PRE-LECTURE VIDEO
ISOCOST

Recall: Short-Run vs. Long-Run Input Choice

- Recall the input prices
  - price of labor is *w* per unit
  - price of capital is *r* per unit
- In the short run, capital is fixed
  - Solve for the cost-minimizing quantity of labor
- In the long run, both *L* and *K* are variable
  - Solve for the cost-minimizing quantity of both labor and capital

How to find out the optimal *L* and *K* in the long run?

- For any output level Q_0
- Need to find out the quantity of *L* and *K* that *minimizes* the total cost of production
- We need some curve that represents output
  - Isoquant (similar to the indifference curve)
- We also need some curve that represents cost
  - Something similar to the budget line

Isocost

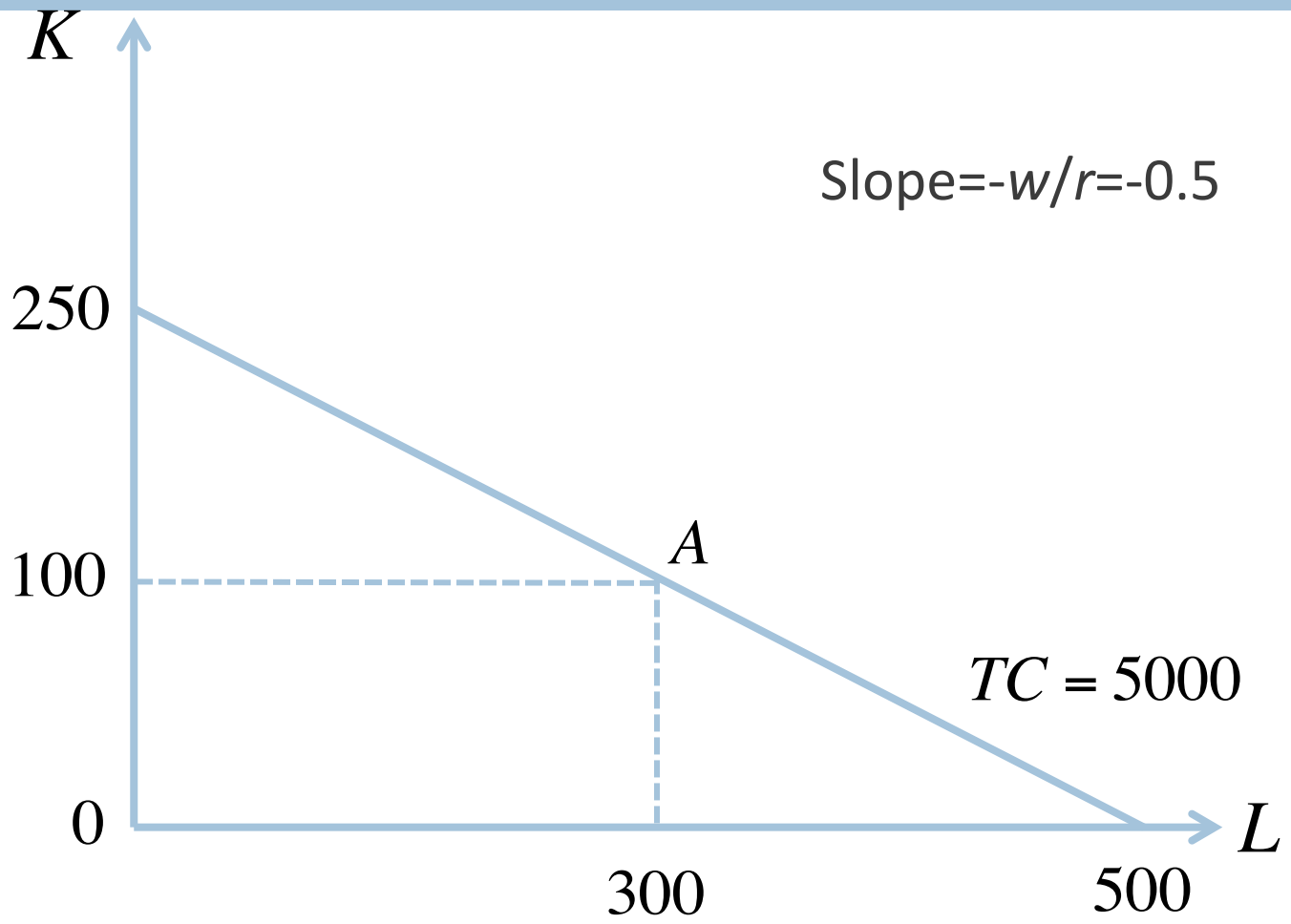
- An *isocost* connects all combinations of *L* and *K* that cost the firm the same amount of money
- The equation of isocost is

$$wL + rK = TC$$

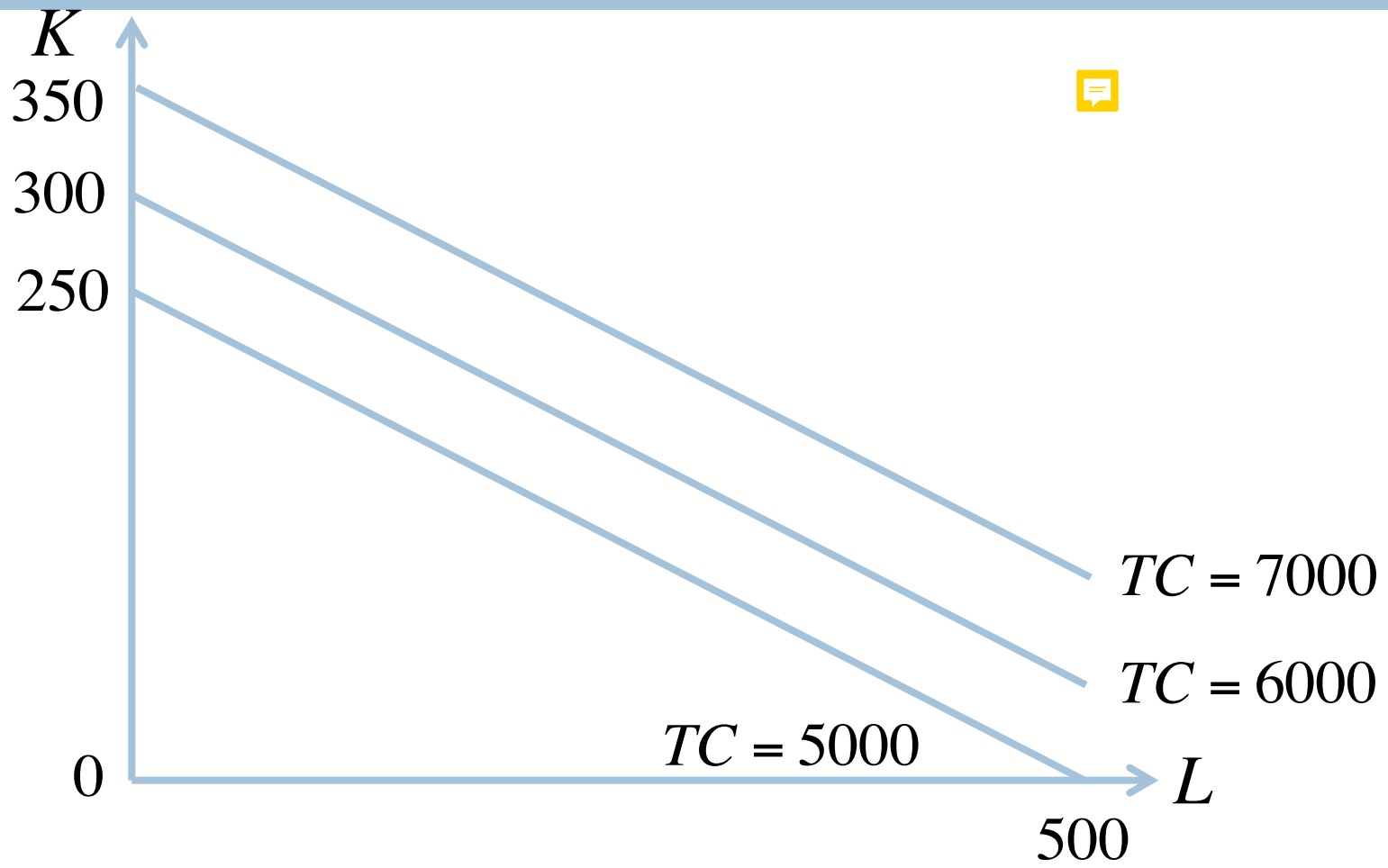
- For example, suppose
  - *w*=10, *r*=20
- The isocost for a total cost of 5000 is

$$10L + 20K = 5000$$

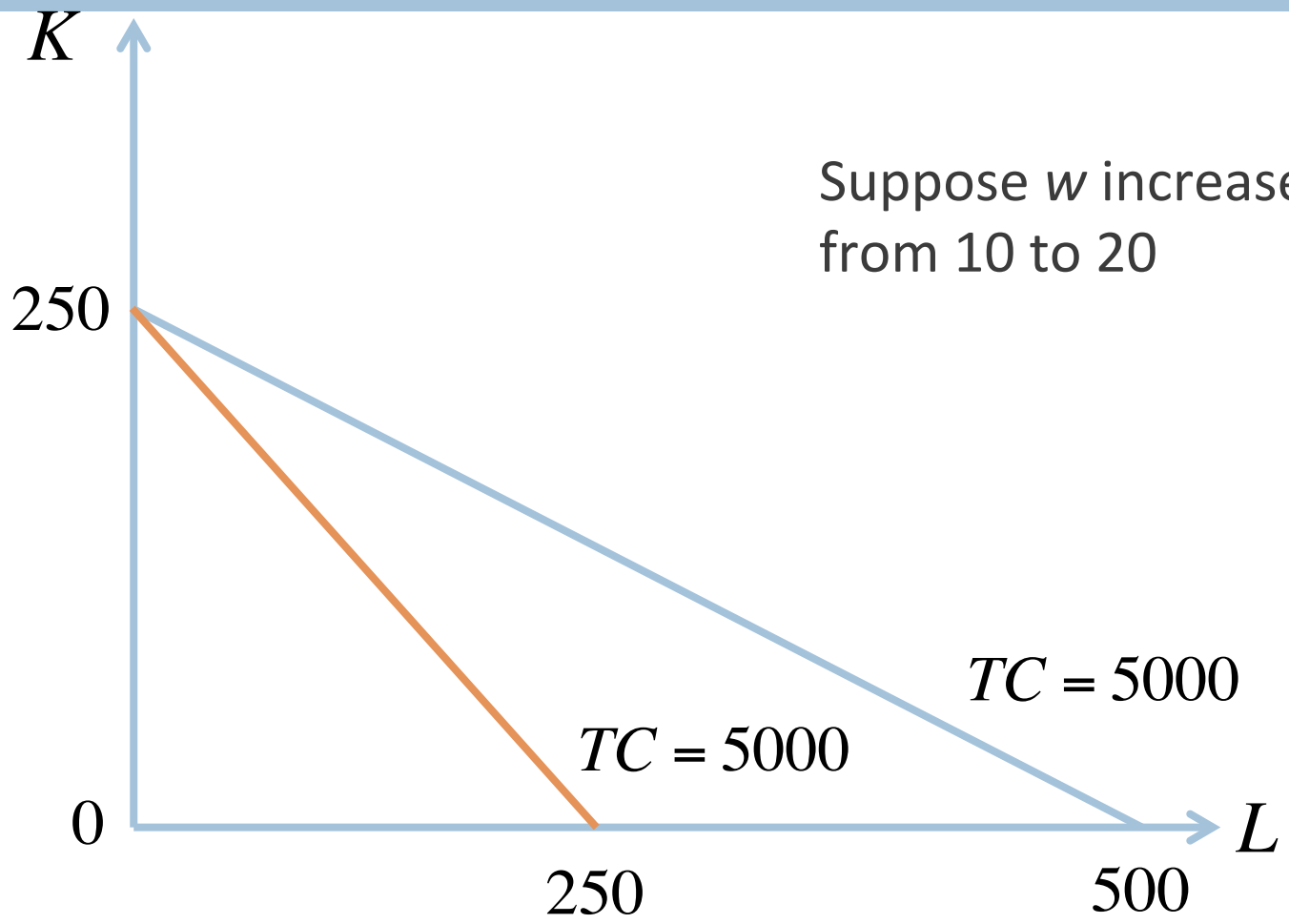
Isocost in Graph



Higher Isocost, Higher Total Cost

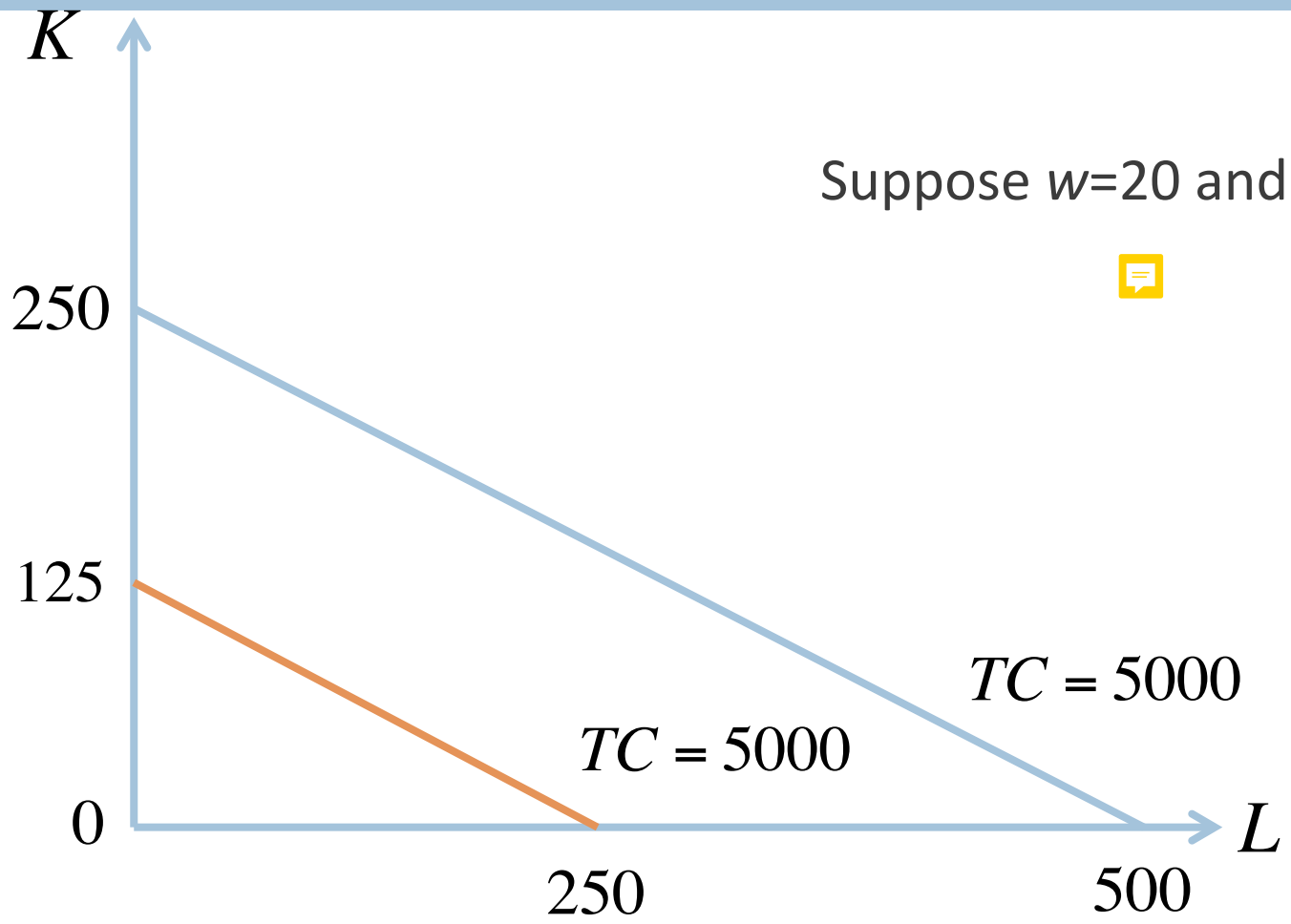


What if labor becomes more expensive?



Suppose *w* increases from 10 to 20

What if *w* and *r* increase by the same proportion?



Suppose *w*=20 and *r*=40

Isoquant vs. Isocost

- If two points are on the same isoquant
  - They generate the same amount of output
- If two points are on the same isocost
  - They cost the firm the same amount of money
- Two points on the same isoquant are not necessarily on the same isocost
- Two points on the same isocost are not necessarily on the same isoquant