Intermediate Microeconomics

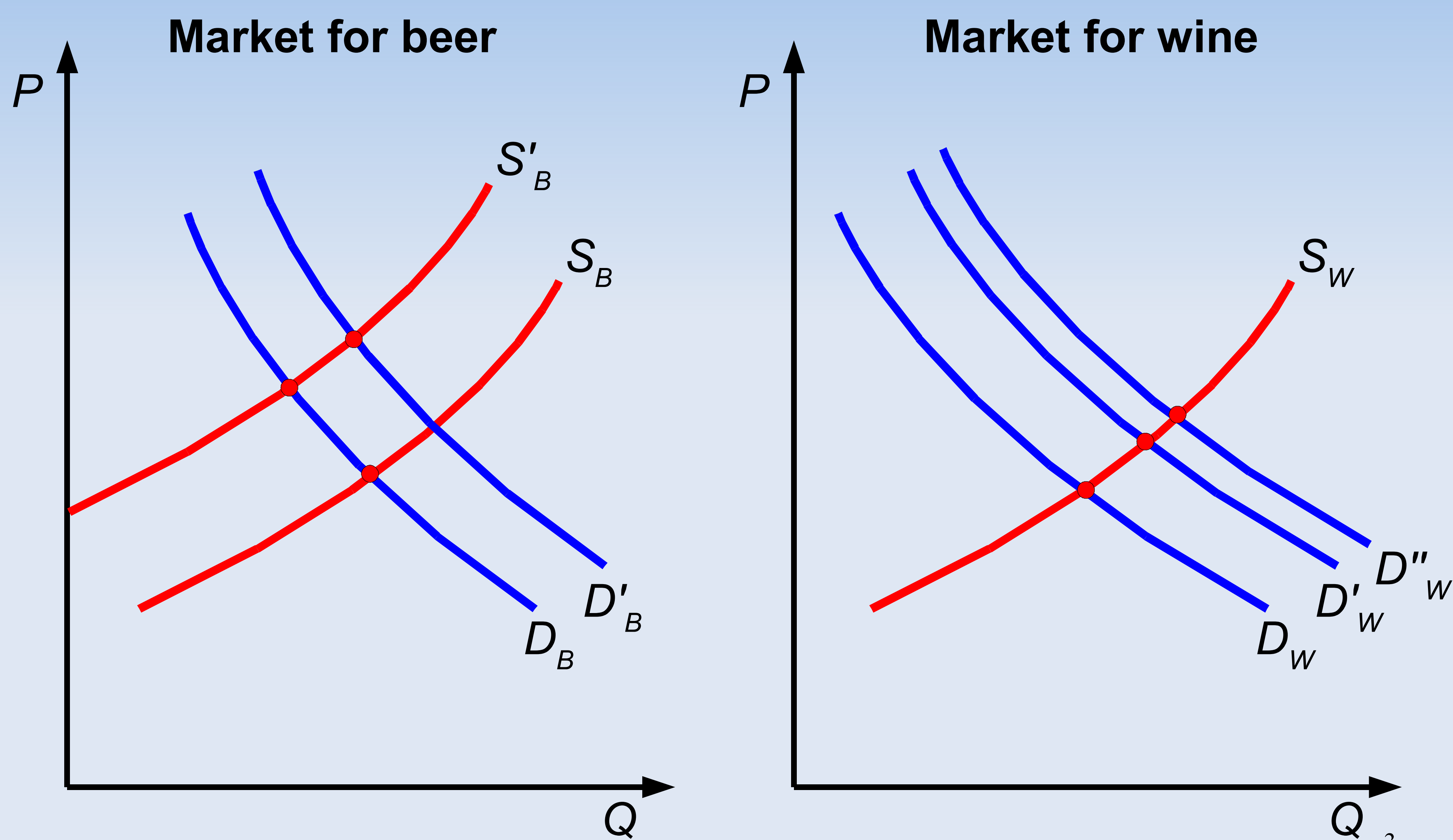
Chapter 12

General Equilibrium and Welfare Economics

Partial vs general equilibrium

- *Partial equilibrium* = study of equilibrium in one market in isolation
- *General equilibrium* = study of equilibrium of all markets simultaneously
- Until now, we only looked at one market at a time (partial equilibrium) – exception: increasing-cost industry analysis
- But: changes in one market can (and usually do) affect other markets as well

Example: tax on beer



Partial vs general equilibrium

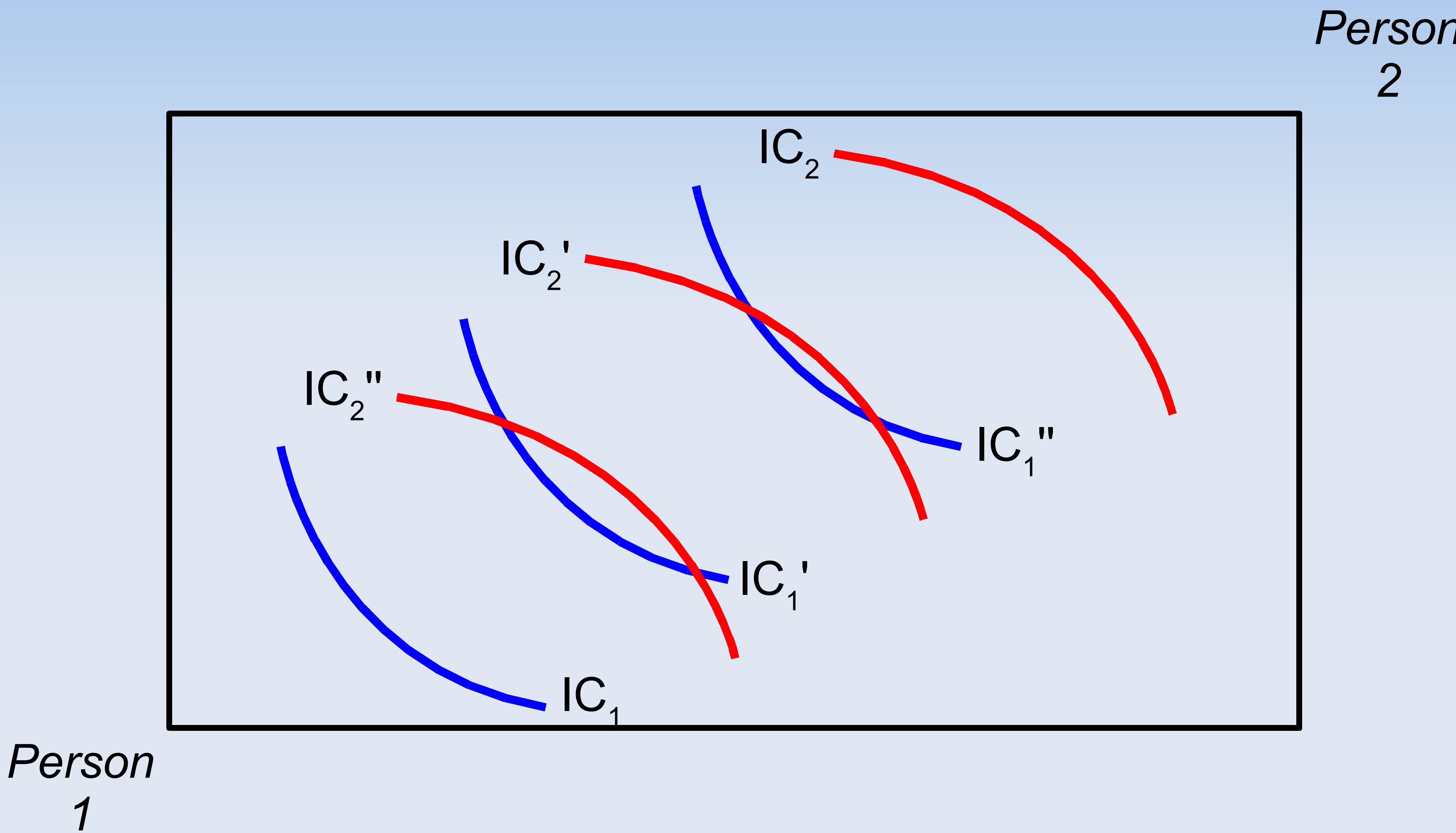
- If two goods are “related” (complements or substitutes), then their markets are linked
- Changes to demand/supply in one market affect the equilibrium in linked markets
- Partial equilibrium analysis would not consider all this feedback between linked markets

Pure exchange economy

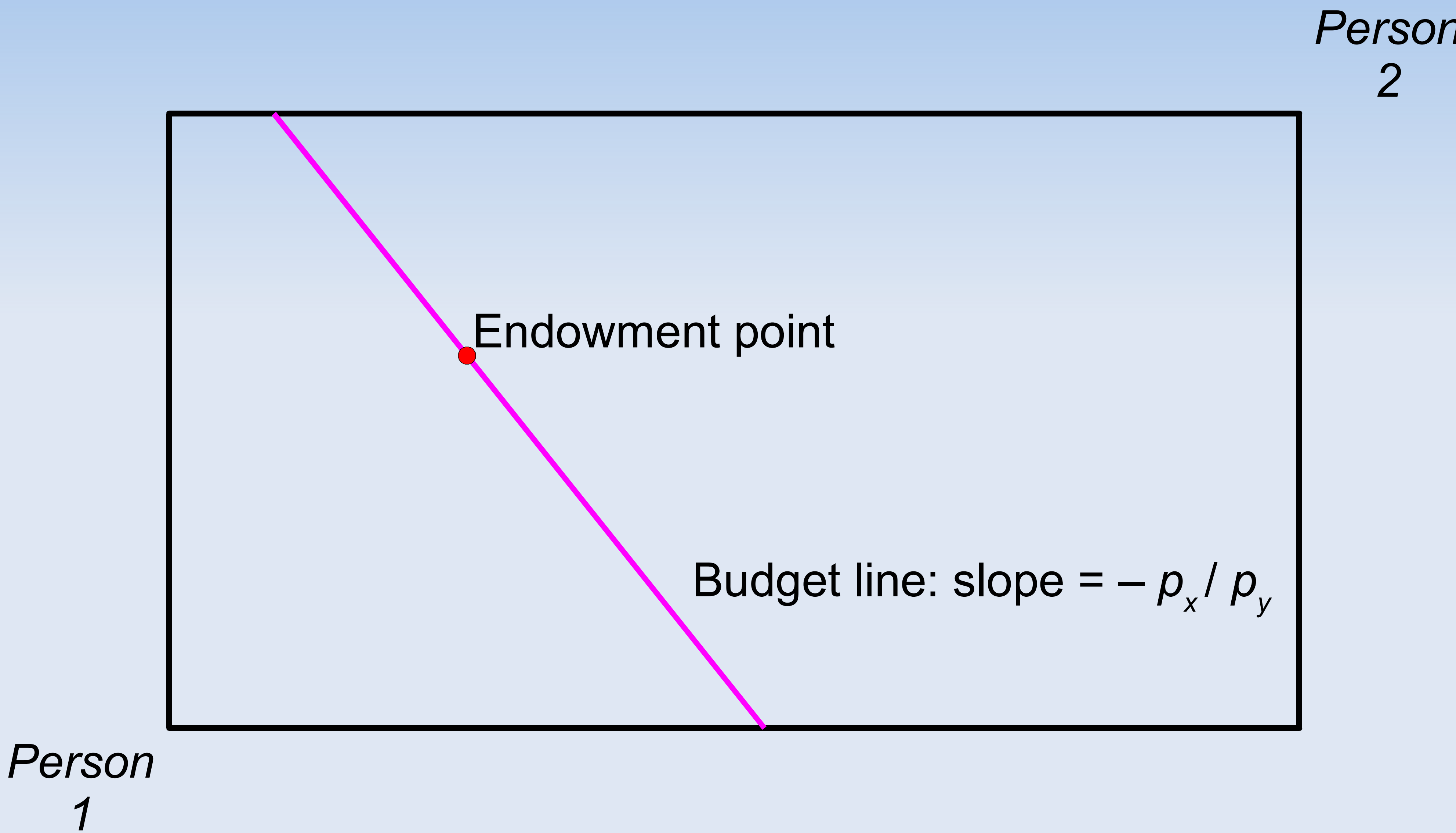
- *Pure exchange economy* = economy in which quantities supplied if all goods are fixed ⇒ the only economic problem is to allocate goods among consumers
- A simple case: two consumers, two goods
- Can be represented in an *Edgeworth box*
- Since there''s no production, each consumer has an *endowment* of each good ⇒ *endowment point*

Edgeworth box

Edgeworth box – indifference curves



Edgeworth box – budget line

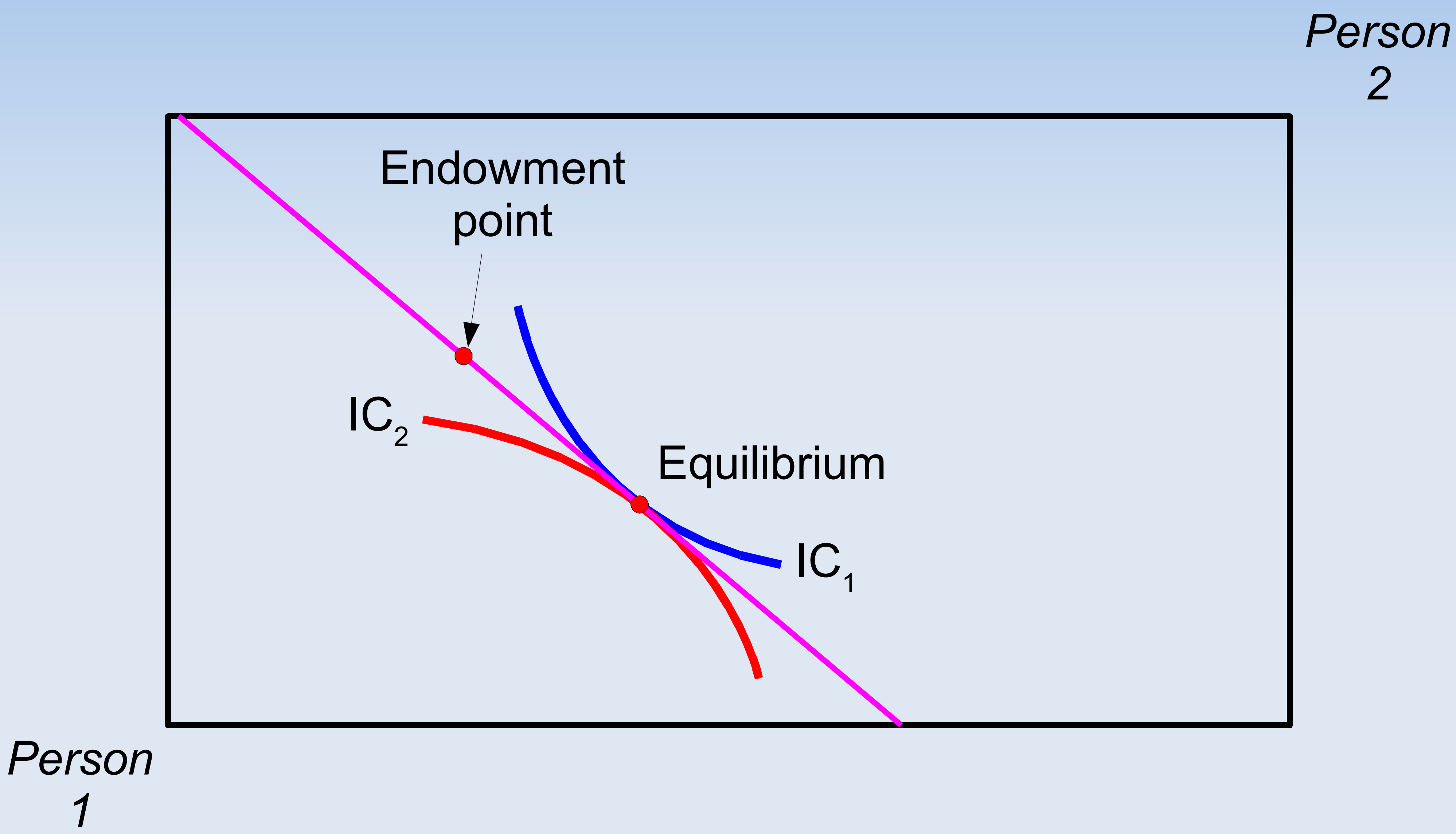


Equilibrium in Edgeworth box

- Prices are not “given” in this setting (consumers trade for the two goods)
- Hence, an equilibrium consists of:
  - prices (of good x and good y)
  - consumption bundles (for the two consumers)

  such that:
  - consumers maximize their utility
  - quantity demanded equals quantity supplied for both goods

Edgeworth box – equilibrium



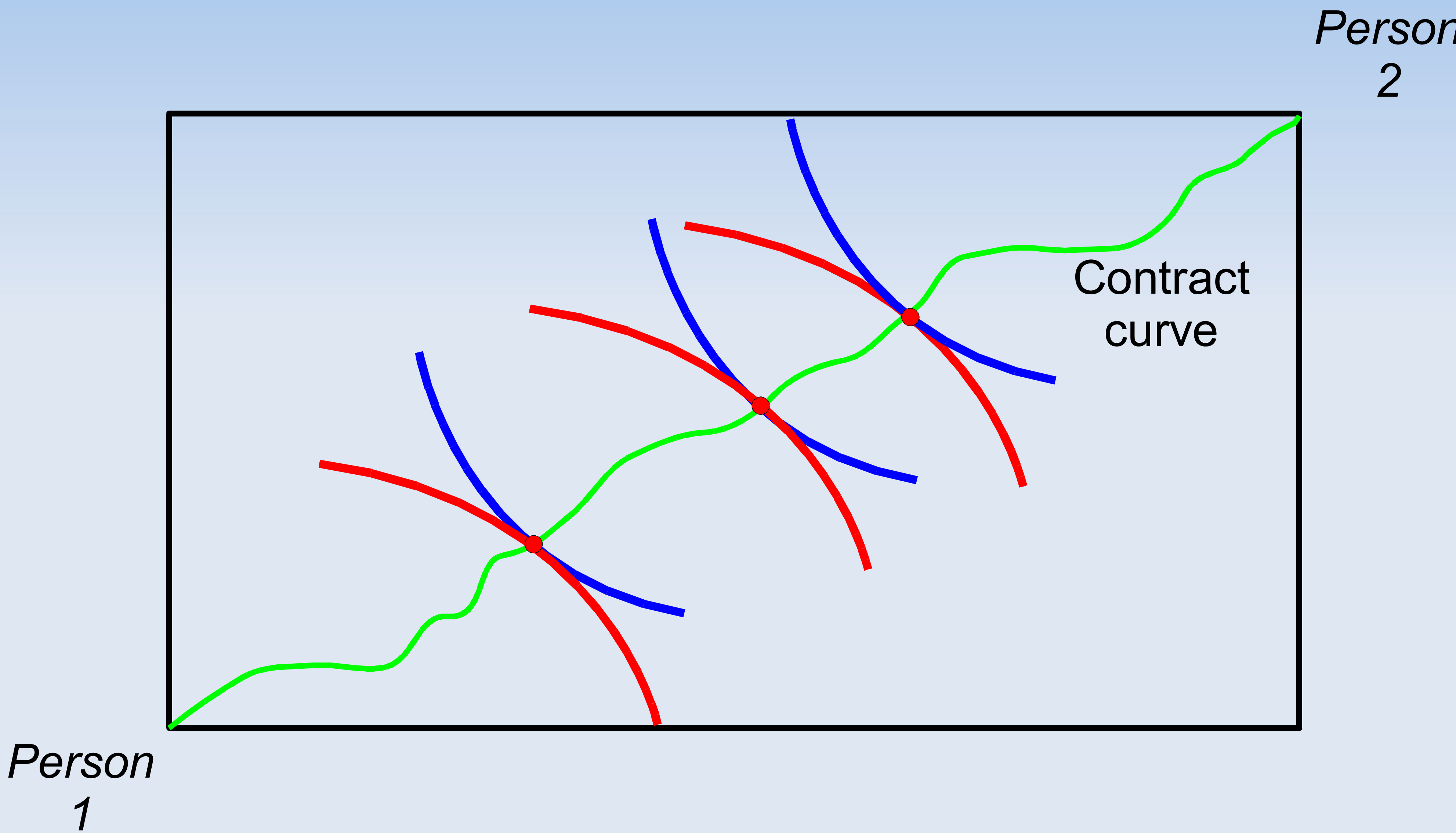
Equilibrium in Edgeworth box

- At the equilibrium, the indifference curves of the two consumers are tangent to each other and to the budget line ⇒ $MRS_1 = MRS_2 = p_x / p_y$
- This also gives us the equilibrium price ratio: note that we don't obtain *prices*, but only the ratio between the two prices!
- Also note that prices act to clear the market: in equilibrium, prices adjust such that neither individual needs to know what the other does (their own decision are optimal)

Welfare economics

- *Welfare economics* = branch of economic theory concerned with the social desirability of alternative economic states
- *Consumption efficient allocation* = allocation of commodities such that, given the total supplies of the commodities, the only way to make one person better off is to make another person worse off ⇒ point of tangency of indifference curves of the two consumers ($MRS_1 = MRS_2$)
- *Contract curve* = set of all consumption-efficient points in an Edgeworth box

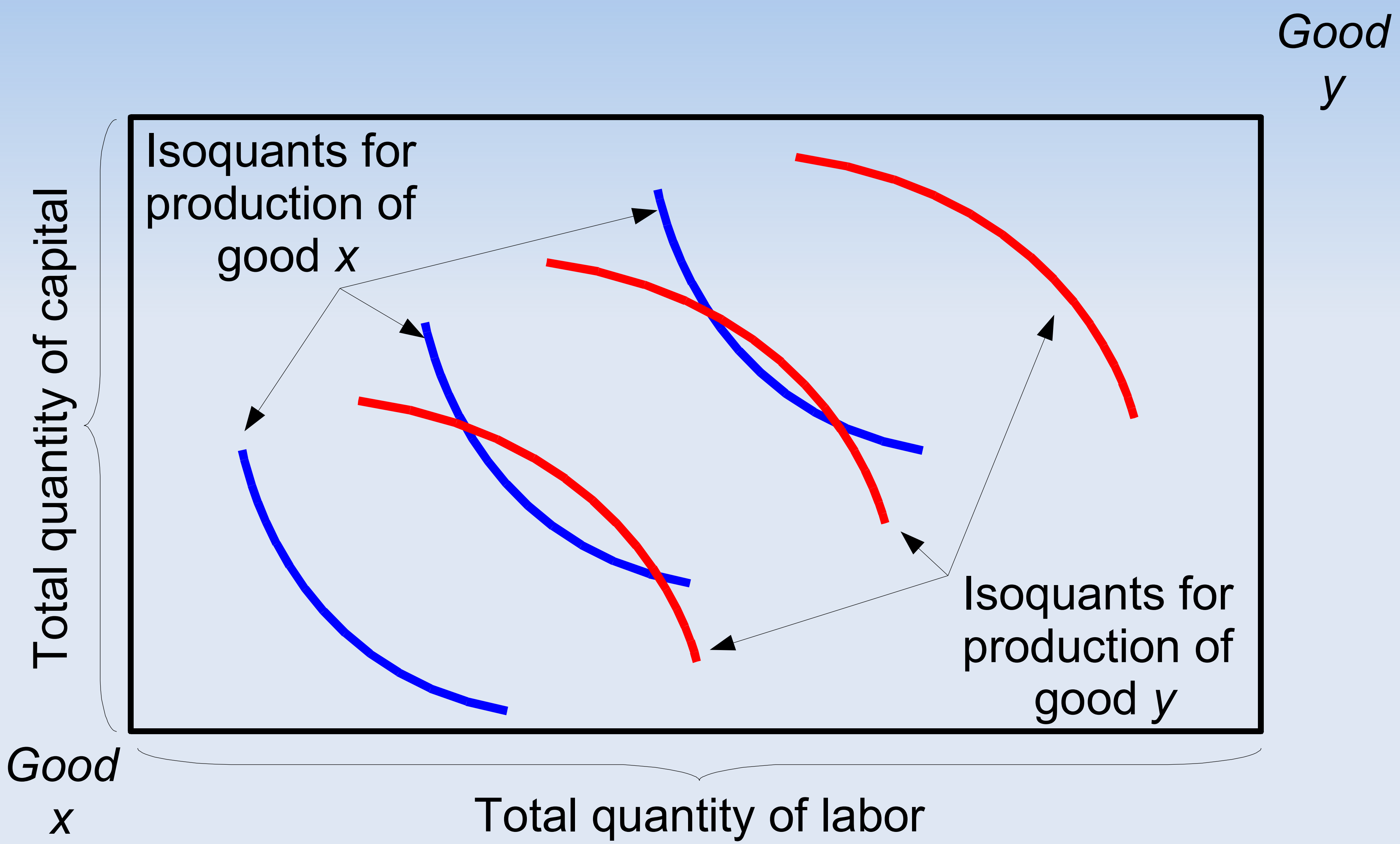
Edgeworth box – contract curve



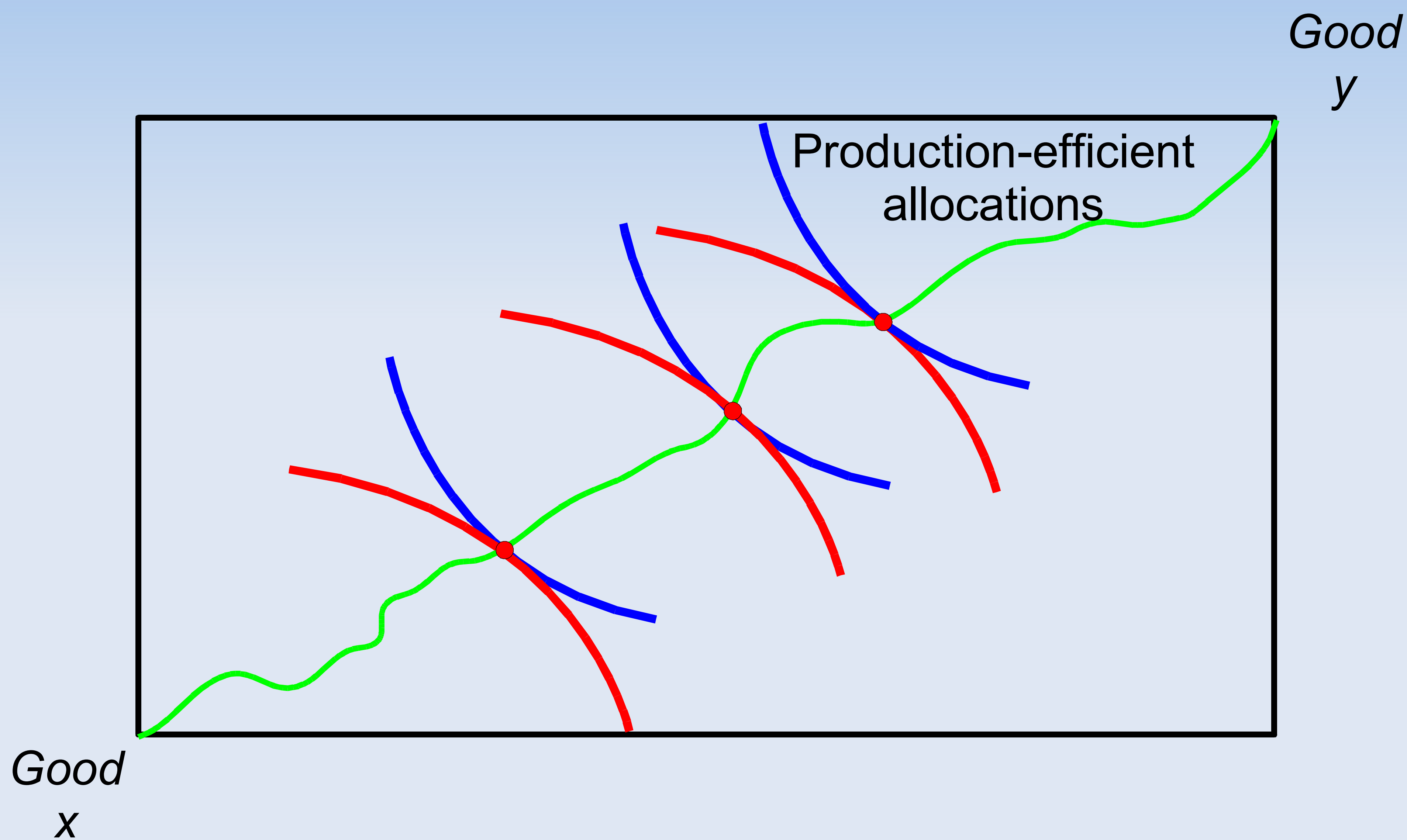
Production efficiency

- What if goods are being produced?
- We can use the same kind of analysis (Edgeworth box + efficiency) to analyze production:
  - goods instead of consumers
  - inputs instead of goods
- *Production efficient allocation* = allocation of inputs such that the only way to increase the output of one commodity is to decrease the output of another commodity

Edgeworth box for production



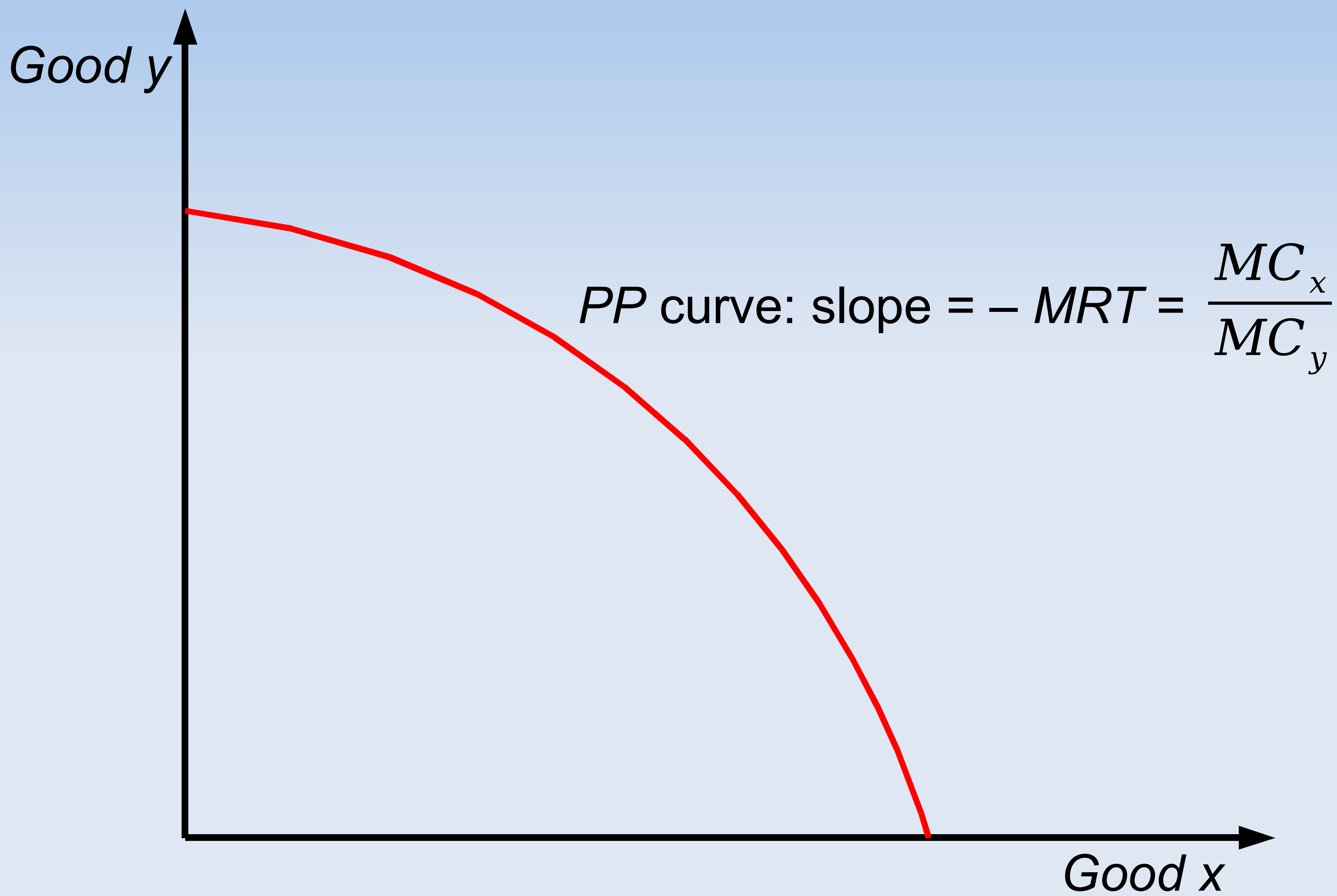
Production-efficient allocations



Production possibilities curve

- When the economy is producing efficiently, the only way to produce more of good *x* is to give up some of good *y*
- *Production possibilities curve* (*PP*) = set of all production-efficient points
- *Marginal rate of transformation* (*MRT*) = rate at which the economy can transform one output into another by shifting its resources
- Slope of production possibilities curve = – *MRT*
- Also, *MRT* equals the ratio of marginal costs

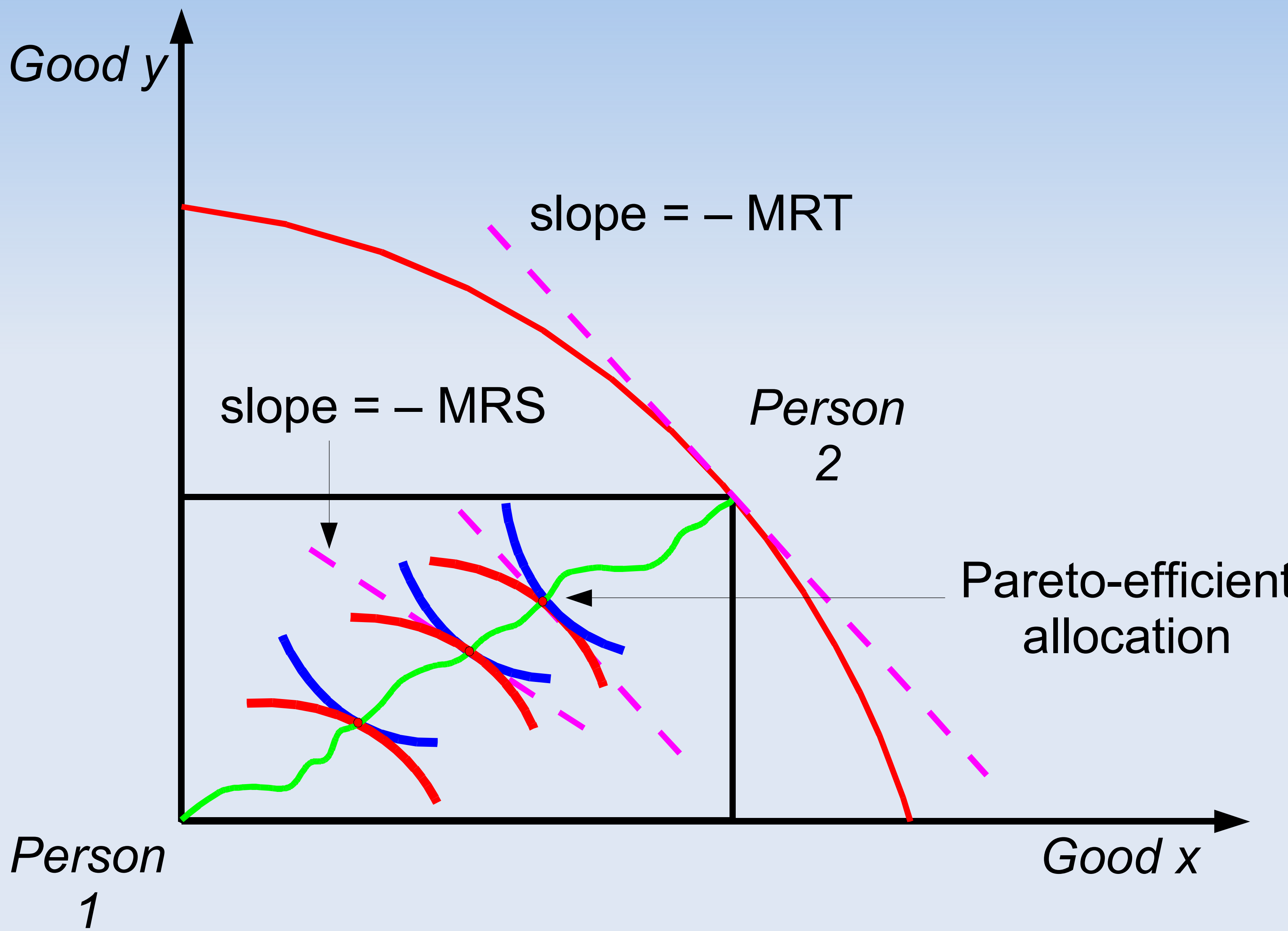
Production possibilities curve



Pareto efficiency

- *Pareto efficient allocation* = allocation of commodities and inputs such that the only way to make one individual better off is to make another worse off
- Hence, Pareto-efficient allocations must be:
  - consumption-efficient (on the contract curve)
  - production-efficient (on the PP curve)
  - *allocation* efficient = allocation of goods such that the MRT between any two goods is equal to consumers' common value of the MRS between the two goods

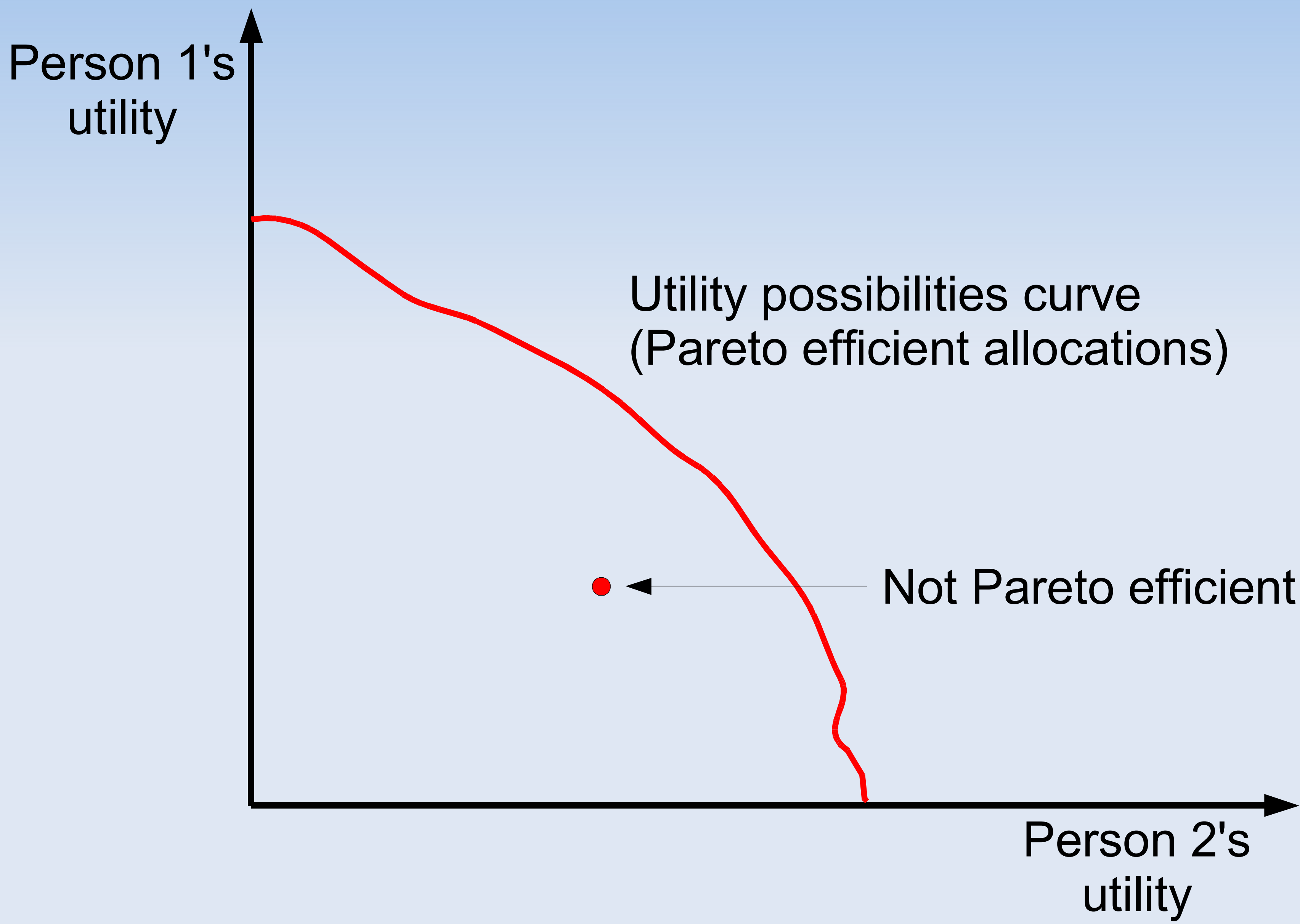
Pareto efficient allocations



Utility possibilities frontier

- By changing the point on the PP curve, we can find all the Pareto-efficient points ⇒ we can find the optimal utility levels for both consumers
- *Utility possibilities frontier* = graph that shows the maximum amount of utility an individual can obtain, given another's level of utility
- All points on the utility possibilities frontier are Pareto efficient (no Pareto improvements)
- *Pareto improvement* = reallocation of resources that makes at least one person better off without making anyone else worse off

Utility possibilities curve



First Welfare Theorem

- First fundamental theorem of welfare economics: *As long as producers and consumers act as price-takers and there is a market for every commodity, the equilibrium allocation of resources is Pareto efficient. That is, the economy operates at some point on the utility possibilities frontier.*
- This is just Adam Smith's “invisible hand” claim: left alone, the market automatically allocates resources efficiently (no need of centralized direction)

Fairness and the role of prices

- In a market economy, prices act as to “clear the market” (equate quantity demanded and quantity supplied)
- Goods don't have an *inherent* value: prices only reflect the interaction of market demand and supply
- So, are prices (or wages) ”fair”? First Welfare Theorem only talks about *efficiency*, not *fairness*!

Theory of second best

- In practice, it might not always be possible to attain efficiency (e.g., there might interventions of government that can't be eliminated)
- *Theory of second best* = if a first-best allocation is impossible to obtain, then a second-best allocation may involve the introduction of additional wedges between price and marginal cost
- In other words: two wrongs can make a right

The role of government

- First Welfare Theorem might fail in practice because of market failures:
  - market power (some firms/consumers are price makers)
  - missing markets (some goods cannot be traded) – due to asymmetric information or externalities

  ⇒ government intervention (correct market failures, introduce or substitute for missing markets)
- Even if it does not fail, the resulting allocation might not be deemed “equitable” ⇒ government intervenes to reallocate commodities