

Cost-of-Living Indexes

Laspeyres Index

- The Laspeyres index tells us:
 - The amount of money at current year prices that an individual requires to purchase the bundle of goods and services that was chosen in the base year divided by the cost of purchasing the same bundle at base year prices.



Cost-of-Living Indexes

- Calculating Rachel's Laspeyres cost of living index
 - Setting the quantities of goods in 1997 equal to what were bought by her sister, but setting their prices at their 1997 levels result in an expenditure of \$1,720 ($100 \times 2.20 + 15 \times \100)



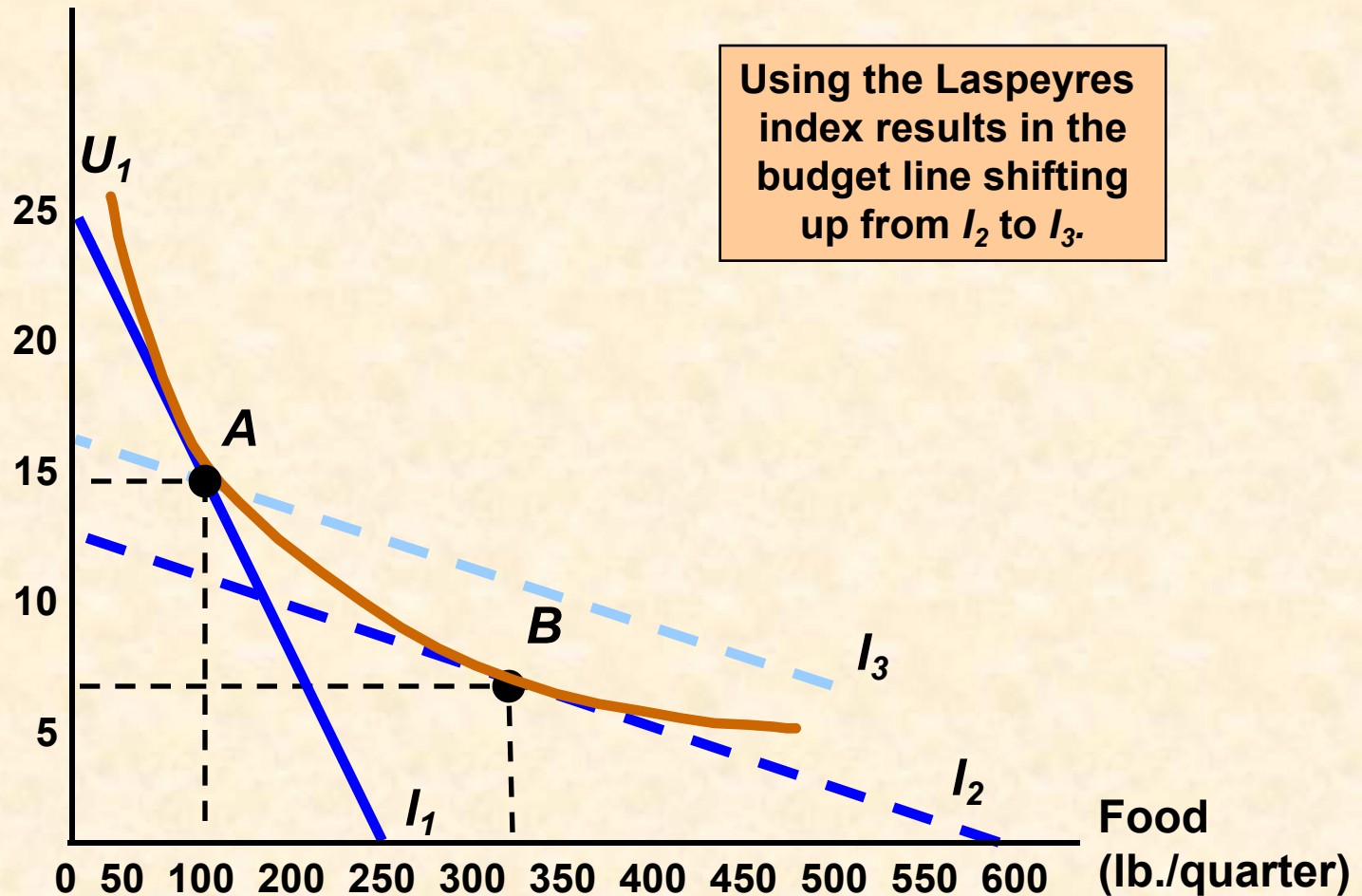
Cost-of-Living Indexes

- Her cost of living adjustment would now be \$1,220.
- The Laspeyres index is:
$$\$1,720 / \$500 = 344.$$
- This overstates the true cost-of-living increase.



Cost-of-Living Indexes

Books
(per quarter)



Cost-of-Living Indexes

■ What Do You Think?

- Does the Laspeyres index always overstate the true cost-of-living index?



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■ Yes!

- The Laspeyres index assumes that consumers do not alter their consumption patterns as prices change.



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■ Yes!

- By increasing purchases of those items that have become relatively cheaper, and decreasing purchases of the relatively more expensive items consumers can achieve the same level of utility without having to consume the same bundle of goods.



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■ The Paasche Index

- Calculates the amount of money at current-year prices that an individual requires to purchase a current bundle of goods and services divided by the cost of purchasing the same bundle in the base year.



Cost-of-Living Indexes

Comparing the Two Indexes

- Both indexes involve ratios that involve today's current year prices, P_{Ft} and P_{Ct} .
- However, the Laspeyres index relies on base year consumption, F_b and C_b .
- Whereas, the Paasche index relies on today's current consumption, F_t and C_t .



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- Then a comparison of the Laspeyres and Paasche indexes gives the following equations:

$$LI = \frac{P_{Ft} F_t + P_{Ct} C_t}{P_{Ft} F_t + P_{Ct} C_t}$$

$$PI = \frac{P_{Fb} F_t + P_{Ct} C_t}{P_{Fb} F_t + P_{Ct} C_t}$$



Cost-of-Living Indexes

Comparing the Two Indexes

- Suppose:
 - Two goods: Food (F) and Clothing (C)



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Comparing the Two Indexes

■ Let:

- P_{Ft} & P_{Ct} be current year prices
- P_{Fb} & P_{Cb} be base year prices
- F_t & C_t be current year quantities
- F_b & C_b be base year quantities



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Comparing the Two Indexes

■ Sarah (1990)

- Cost of base-year bundle at current prices equals \$1,720 ($100 \text{ lbs} \times \$2.20/\text{lb} + 15 \text{ books} \times \$100/\text{book}$)
- Cost of same bundle at base year prices is \$500 ($100 \text{ lbs} \times \$2.00/\text{lb} + 15 \text{ books} \times \$20/\text{book}$)



Cost-of-Living Indexes

Comparing the Two Indexes

■ Sarah (1990)

$$LI = \frac{\$1,720}{\$500} = 344$$



Cost-of-Living Indexes

Comparing the Two Indexes

■ Sarah (1990)

- Cost of buying current year bundle at current year prices is \$1,260 ($300 \text{ lbs} \times \$2.20/\text{lb} + 6 \text{ books} \times \$100/\text{book}$)
- Cost of the same bundle at base year prices is \$720 ($300 \text{ lbs} \times \$2/\text{lb} + 6 \text{ books} \times \$20/\text{book}$)



Cost-of-Living Indexes

Comparing the Two Indexes

■ Sarah (1990)

$$PI = \frac{\$1,260}{\$720} = 175$$



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The Paasche Index

- The Paasche index will understate the cost of living because it assumes that the individual will buy the current year bundle in the base year.



Cost-of-Living Indexes

- In 1995, the government adopted the *chain-weighted* price index to deflate its measure of real GDP.
 - Developed to overcome problems that arose when long-term comparisons of GDP were made using fixed-weight price indexes and prices were rapidly changing.



Cost-of-Living Indexes

The Bias of the CPI

■ What Do You Think?

- What is the impact on the Federal budget of using the CPI (a Laspeyres index) to adjust social security and other programs for changes in the cost of living?



Summary

- People behave rationally in an attempt to maximize satisfaction from a particular combination of goods and services.
- Consumer choice has two related parts: the consumer's preferences and the budget line.



Summary

- Consumers make choices by comparing market baskets or bundles of commodities.
- Indifference curves are downward sloping and cannot intersect one another.
- Consumer preferences can be completely described by an indifference map.



Summary

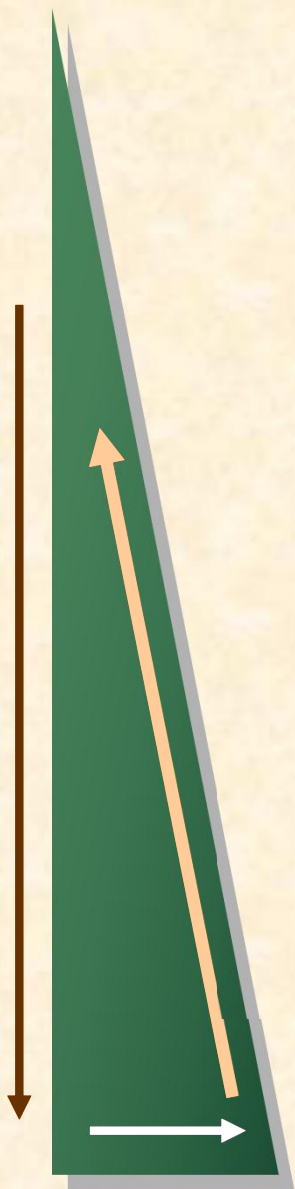
- The marginal rate of substitution of F for C is the maximum amount of C that a person is willing to give up to obtain one additional unit of F .
- Budget lines represent all combinations of goods for which consumers expend all their income.



Summary

- Consumers maximize satisfaction subject to budget constraints.
- The theory of revealed preference shows how the choices that individuals make when prices and income vary can be used to determine their preferences.





End of Chapter 3

Consumer Behavior