ECON 222A
Macroeconomic Theory I

Consumption, Saving, and Investment

Lecture 7

Today's Lecture

- Turn the focus from the labor market to the goods market
- Study the determinants of Consumption and Saving
- Download the file from the website (missing appendix to Ch.4)

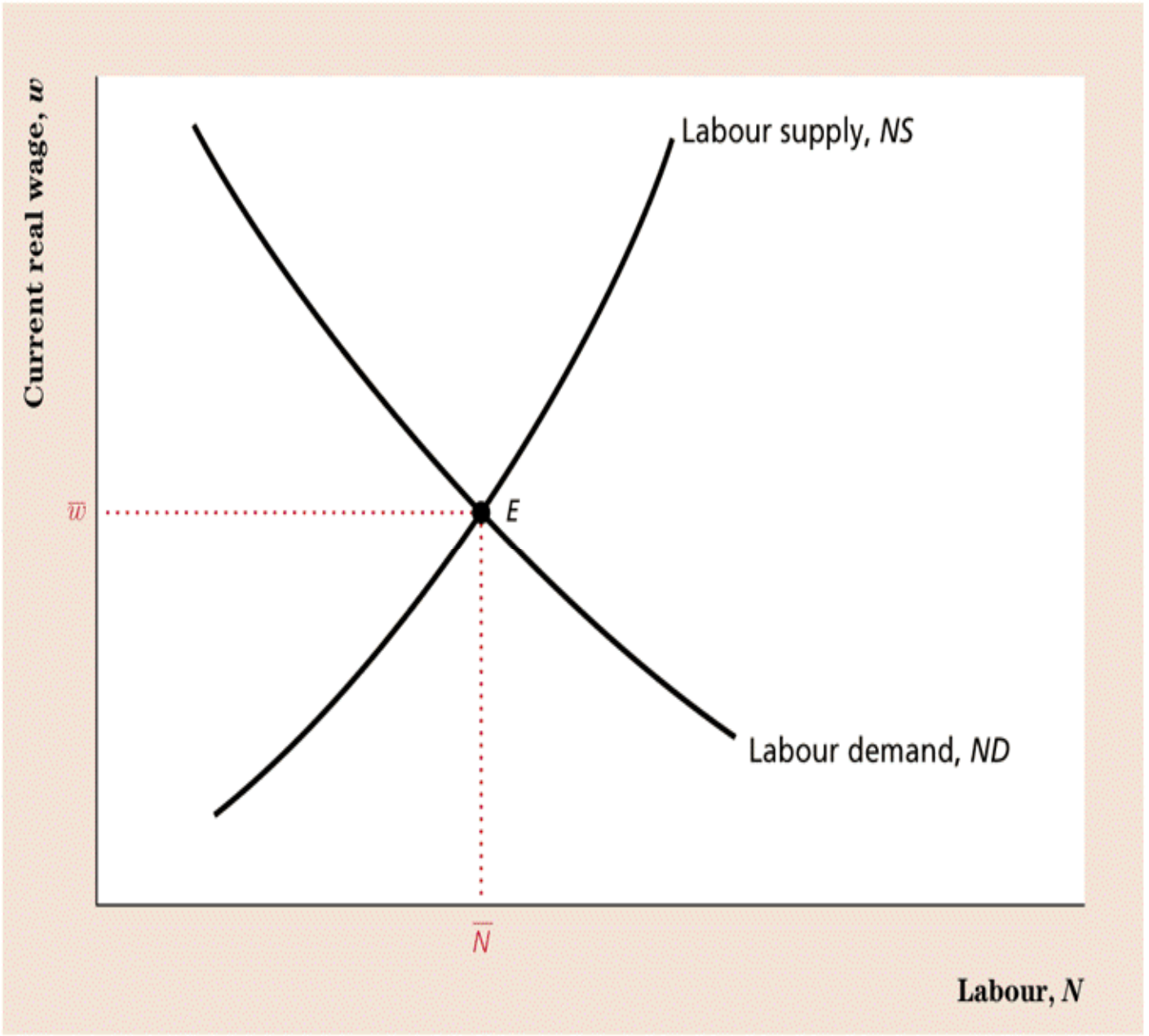
Labor Supply Curve

- Labor supply curve – relates the amount of labor supplied to the current wage, all else equal.
- Positive relationship: as wages go up, people are more willing to supply labor
- Implicit assumption: substitution effect dominates wealth effect *IN THE SHORT RUN*
- For temporary changes in wages: SE > IE; for permanent changes is the opposite: SE < IE

FIGURE 3.11

LABOUR MARKET EQUILIBRIUM

The quantity of labour demanded equals the quantity of labour supplied at point *E*. The equilibrium real wage is $\overline{w}$, and the corresponding equilibrium level of employment is $\overline{N}$, the full-employment level of employment.



Consumption, Saving & Investment

- Last week: production and output
  – what we produce
- This week: consumption, saving, investment
  – what to do with what is produced
- Move from output supply as determined by firm's *ND* and HH's *NS*, to output demand determined by firm's Investment and HH's savings decisions.

Consumption, Saving & Investment

- In the labor market equilibrium is reached through changes in *w*

- In the goods market equilibrium is reached through changes in *r*

Expenditure Approach

$$Y = C + I + G + NX$$

- *G* is determined by non-economic factors and by the political system (ignore it for now)
- *NX* = 0 that is consider a closed economy
- Focus here is on *C* and *I*; *Y = C + I*
  - Natural issue: what G&S to consume today, and what to leave for G&S tomorrow

Where are we?

$$Y = C + I + G + NX$$

$$F(\underbrace{K}_{?}, \underbrace{L}_{\text{ch. 3}}) = \underbrace{C}_{\text{tradeoffs}} + \underbrace{I}_{?} + \underbrace{G}_{\text{(fixed)}} + \underbrace{NX}_{=0 \text{ (for now)}}$$

- We have a theory for F and L (chapter 3)
- We have no clue (yet) about K, I, G and NX.
- We have a glimpse of tradeoffs between consumption and leisure: still incomplete
- Our goal in this chapter: a theory for C, I and the relationship between I and K.

Where are we going?

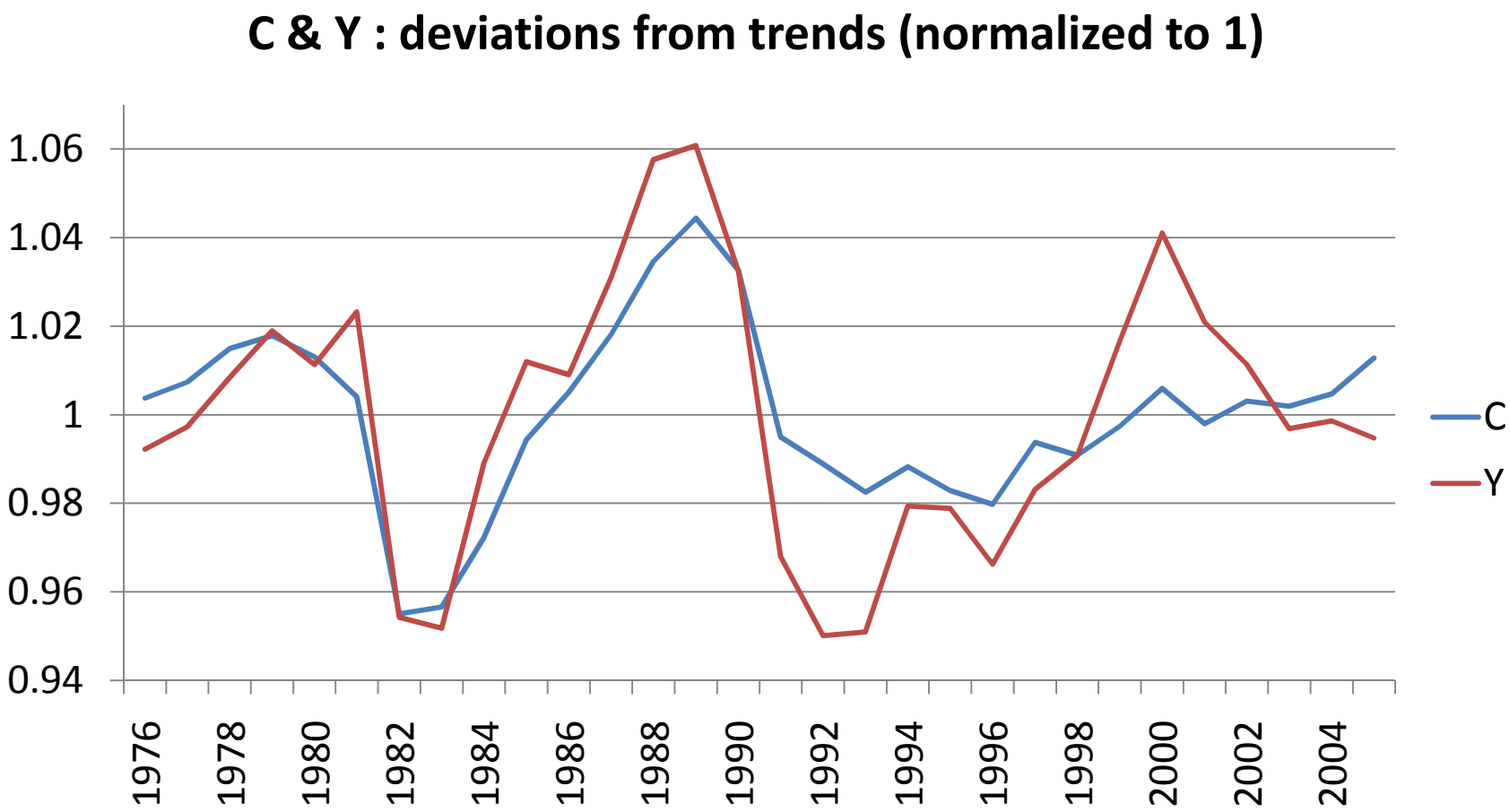
- What motivations could firms have to invest?
  - Change the level of K over time.
- What motivations could consumers have to save?
  - Smooth their consumption over time.
- Savings/Investment = future
  - We need a theory for the value of the future.
  - Expectations on the future will matter.

Goals

- Think about Aggregate demand for G&S
  – later think about spending fluctuations

- Think about capital stock formation
  – later think about how the economy grows

Consumption, Income and Savings



Source: StatCan

Consumption and Savings

- Previous figure:
  - Consumption tracks income…
  - …but not quite

$$MP_C \equiv \frac{\partial C}{\partial Y} < 1$$

- Variations in C are *always* within variations in Y (blue line within red line)
- People *smooth* their consumption.
  - They know they might have a lower Y in the future so they save to *insure* themselves.

Consumption and Savings

- Last consumer model: tradeoff between consumption and leisure.
  - Decisions: current period only.
- Now, we focus between the current period and the next period
  - Decisions for now *and* tomorrow.
- Trade-off is between consuming now *and* consuming tomorrow.

Consumption & Saving

- *C* represents 60% of total spending
- Aggregate desired consumption demand, C^d, is the sum of all the individuals‘ consumption
- Desired savings, S^d, is the sum of all the individuals' saving
- Discuss the “*d*'s” – desired: C^d is the aggregate quantity of goods and services that the households want to consume, given income and other factors.

Desired Consumption & Saving

- C: consumption goods produced, i.e. ACTUAL amounts available
- C^d: spending on consumption goods i.e. amounts that individuals want/DESIRE
- $C - C^d$ = undesired inventories of consumption goods

Closed Economy Analysis

- With no international economic relationships, NX=0 but also NFP=0

- When NFP=0, the national saving is:

$$S = Y - C - G$$

- And the desired national saving is the saving that occurs when aggregate consumption is at its desired level:

$$S^d = Y - C^d - G$$

Keynesian Consumption Function

- Economists used to describe consumption by a linear function:

$$C^d = c_0 + c_y Y$$

- c_y is called the marginal propensity to consume (*MPC*); is a positive fraction.
- If c_y =0.8 then 80% of any change in current income will be consumed.
- Limitation: cannot be used to study how consumption responds to a change in several important variables (e.g. Expected future income, Wealth, and Interest rate)

What drives C & S decisions?

- How much to consume? How much to save? Compare cost and benefit.
- Trade-off between current vs. future consumption (saving simply defers consumption) depends on *r*: the real interest rate gives a price to the trade-off.
- Assume saver earns *r* (borrower pays back *r* each period).
- Benefit: 1 dollar of consumption today
- Cost: forgoes 1+*r* dollar's worth of consumption next period

What drives C & S decisions?

- Let's start by considering the choice of a single individual

- Appendix 4.A from the old edition (a scanned version is available for download on the website)

Two-period Example

- Two-period model of work (period 1) and retirement (period 2):
- We need two ingredients: 1) what people can afford to consume, 2) how people rank the different options they are facing.

1. We need to consider the budget constraint.
2. We need to consider preferences (utility) over consumption today and tomorrow.

The Budget Constraint

- People have y_1 and y_2 as income in each period.
- They have to choose how much to consume in each period: c_1 and c_2.
- They cannot spend more than their total wealth:

$$c_1 + \underbrace{\frac{c_2}{1+r}}_{\text{curr. value of } c_2} \leq y_1 + \underbrace{\frac{y_2}{1+r}}_{\text{curr. value of } y_2}$$

The Budget Constraint

- Digression : multiply everything by (1+r): same inequality.

$$(1+r)c_1 + c_2 \leq (1+r)y_1 + y_2$$

- The variables are now expressed in terms of next period values.

The Budget Constraint

$$s_1 = y_1 - c_1$$

$$s_2 = y_2 - c_2 + (1+r)s_1$$

- Since there is no third period, saving in the second period would be a waste of resources:

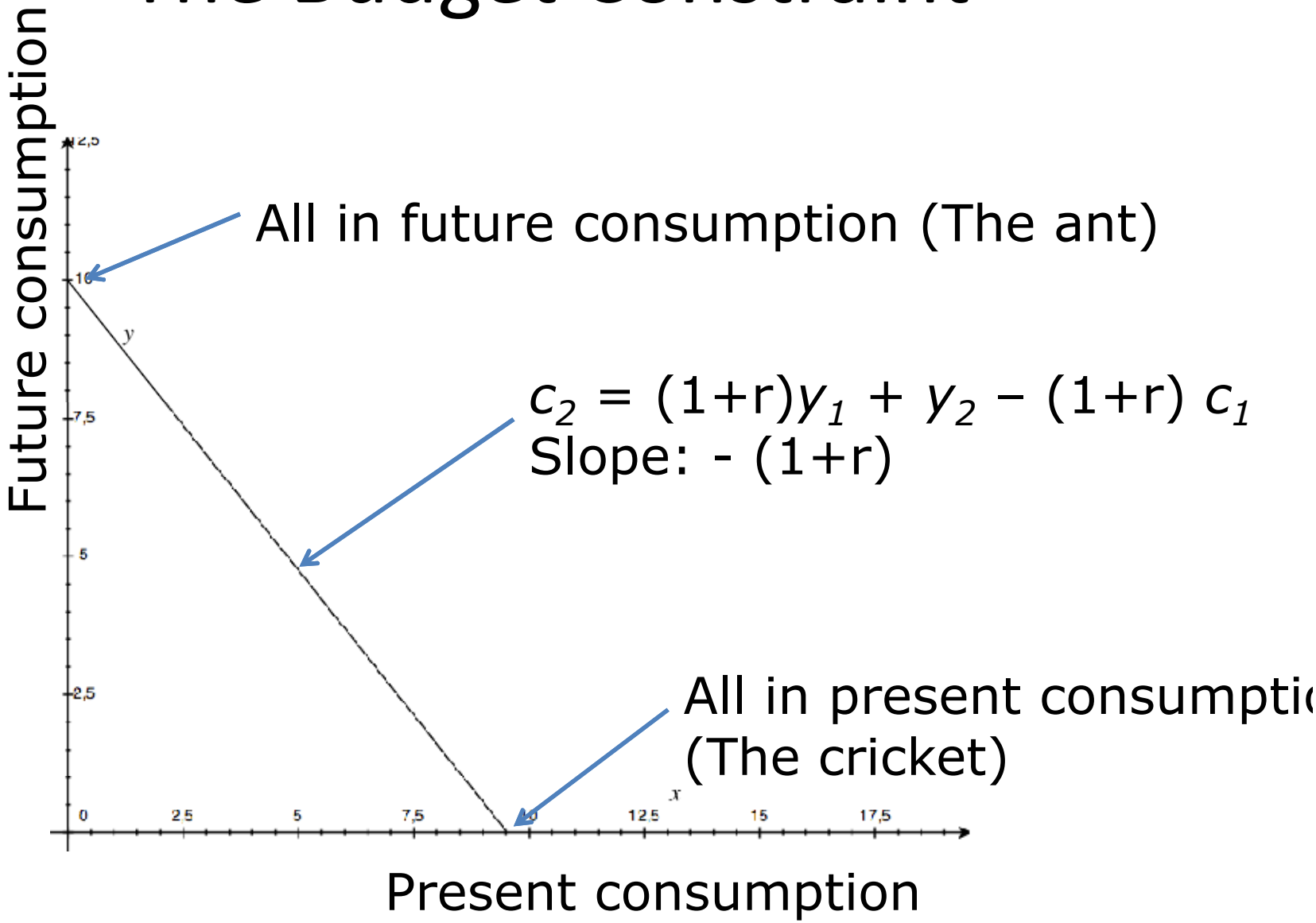
$$s_2 = 0$$

$$c_2 = y_2 + (1+r)s_1$$

- Substituting for s_1 and rearranging gets the present-value budget constraint:

$$c_1 + c_2/(1+r) = y_1 + y_2/(1+r)$$

The Budget Constraint



What to do?

- Could:

  - Starve today and be rich tomorrow, or

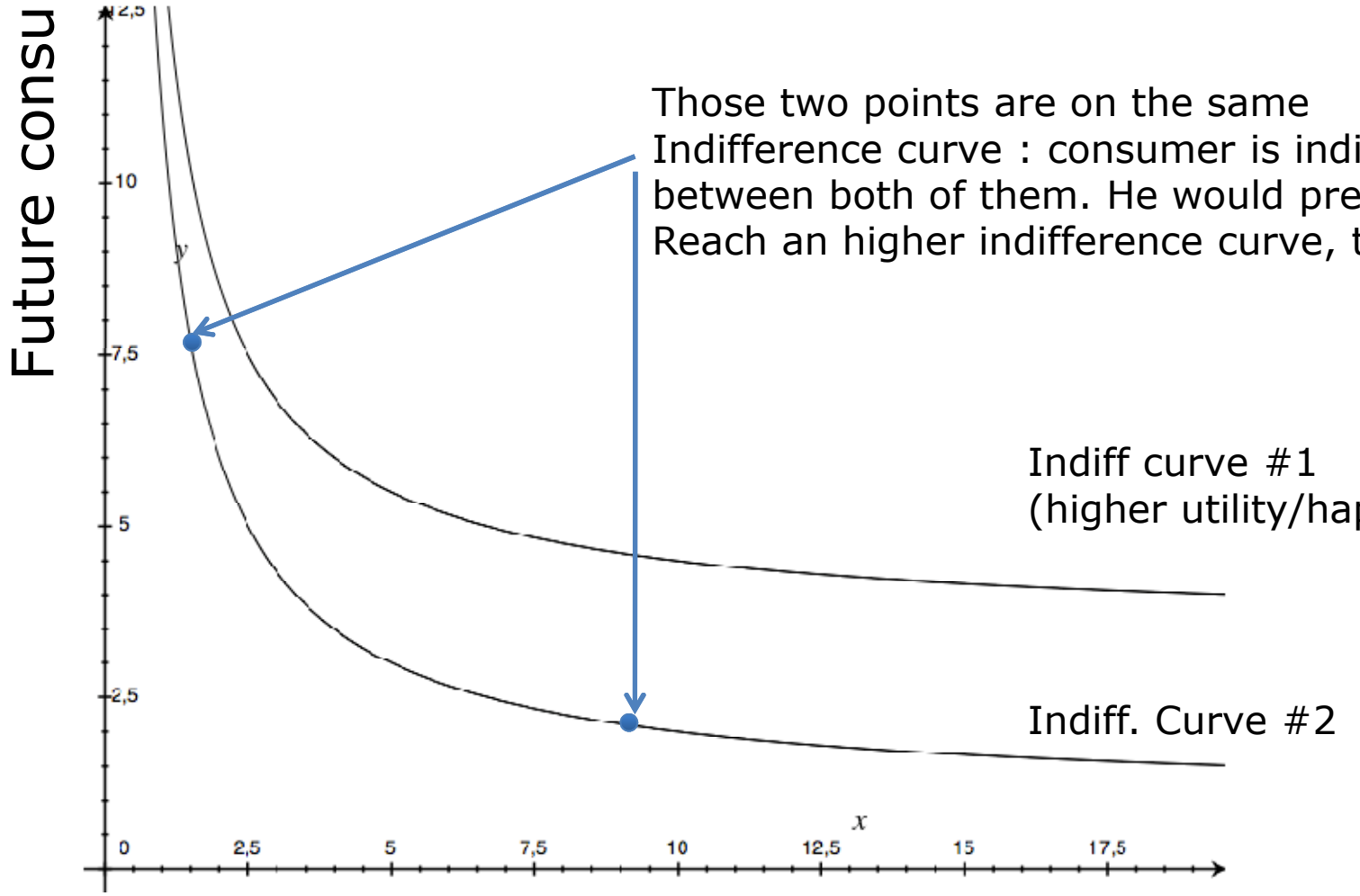
  - Live the life today and be poor tomorrow

- Generally, people want neither. This is called consumption-smoothing, or the motive to have relatively even consumption over time (avoid large swings).

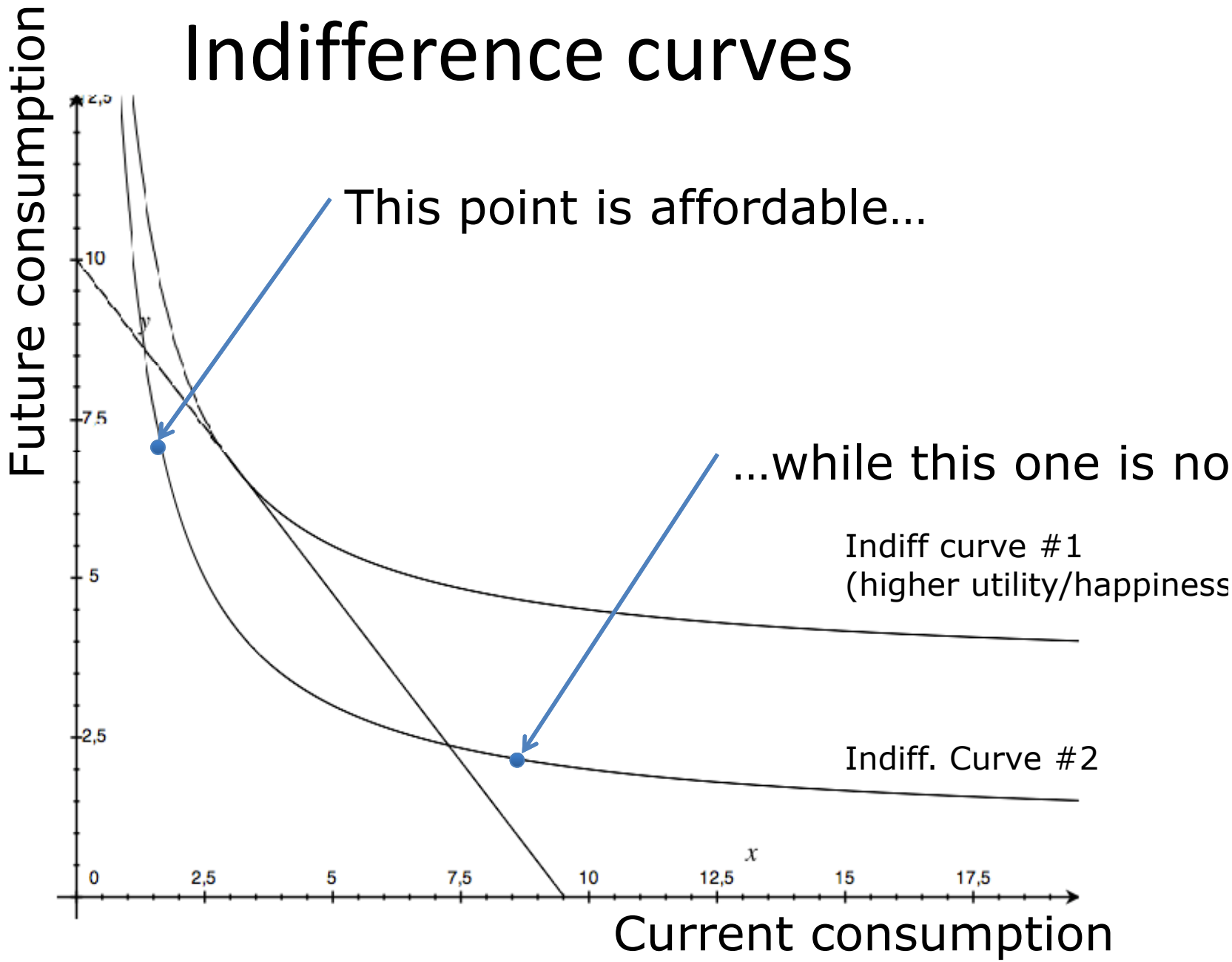
Consumption smoothing

- How do we model consumption smoothing?
- We give consumers a choice rule that strictly prefers “mixes” rather than extremes.
  - (c1 = 0.5, c2 = 0.47) will be preferred to (c1=1, c2=0) or (c1=0, c2=0.95)
- We express this through *indifference curves* that are *convex*.
  - Indifference curves : the consumer is indifferent between any points on this curve.
  - It gives him the same utility/happiness.

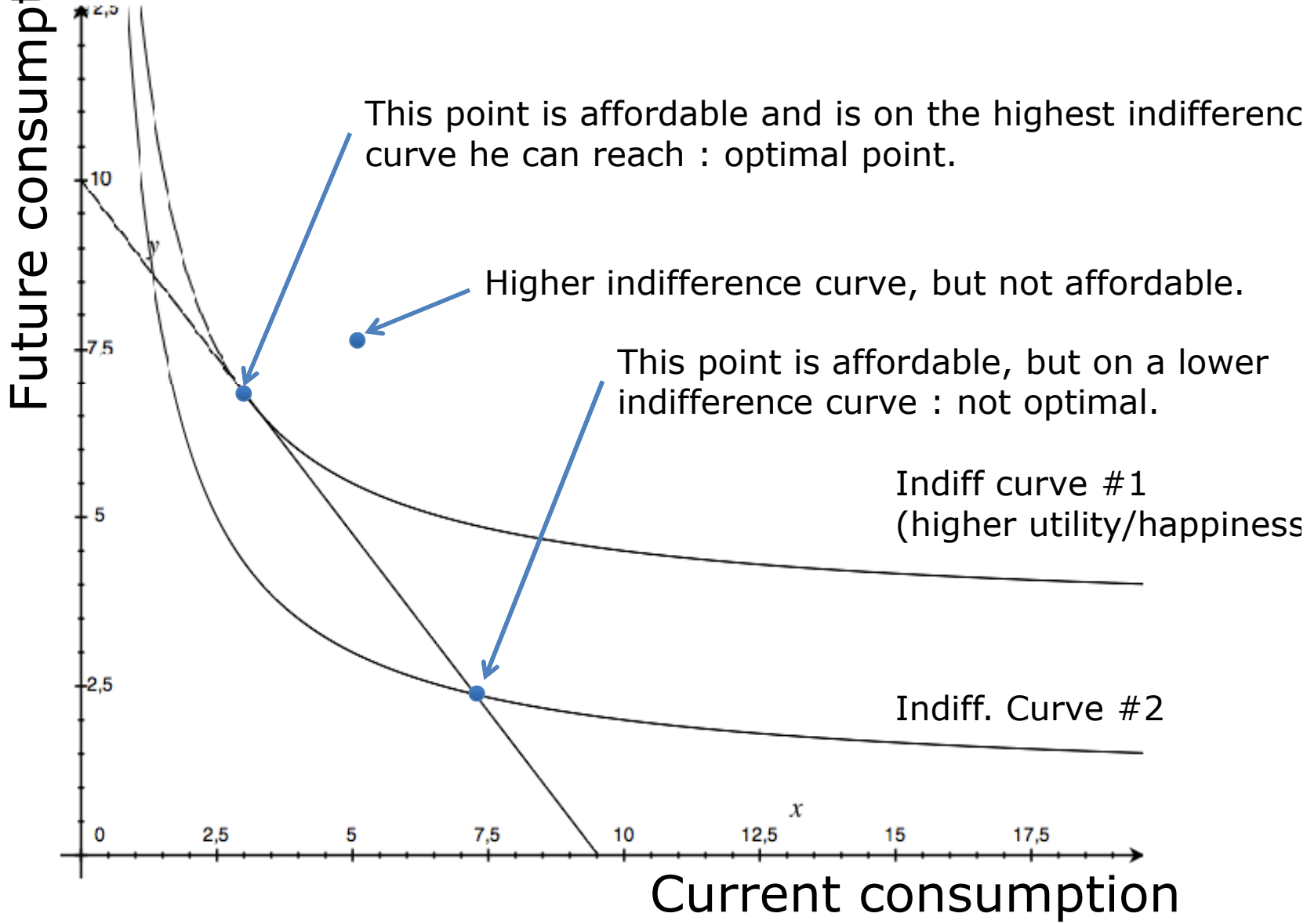
Indifference curves



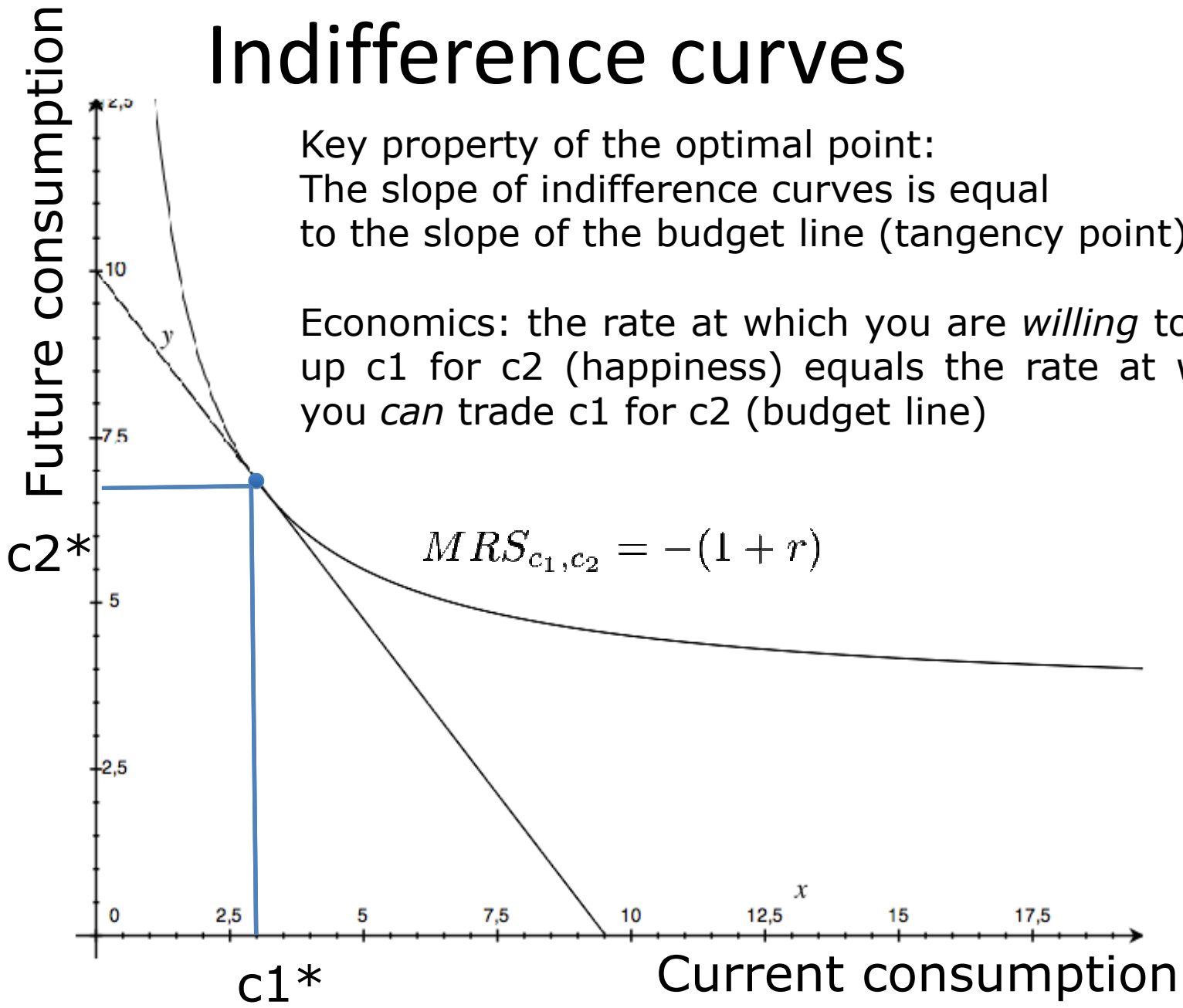
Indifference curves



Indifference curves



Indifference curves

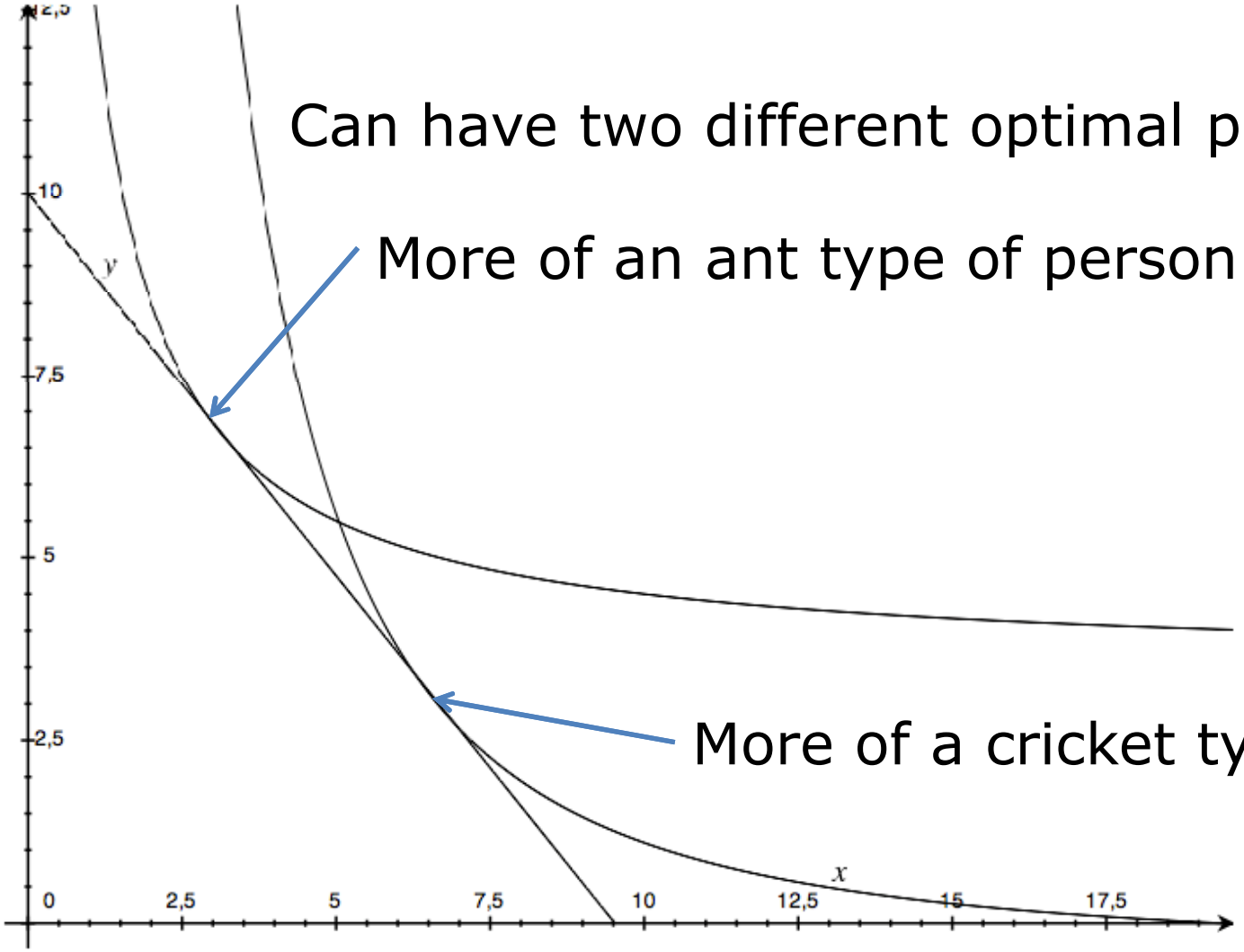


Key property of the optimal point:
The slope of indifference curves is equal
to the slope of the budget line (tangency point)

Economics: the rate at which you are *willing* to give up c1 for c2 (happiness) equals the rate at which you *can* trade c1 for c2 (budget line)

$$MRS_{c_1,c_2} = -(1+r)$$

Different individuals



Effect of Current Income Change

- Example: a one-time bonus at work
- Consumption and saving both rise when *current income rises*.
- If we consider the Keynesian Consumption function:

  - Imagine Current income Y increases by \$1:

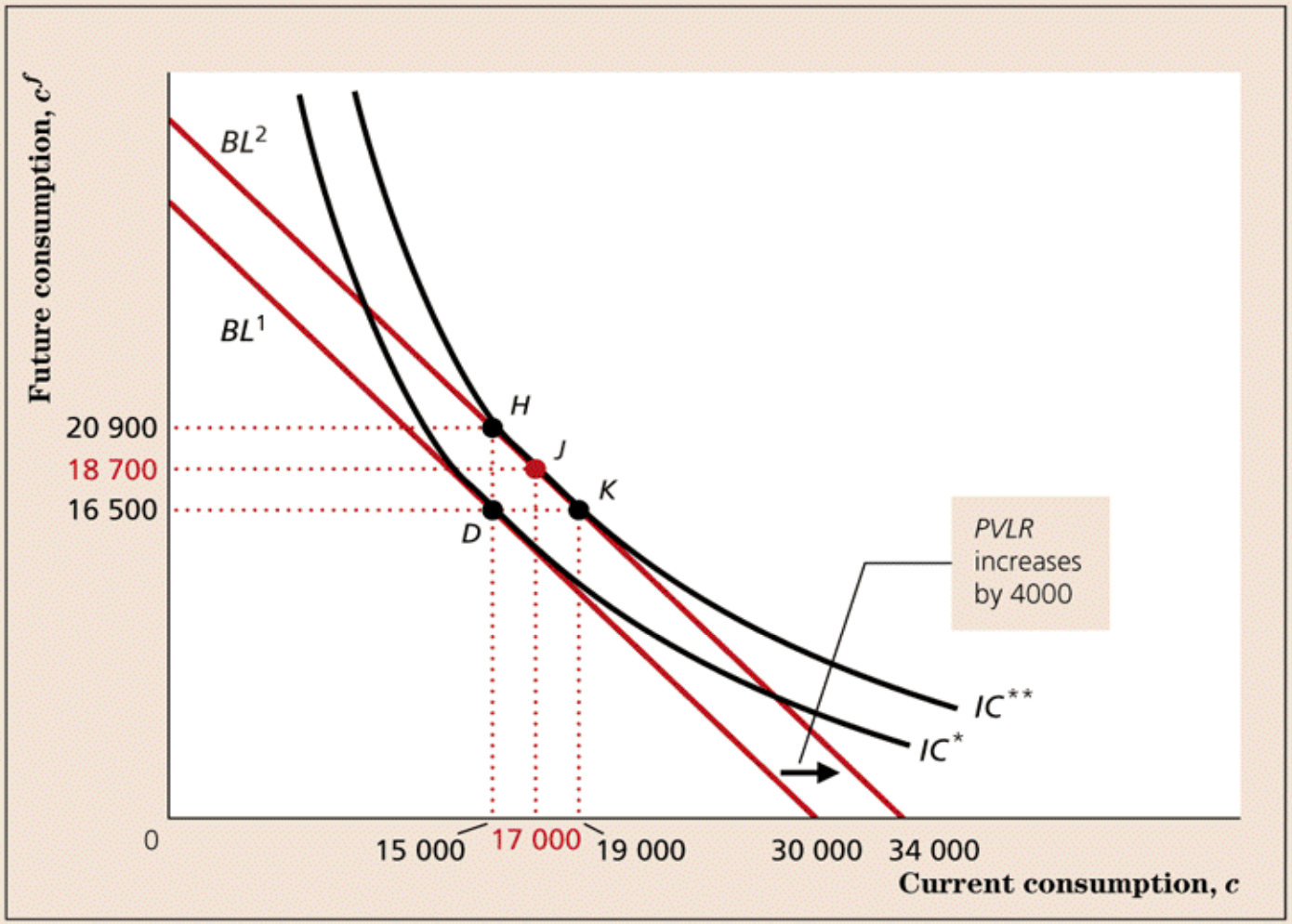
  - C^d rises by < 1; so S^d also rises (by fraction not consumed)

  - Ex: If MPC=0.8, C^d goes up by \$0.8, S^d by \$0.2

FIGURE 4.A.4

AN INCREASE IN INCOME OR WEALTH

An increase in current income, future income, and/or initial wealth that raises Prudence's *PVLR* by 4000 causes the budget line to make a parallel shift to the right by 4000, from BL^1 to BL^2. If Prudence's original consumption plan was to consume at point *D*, she could move to point *H* by spending all the increase on future consumption and none on current consumption; or she could move to point *K* by spending all the increase on current consumption and none on future consumption. However, if Prudence has a consumption-smoothing motive she will move to point *J*, which has both higher current consumption and higher future consumption than *D*. Point *J* is optimal because it lies where the new budget line BL^2 is tangent to an indifference curve, IC^{**}.



Effect of Change in Expected Future Income

- Example: finding a job few months before graduation date
- Higher expected future income leads to more consumption today: saving falls.
- Same intuition: you want to smooth consumption, so the expected future income increase is spread over lifetime consumption which implies:

  - Current consumption increases

  - Current savings decrease since current income is unchanged

Effect of Change in Expected Future Income (2)

- That's the theory: how do we test it?

- We cannot directly measure expected future income, but we can deduce some things about it from the survey-based index of consumer confidence.

Done!

- Problem set 2 (February 11th) and the solutions to Problem set 1 were posted. Please, check the website.