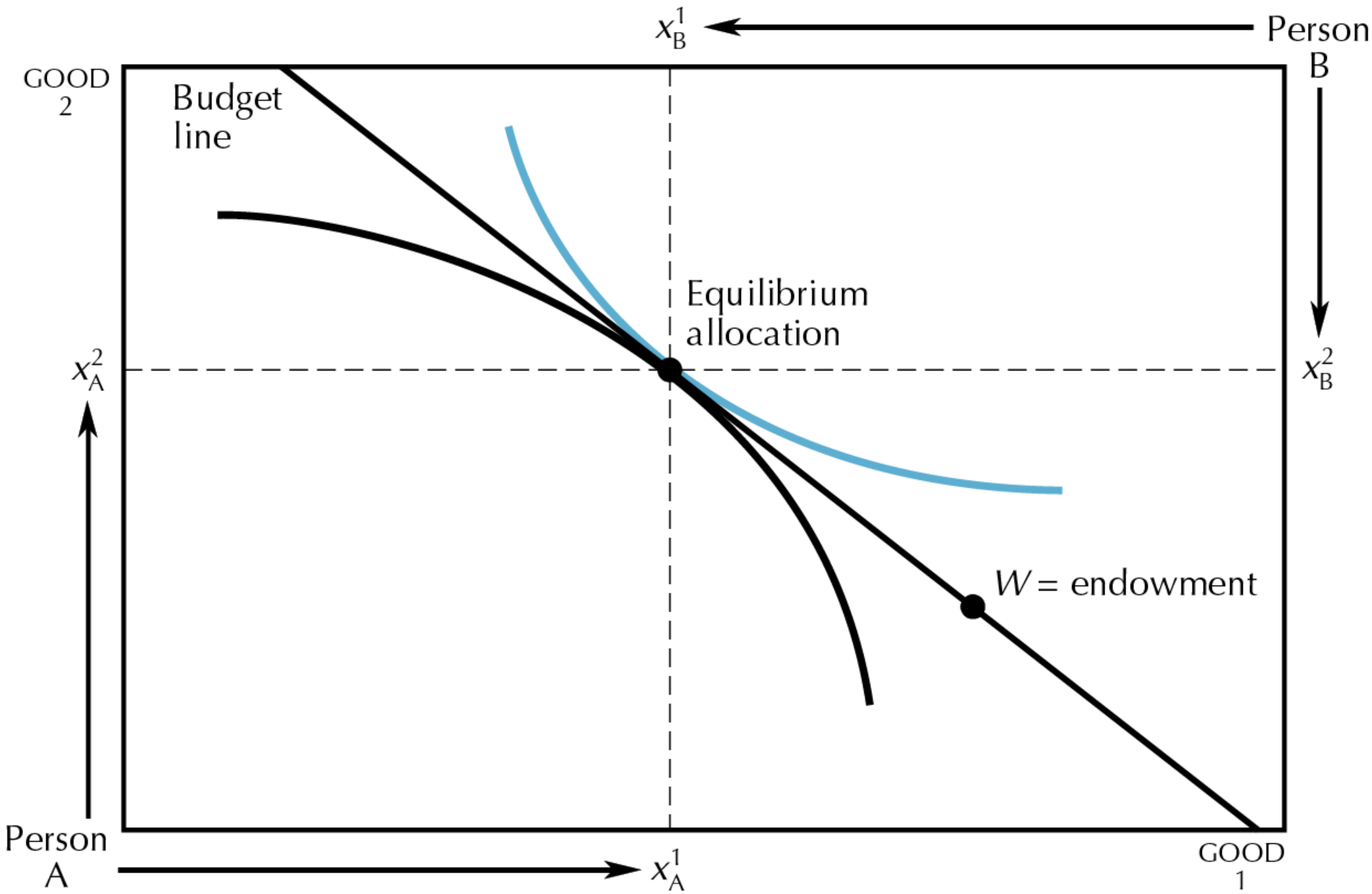
general equilibrium
in a pure exchange economy

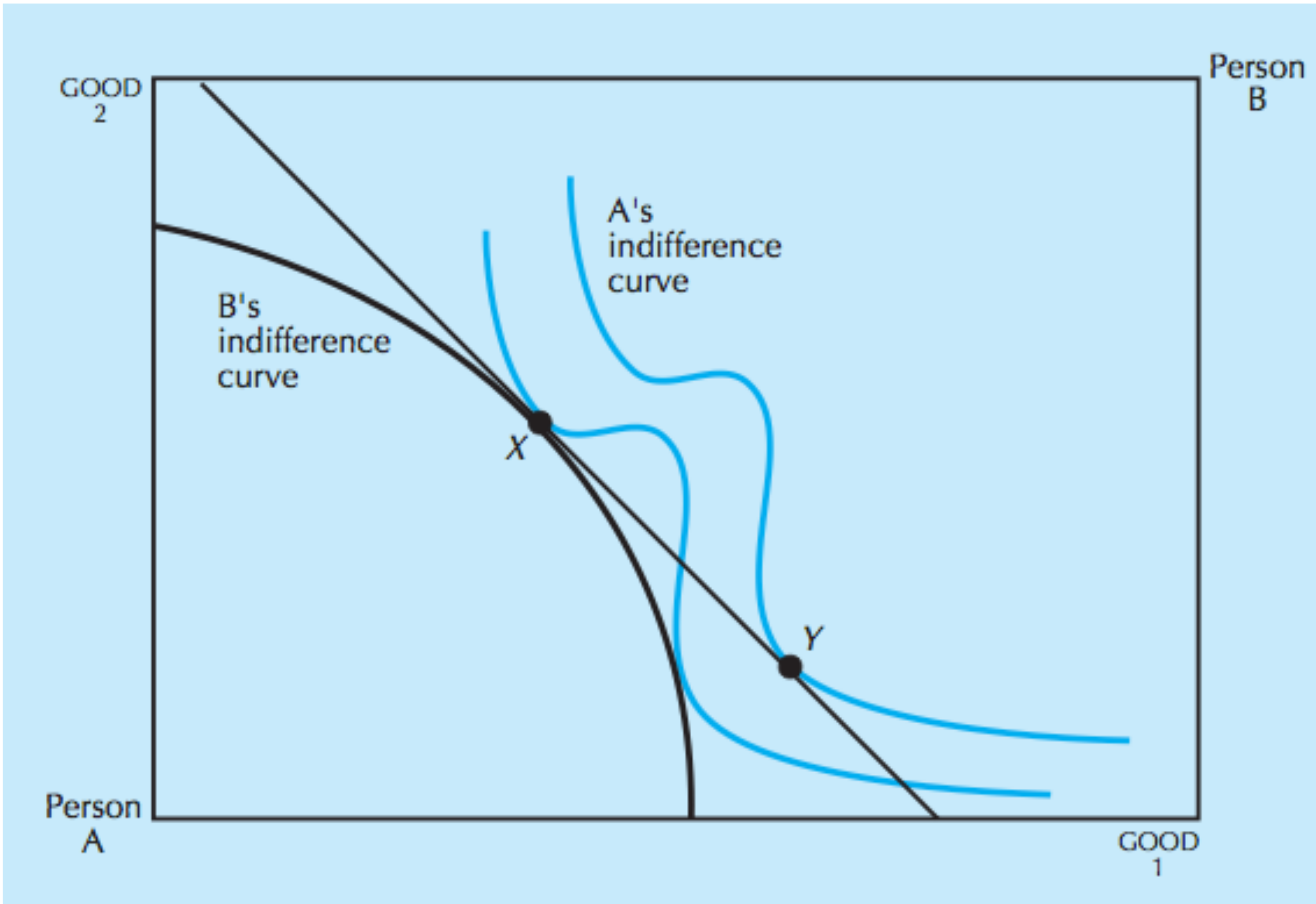
walrasian equilibrium
- existence
- first welfare theorem
- second welfare theorem

walrasian equilibrium: existence

- 2-good, 2-agent case: walrasian equilibrium



example: inexistence



walrasian equilibrium: existence

In order to ensure existence, we need continuity of the aggregate excess demand – to ensure that there is a price that sets it equal to zero.

For that, we need

- either all individual demand curves to be continuous (for which convexity of preferences would be a sufficient condition)
- or, if some individual demand curves are not continuous, we need each consumer to be "small" relative to the market.

first welfare theorem

If $(p_1^*, p_2^*, x_1^{A*}, x_2^{A*}, x_1^{B*}, x_2^{B*})$ is a walrasian equilibrium, then $(x_1^{A*}, x_2^{A*}, x_1^{B*}, x_2^{B*})$ is Pareto efficient.

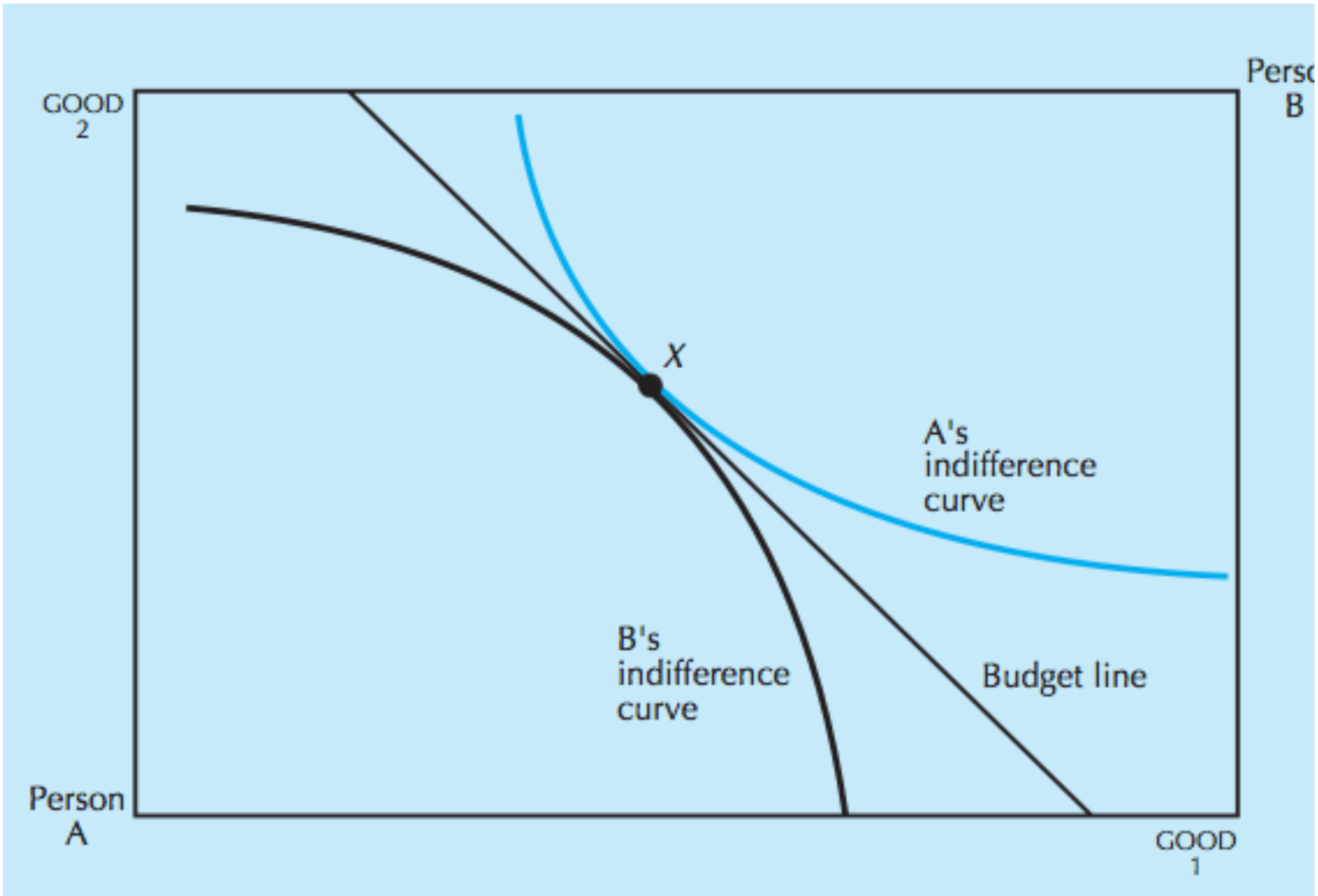
- If $MRS^i = p_1/p_2$ for all i, then $MRS^i = MRS^j$ for all i and j
- Consequences: info on prices is enough to make decisions; market ensures efficiency?
  - if equilibrium exists
  - if there are no externalities, public goods, market power, asymmetric information
  - and it tells us nothing on distribution

second welfare theorem

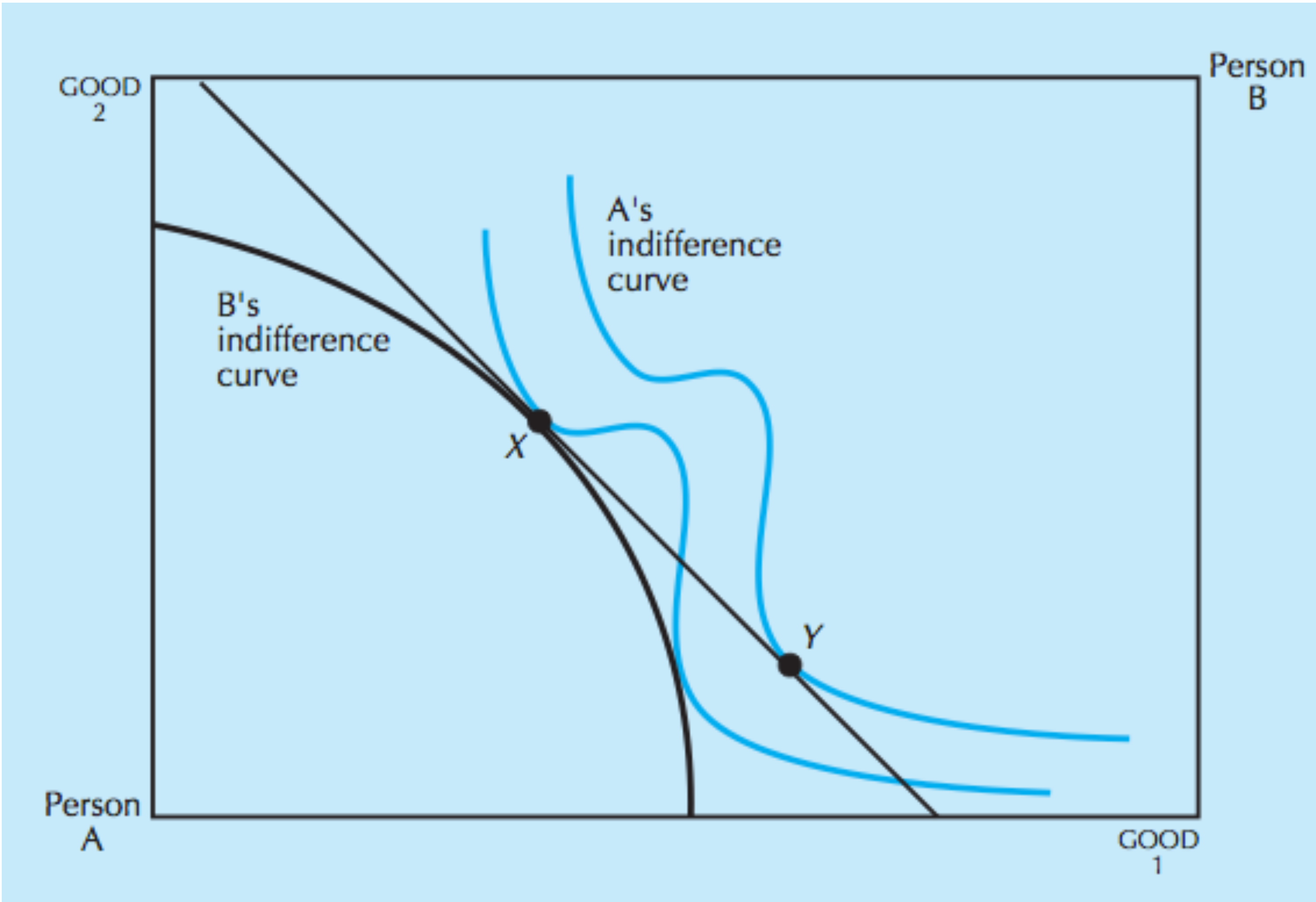
If $(x_1^{A*}, x_2^{A*}, x_1^{B*}, x_2^{B*})$ is Pareto efficient, then there is a price vector (p_1^*, p_2^*) and a redistribution of the endowment such that $(p_1^*, p_2^*, x_1^{A*}, x_2^{A*}, x_1^{B*}, x_2^{B*})$ is a walrasian equilibrium.

- If $MRS^i = MRS^j$ for all i and j, we can set $p_1/p_2 = MRS^i$
- for the allocation to become an equilibrium, we need to make sure it is on the budget constraint for all agents, which may require reallocation of the endowment

second welfare theorem



second welfare theorem: convexity



second welfare theorem

- prices have allocative and distributive roles: separate the two, letting prices focus on reflecting scarcity
- separate efficiency from distribution
- but lump-sum reallocation of endowments and not changes involving marginal decisions – labor tax already involves distortion...