Price indexes

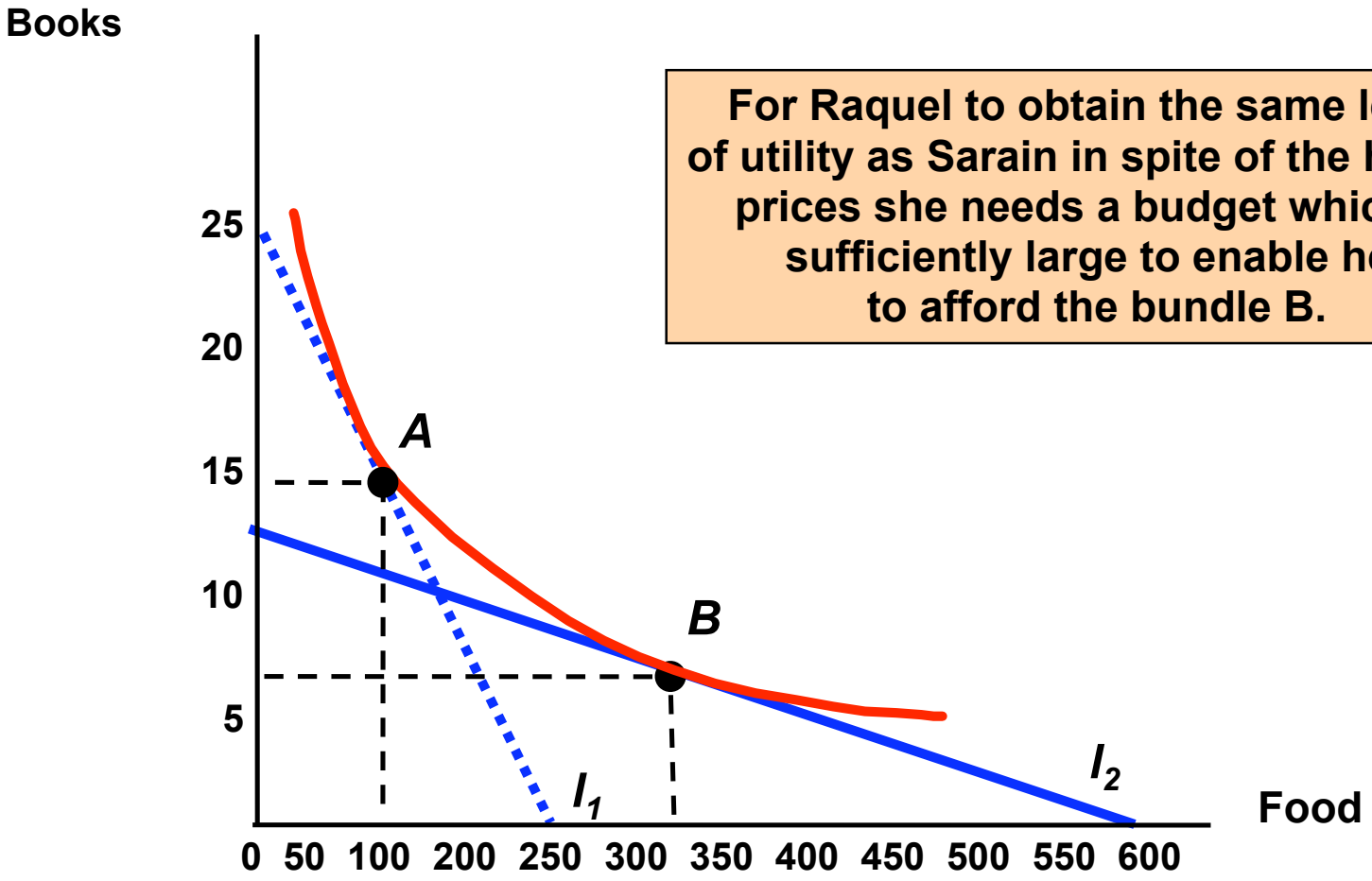
A price index compares the prices in a period t with the prices in a base period 0. It tries to measure the price variation of a set of goods during the base period 0 and period t.

Price indexes

	1990 (Sara)	2000 (Raquel)
Price of food	2,00$/kg	2,20$/kg
Price of books	20$/book	100$/book
Quantity food	100	?
Quantity books	15	?
Expenditure	500$	?

How much income does Raquel need to attain the same utility as Sara in spite of the higher prices?

Price indexes



For Raquel to obtain the same level of utility as Sarain in spite of the higher prices she needs a budget which is sufficiently large to enable her to afford the bundle B.

Price indexes

	1990 (Sara)	2000 (Raquel)
Price of food	2,00$/kg	2,20$/kg
Price of books	20$/book	100$/book
Quantity food	100	300
Quantity books	15	6
Expenditure	500$	1260$

The ideal index for the cost of life

- The adjustment in expenditure of Raquel which compensates for the increase in prices is 760$

$$1.260\$/500\$ = 2{,}52,$$

  equivalent to a 152% increase compared to Sara

- This value can be interpreted as an ídeal index for the cost of life: increase in expenditure necessary to maintain the same level of utility as in the base period.

Price index of Laspeyres

Suppose (A,V) is the consumer´s choice in the base period 0.

The index of Laspeyres is the cost of (A,V) in period t devided by its cost during the base period

$$IL = (\mathbf{P'}_A\mathbf{A} + \mathbf{P'}_V\mathbf{V}) \,/\, (\mathbf{P}_A\mathbf{A} + \mathbf{P}_V\mathbf{V}).$$

Price index of Laspeyres

- In the year 2000 the goods purchased by Sara in 1990 cost

$$2{,}20\$ \times 100 + 100\$ \times 15 = 1.720\$.$$

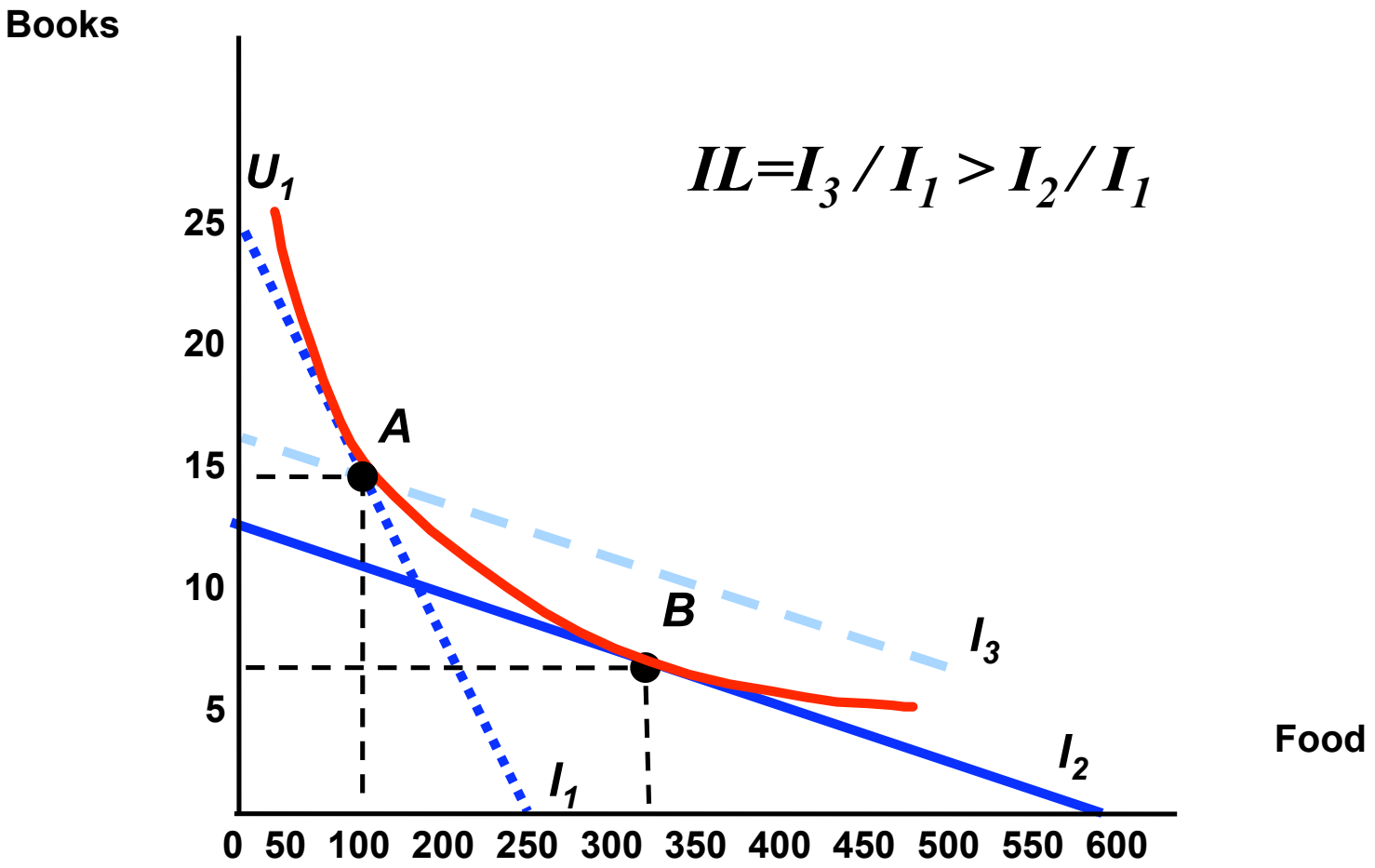
- The same bundle of goods only costed 500$ in 1990

- The index of Laspeyres is

$$IL = 1.720\$/500\$ = 3{,}44$$

which is a 244% increase (*overestimates the ideal index*)

Price index of Laspeyres



$$IL = I_3 / I_1 > I_2 / I_1$$

Price index of Laspeyres

The index Laspeyres *overestimates* the ideal index for the cost of life because it assumes that consumers do not change their choice of good after the price change.

Price index of Paasche

Suppose (A',V') is the consumer´s choice in period t.

The index of Paasche is the cost of (A',V') in period t devided by its cost during the base period

$$IP = (\mathbf{P'}_A\mathbf{A'} + \mathbf{P'}_V\mathbf{V'}) \;/\; (\mathbf{P}_A\mathbf{A'} + \mathbf{P}_V\mathbf{V'}).$$

Price index of Paasche

- In 2000 the bundle of goods purchased by Raquel costs 1260$

- In 1990 the same bundle only costed

$$2\$ \times 300 + 20\$ \times 6 = 720\$$$

- The price index Paasche is

$$IP = 1.260\$/720\$ = 1{,}75.$$

which is a 75% increase (*underestimates the ideal index*)

Price index of Paasche