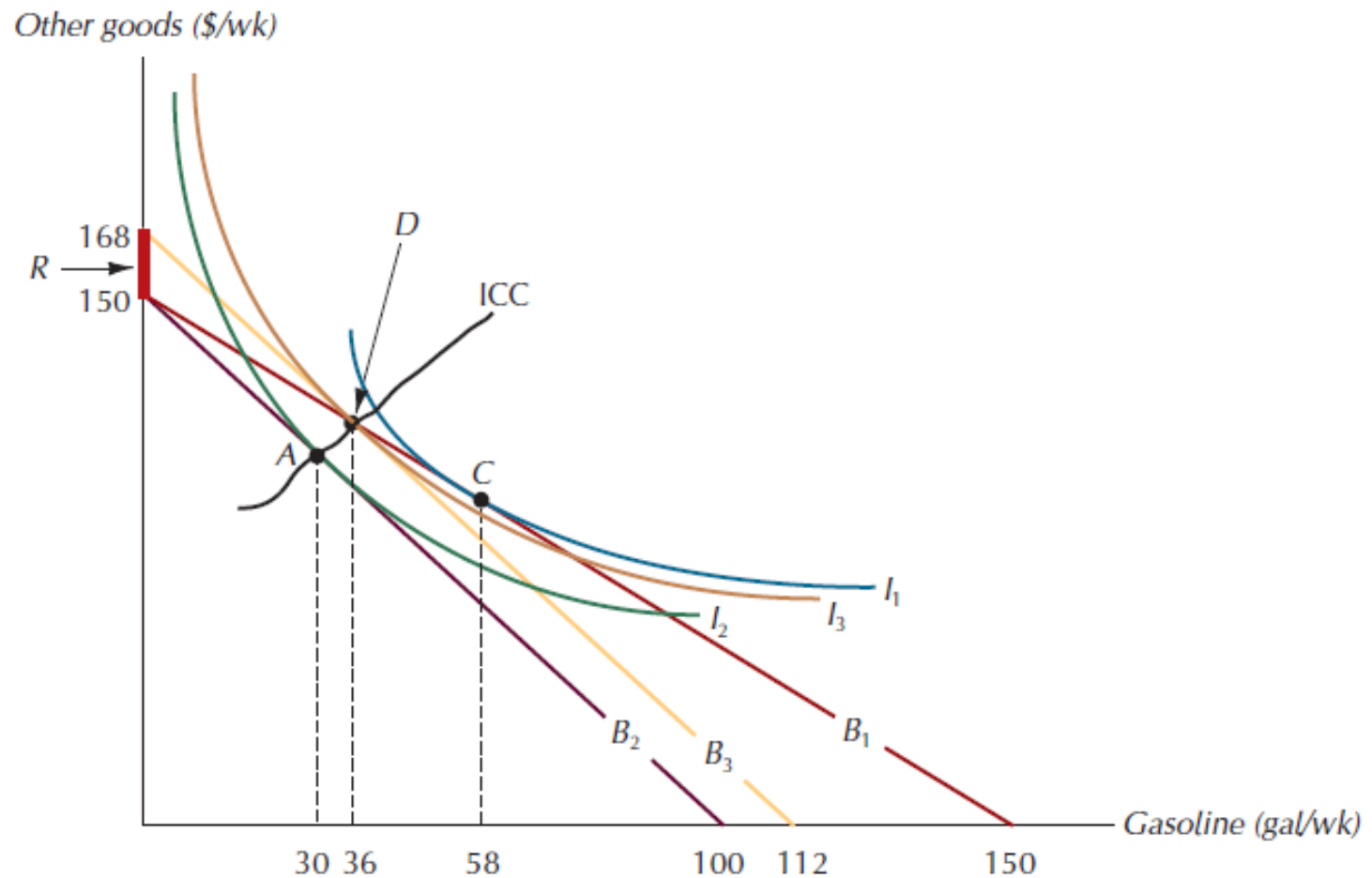
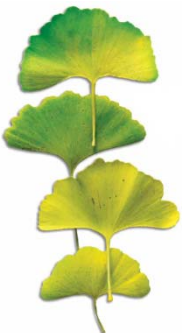


Figure 5.1: A Gasoline Tax and Rebate



Application: A Gasoline Tax And Rebate Policy

- Despite the rebate, the consumer substantially curtails his gasoline consumption.
 - If gasoline is a normal good, the effect of the rebate is to offset partially the income effect of the price increase. It does nothing to alter the substitution effect.



Application: School Vouchers

- Policy Proposal: each family be given a ***voucher*** that could be used toward the tuition at any school of the family's choosing.
- Current system: families who choose to go to private schools do not receive a refund on their school taxes.
- Question: what is the effect of vouchers on the level of resources devoted to education.

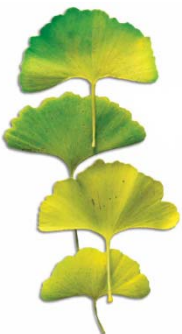


Figure 5.2: Educational Choice under the Current System

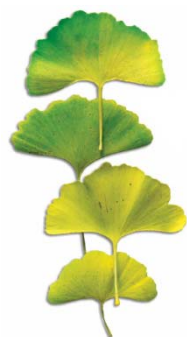
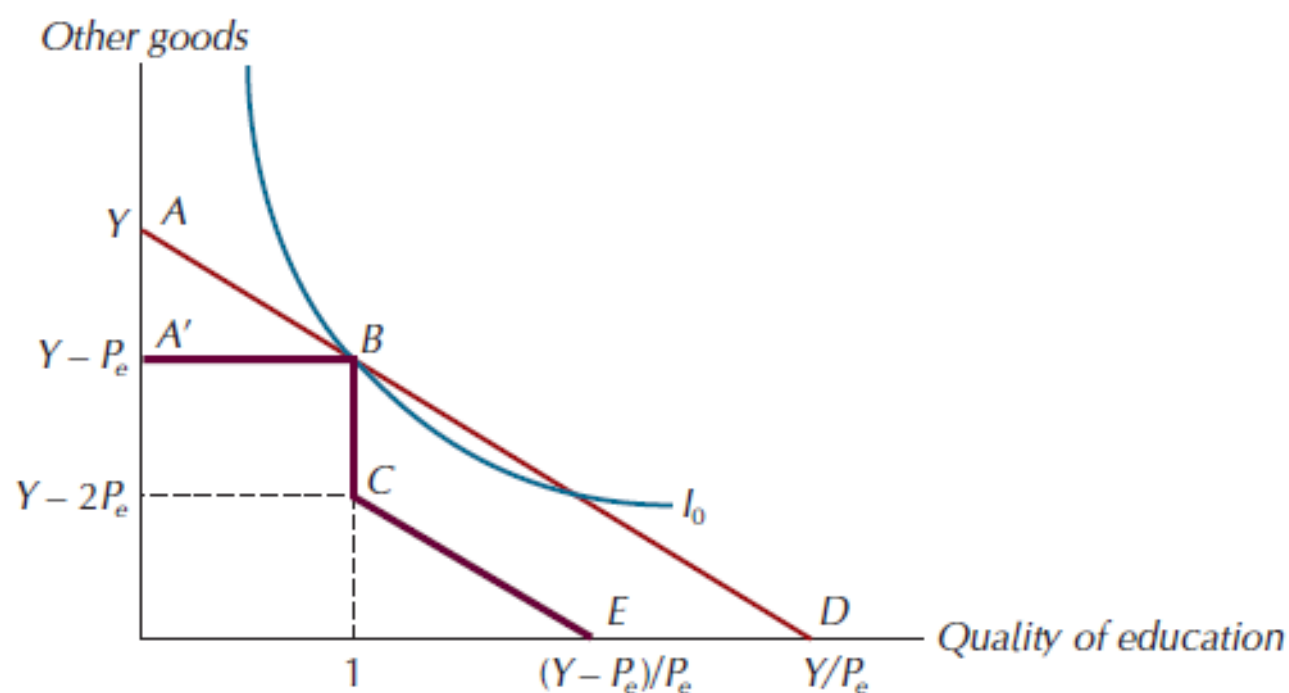
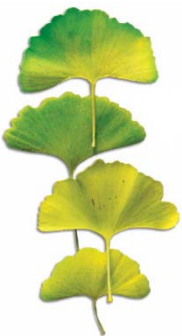
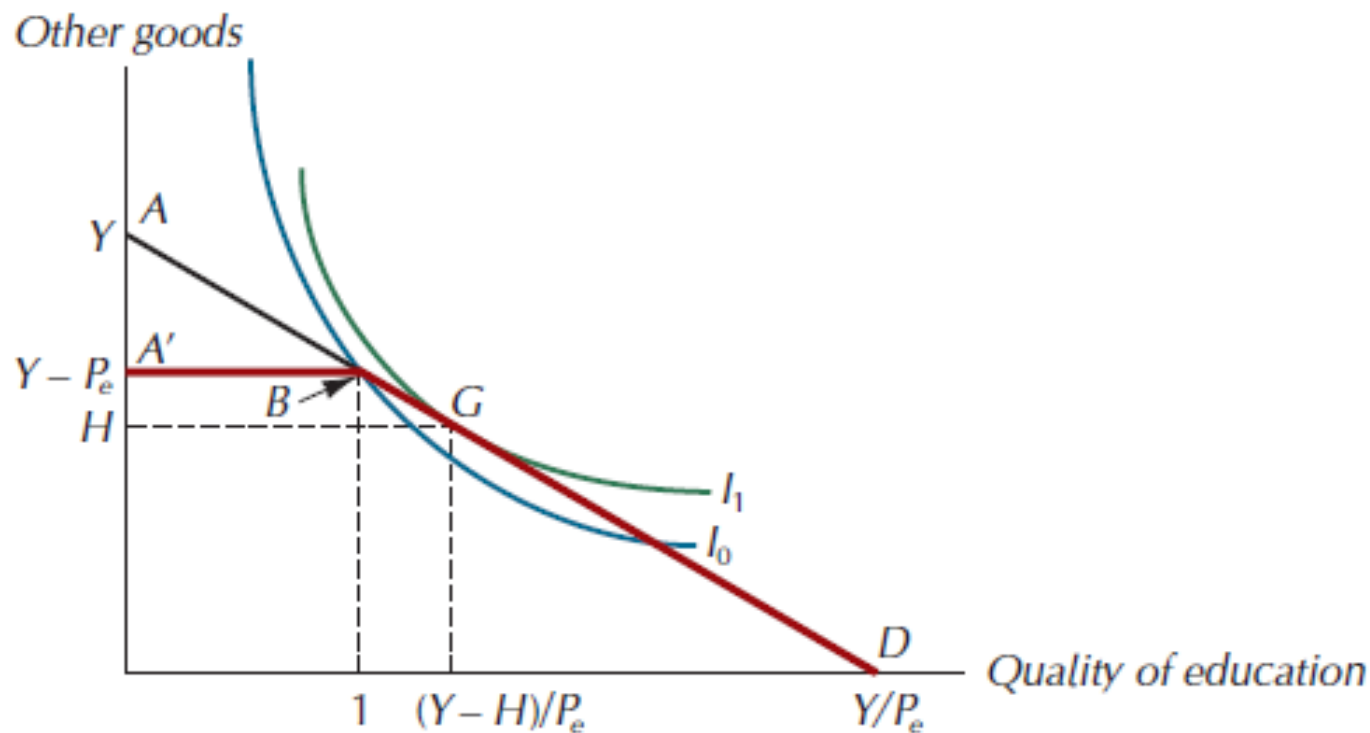
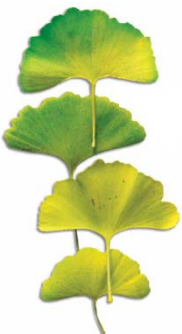


Figure 5.3: Educational Choice under a Voucher System



Application: School Vouchers

- Result from Consumer Choice Analysis:
switching to a voucher system will increase the level of spending on education.
 - Parents no longer have to forfeit their school taxes when they switch from public to private schools



Consumer Surplus

- ***Consumer surplus:*** a dollar measure of the extent to which a consumer benefits from participating in a transaction.
 - In a graph → area between demand curve and price.

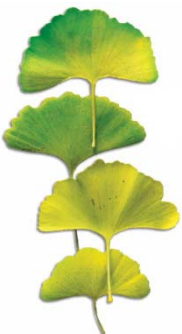


Figure 5.4: The Demand Curve Measure of Consumer Surplus

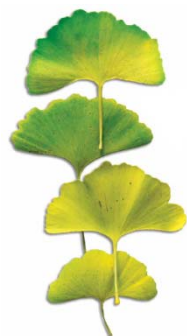
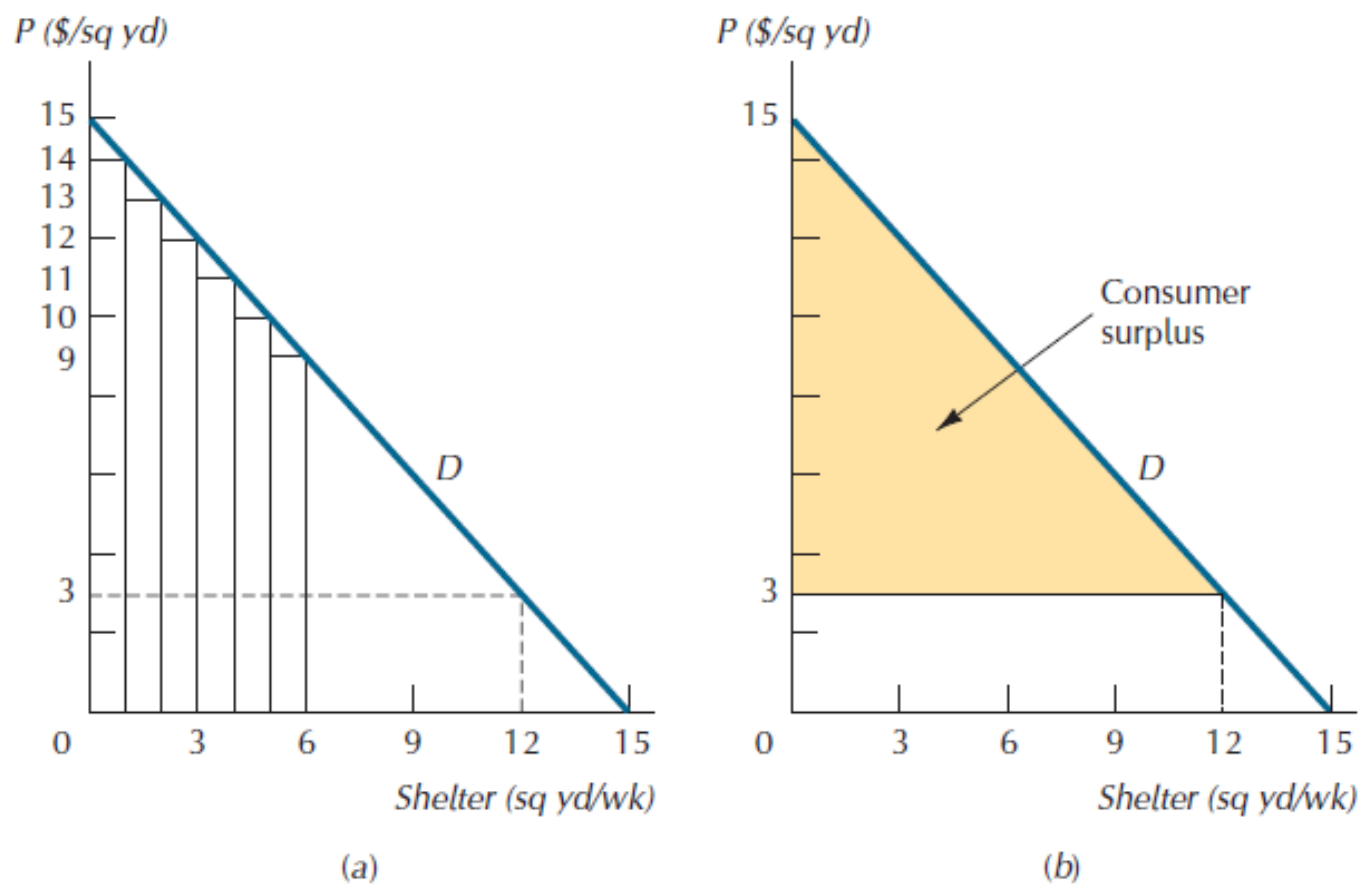


Figure 5.5: The Loss in Consumer Surplus from an Oil Price Increase

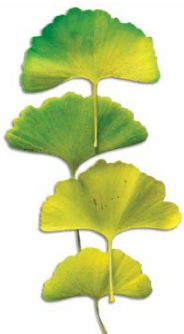
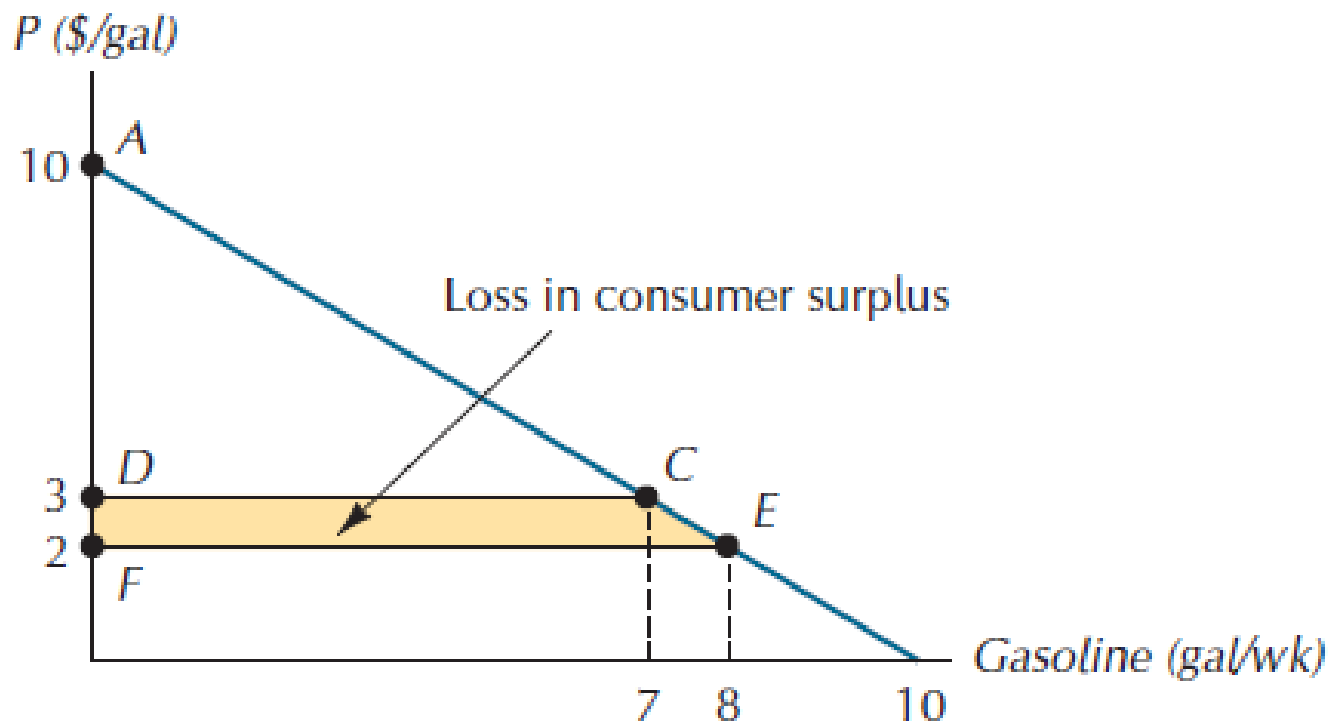


Figure 5.6: An Individual Demand Curve for Tennis Court Time

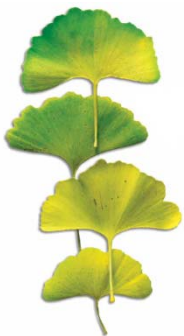
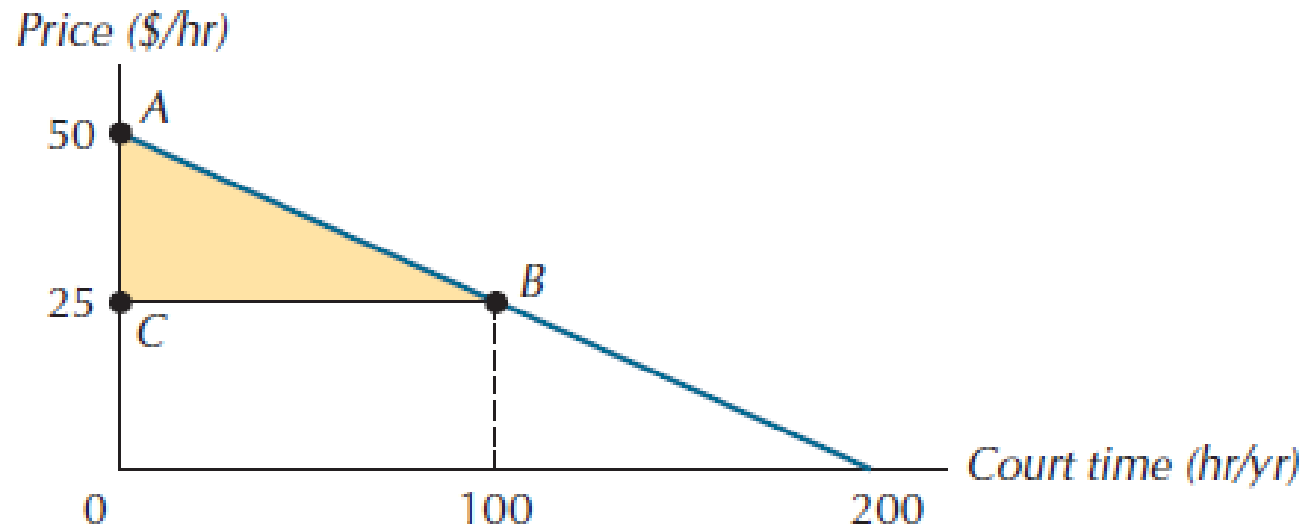
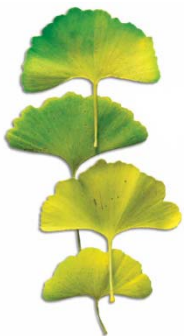
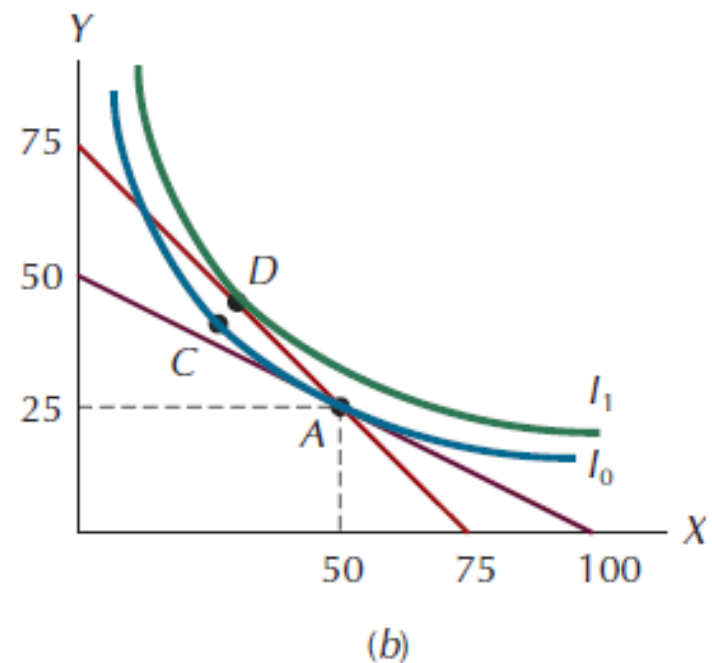
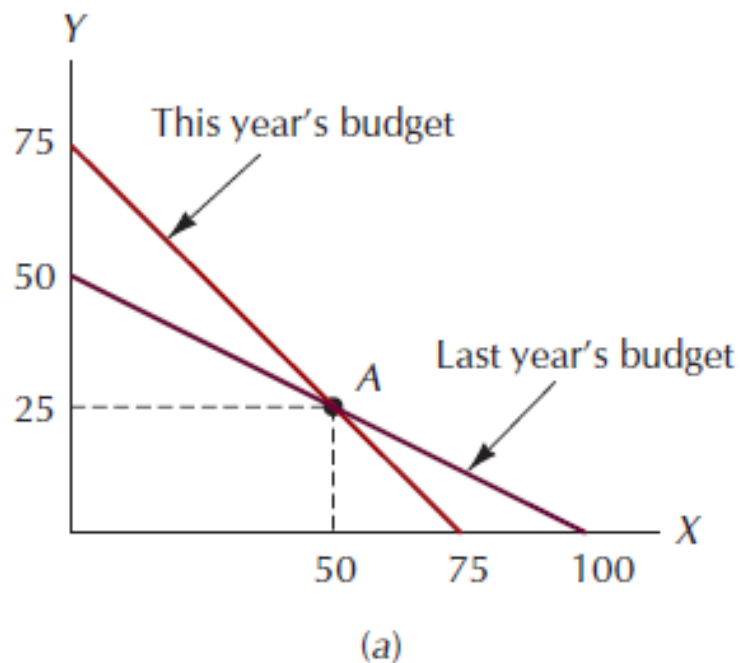


Figure 5.7: Budget Constraints for 2 Years



Application: The Welfare Effects of Changes in Housing Prices

Two scenarios:

1. You have just purchased a house for \$200,000. The very next day, the prices of all houses, including the one you just bought, double.
 2. You have just purchased a house for \$200,000. The very next day, the prices of all houses, including the one you just bought, fall by half.
- In each case, how does the price change affect your welfare? (Are you better off before the price change or after?)

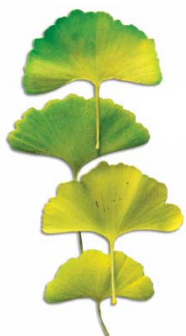


Figure 5.8: Rising Housing Prices and the Welfare of Homeowners

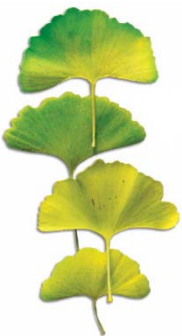
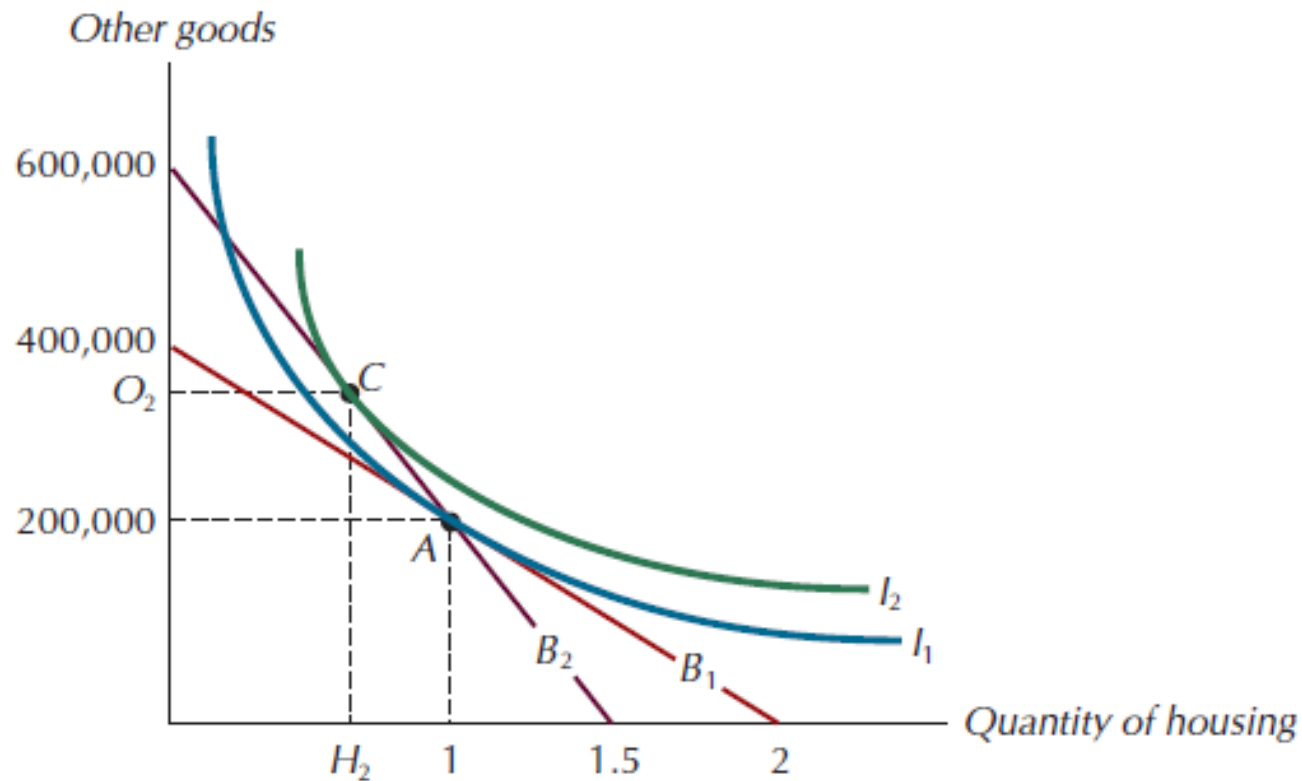
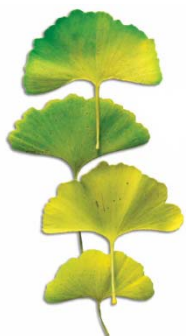
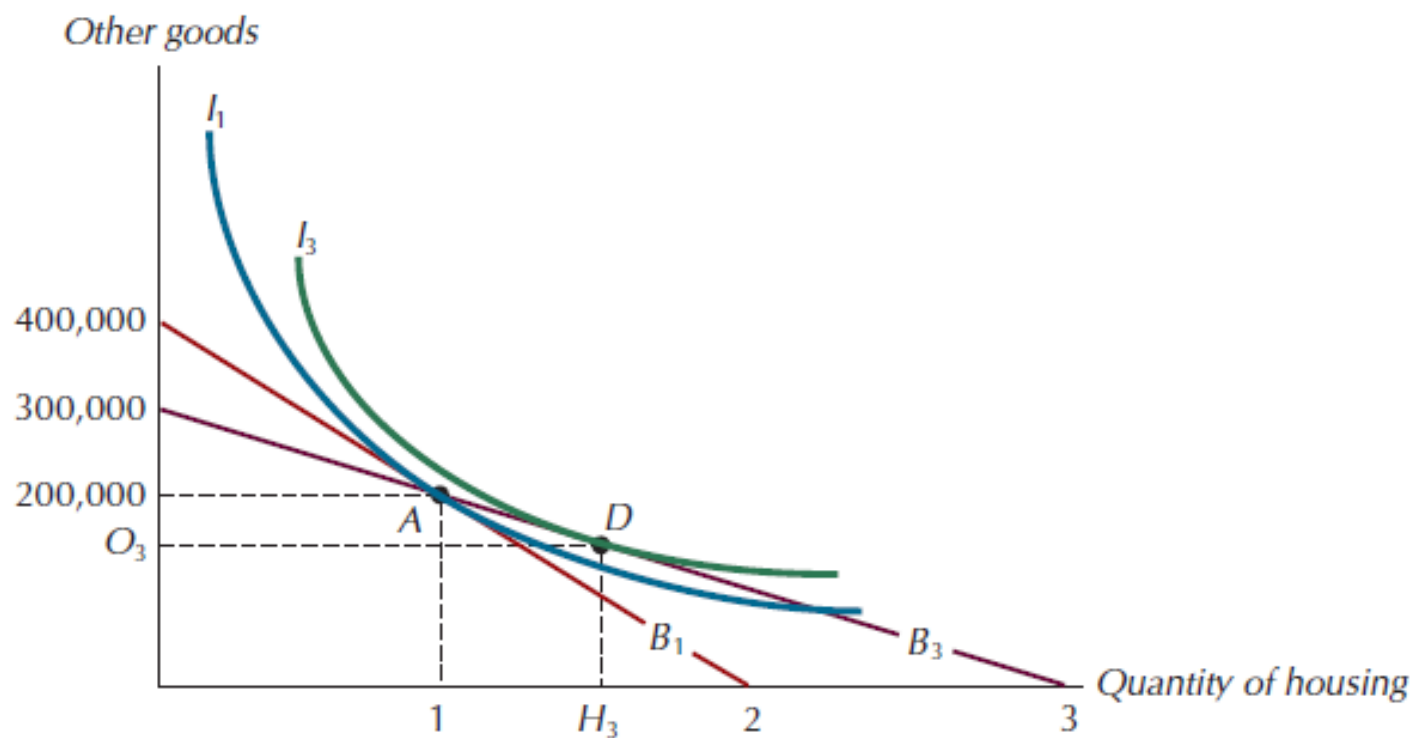


Figure 5.9: Falling Housing Prices and the Welfare of Homeowners



Application: A Bias in the Consumer Price Index

- ***Consumer price index (CPI)***: measures changes in the “cost of living,” the amount a consumer must spend to maintain a given standard of living.
 - Fails to substitution into account hence overestimating the cost of living.
 - The bias will be larger when there are greater differences in the rates of increase of different prices.

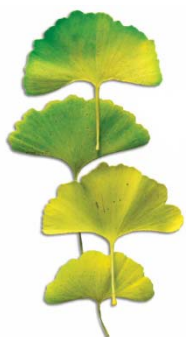
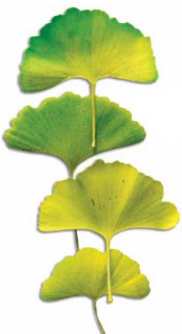
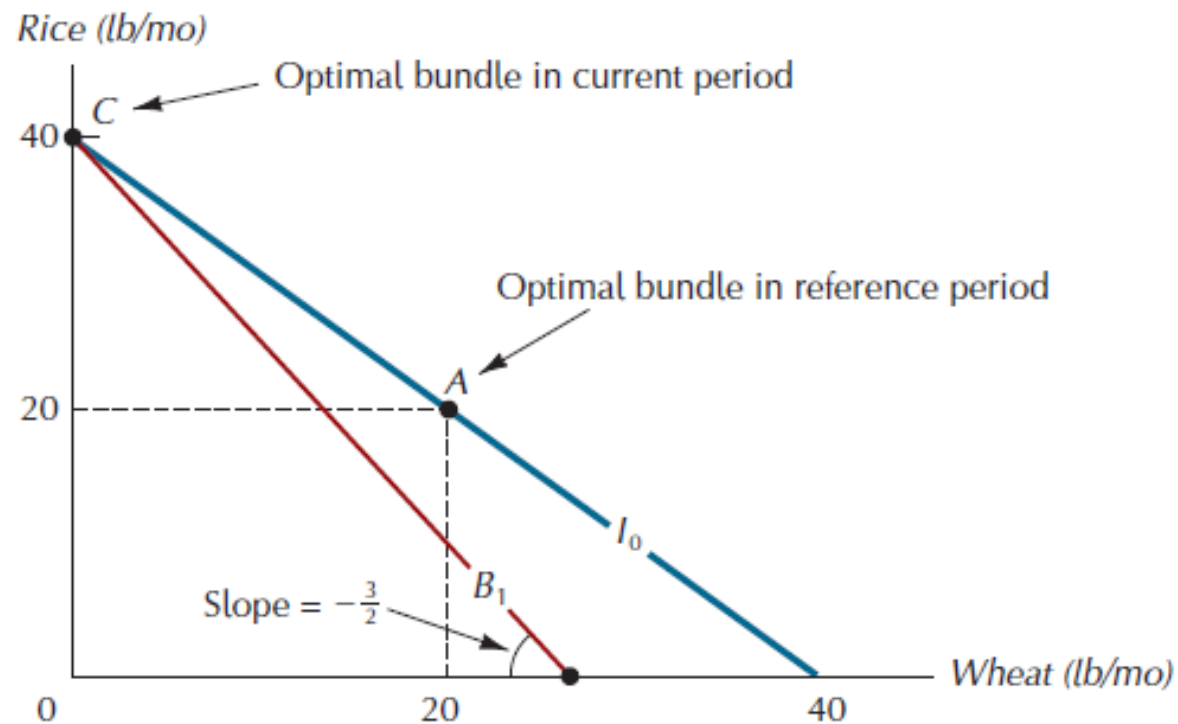


Figure 5.10: The Bias Inherent in the Consumer Price Index



Application: The Marta Fare Increase

- In 1987 the Metropolitan Atlanta Rapid Transit Authority (MARTA) raised its basic fare from 60 to 75 cents/ride.
- In the 2 months following the fare increase, total system revenues rose 18.3 percent in comparison with the same period a year earlier.
- What do these figures tell us about the original price elasticity of demand for rides on the MARTA system?

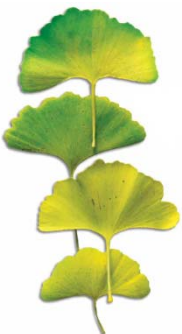
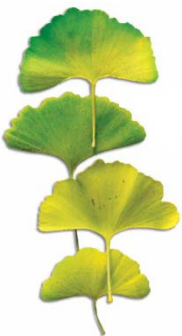
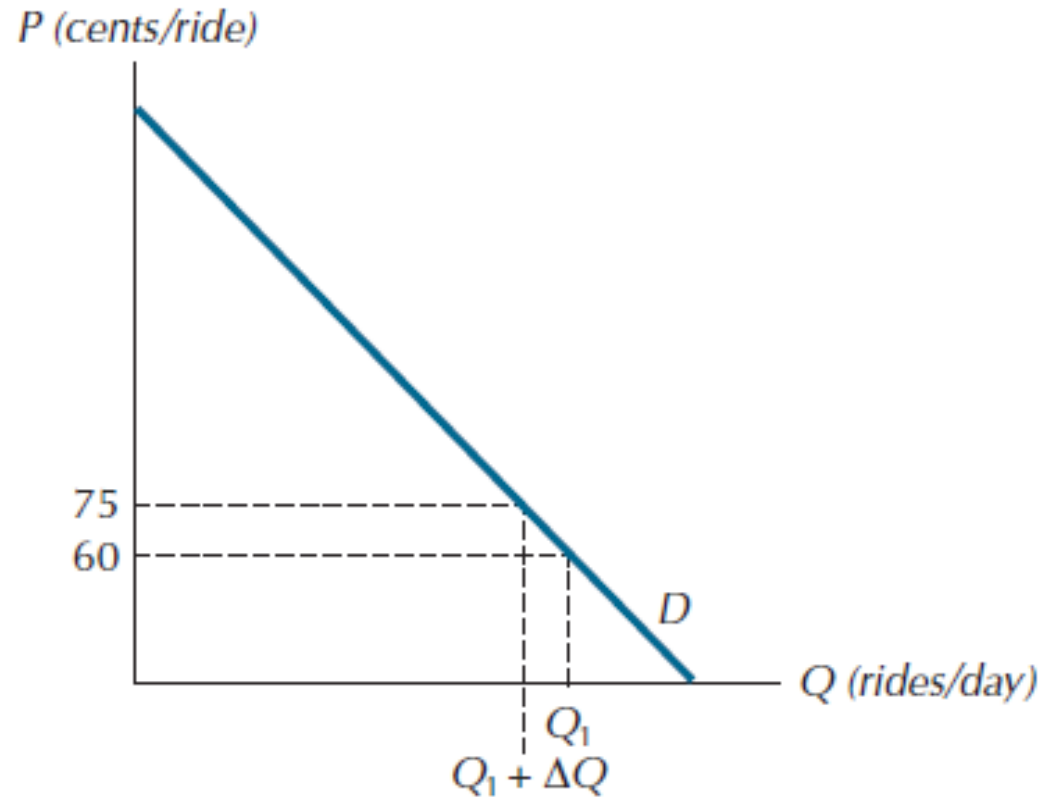


Figure 5.11: The MARTA Fare Increase



The Intertemporal Choice Model

- How would rational consumers distribute their consumption over time?
- ***Two time periods: current and future.***
- ***Two alternatives (goods): current consumption (C_1) versus future consumption (C_2).***

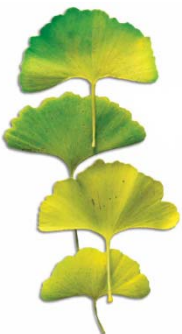
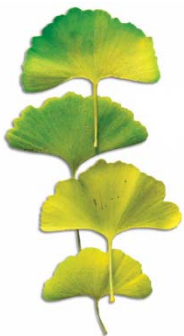
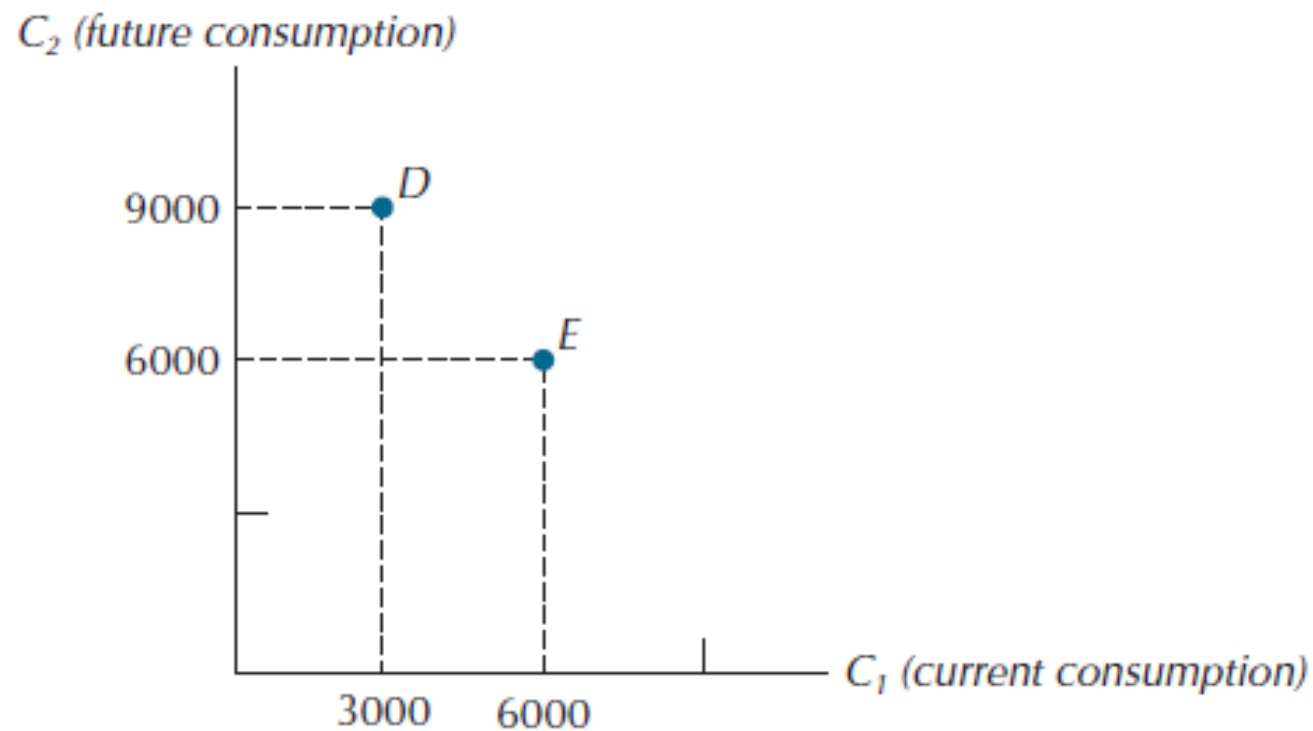


Figure 5.12: Intertemporal Consumption Bundles



The Intertemporal Choice Model

- ***Present value:*** the present value of a payment of X dollars T years from now is $X(1+r)^{-T}$, where r is the annual rate of interest.
- ***Present value of lifetime income:*** the horizontal intercept of the intertemporal budget constraint as the

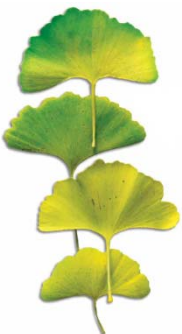


Figure 5.13: The Intertemporal Budget Constraint

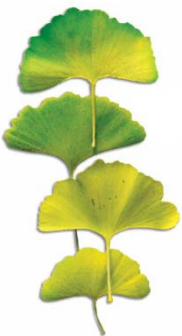
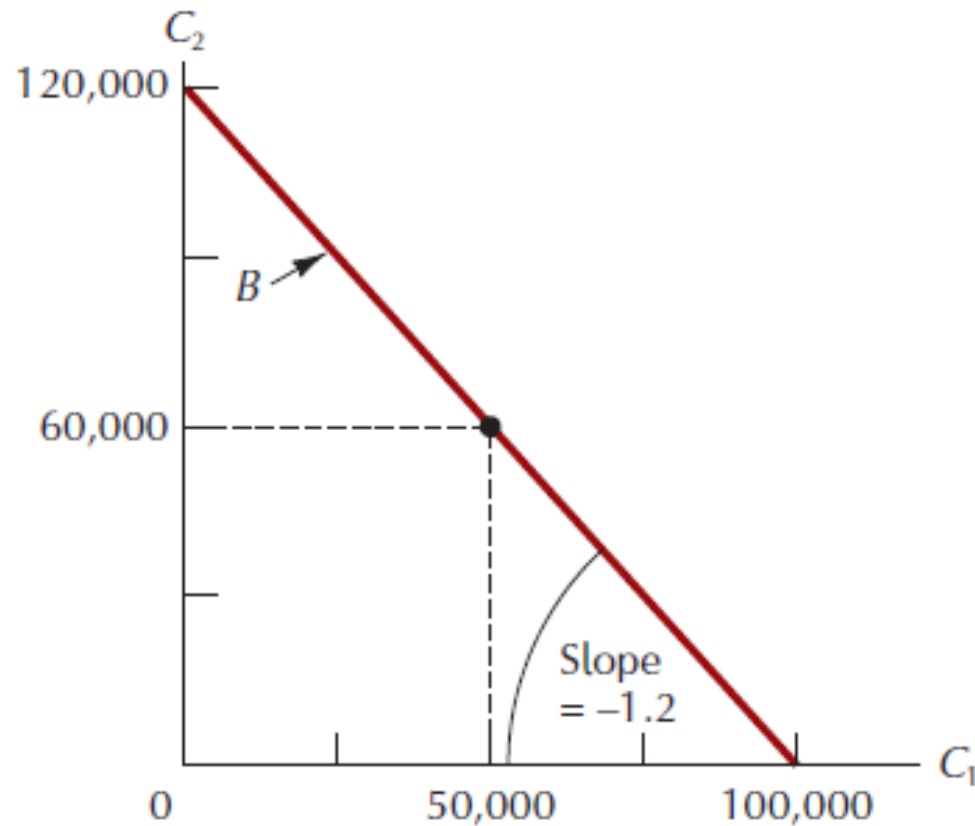
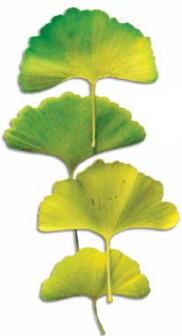
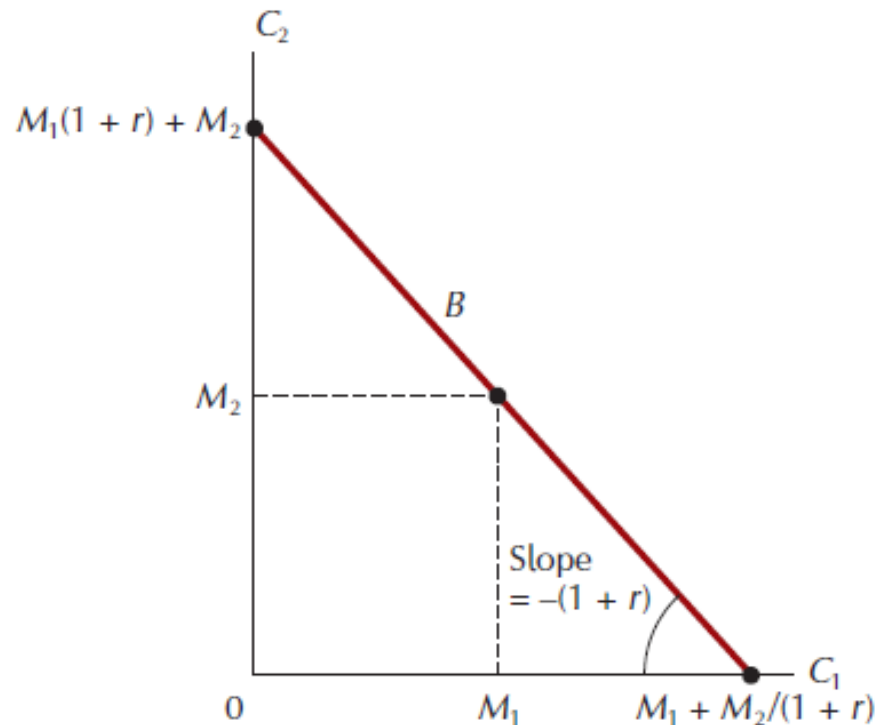


Figure 5.14: Intertemporal Budget Constraint with Income in Both Periods, and Browsing or Lending at the Rate r



The Intertemporal Choice Model

- ***Marginal rate of time preference:*** the number of units of consumption in the future a consumer would exchange for 1 unit of consumption in the present.
 - It declines as one moves downward along an indifference curve.

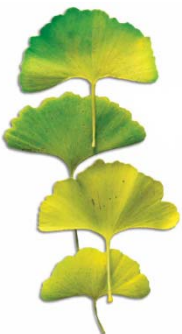


Figure 5.15: An Intertemporal Indifference Map

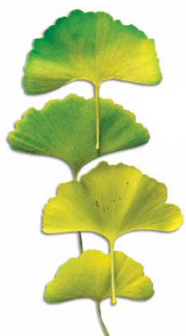
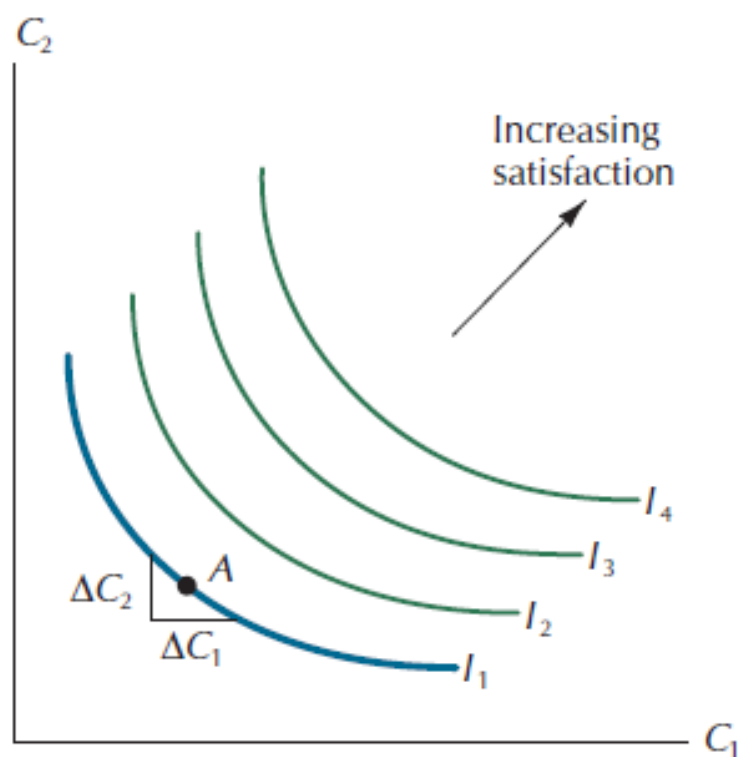


Figure 5.16: The Optimal Intertemporal Allocation

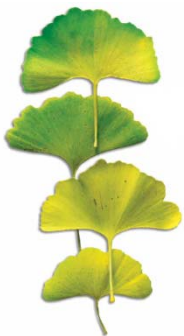
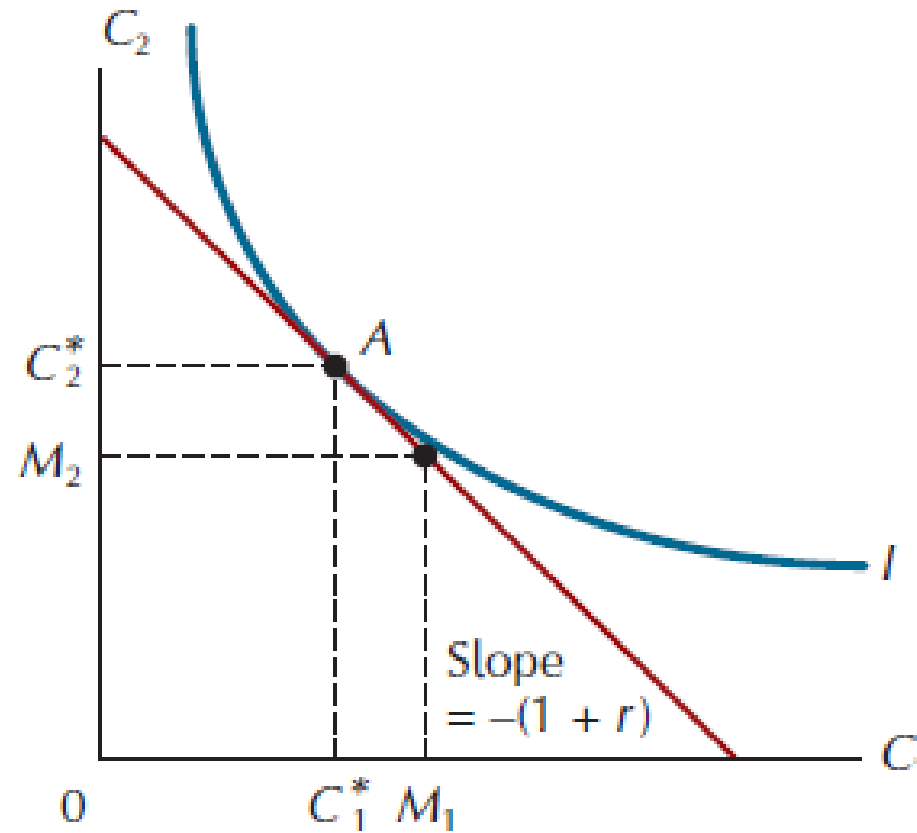


Figure 5.17: Patience and Impatience

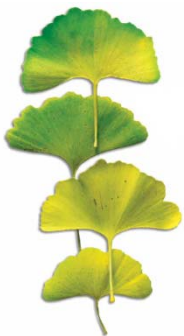
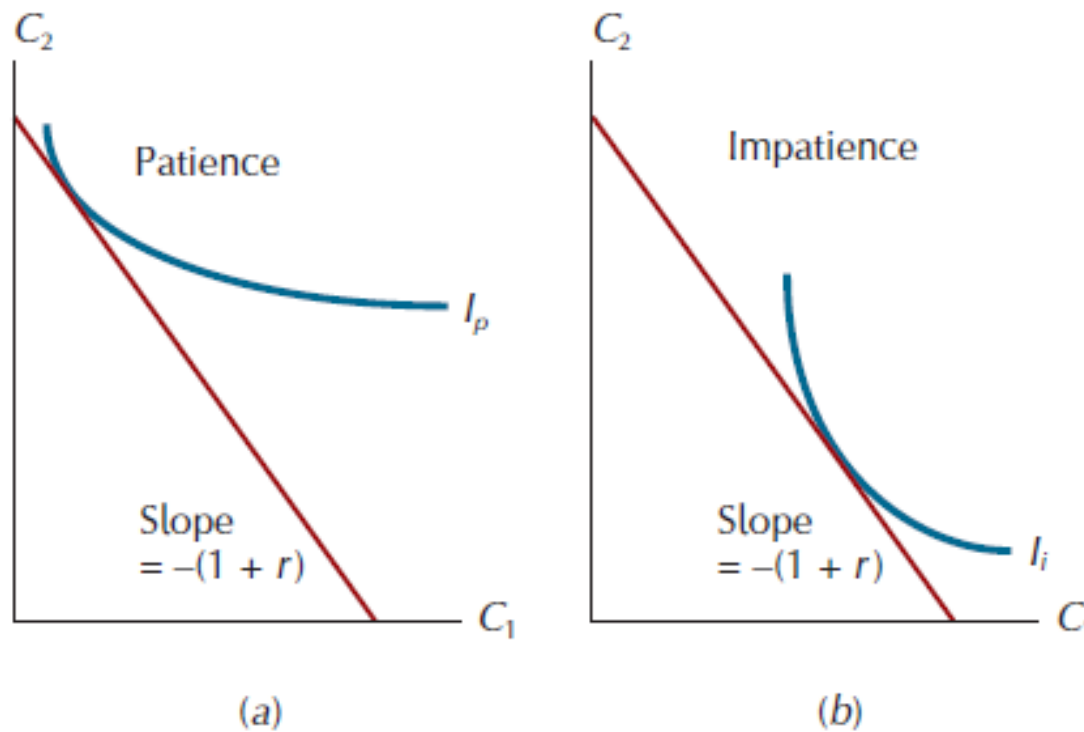
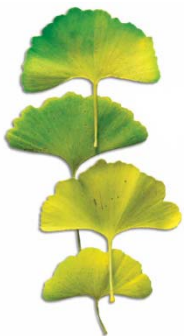
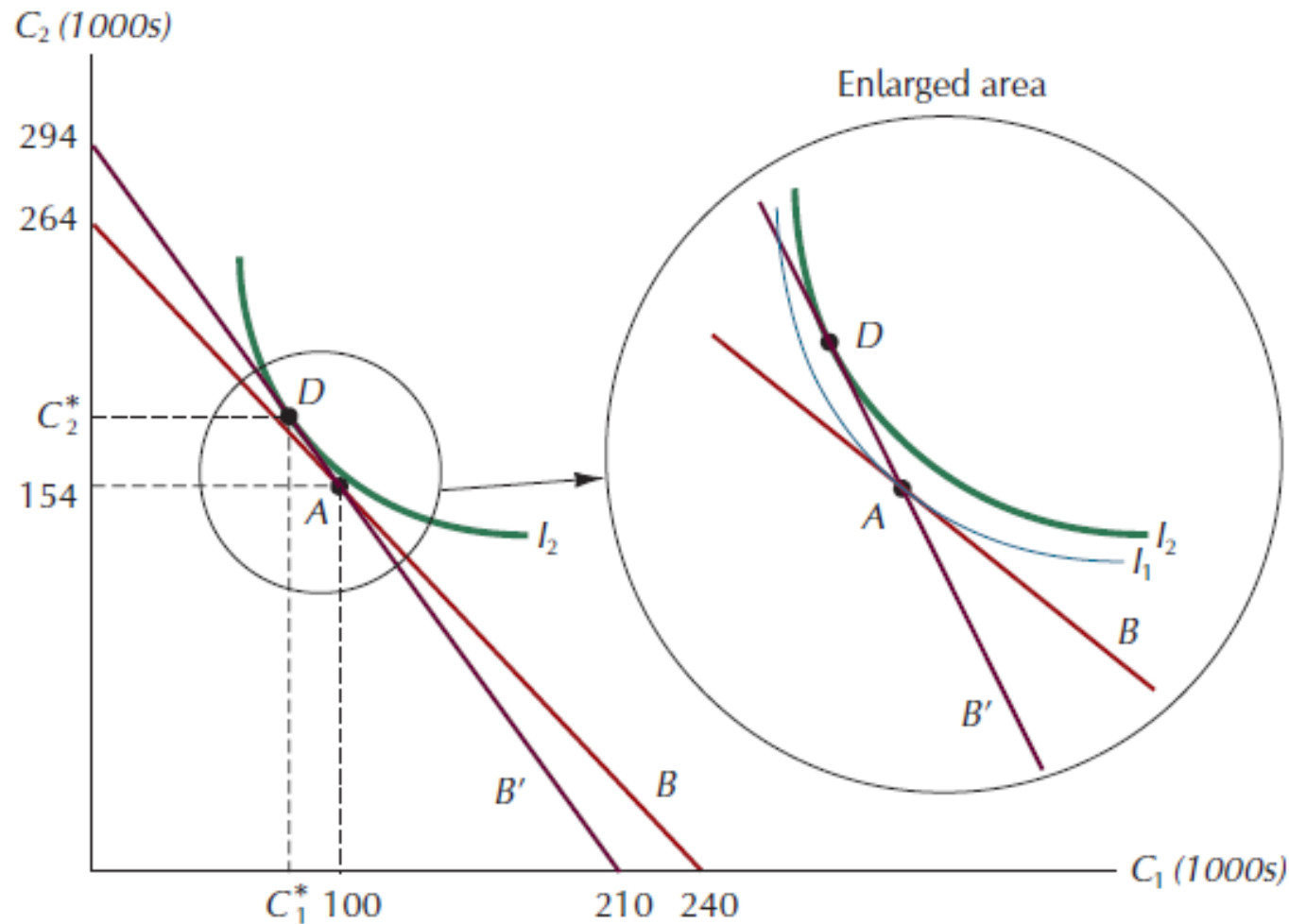


Figure 5.18: The Effect of a Rise in the Interest Rate



Application: The Permanent Income And Life-Cycle Hypotheses

- ***Permanent income hypothesis:*** says that the primary determinant of current consumption is not current income but what he called ***permanent income***.
 - ***Permanent income:*** the present value of lifetime income.

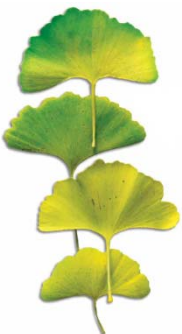


Figure 5.19: Permanent Income, not Current Income, is the Primary Determinant of Current Consumption

