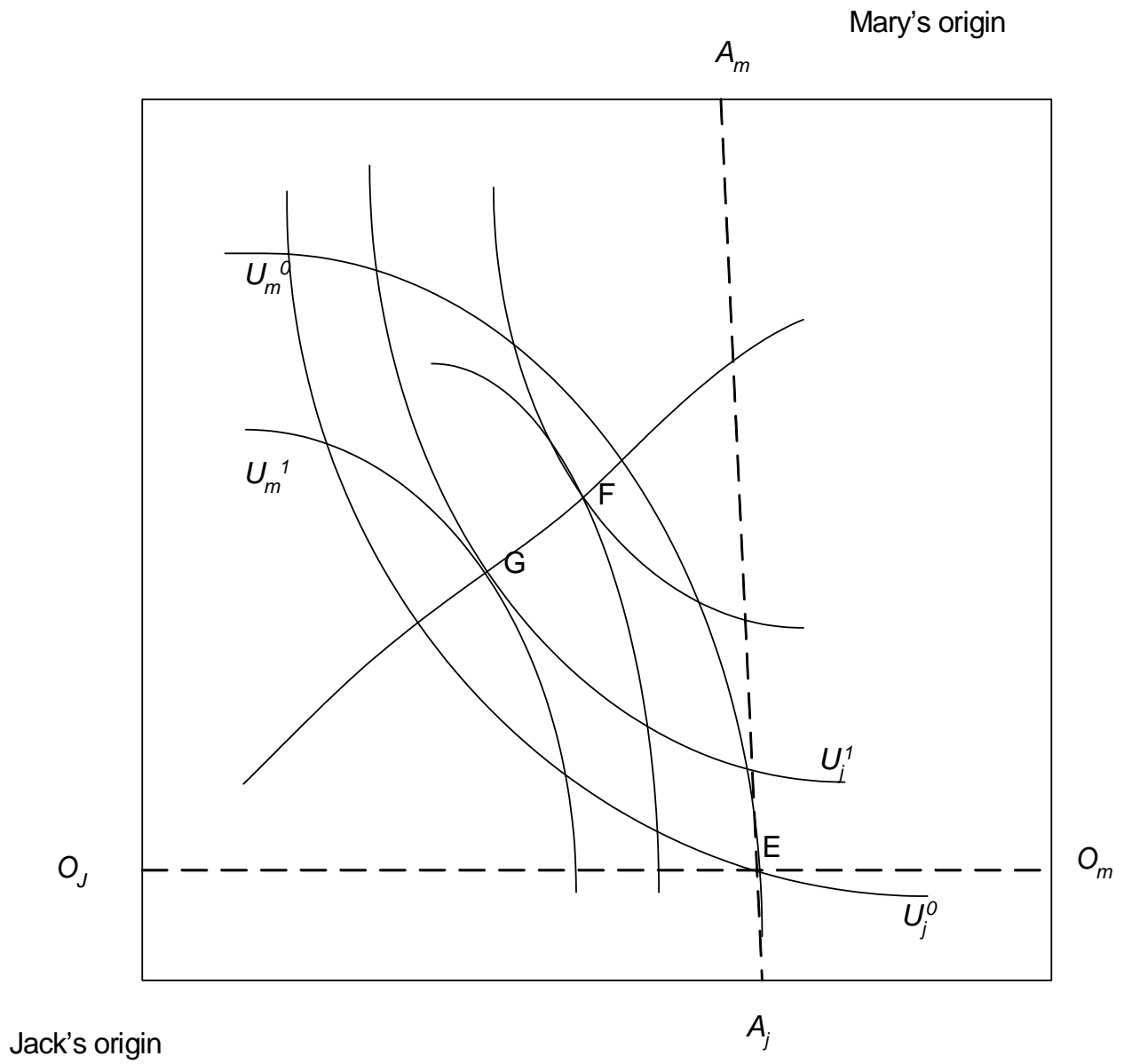


1 General Equilibrium

- 2 types of agents in a pure exchange economy: Edgeworth box.
- Equal numbers of 2 type of agents: Jack and Mary.
- 2 goods, apples and oranges. Jack has A_j and O_j apples and oranges respectively.
- Mary has A_m and O_m respectively.
- Positive analysis: How do they trade? How are relative prices are determined in a competitive market?
- Normative analysis: What kind welfare properties does a competitive equilibrium have?

- In an Edgeworth box, the horizontal length is the sum of Jack's and Mary's endowments of apples. The vertical length is the sum of Jack's and Mary's endowments of oranges.
- All allocations within an Edgeworth box is an allocation of resources between Jack and Mary. Jack's allocations start from the origin $\{0,0\}$. So if we consider the allocation $\{A, O\}$. Then we say Jack gets A apples and O oranges.
- Mary's allocation is the remainder: $A_j + A_m - A$ apples and $O_j + O_m - O$ oranges. Mary's origin is at the North East corner of the Edgeworth Box.
- Jack has standard indifference curves for apples and oranges. His utility increases as the allocation moves to the North East.



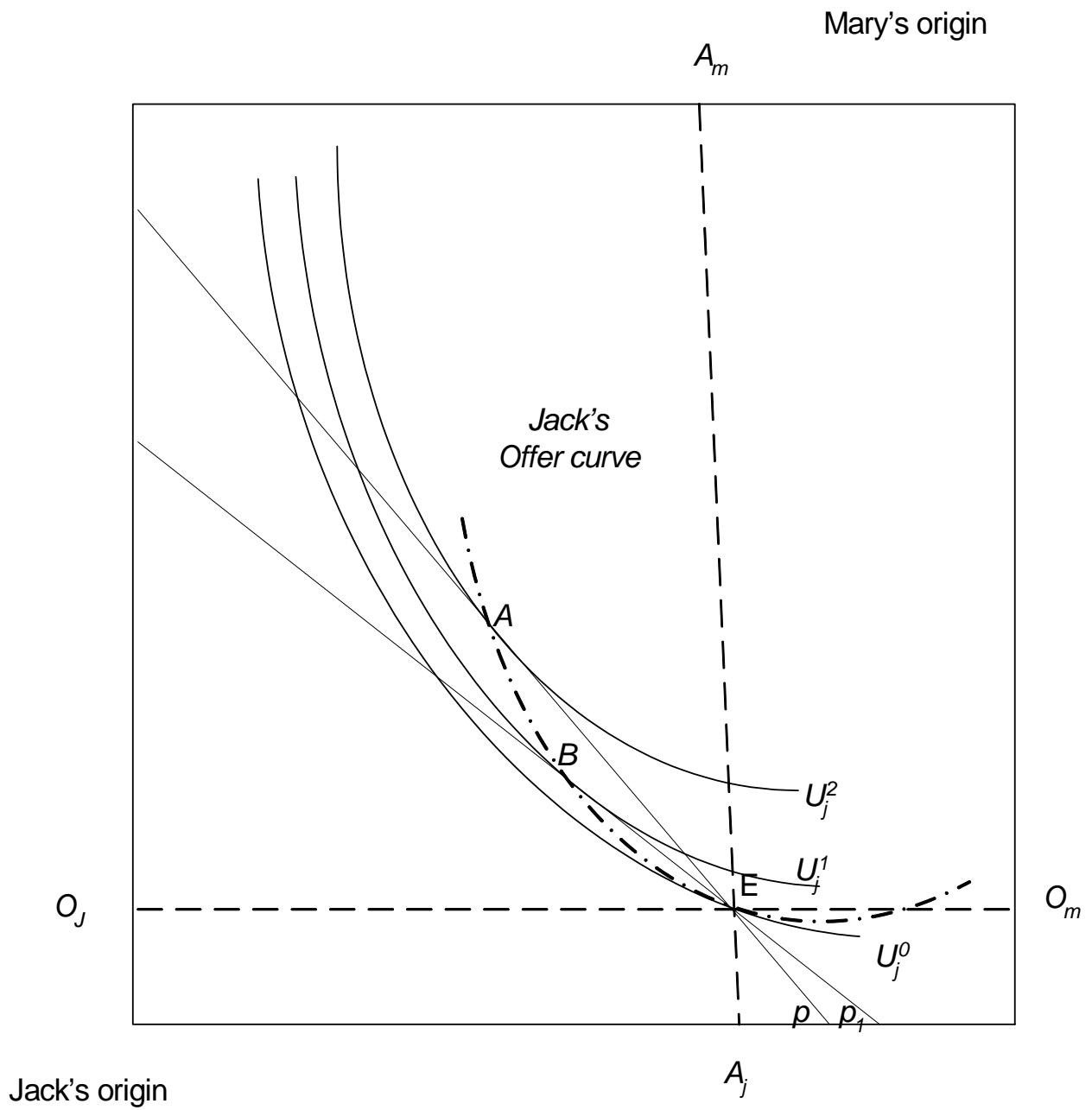
- Mary also has standard indifference curves but they are flipped around on the Edgeworth box. Mary's utility increases as her allocation moves to the South West.
- An allocation is efficient (pareto efficient or optimal) if you cannot find another allocation which makes one person better off without making the other person worse off.
- Efficient allocations equates the marginal rates of substitution between the agents. I.e. where the indifference curves are tangent to each other.
- Is autarky (each person consuming their endowments) efficient?
- So there are gains to trade.

- The contract curve is the locus of efficient allocations.
- If you are off the contract curve, then you can find another point in the edgeworth box than will be welfare improving for both parties.
- Is there any gain to trade if the initial endowment is on the contract curve?
- Efficiency is not fairness.

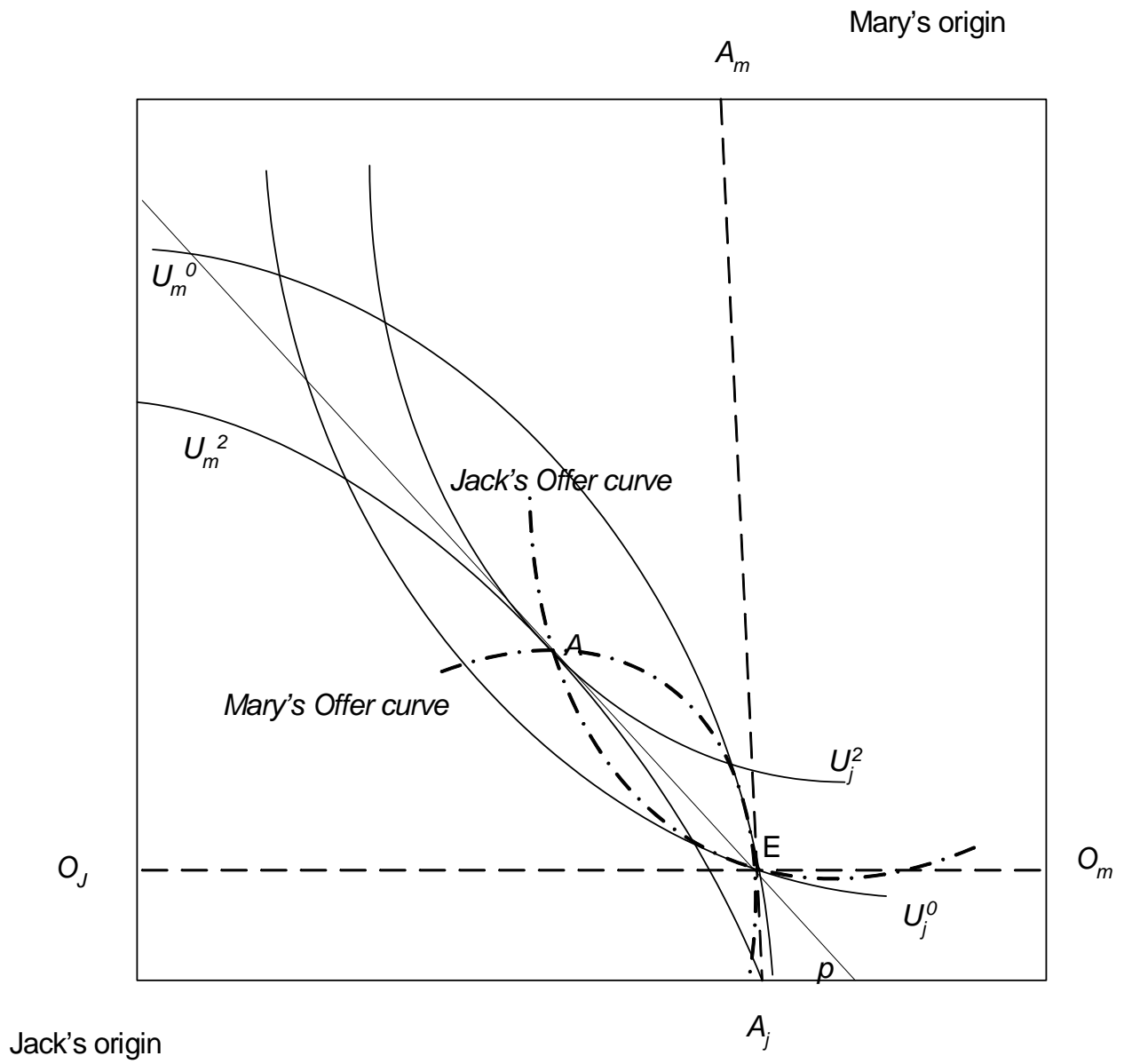
2 Competitive equilibrium

- First consider Jack's choice problem and derive his offer curve.

- Let the price of oranges be normalized to 1 and the price of an apple be p oranges.
- Let the initial price be p_0 . Note how the budget constraint cuts through the endowment point, $\{A_j, O_j\}$. In this case, Jack maximizes his utility by choosing $A = \{A_0, O_0\}$.
- Now let the price of apples rise to p_1 . The budget constraint pivots out.
- Jack will choose $B = \{A_1, O_1\}$.
- If we connect up all the bundles that Jack chooses as the price changes, then we have Jack's offer curve.
- Offer curve is the locus of tangencies (optimal bundles) as the relative price p changes.



- Now flip the picture over for Mary.
- How does her budget constraint shift as p changes?
- The slope of her budget constraint is exactly the same as Jack's slope if we look at it from Jack's origin.
- We can also derive her offer curve.
- Competitive equilibrium is where the two offer curves intersect. Why? Only allocation in which demand equals supply.
- Competitive equilibrium is on the contract curve. Why?
- So it is Pareto optimal. You can't make anybody better without making somebody worse off.



- Welfare theorems of competitive equilibrium:
 - 1. Every competitive equilibrium is pareto optimal.
 - 2. Every pareto optimal allocation can be supported by a competitive equilibrium with lump sum taxes.
- 2. tells you that if the government is worried about distribution of resources, it should relocate income (or endowment) and not directly engage in production and distribution of final goods.
- 1 and 2 holds under specific conditions. E.g. no market power (monopoly or oligopoly). No external-ity. No public good. No asymmetric information So circumstances are narrow.
- So we can justify income redistribution.

- But what about public provision of education and health care?
- Even if we can justify government intervention on efficiency grounds, can we be sure that the government solution is superior?
- What about rent seeking behavior?
- Who will regulate the regulator?
- If Mary is a monopolist, what point will she pick? Tangency between Jack's offer curve and her indifference curve. Is this allocation efficient?.