Revealed Preferences when preferences differ

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joint with Paul van Bruggen

Lunch Talk at Quantecon

I Agreement

Set-up

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- Two contexts, G and S .
  context G: the other is generous ; context S: the other is selfish
- You have a pair of preferences $(\succsim_G, \succsim_S)$ on $\mathbf{R}^2_+$. $\succsim_G$ and $\succsim_S$ represent DM's preference in Context G and Context S respectively.

The Agreement axiom

Agreement: For all $x, y \in \mathbf{R}^2_+$ with $x = (x_1, x_2)$ and $y = (y_1, y_2)$,

$$x \succsim_S (\succ_S) y \quad \text{and} \quad x_1 \leq y_1 \quad \text{imply} \quad x \succsim_G (\succ_G) y.$$

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Agreement is equivalent to a reverse condition:

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$$x \succsim_G (\succ_G) y \quad \text{and} \quad x_1 \geq y_1 \quad \text{imply} \quad x \succsim_S (\succ_S) y.$$

II Revealed Preferences

Generalised axiom of revealed preference (GARP)

One context

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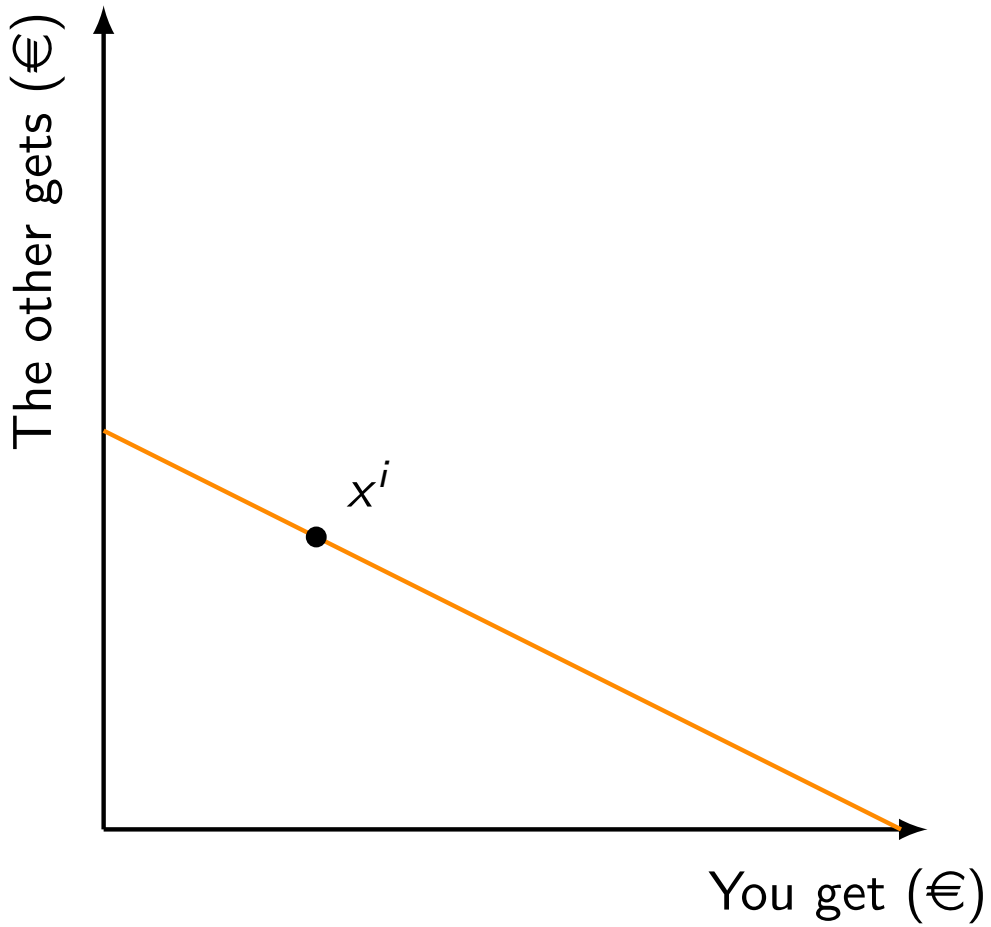

Generalised axiom of revealed preference (GARP)

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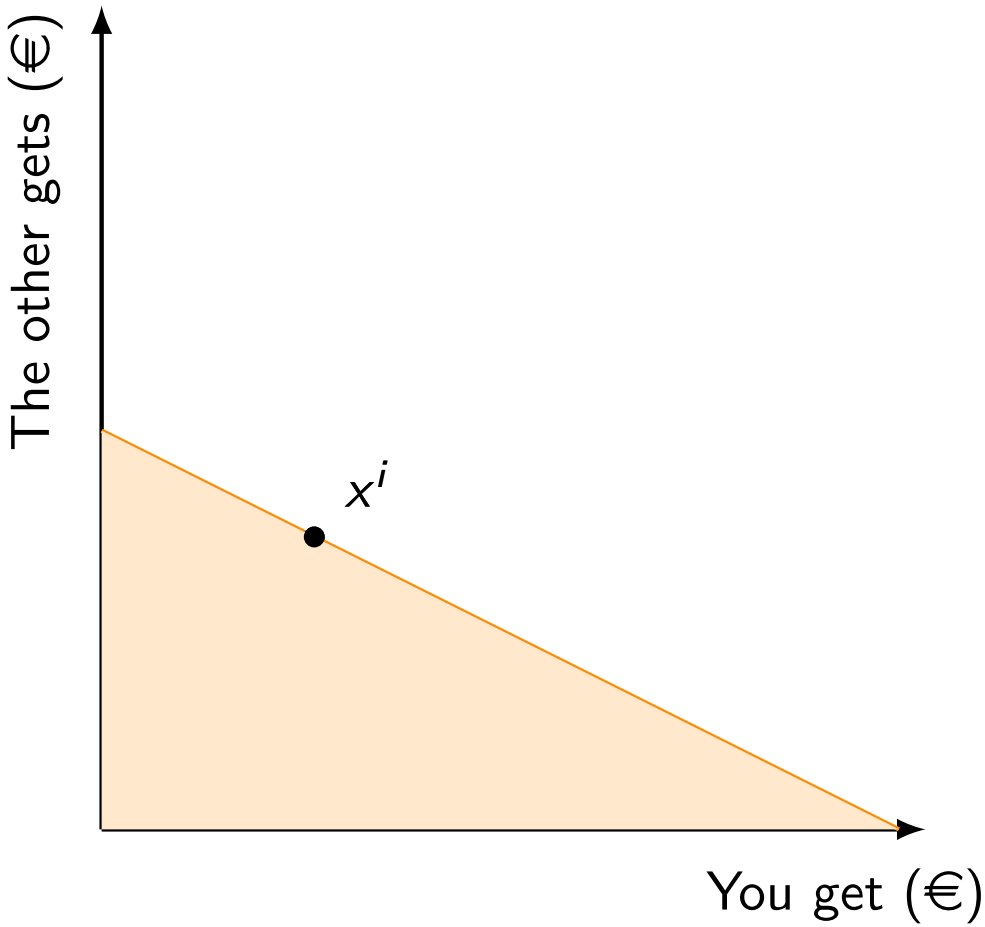

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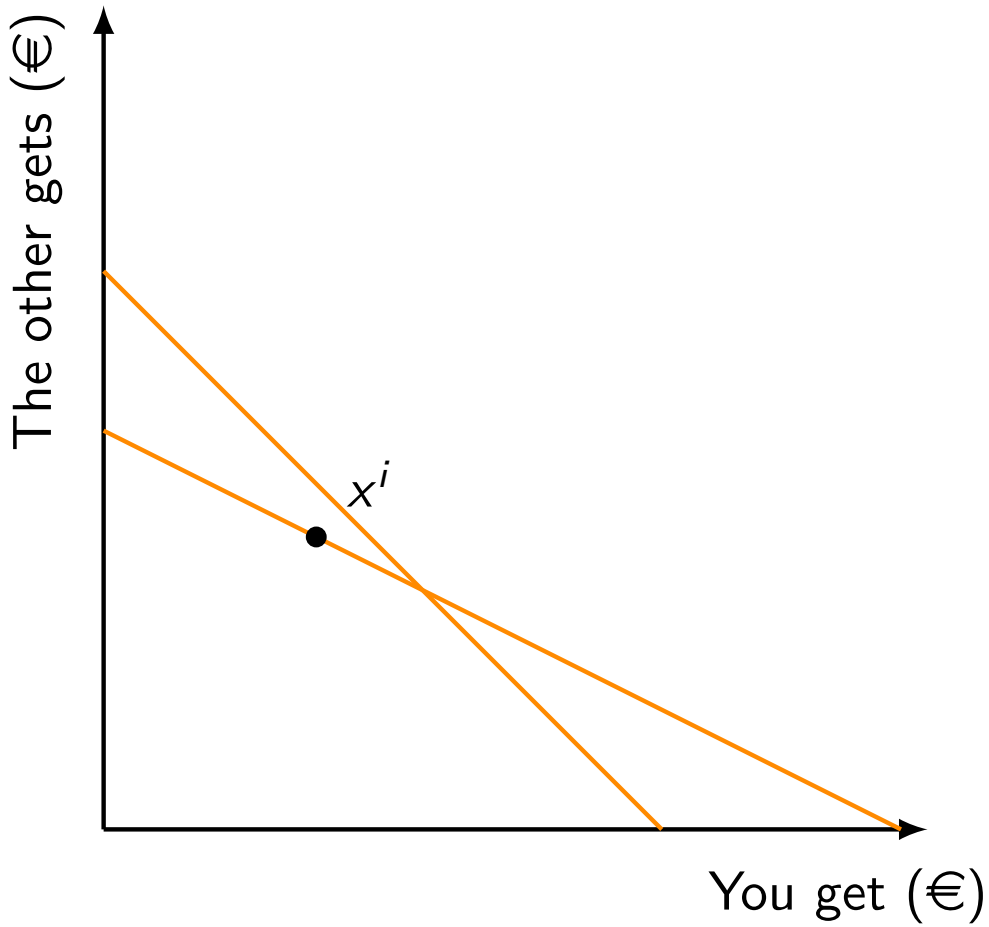

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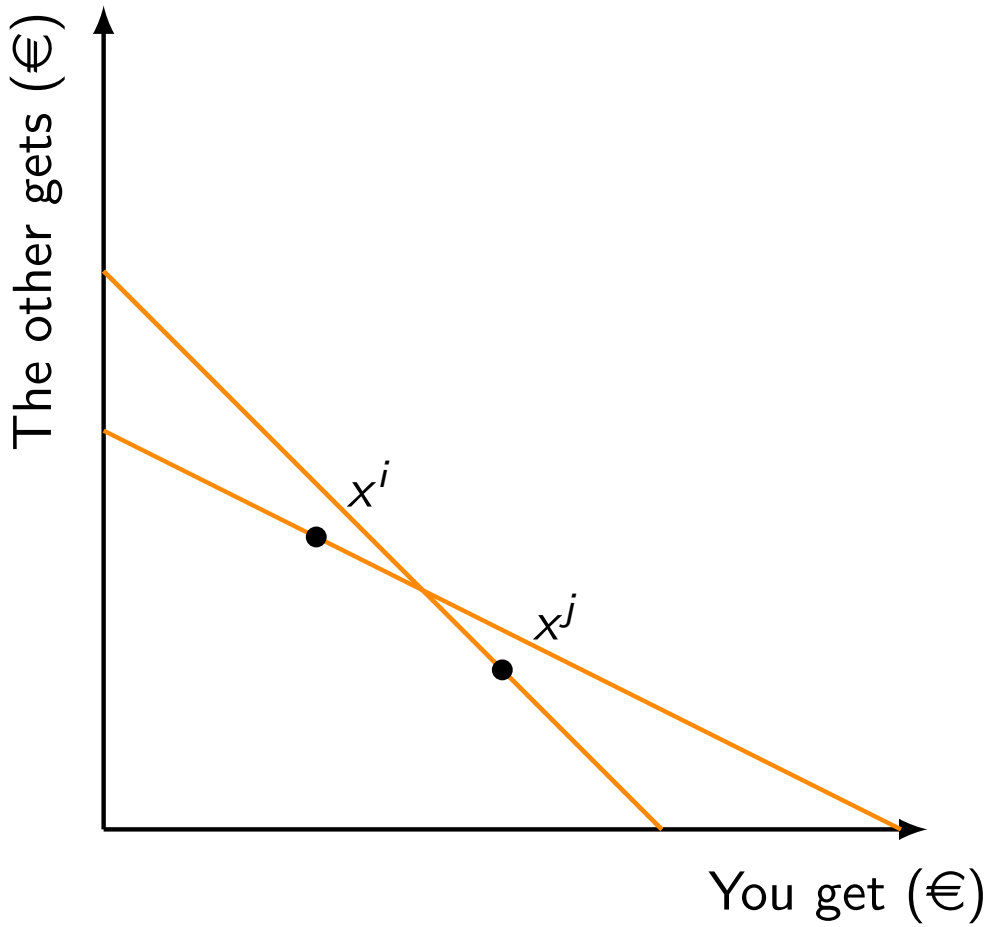

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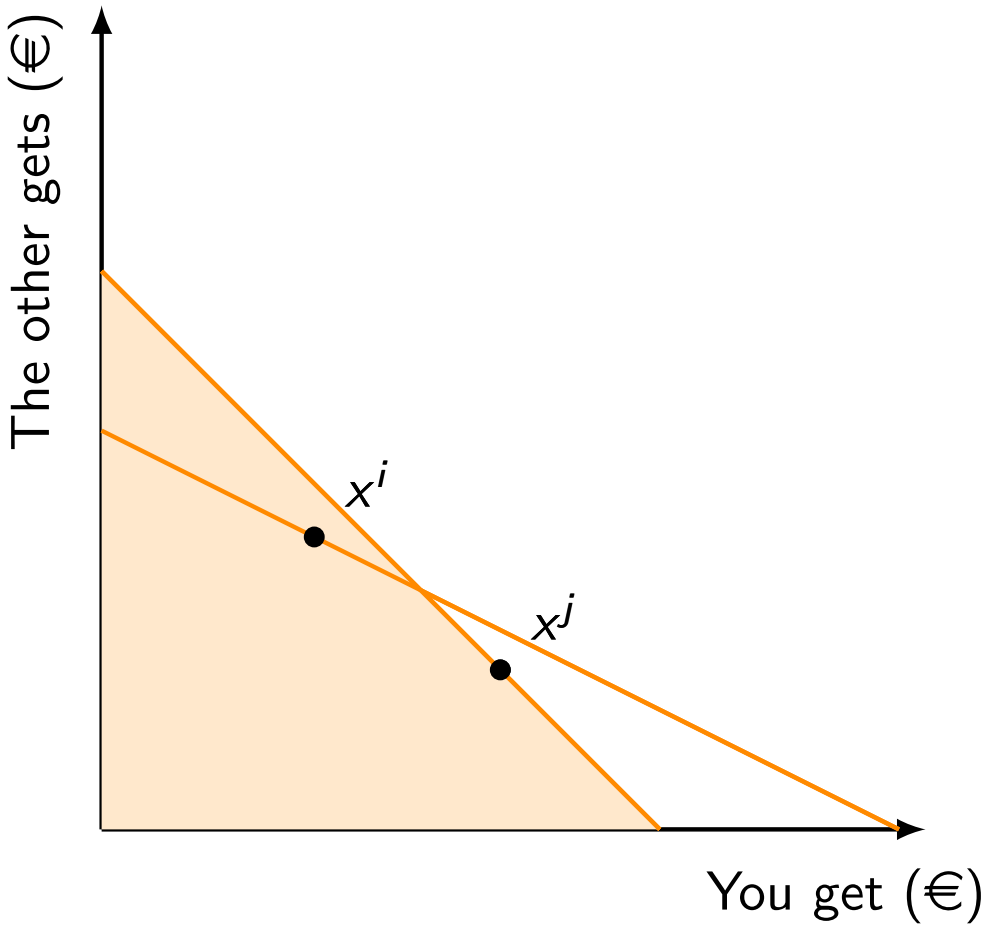

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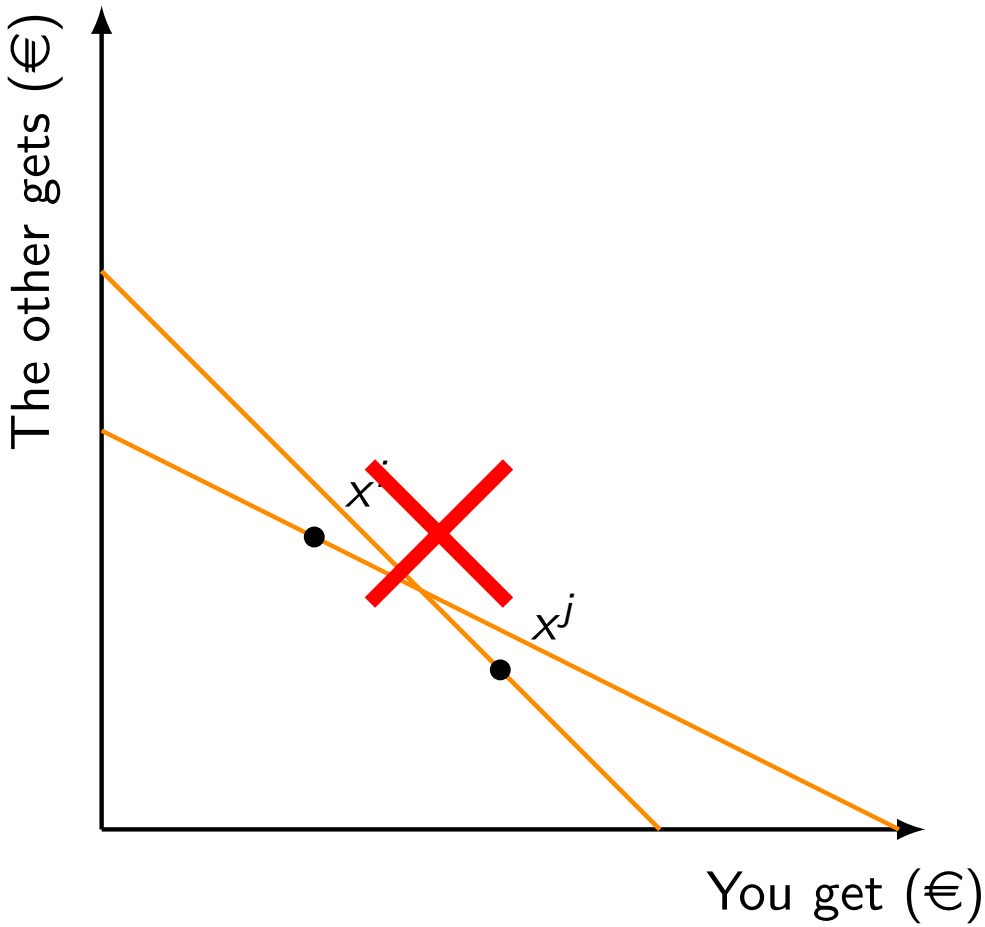
One context



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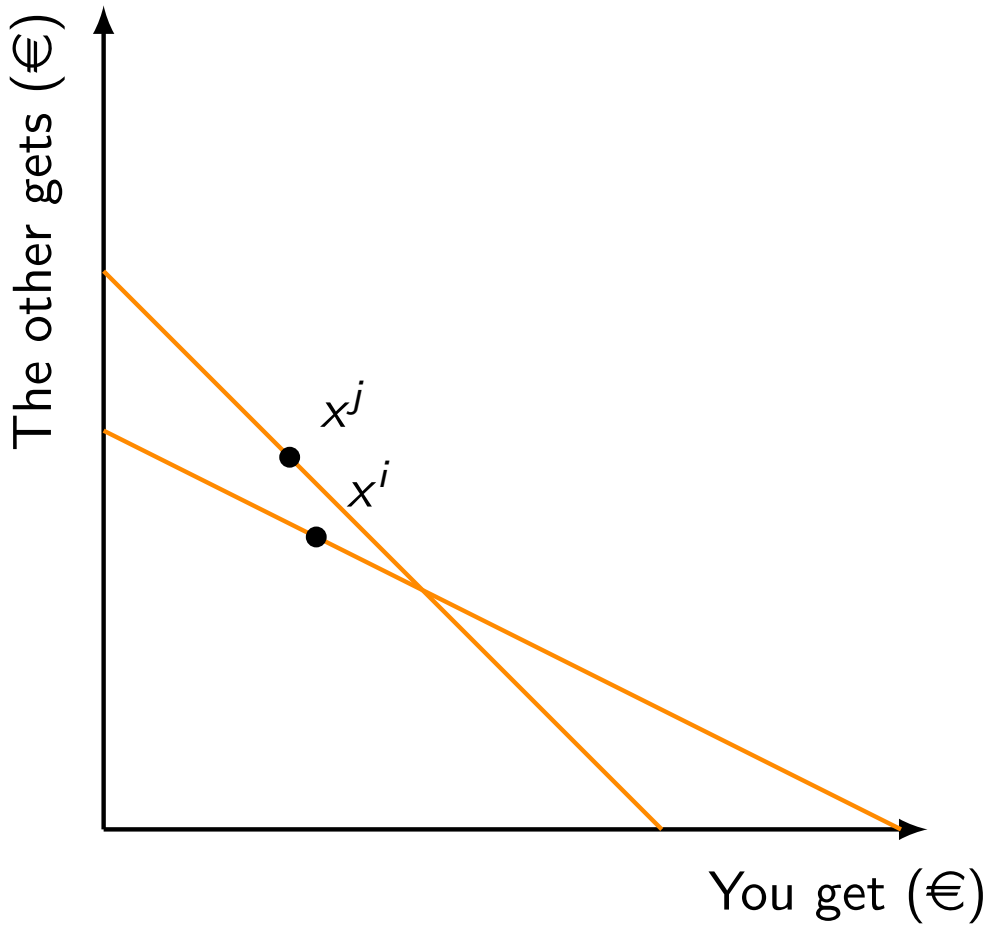

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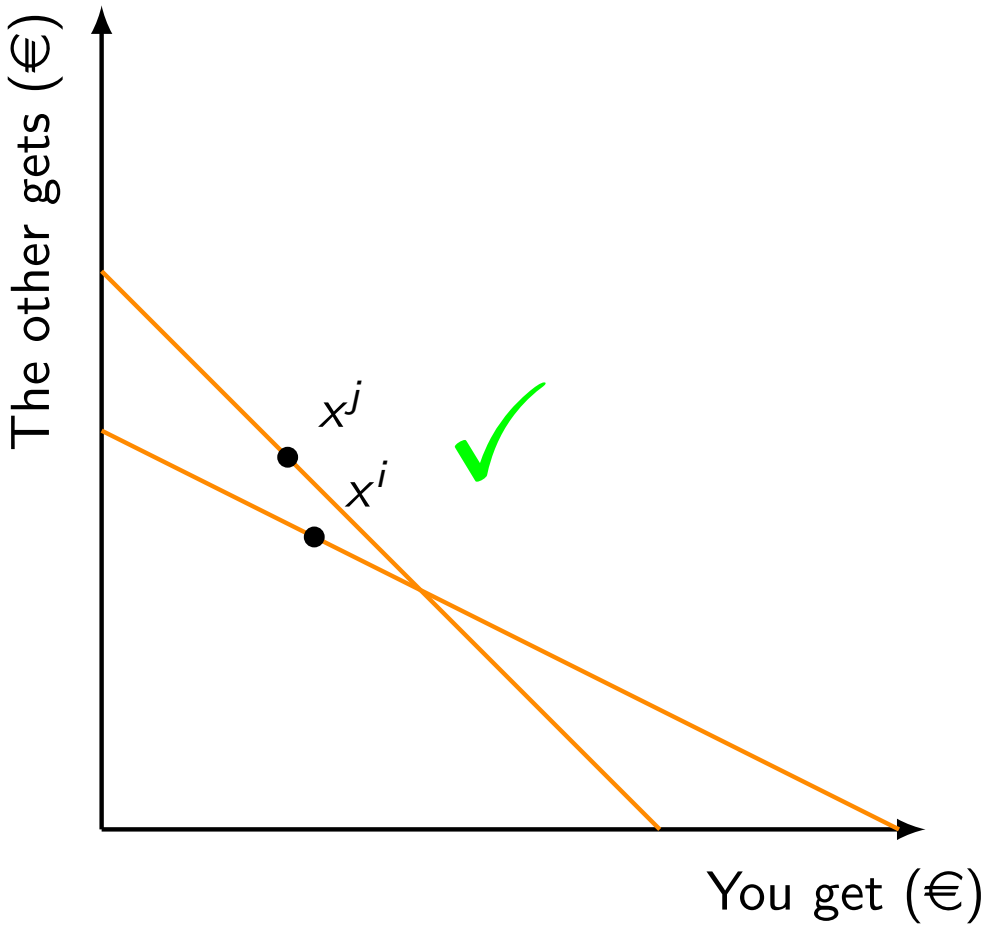
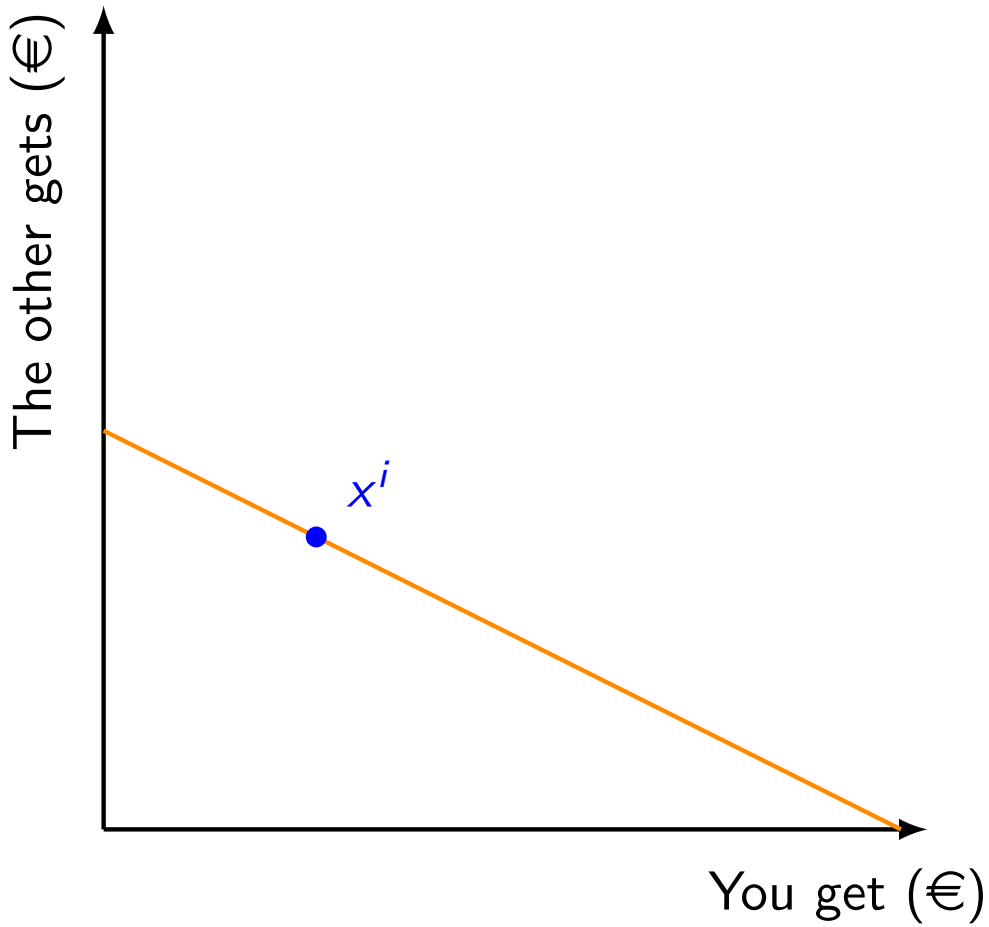


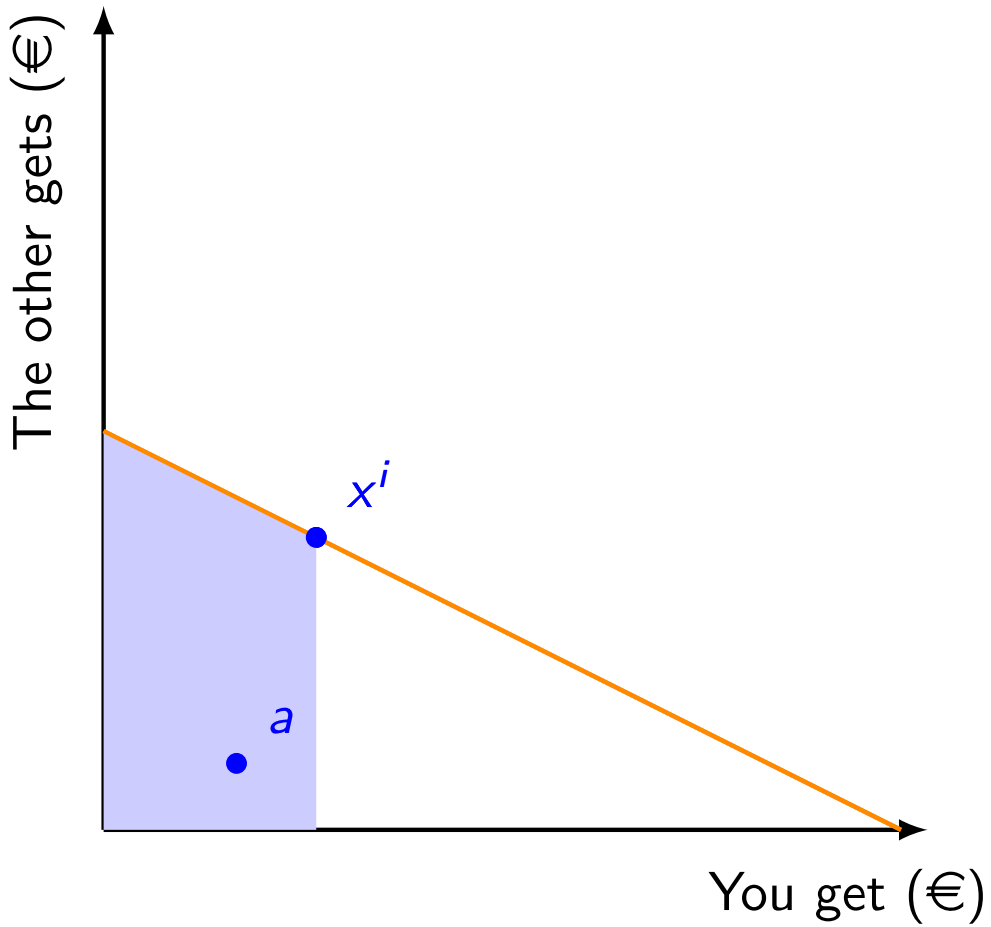
Agreement

Context G: x^i



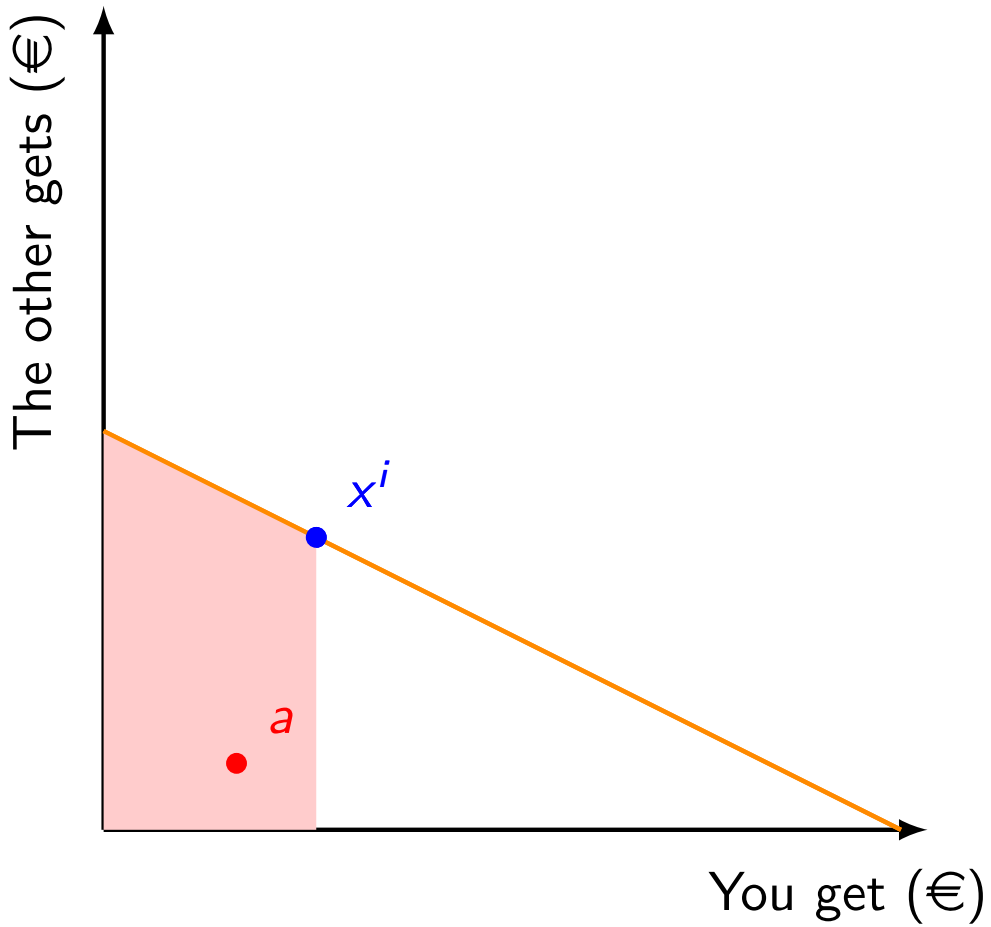
Agreement

Context G: x^i better than a and $x_1^i \geq a_1$



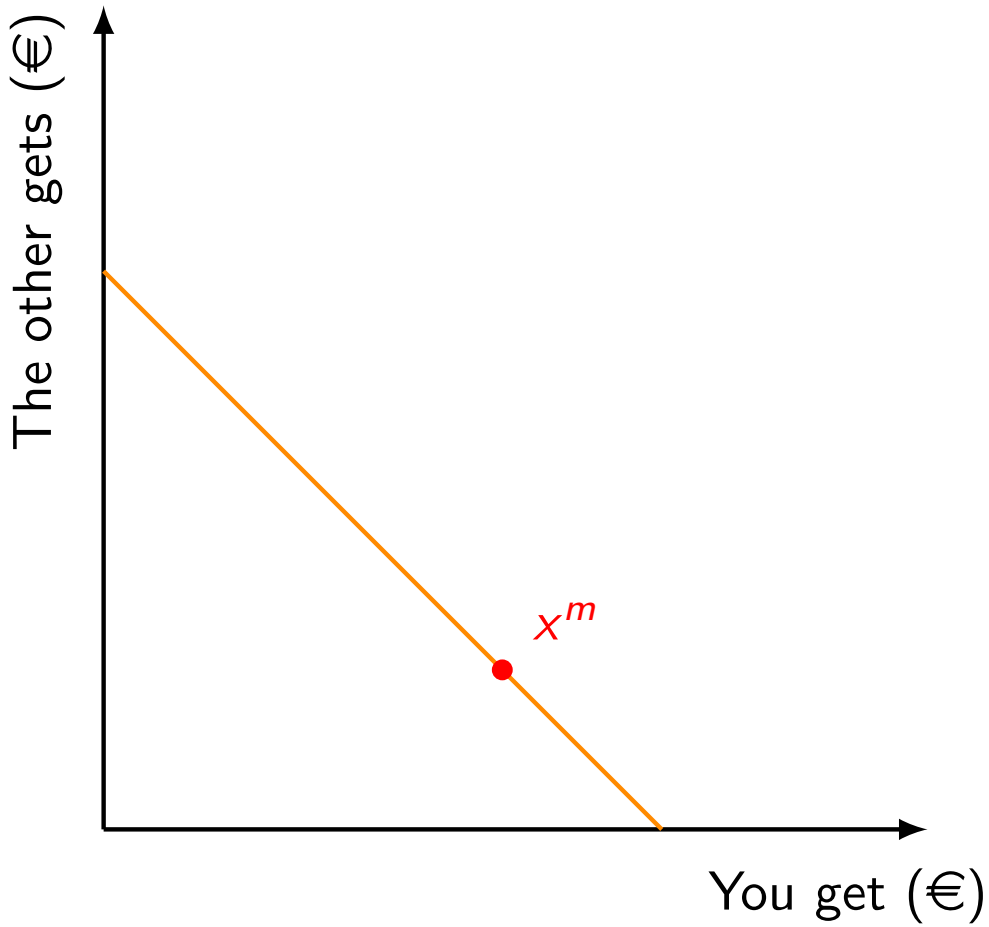
Agreement

Agreement $\Rightarrow$ x^i better than a in Context S



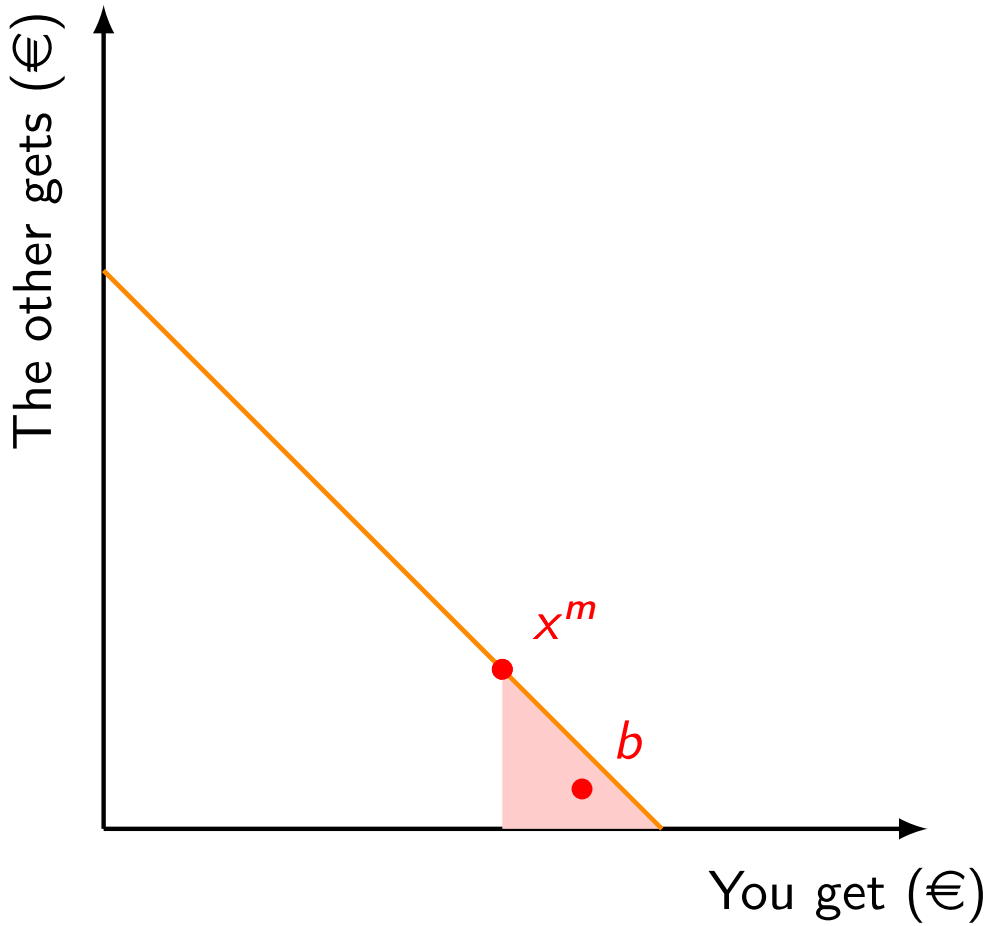
Agreement

Context S: x^m



Agreement

Context S: x^m better than b and $x_1^m \leq b_1$



Agreement

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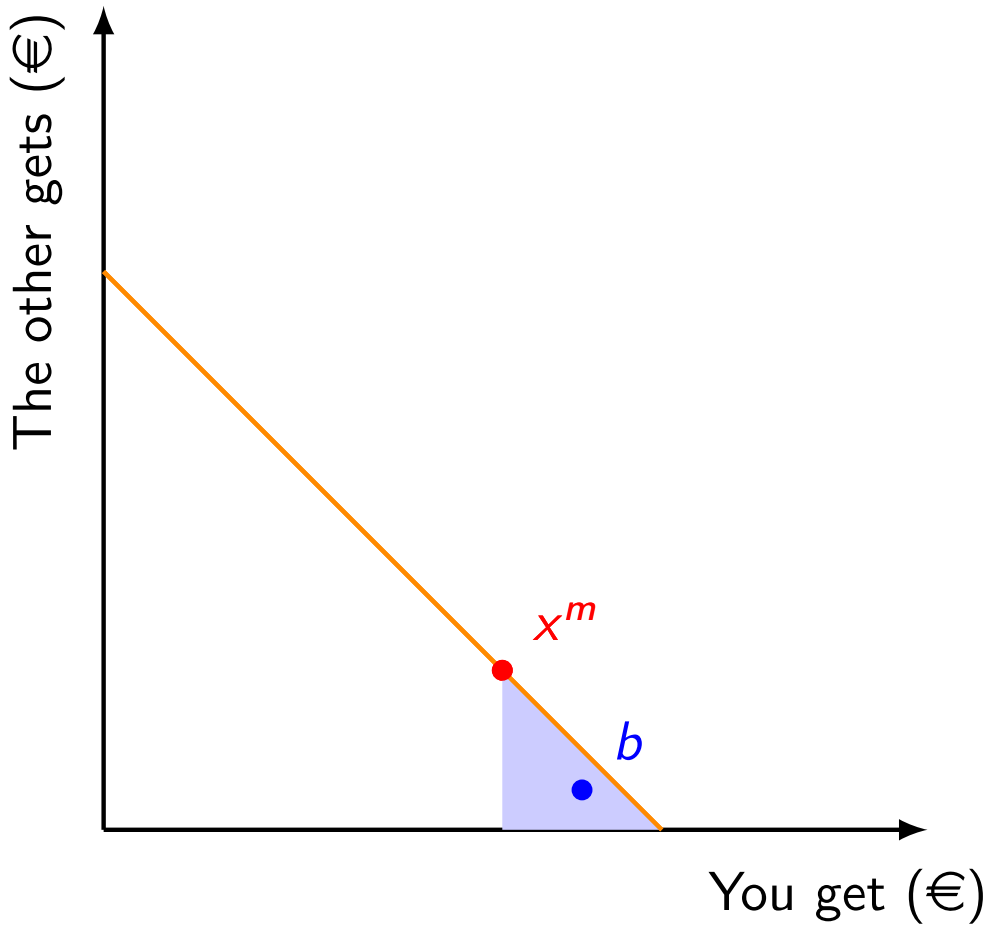
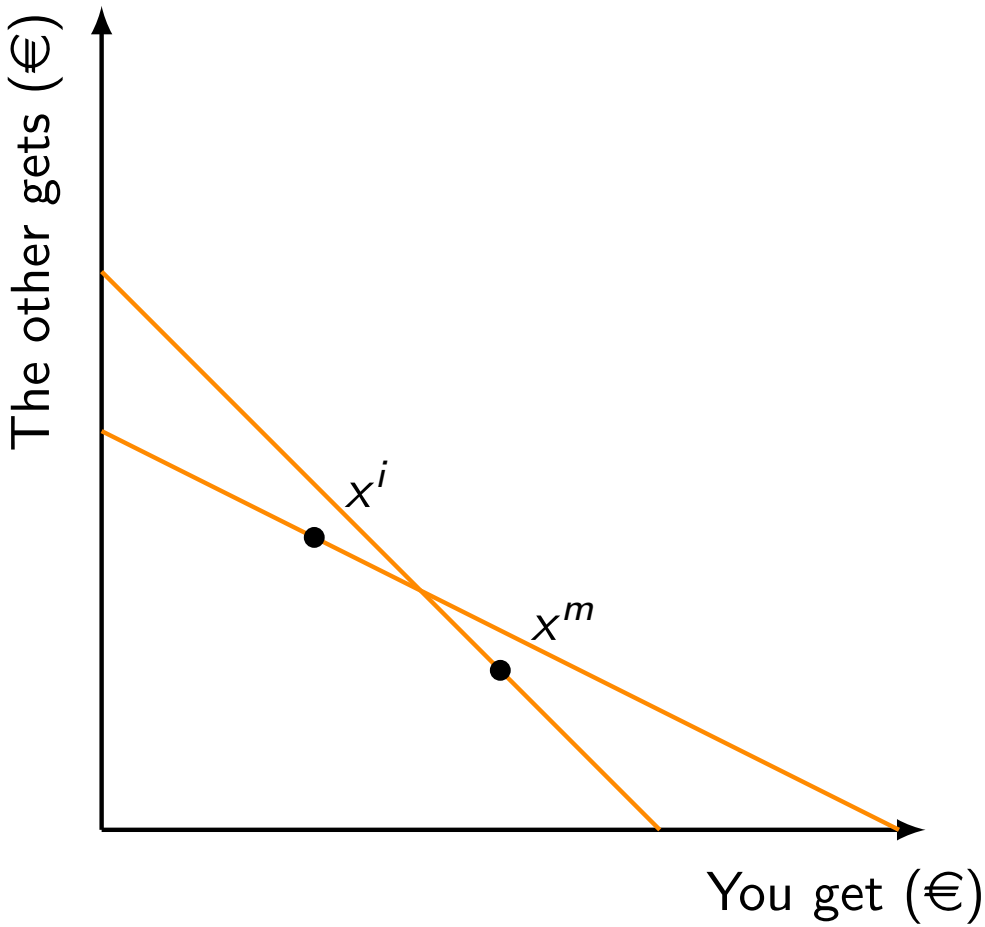
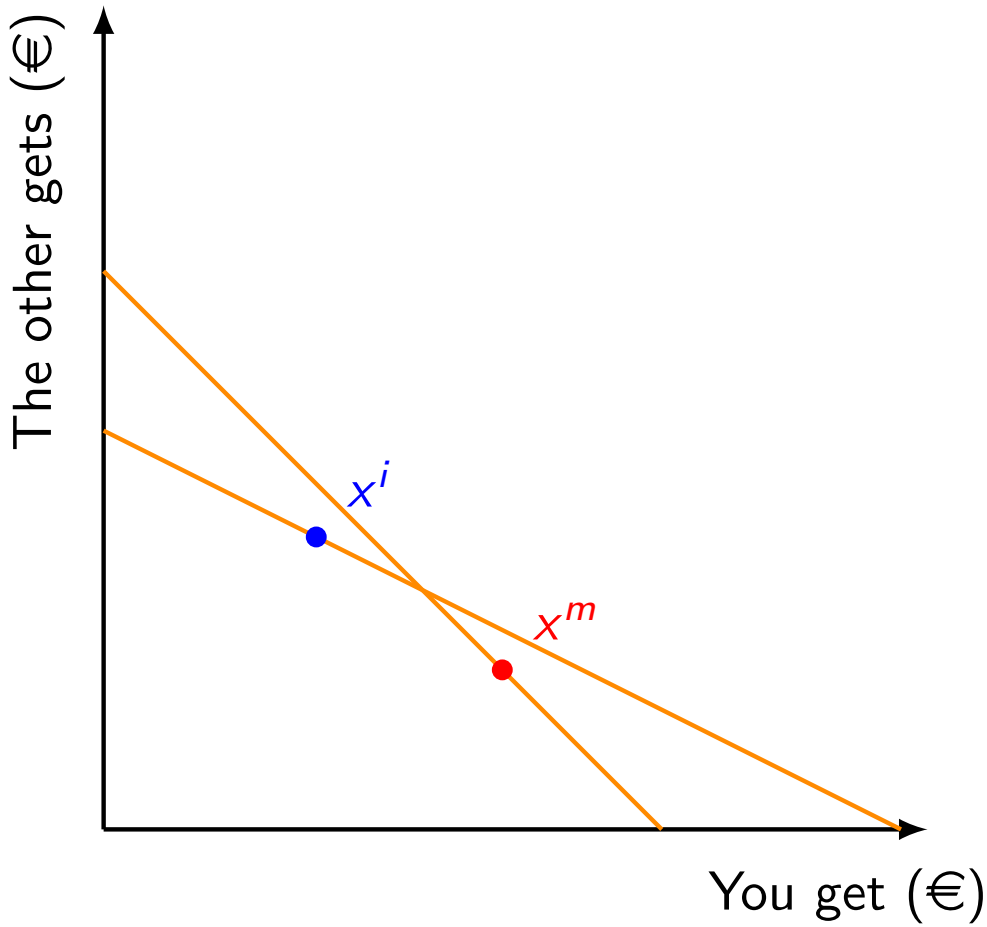


Agreement-GARP



Agreement-GARP

Context G: x^i and Context S: x^m



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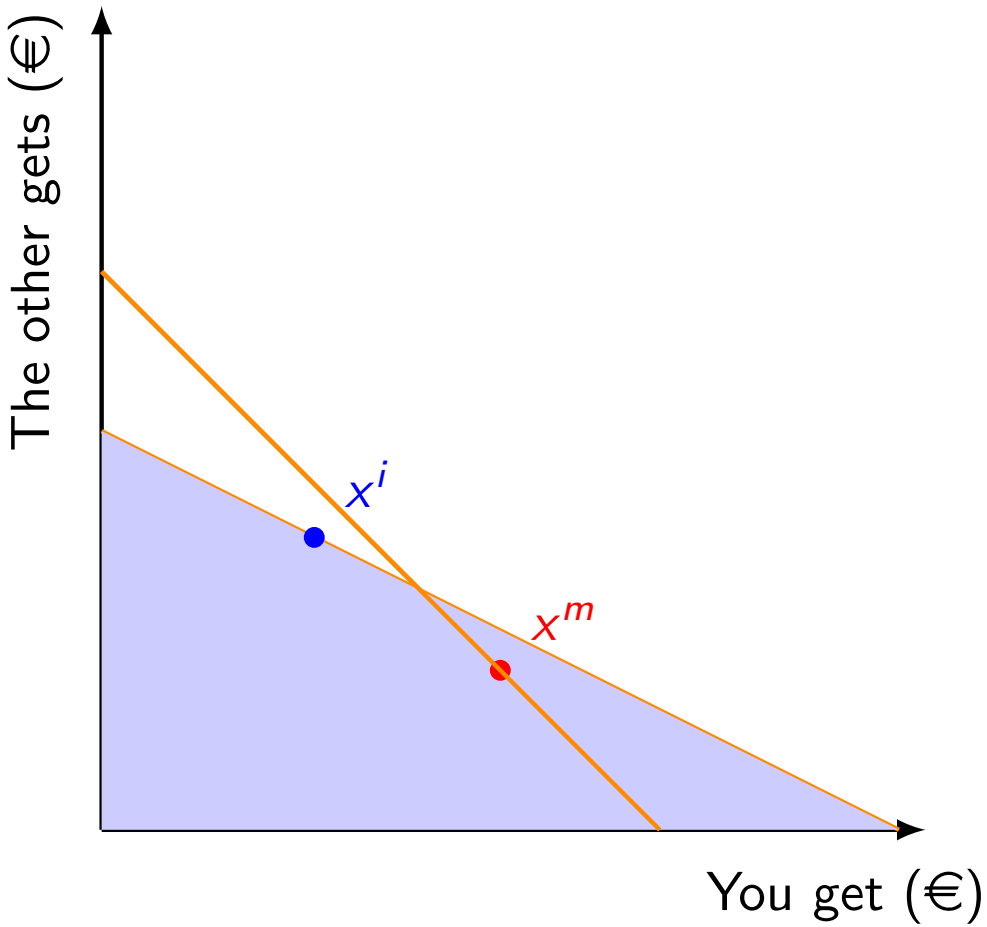
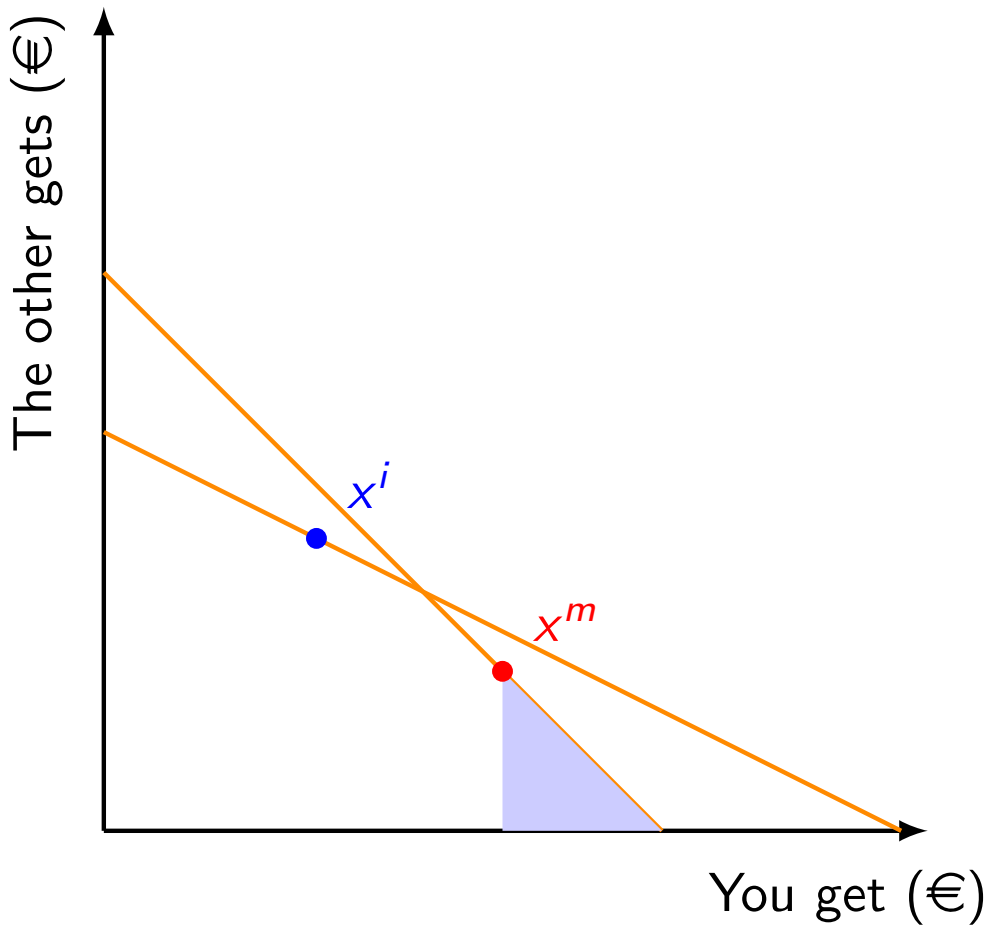


In Context G: x^i is strictly better than x^m

Agreement-GARP

Context G: x^i and Context S: x^m



In Context G: by Agreement, x^m is not better than x^i

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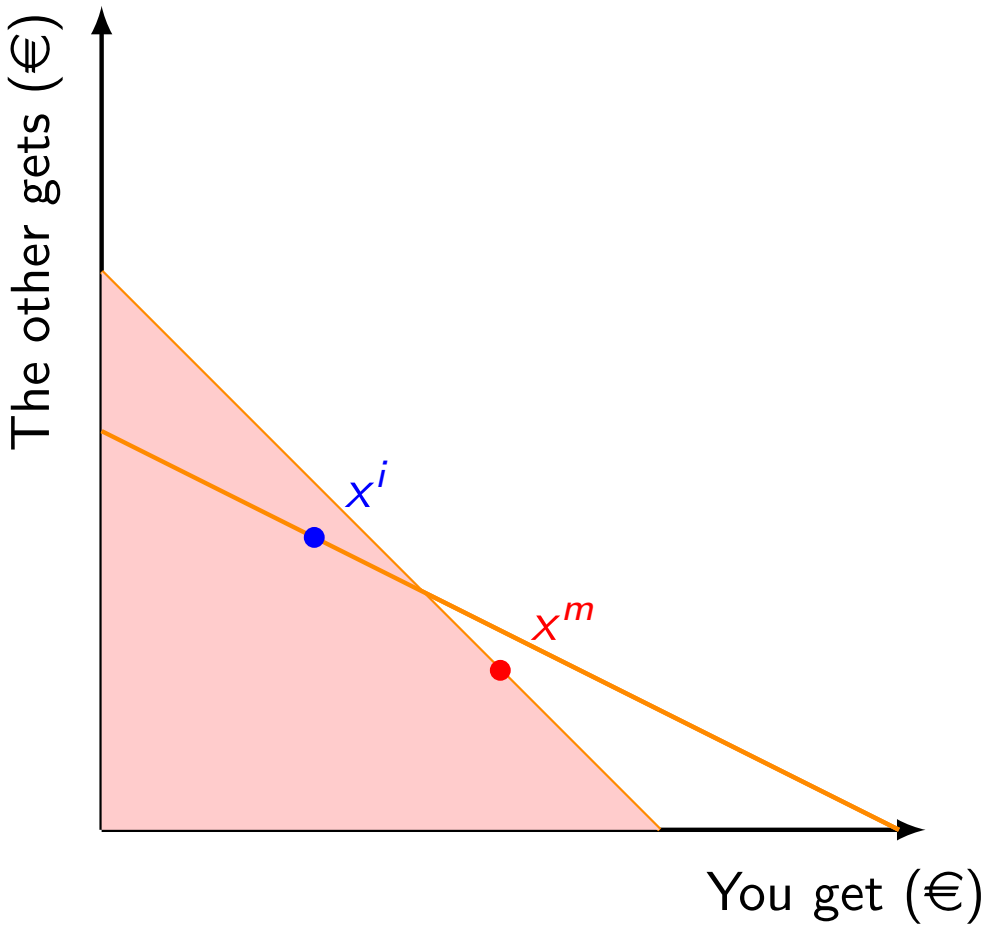
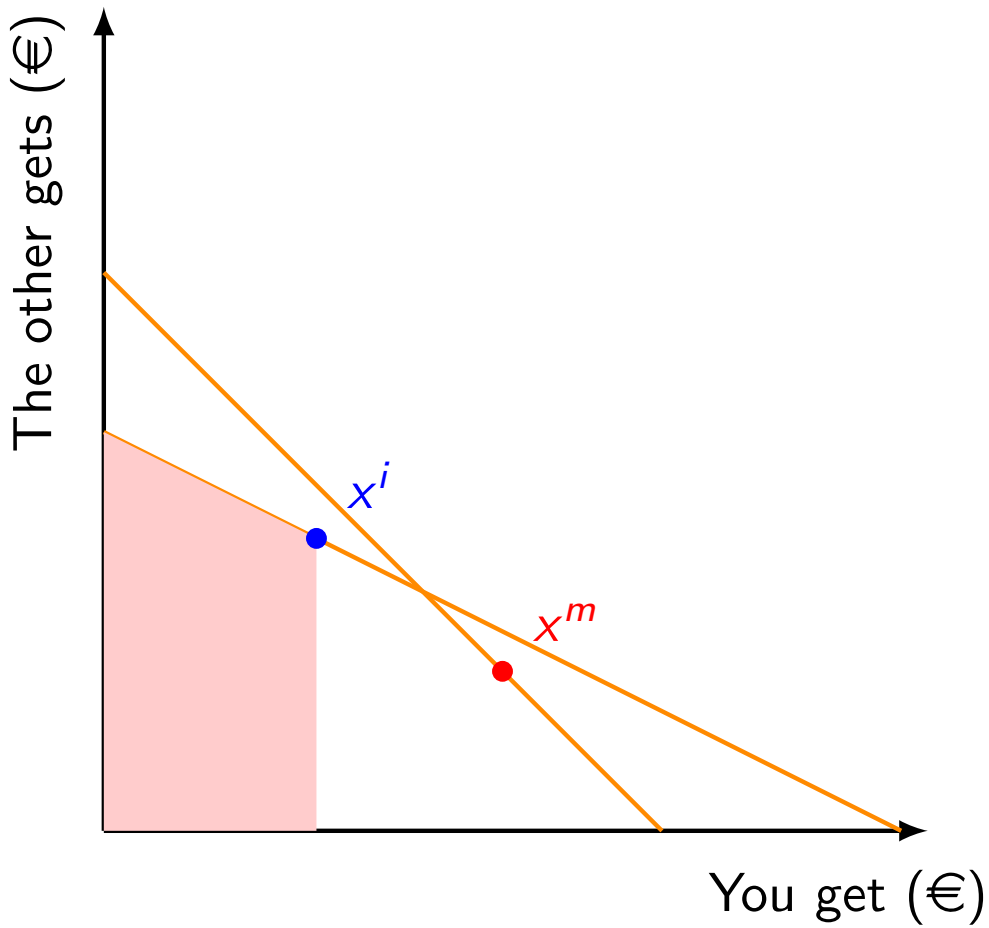


In Context S: x^m is strictly better than x^i

Agreement-GARP

Context G: x^i and Context S: x^m



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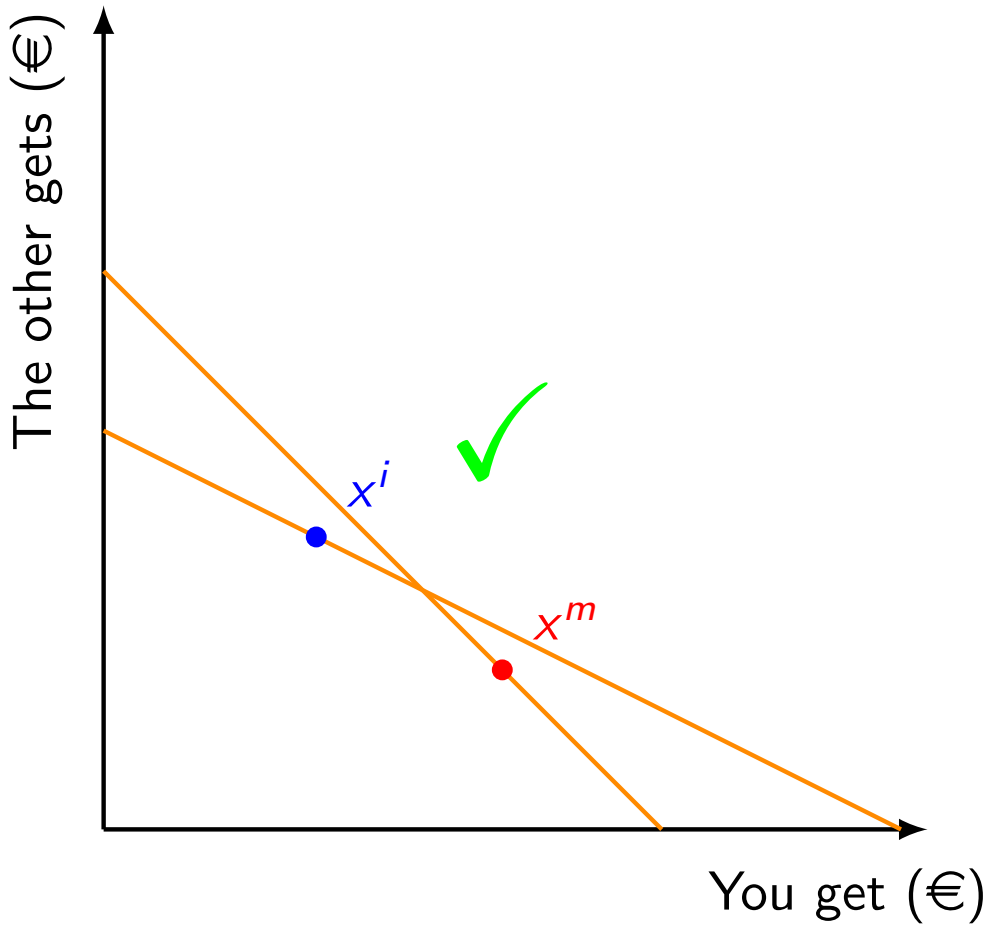

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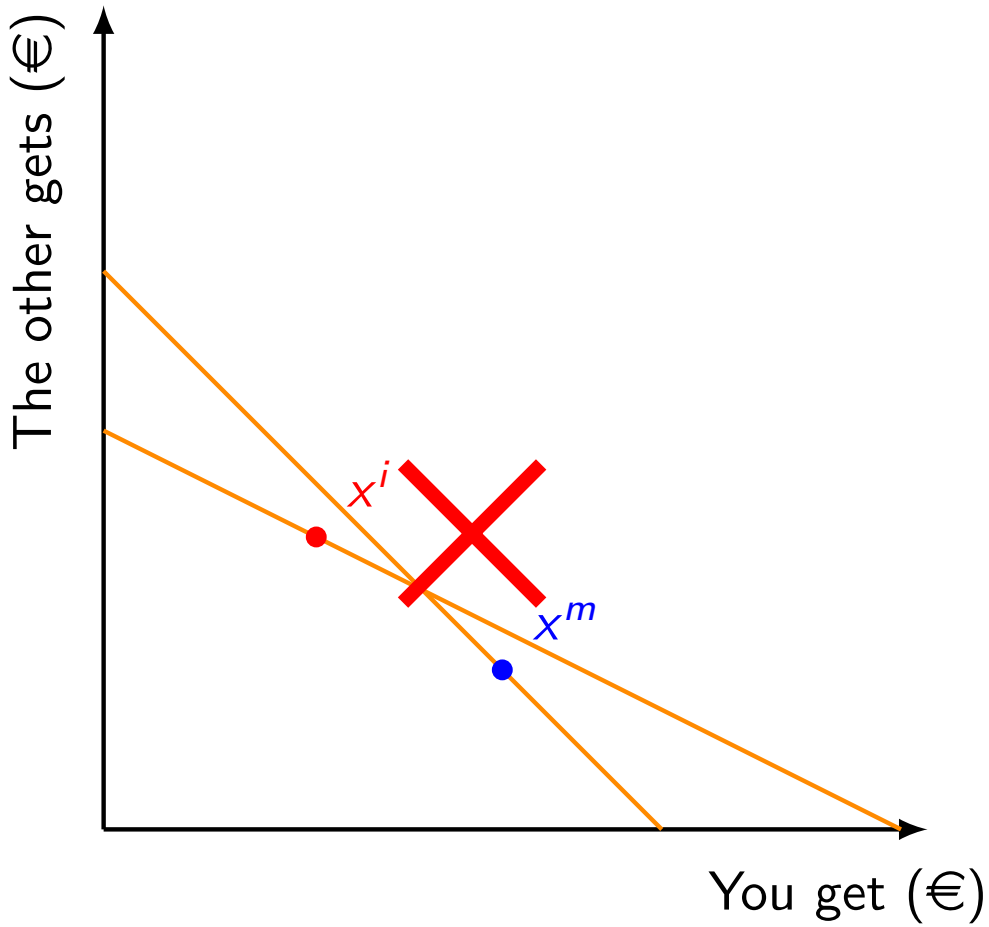

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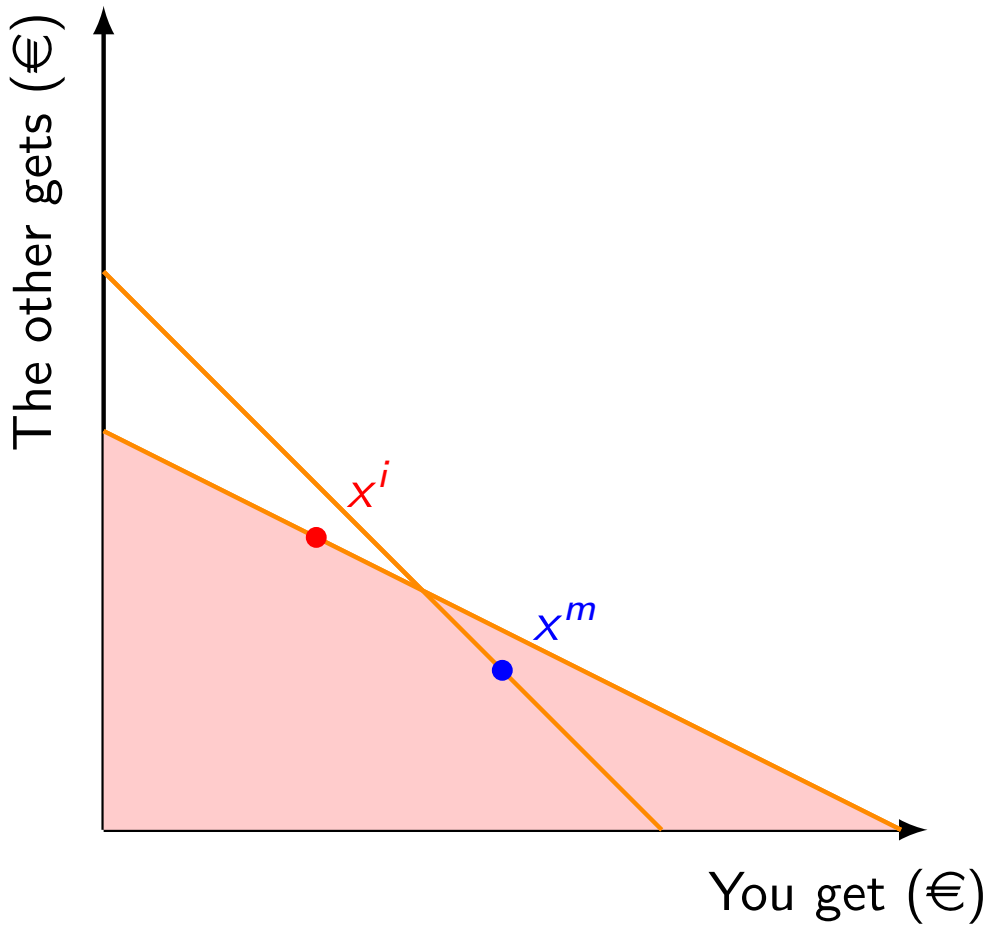

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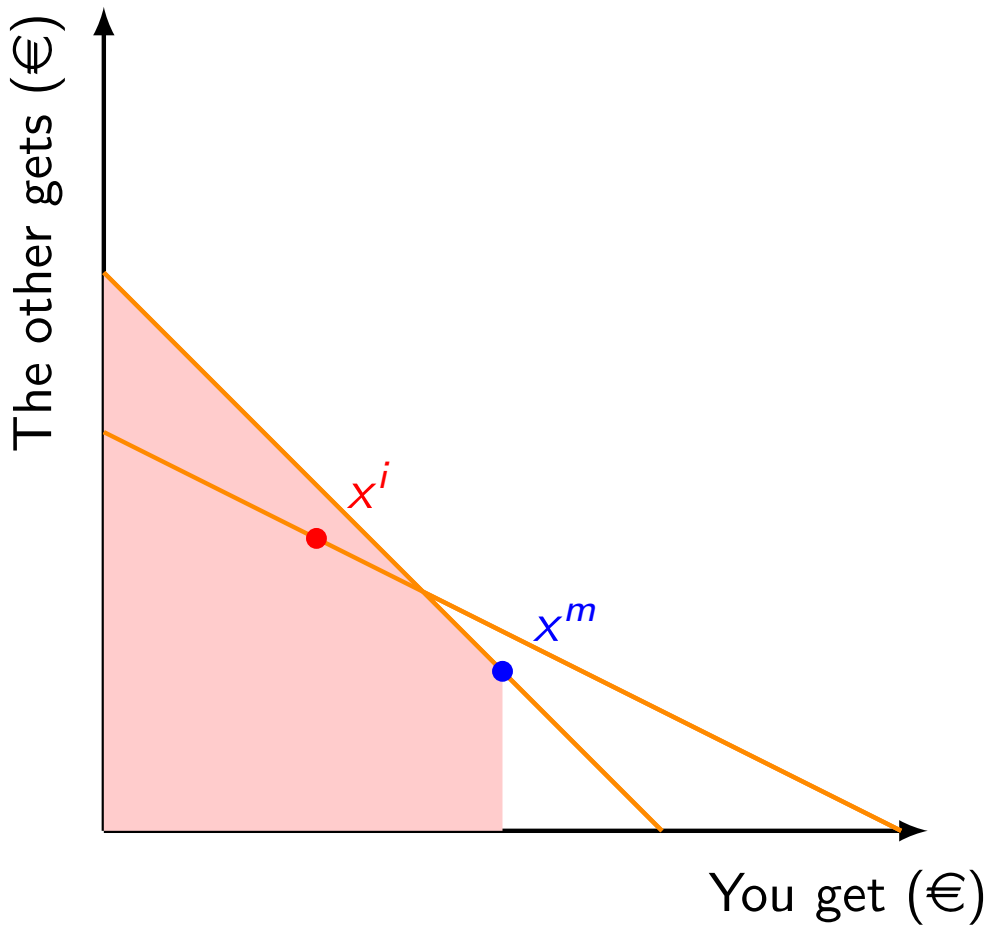
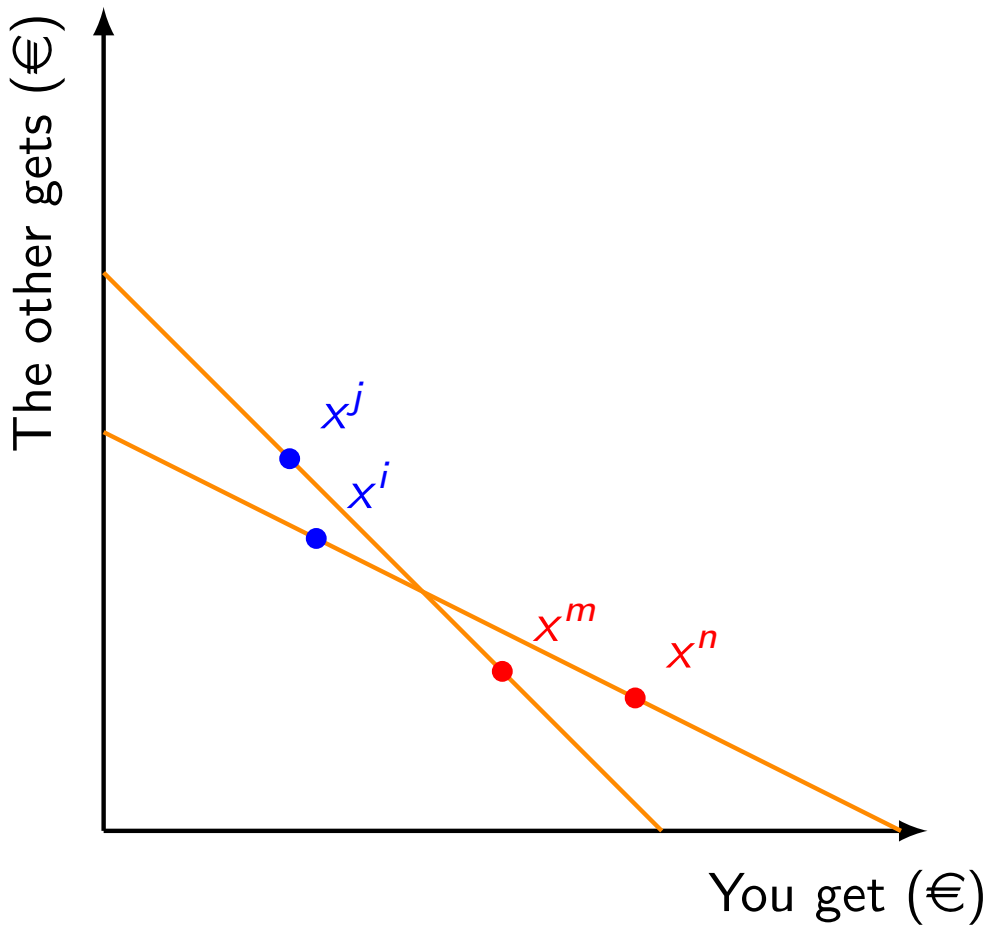


In Context S: by Agreement, x^m is strictly better than x^i

Agreement-GARP

Context G: x^i, x^j and Context S: x^m, x^n



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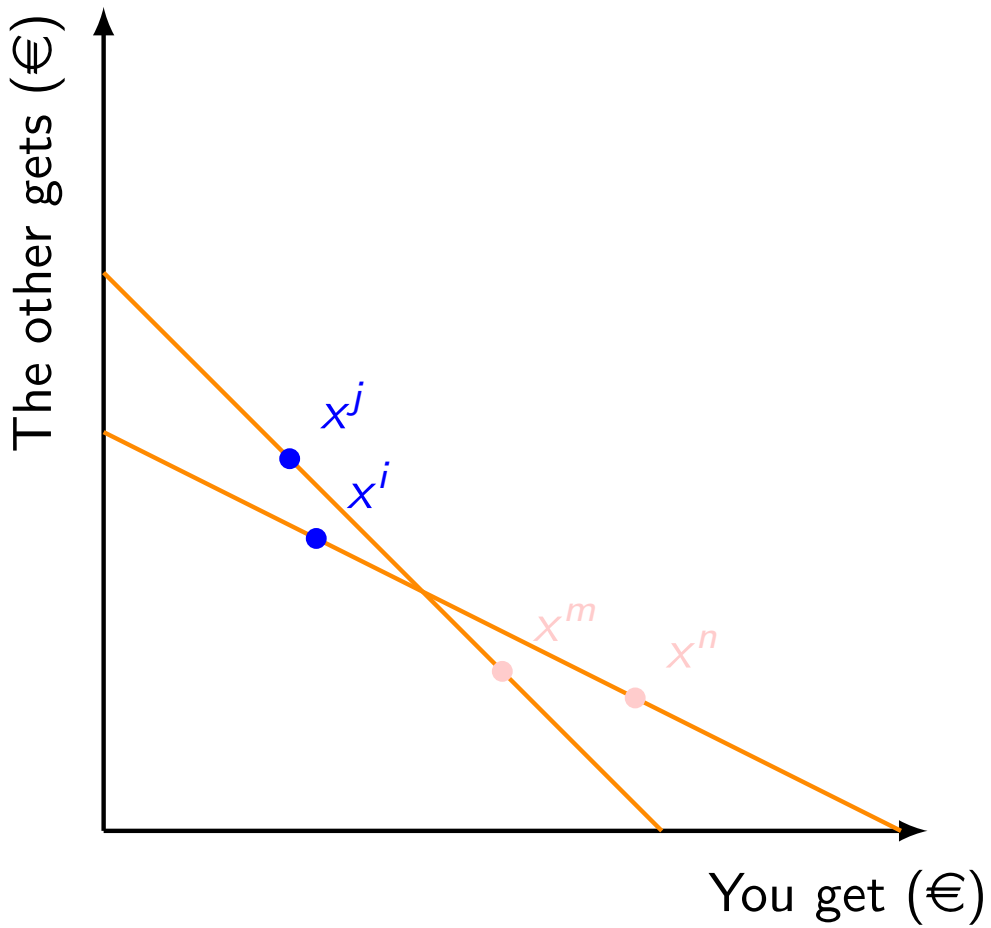

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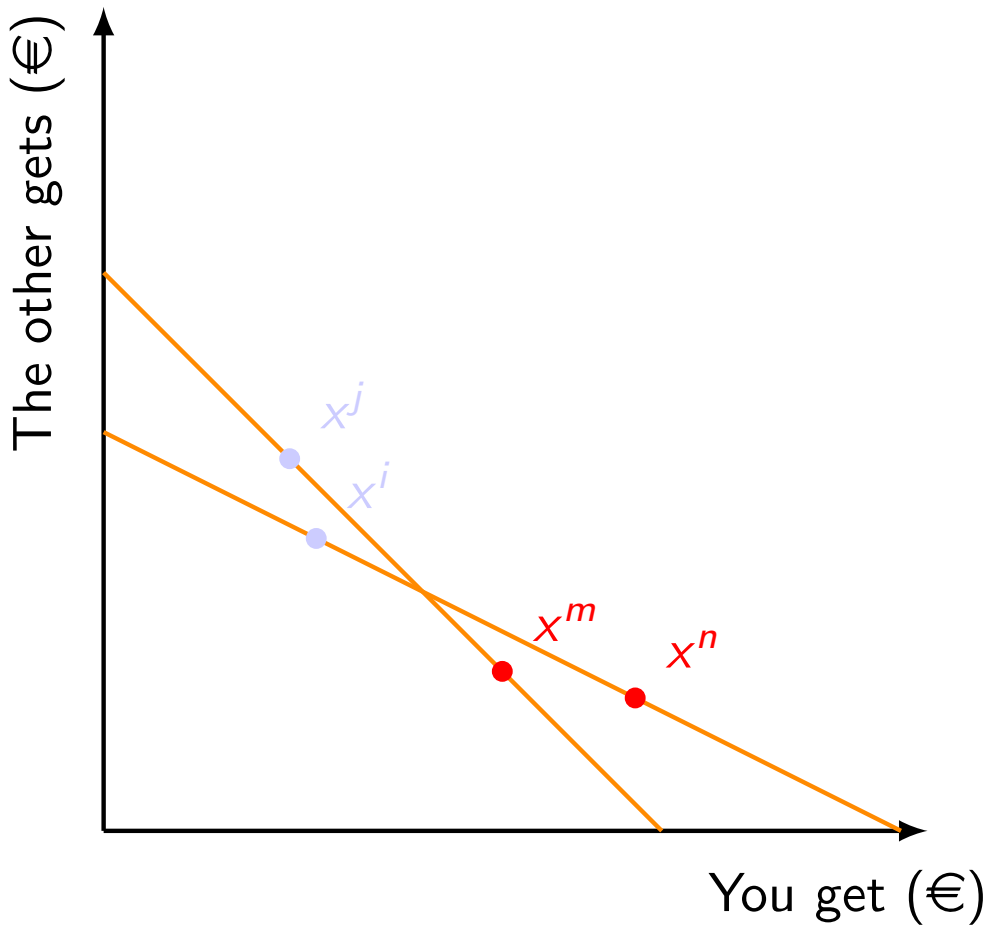

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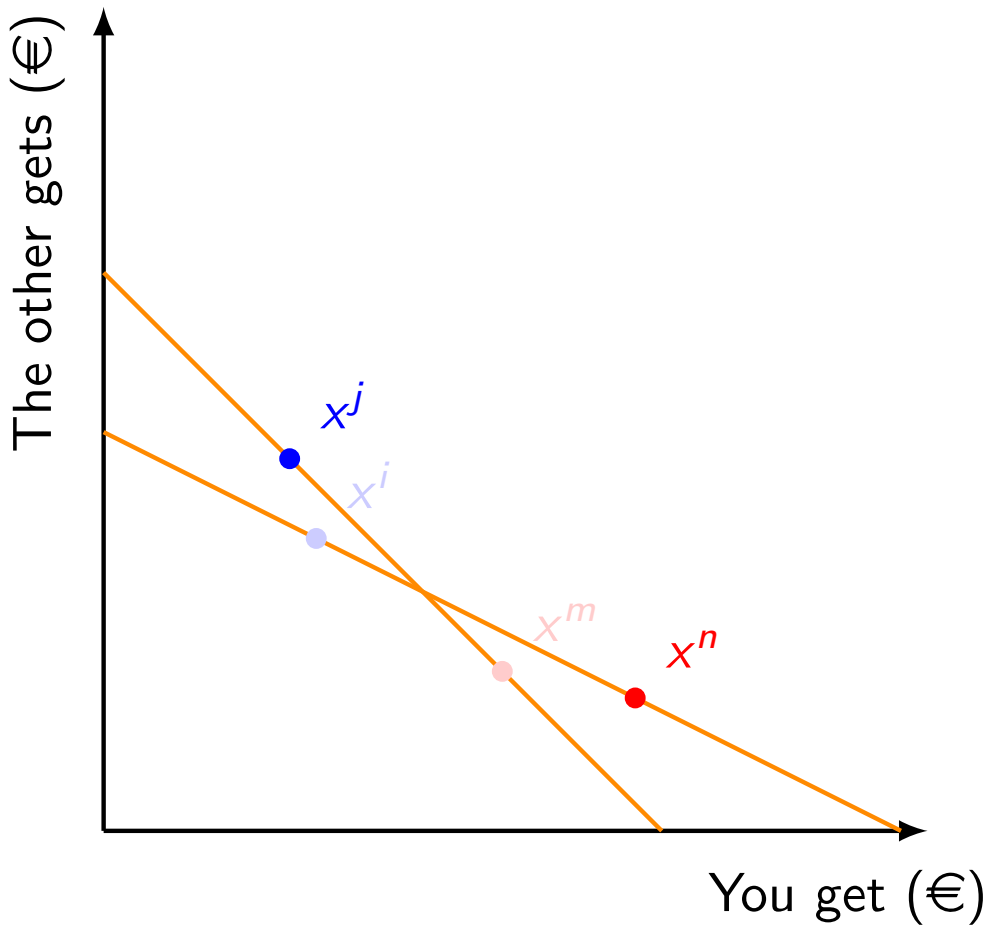

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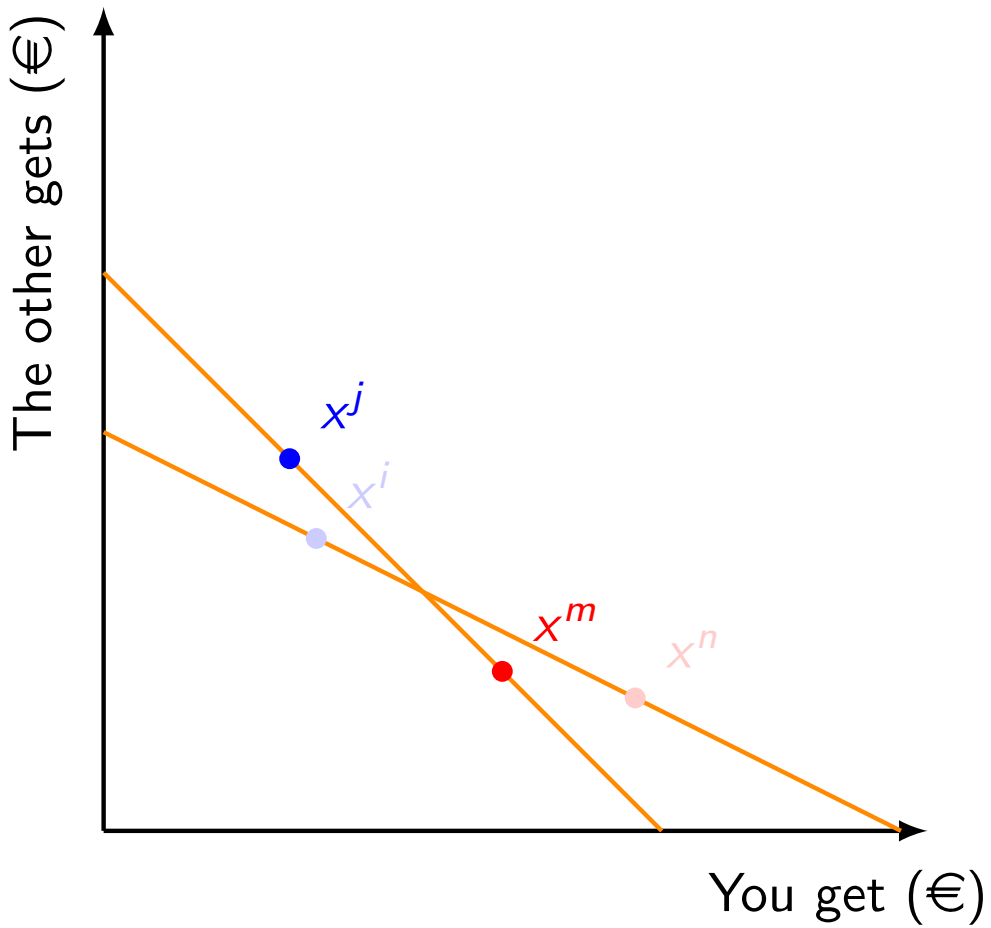

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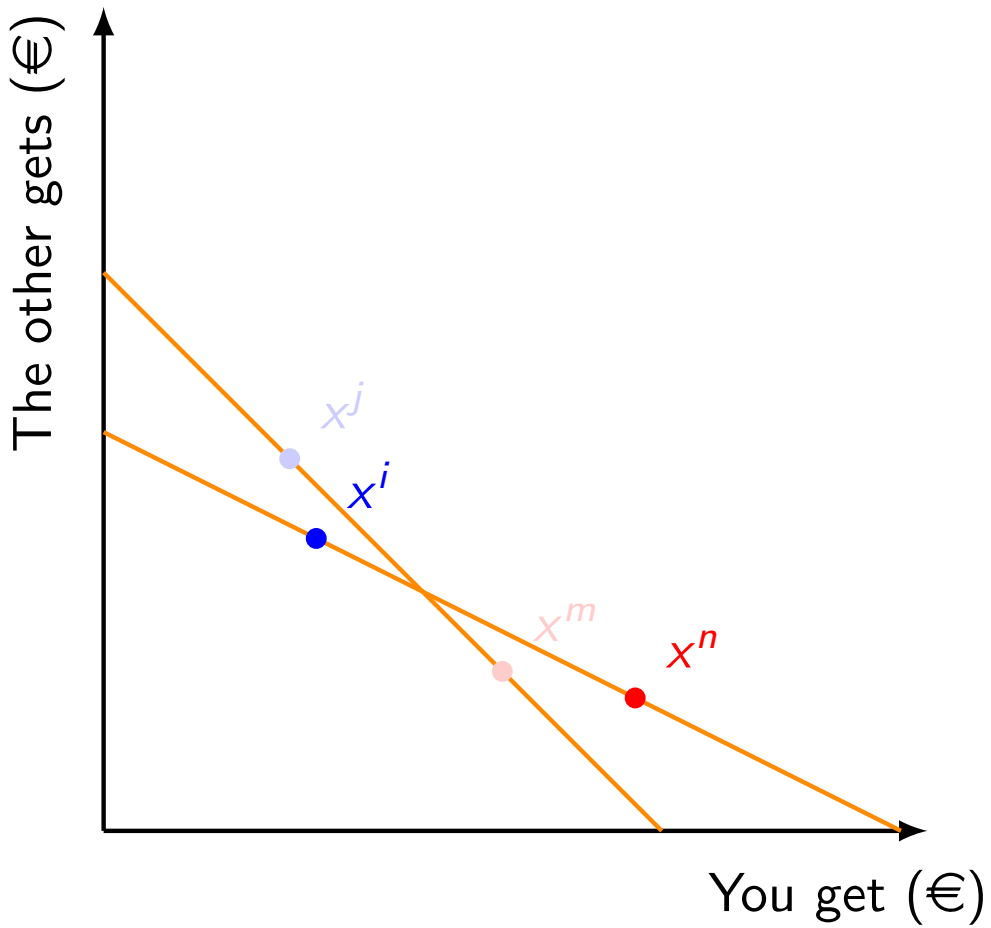

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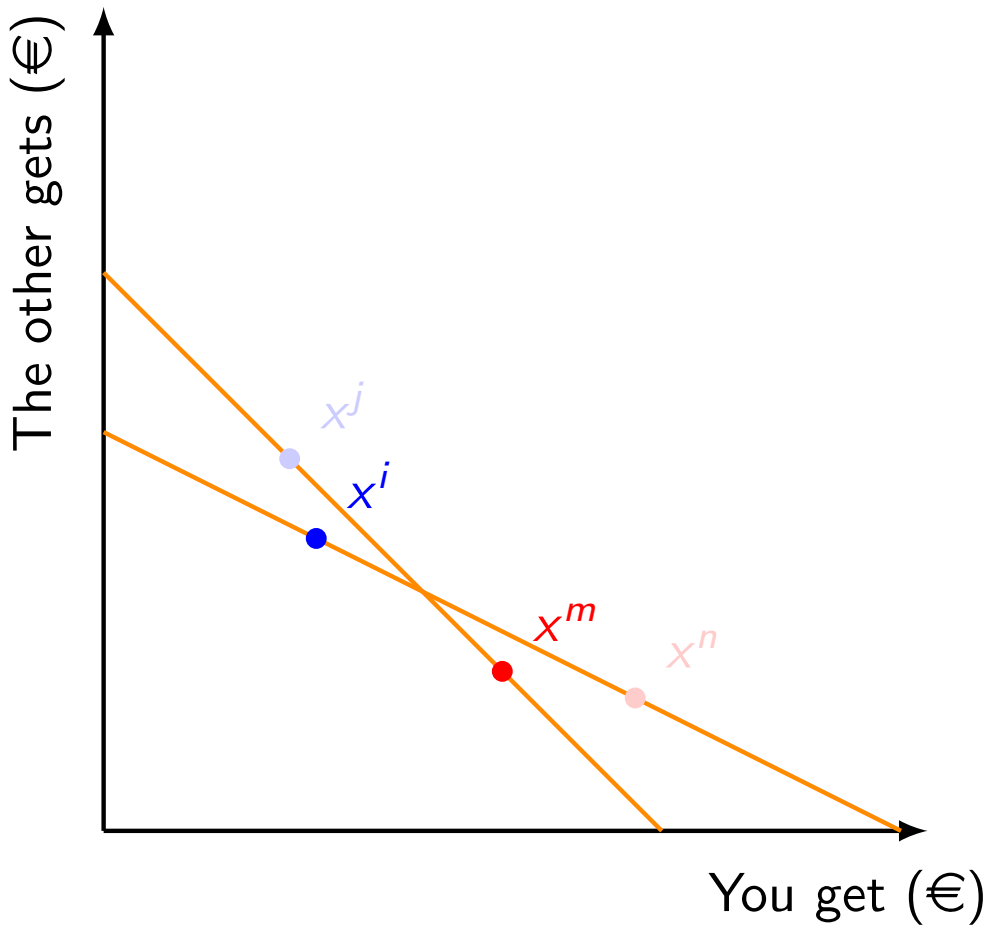
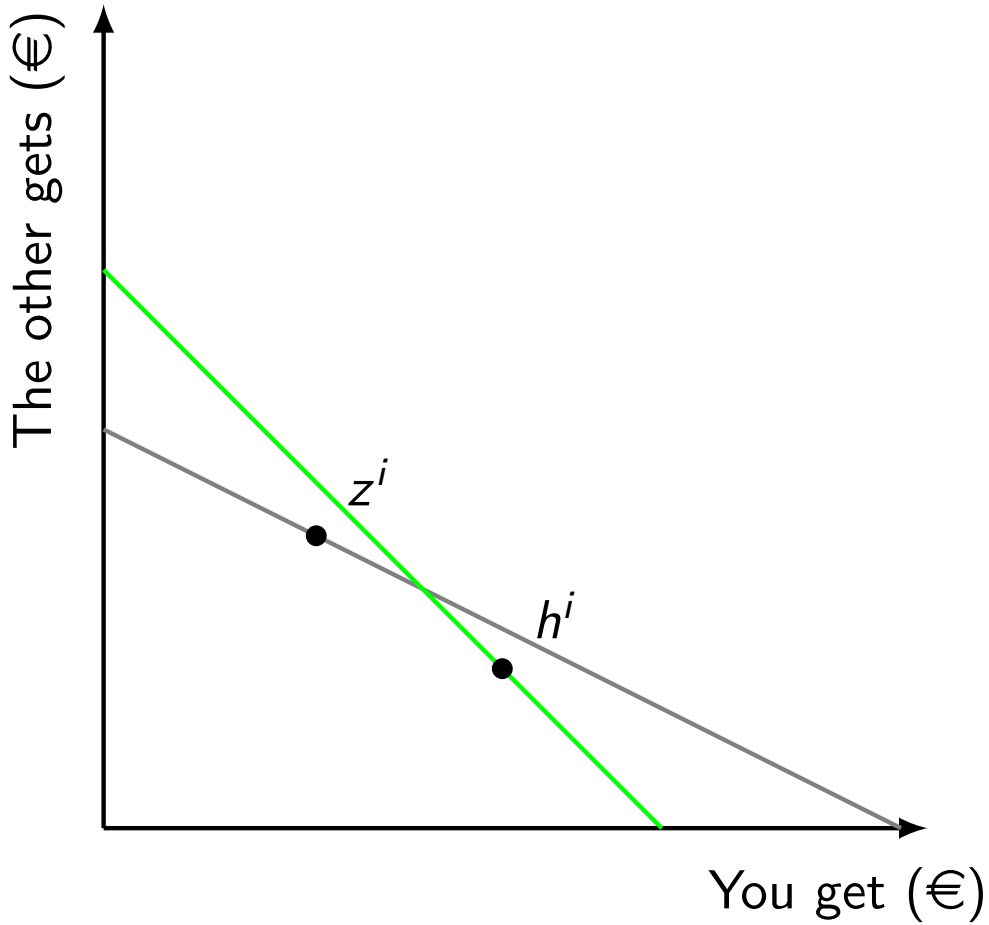
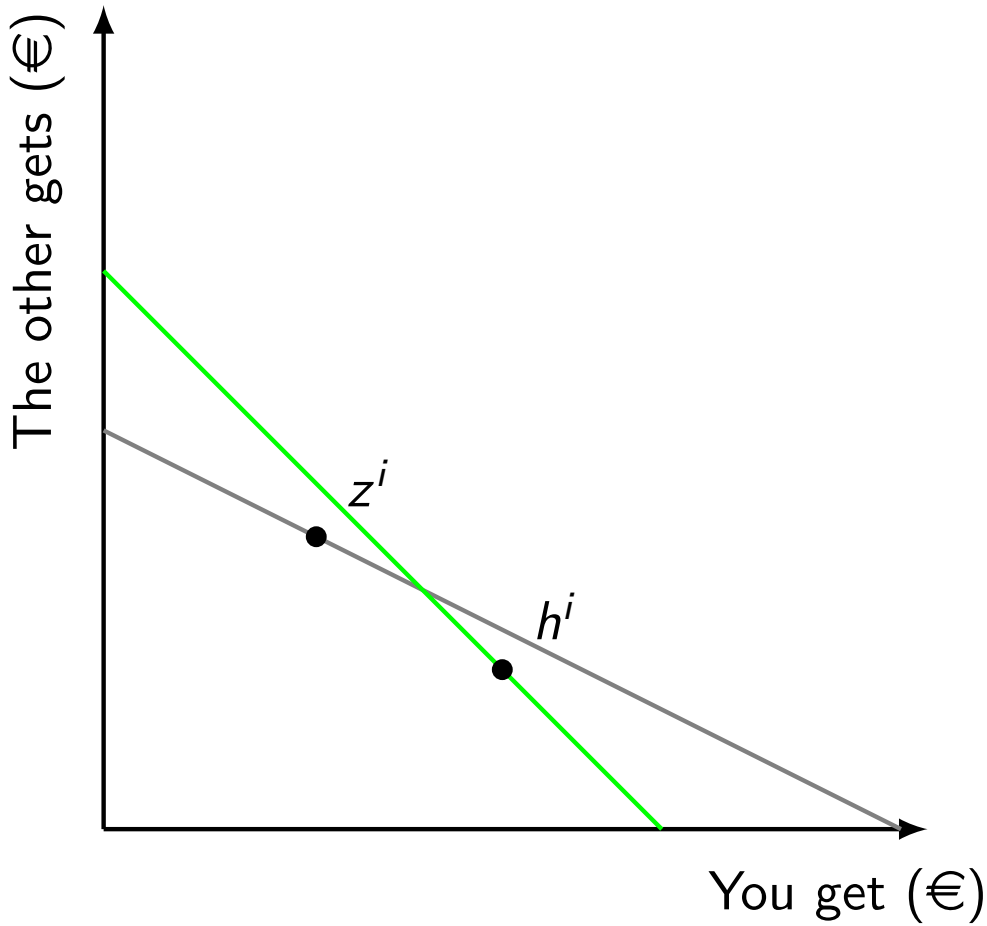


Identifying preferences

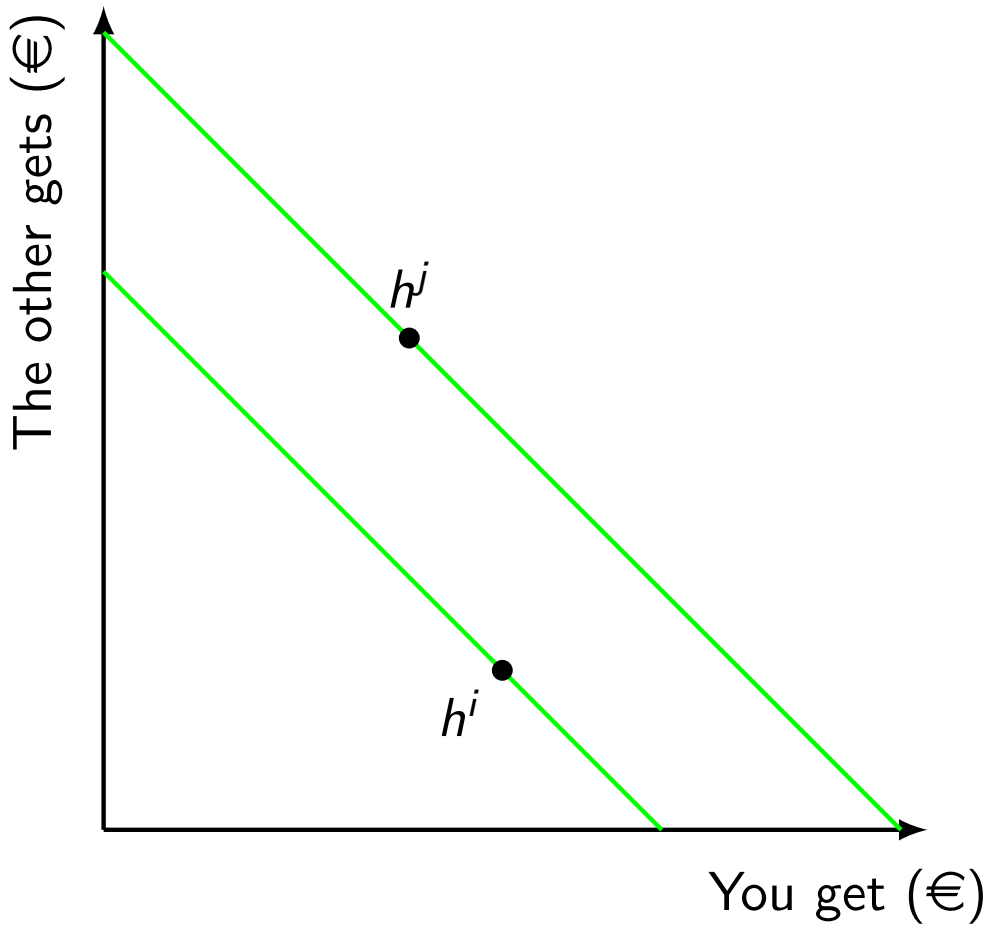


Identifying preferences

Green must be S, grey must be G



Identifying and testing



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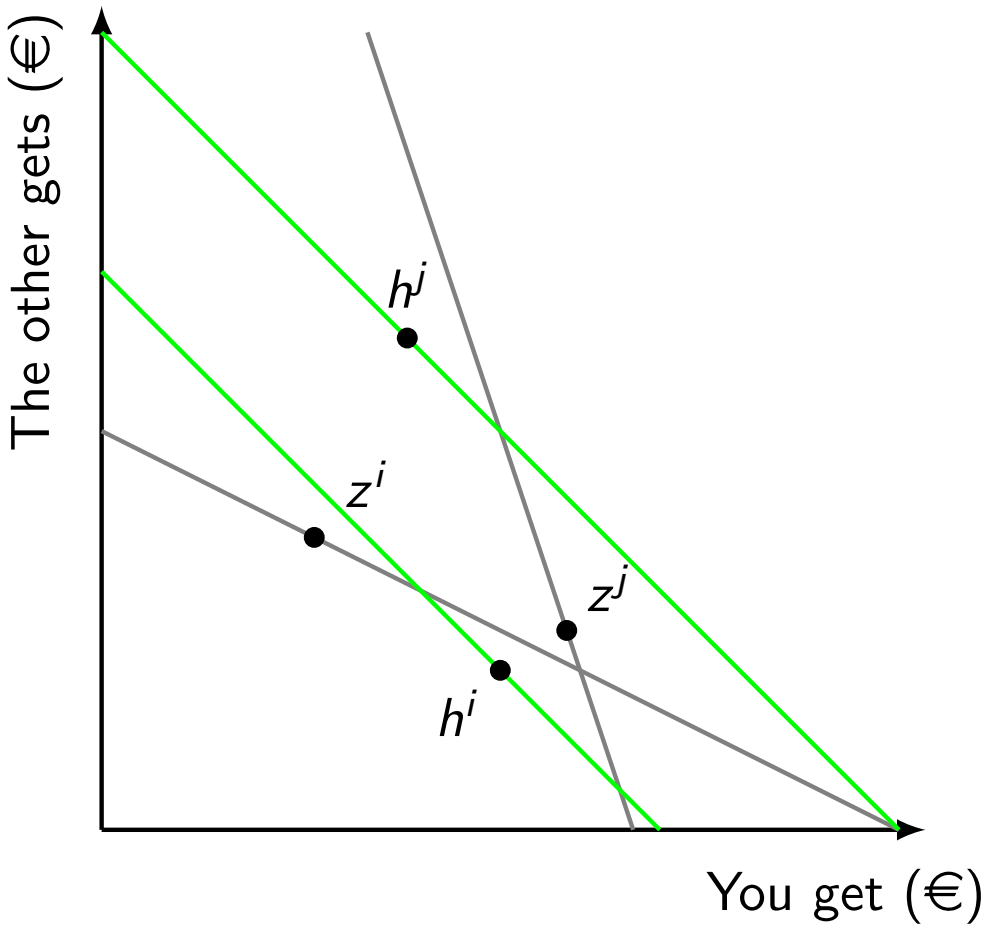

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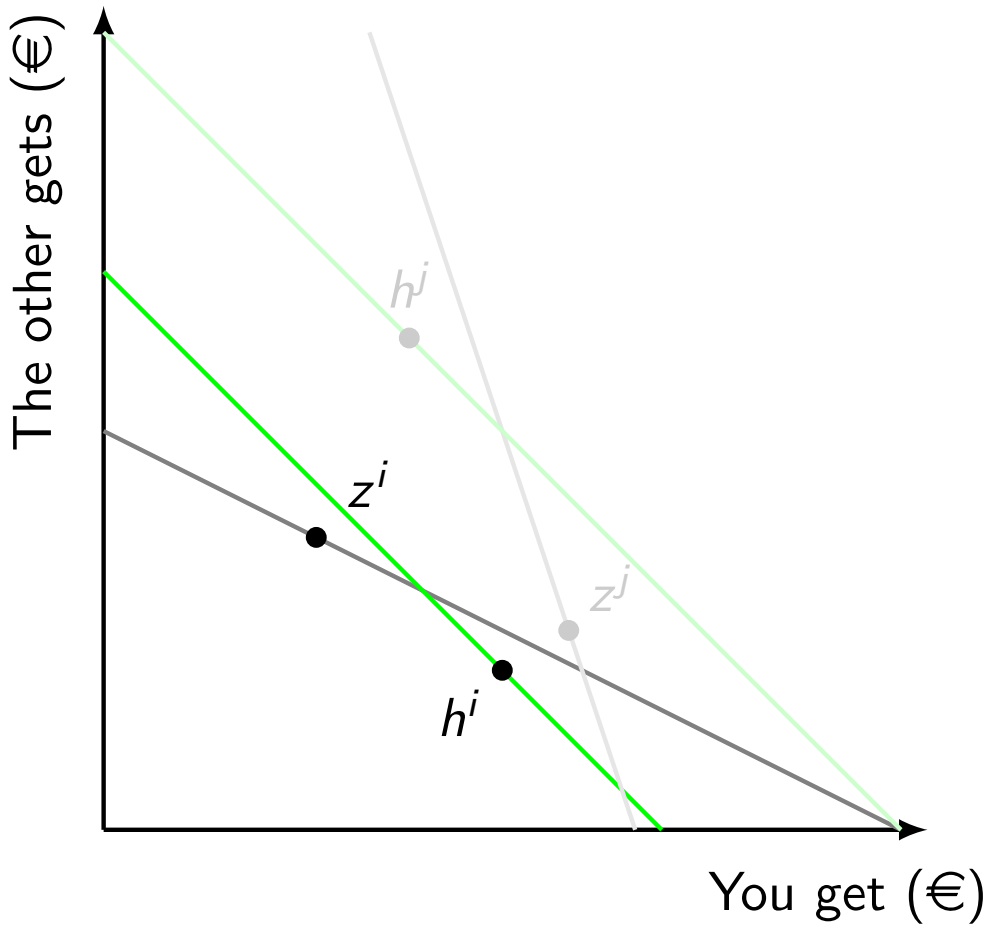

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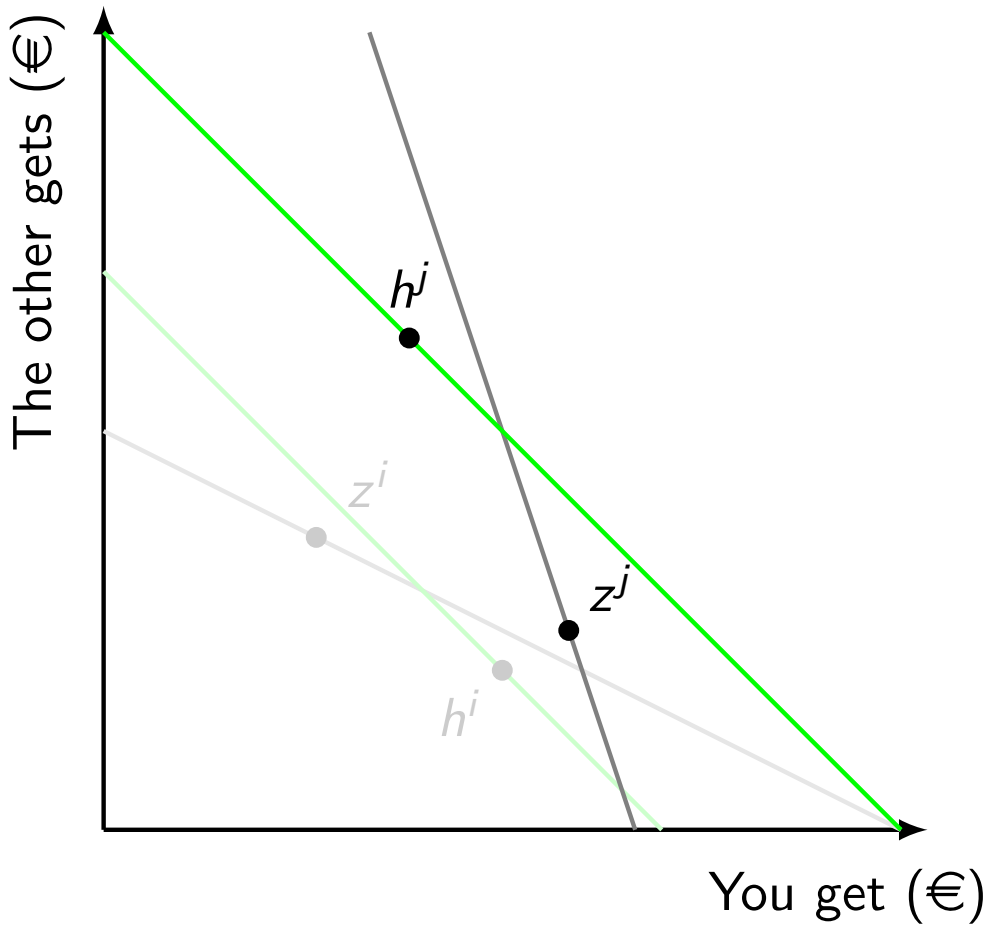
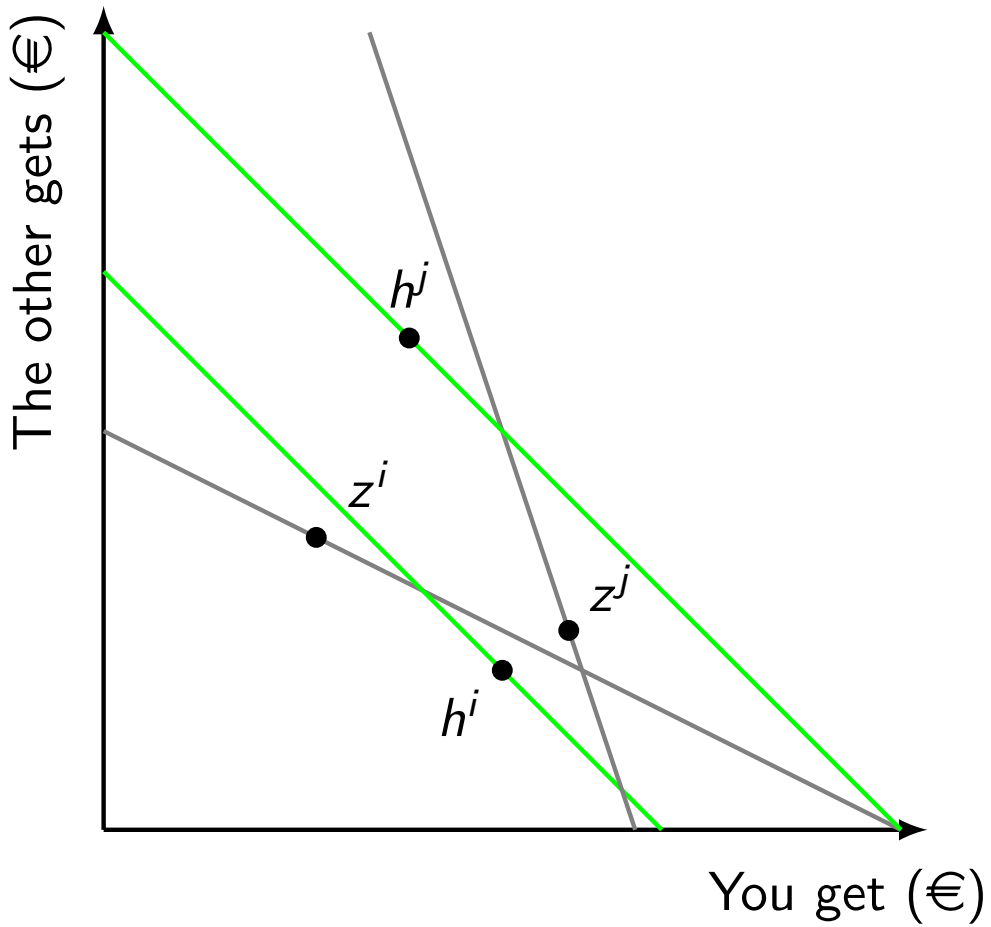


Identifying and testing

Cannot be rationalised with Agreement



III Experiment

Procedure

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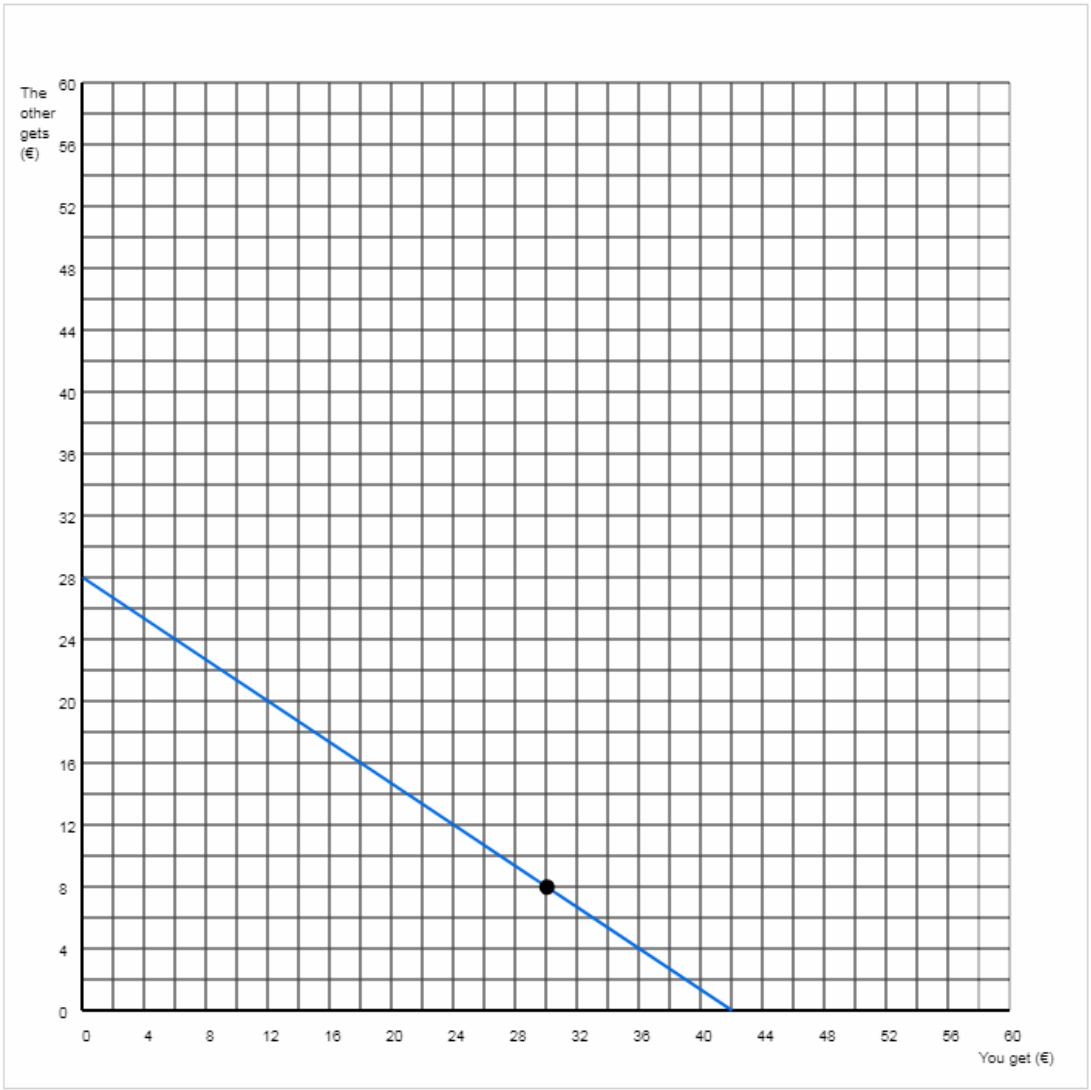
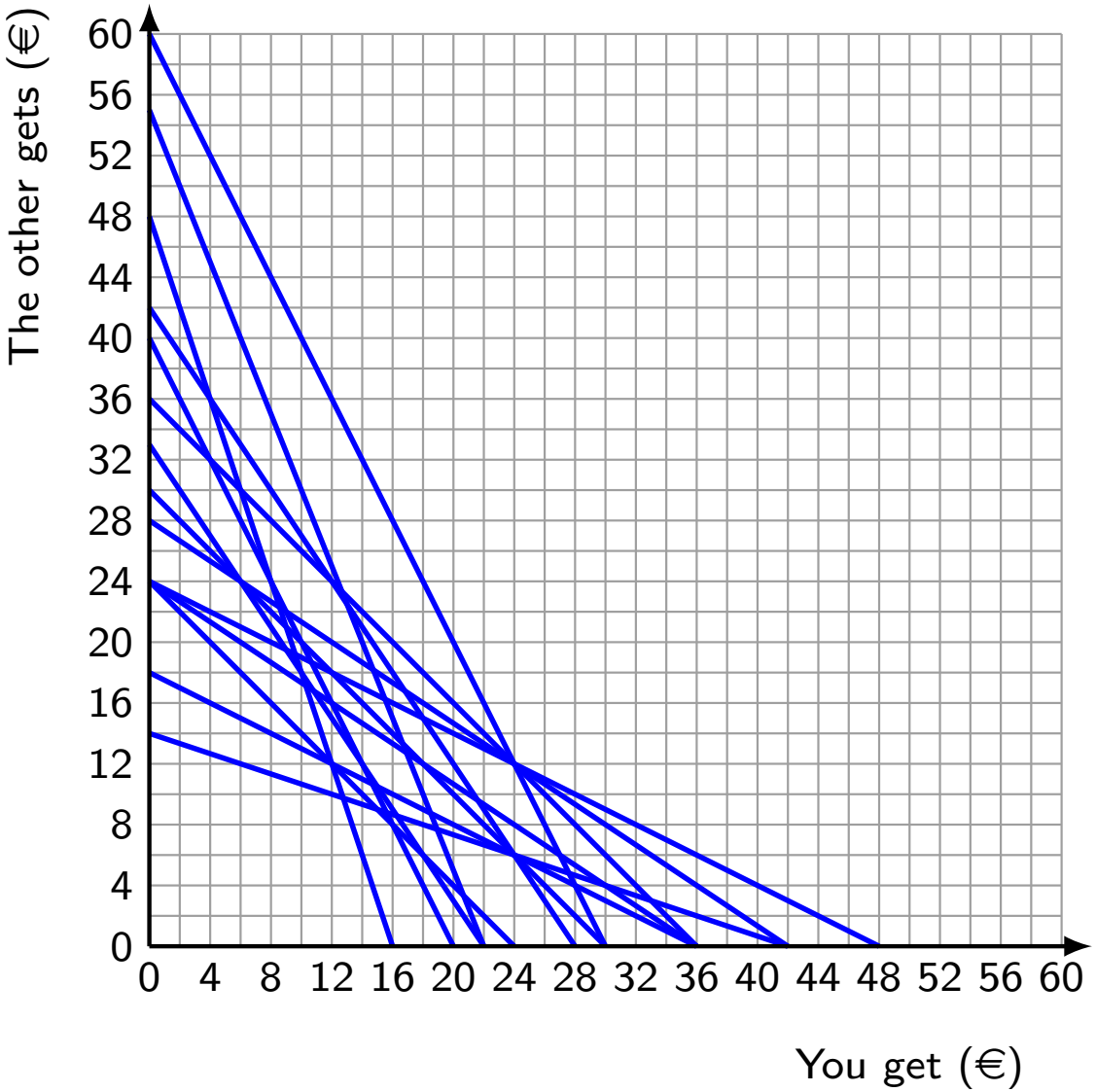
- The second mover (player SM, $N = 85$) made 14 choices from budgets for both these cases (strategy method).
- Either FM's choice or one of SM's choices (randomly selected) was paid out to avoid wealth effects
- The possible choices by FM represent the contexts between which SM's preferences may change.

Interface of one question



Budgets for player SM

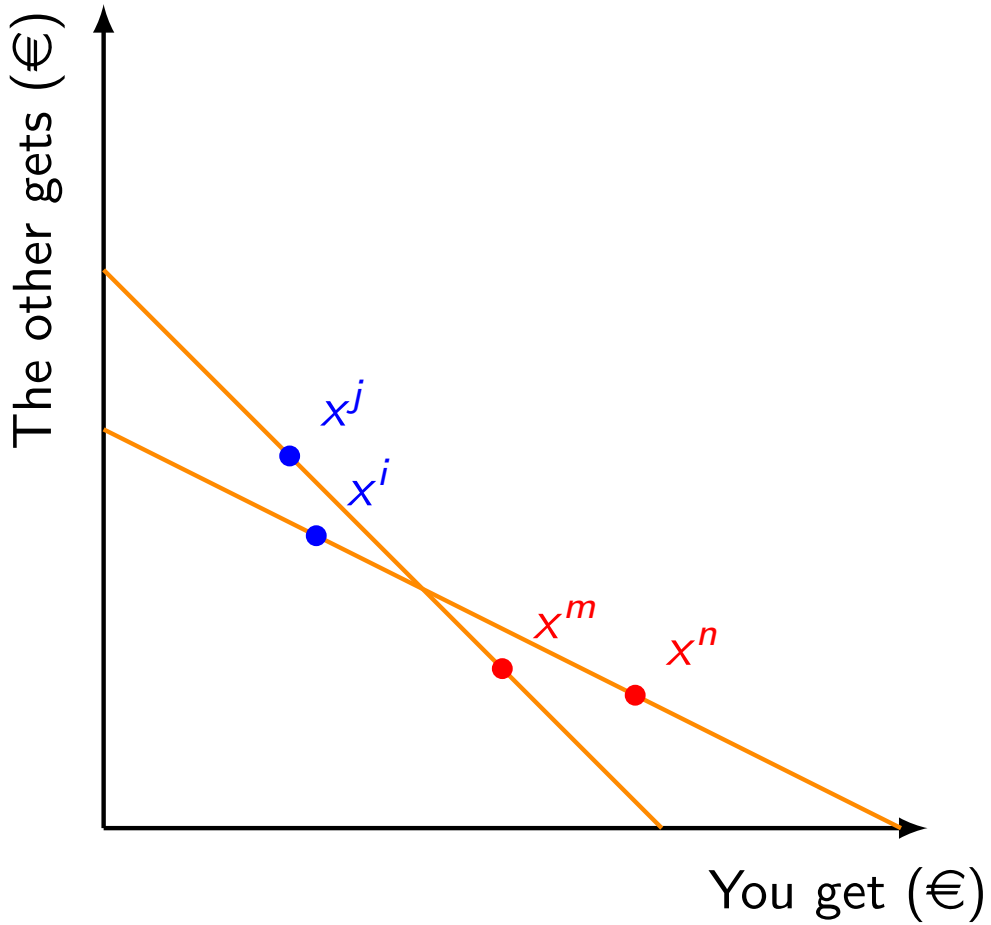


Revealed preference analysis I

Hypothesis: Player SM chooses according to different preference relations in each context.

Testable condition: GARP holds on the data from each context separately, but not on the data from both contexts together.

Testing hypothesis 1



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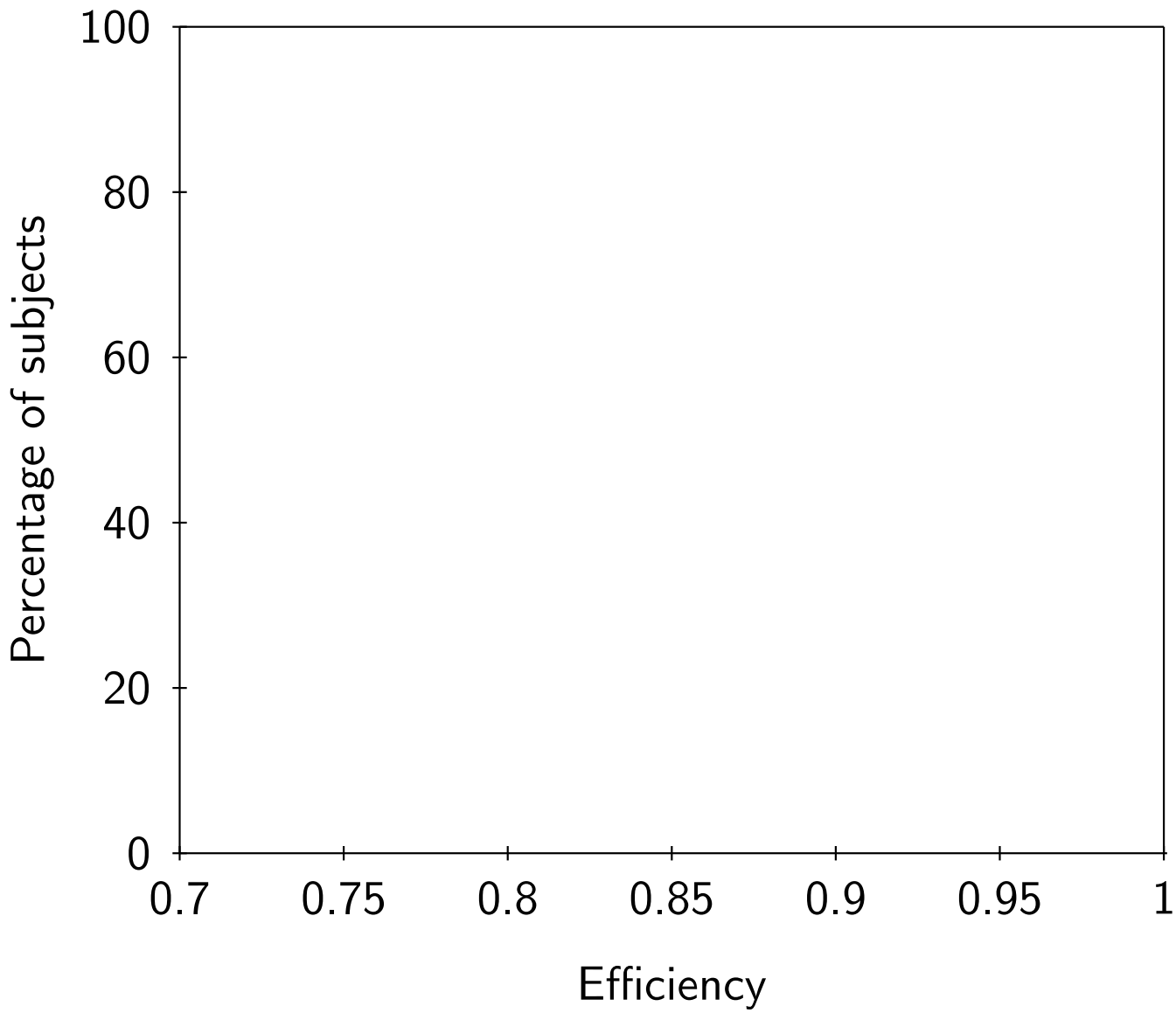

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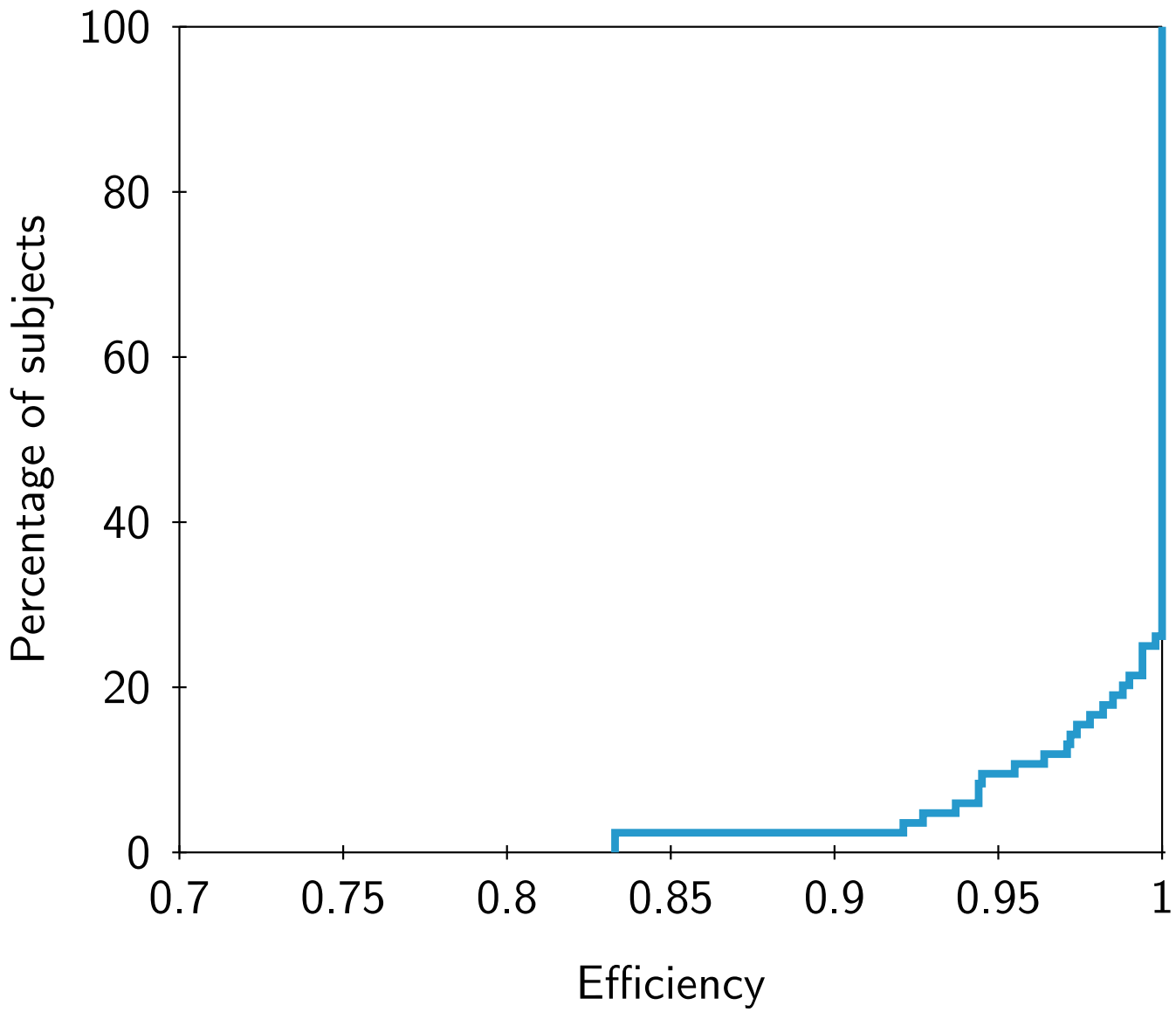
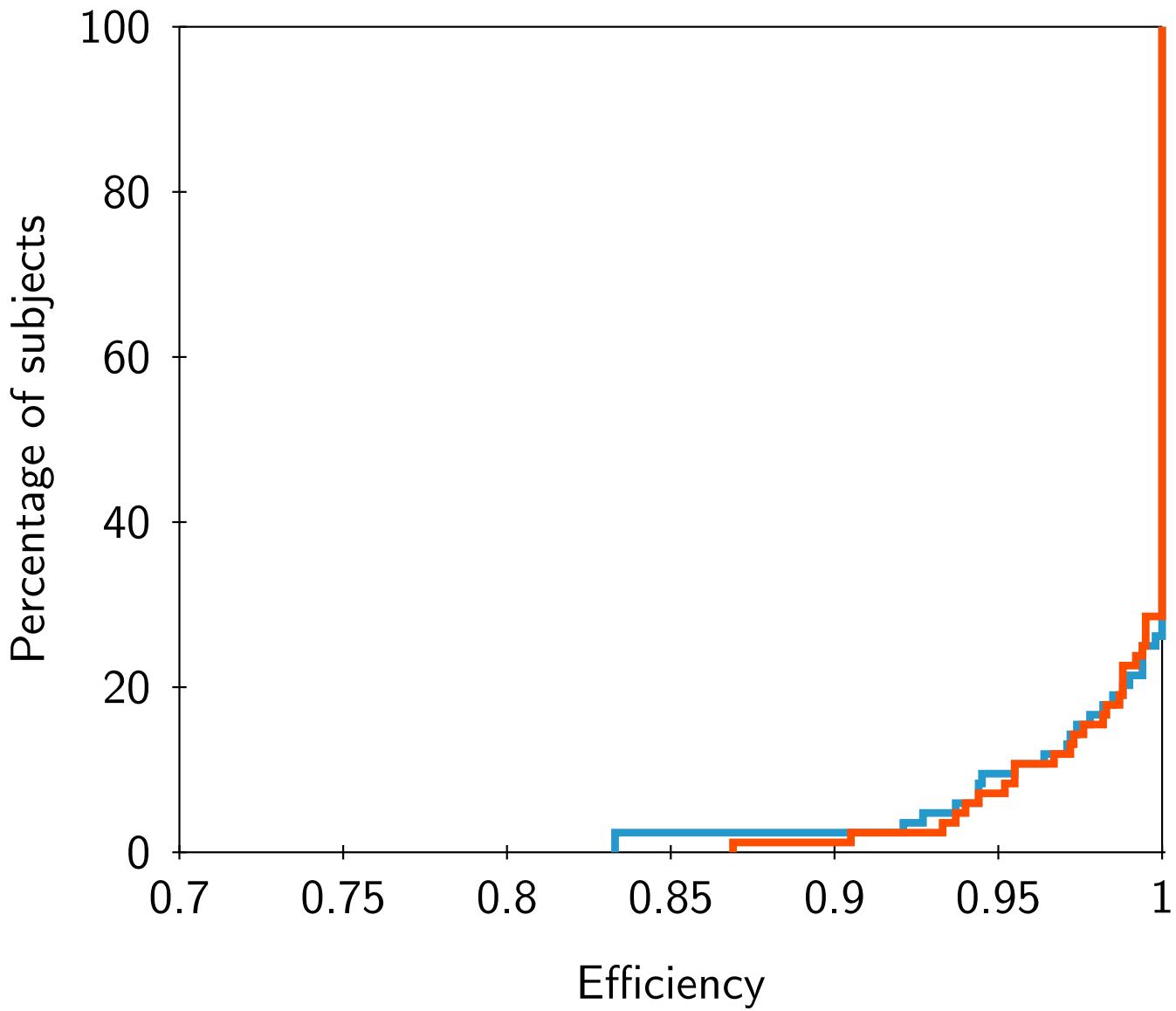
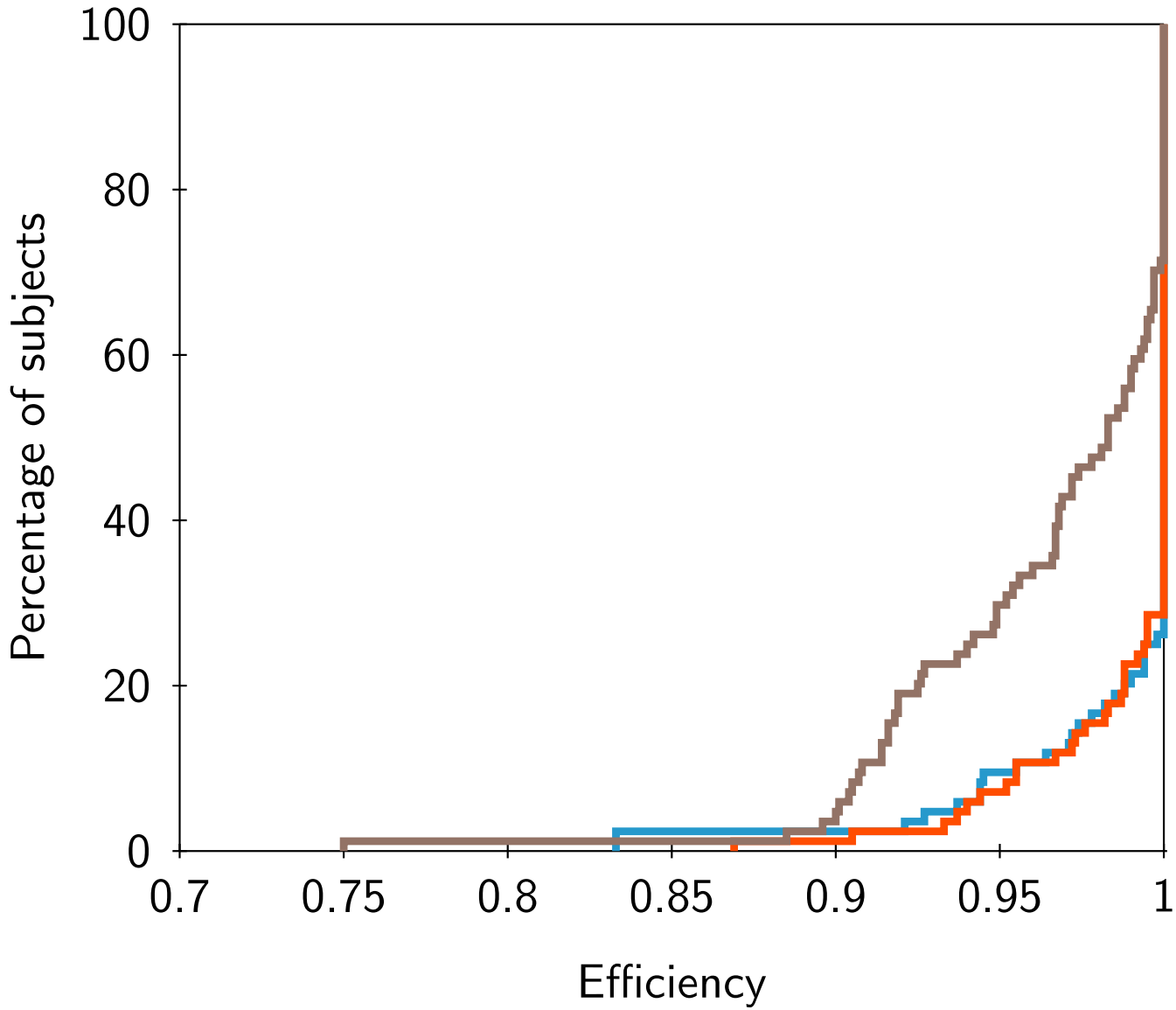


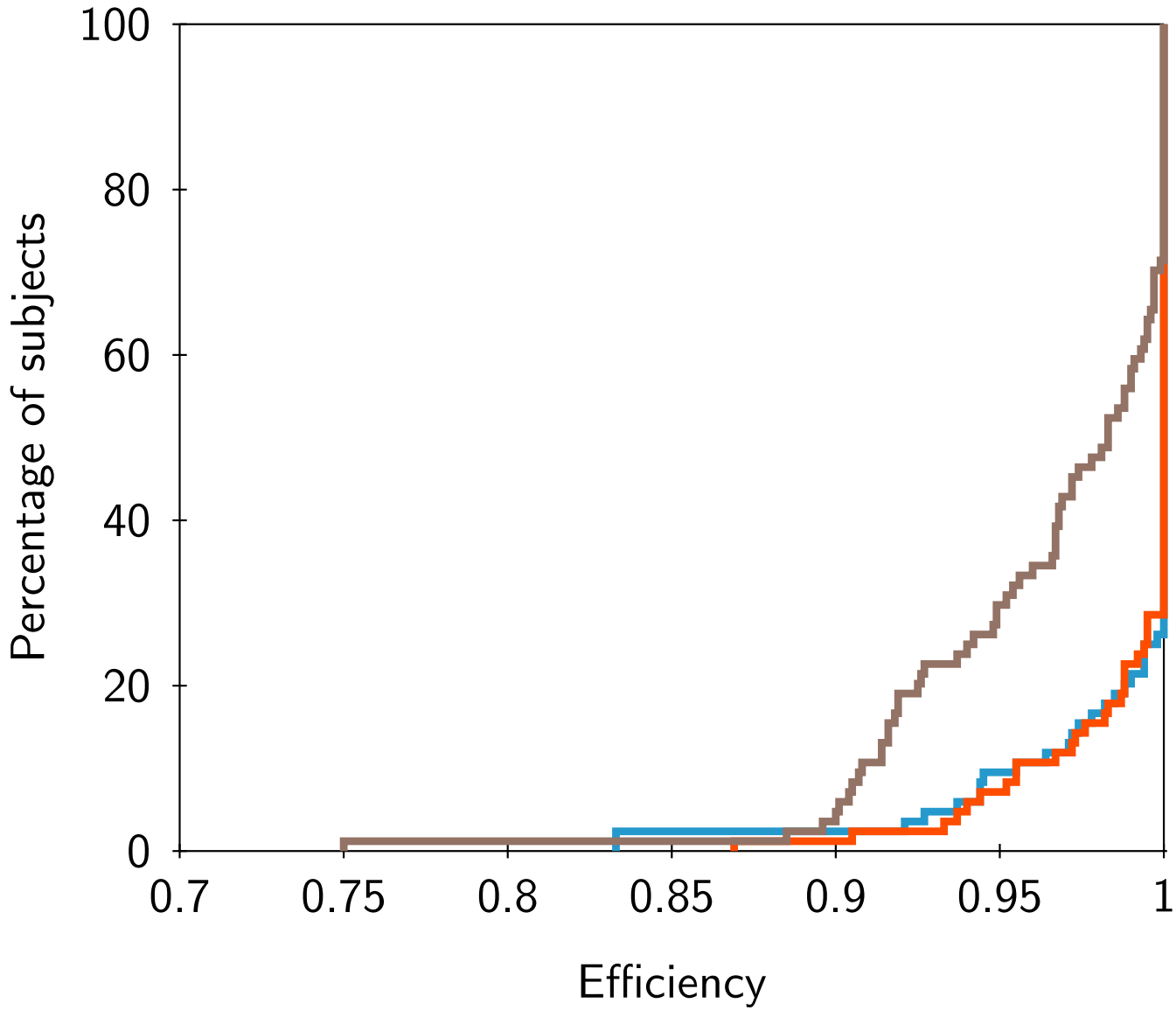
Revealed preference analysis I



Revealed preference analysis I



Revealed preference analysis I

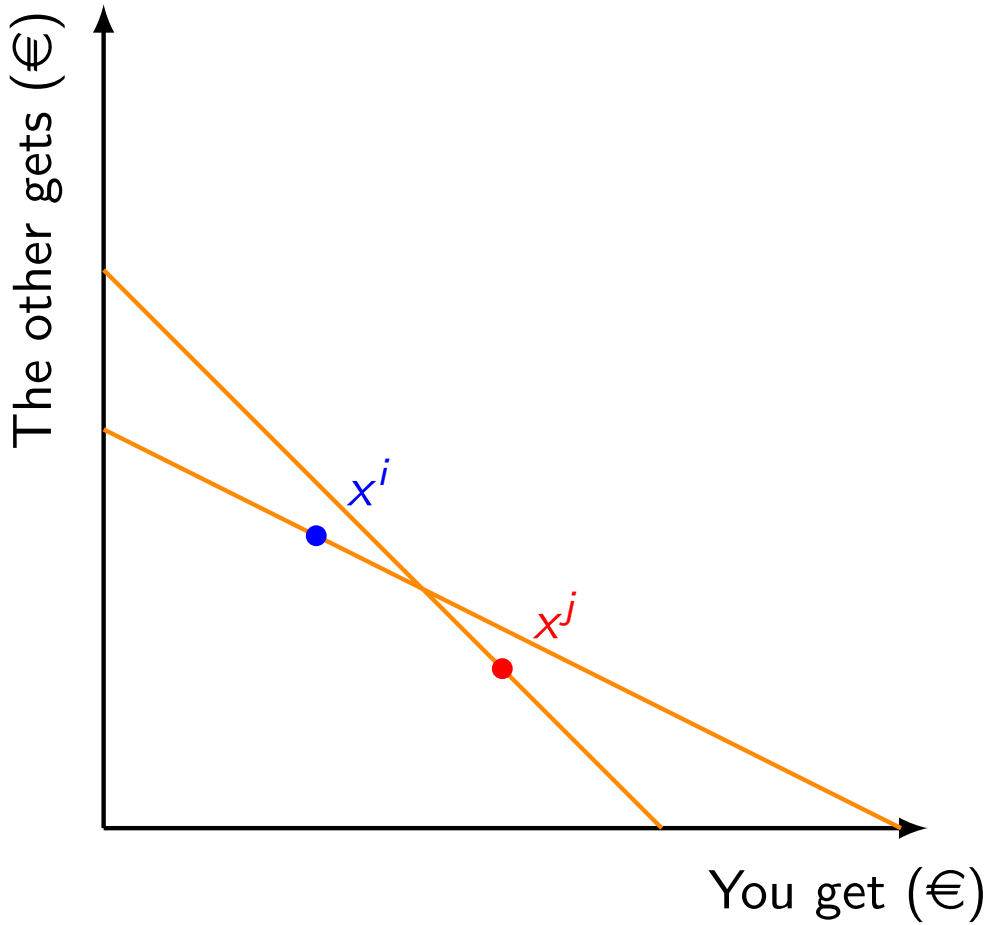


Revealed preference analysis II

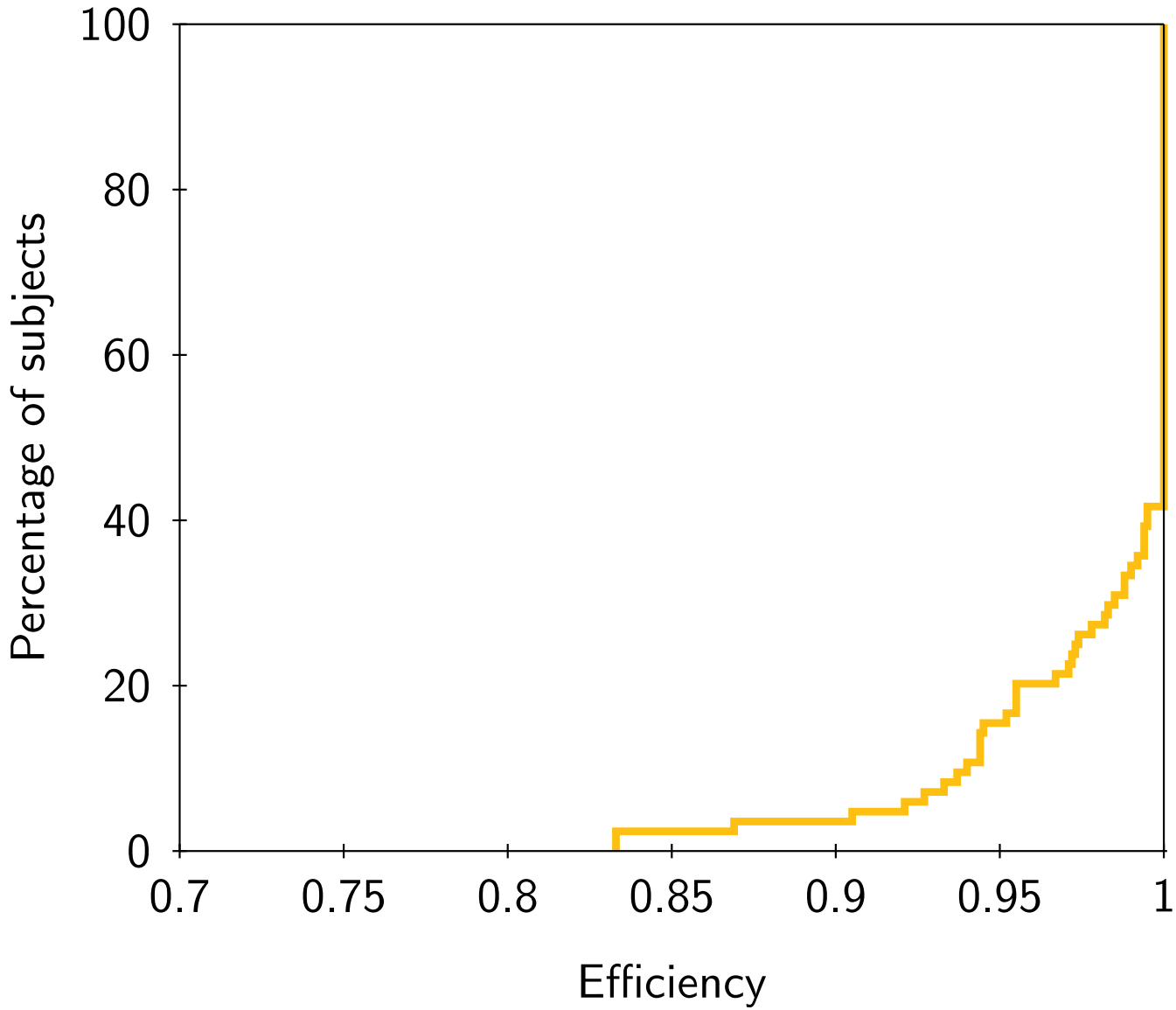
Hypothesis: Player SM's preference relations in the two contexts can be connected with Agreement, with SM being more generous when FM is more generous.

Testable condition: Agreement-GARP holds, with the revealed preferences from the more generous context being more generous.

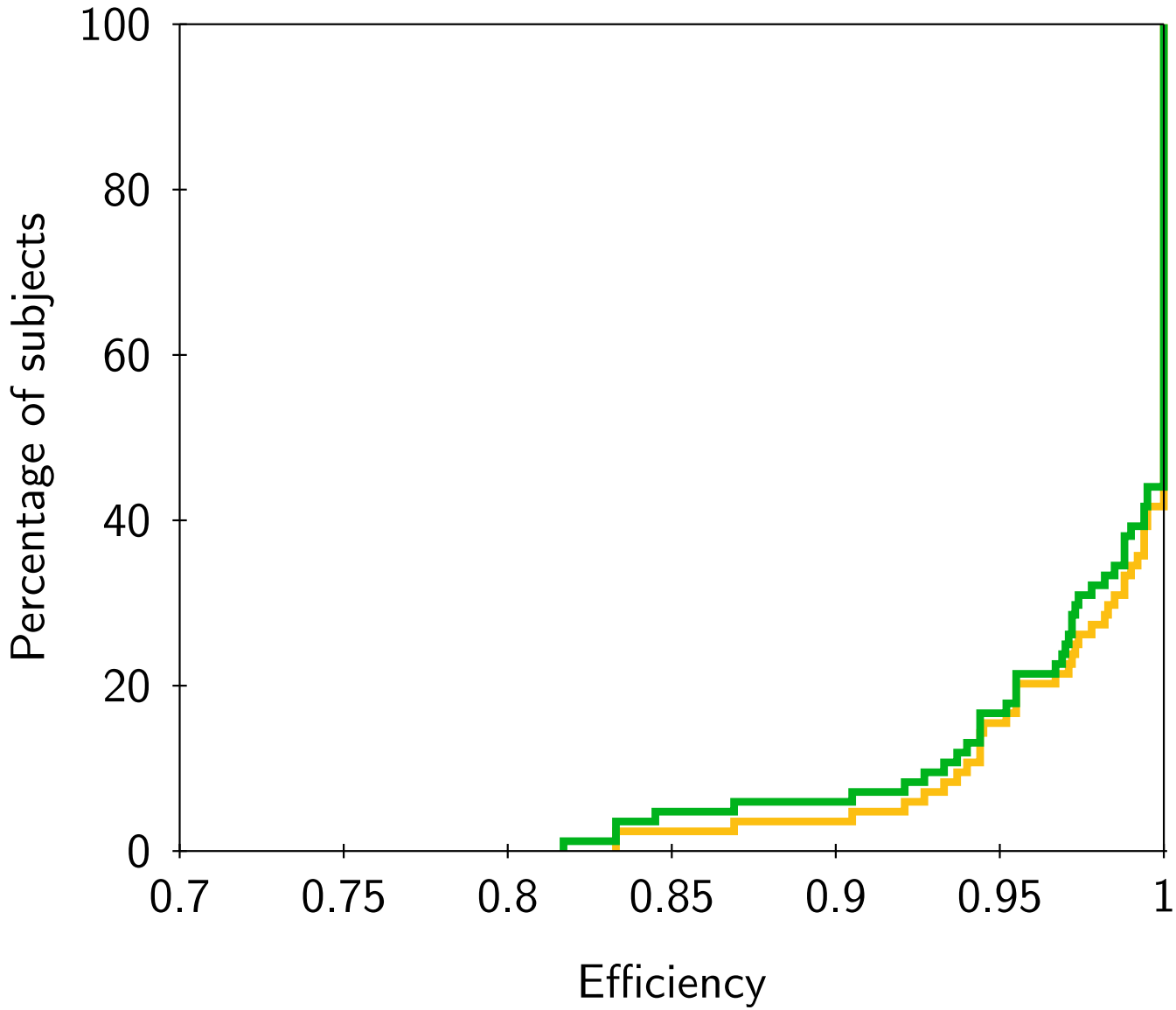
Testing hypothesis 2



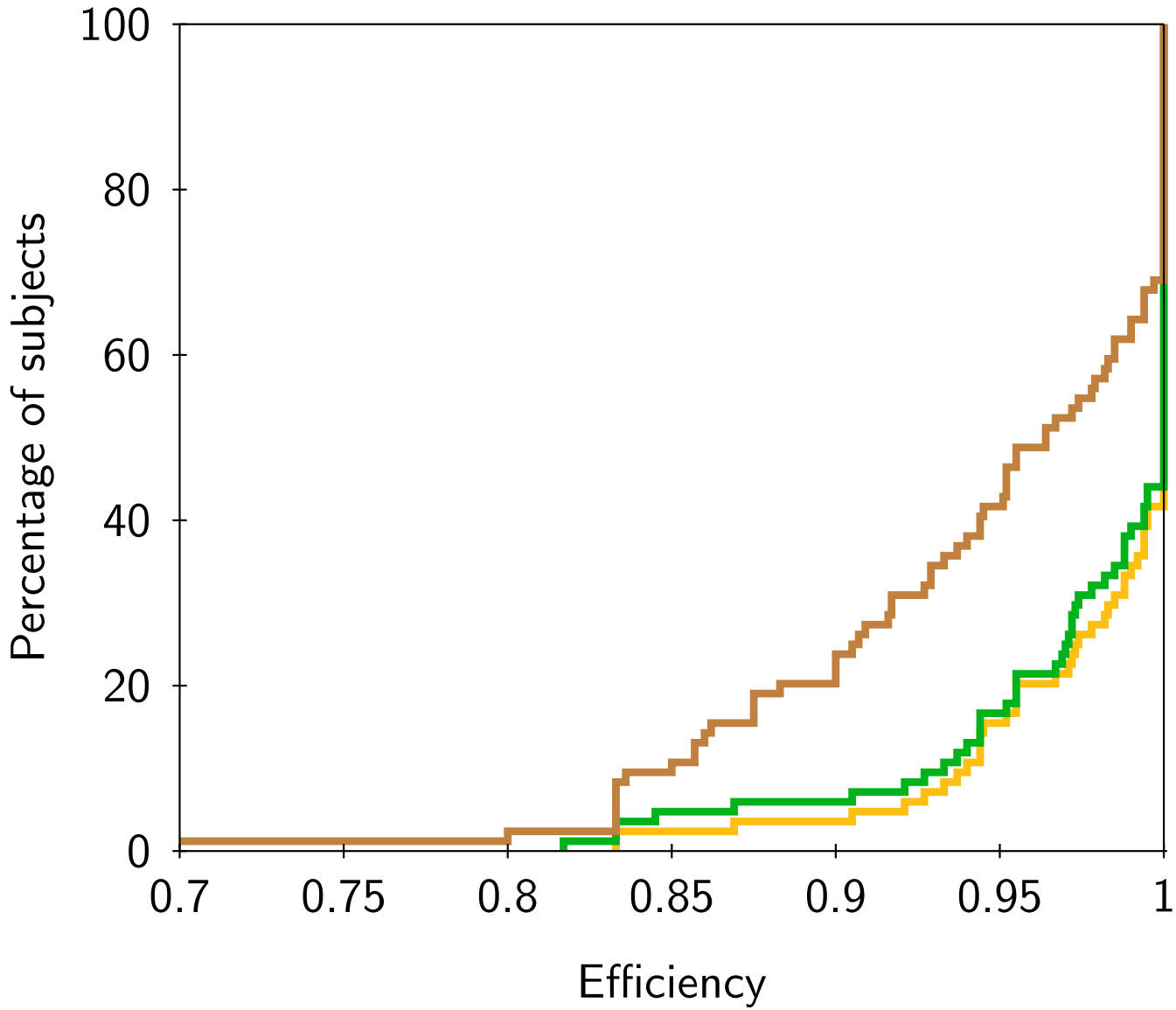
Revealed preference analysis II



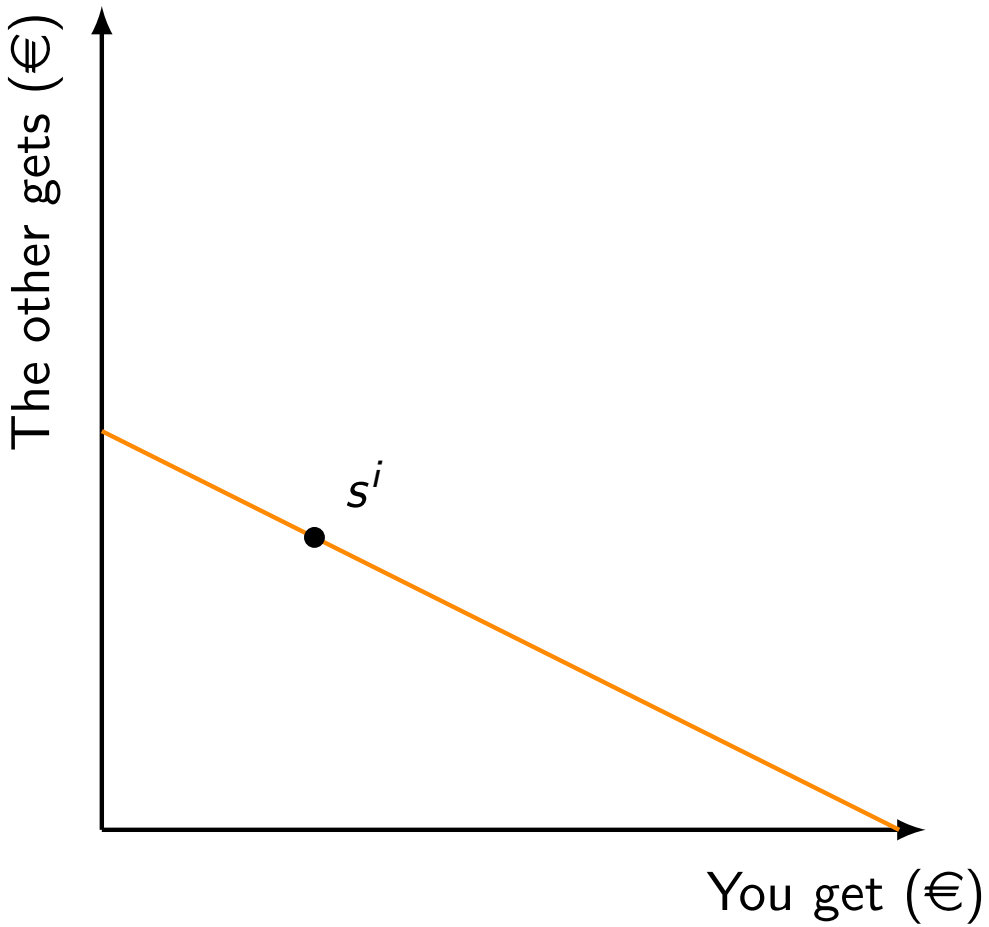
Revealed preference analysis II



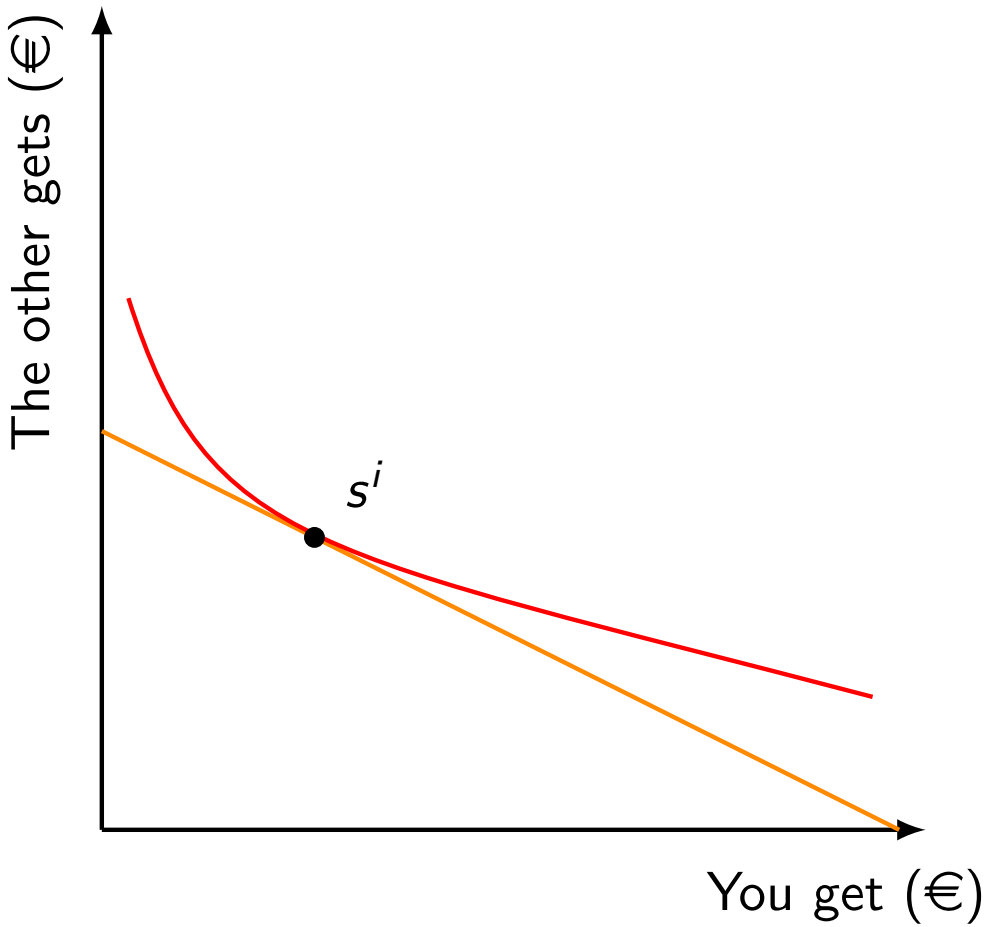
Revealed preference analysis II



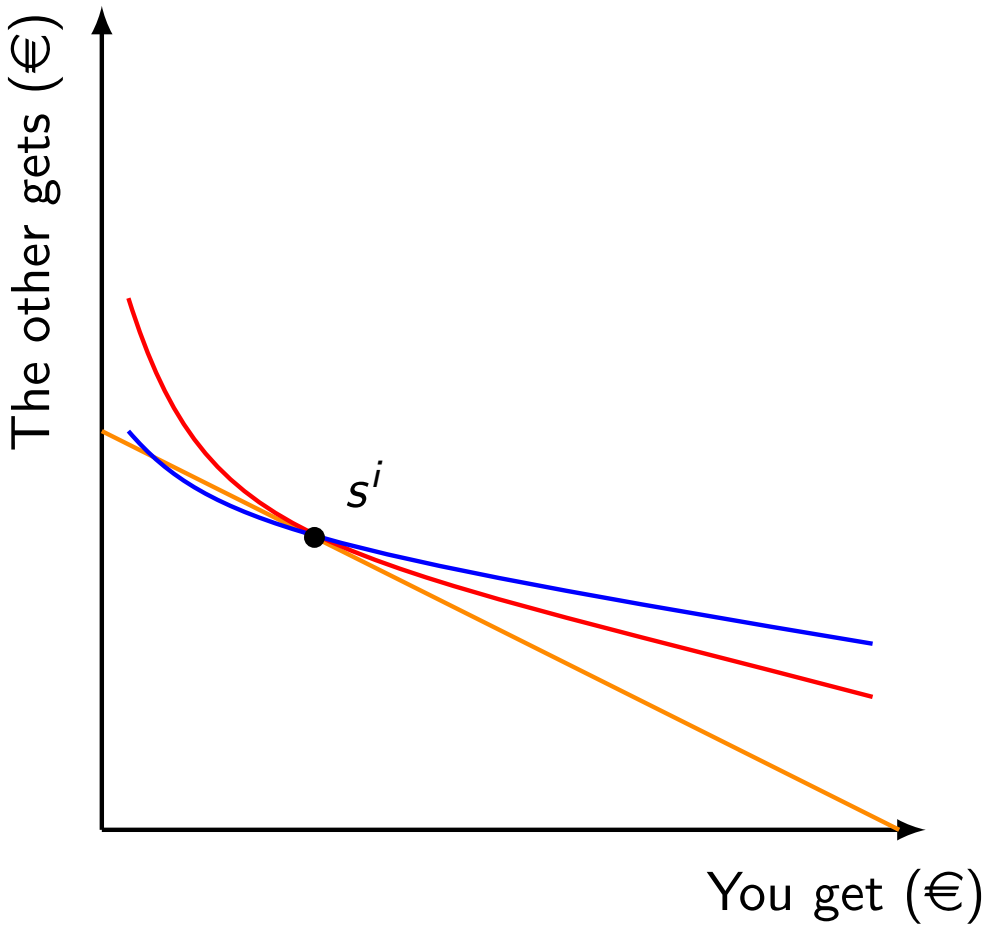
Agreement: essentially a single-crossing condition



Agreement: essentially a single-crossing condition



Agreement: essentially a single-crossing condition

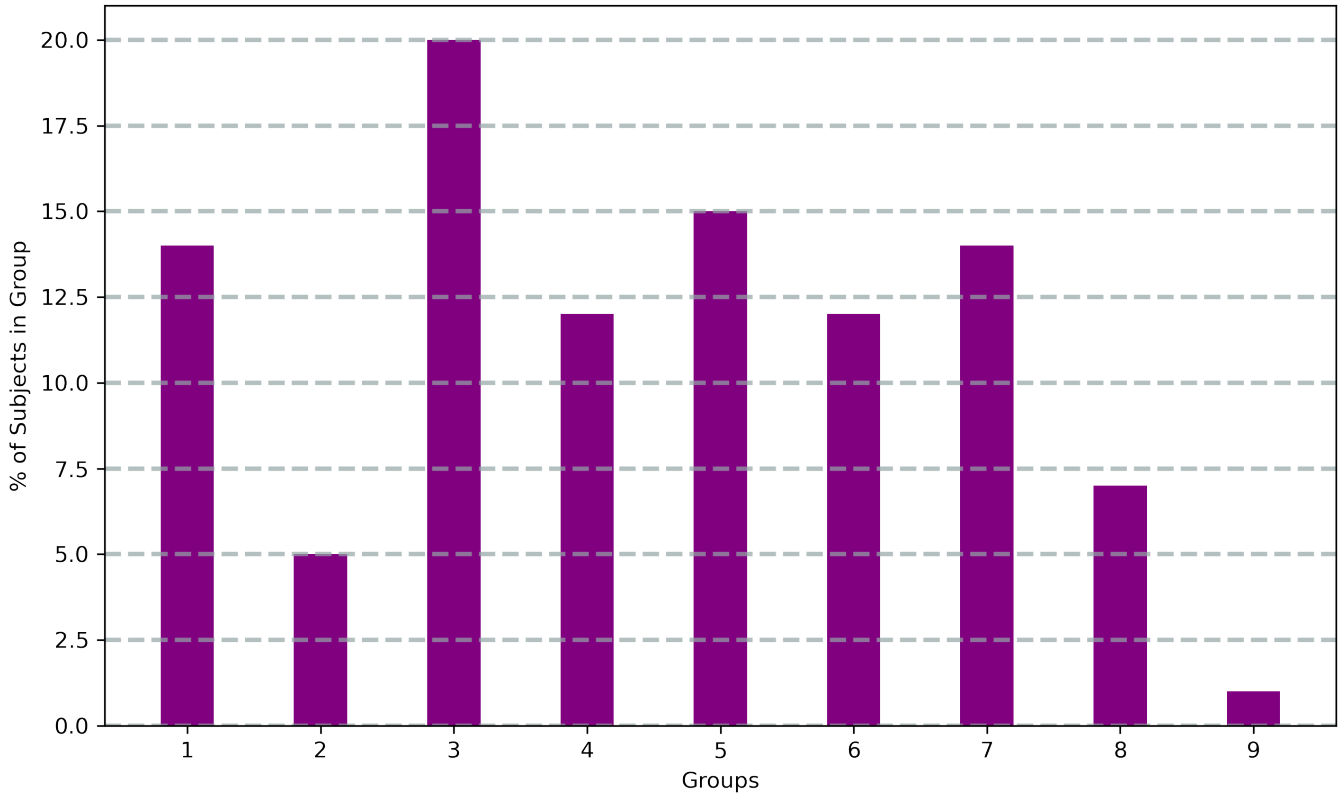


Beyond reciprocity

- A set of utilities satisfy single-crossing condition: deviation from stable preferences.
- Heterogeneity of preferences: same person in difference contexts and different people in same context
- Outcome set can be bundles not limited to money allocations.

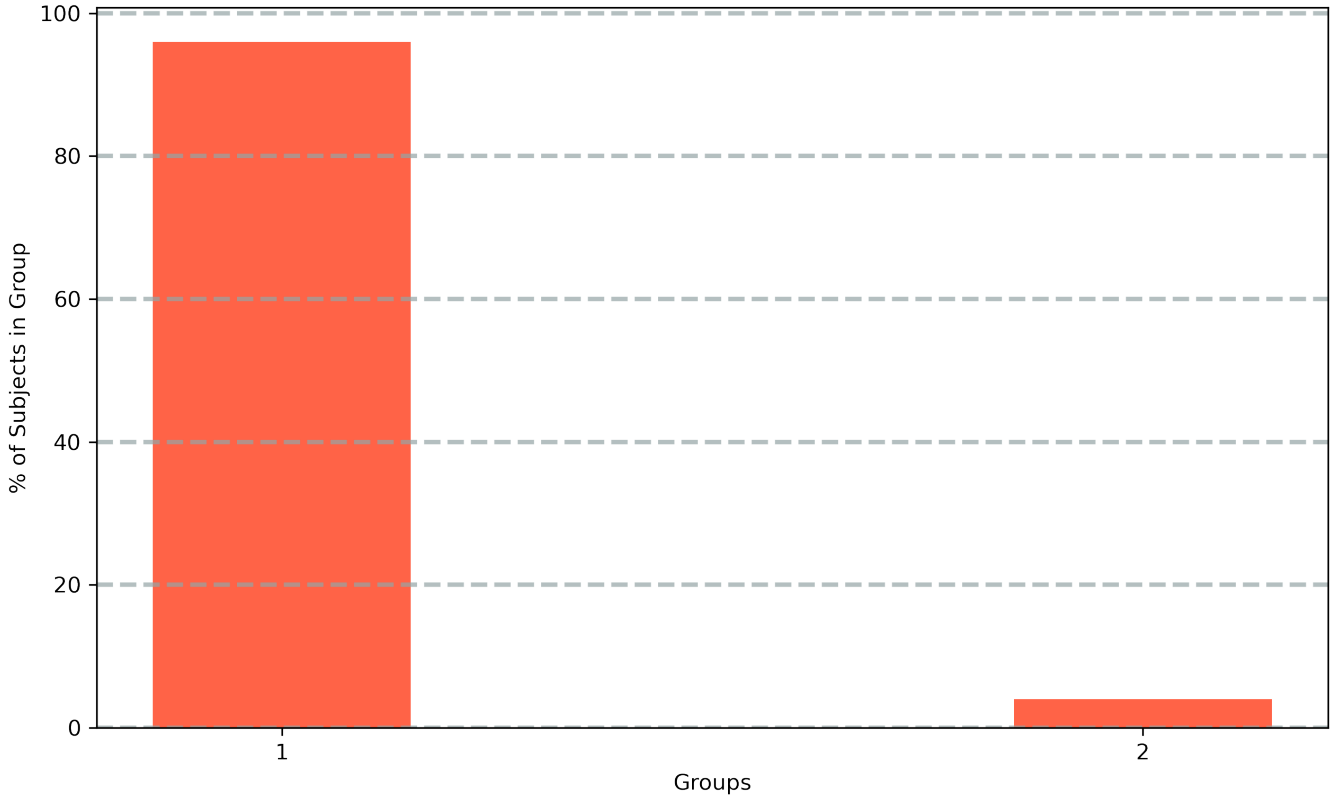
Beyond reciprocity: an example

Choices of subjects in context G grouped by GARP



Beyond reciprocity: an example

Choices of subjects in context G grouped by Agreement-GARP



Computational Problem I

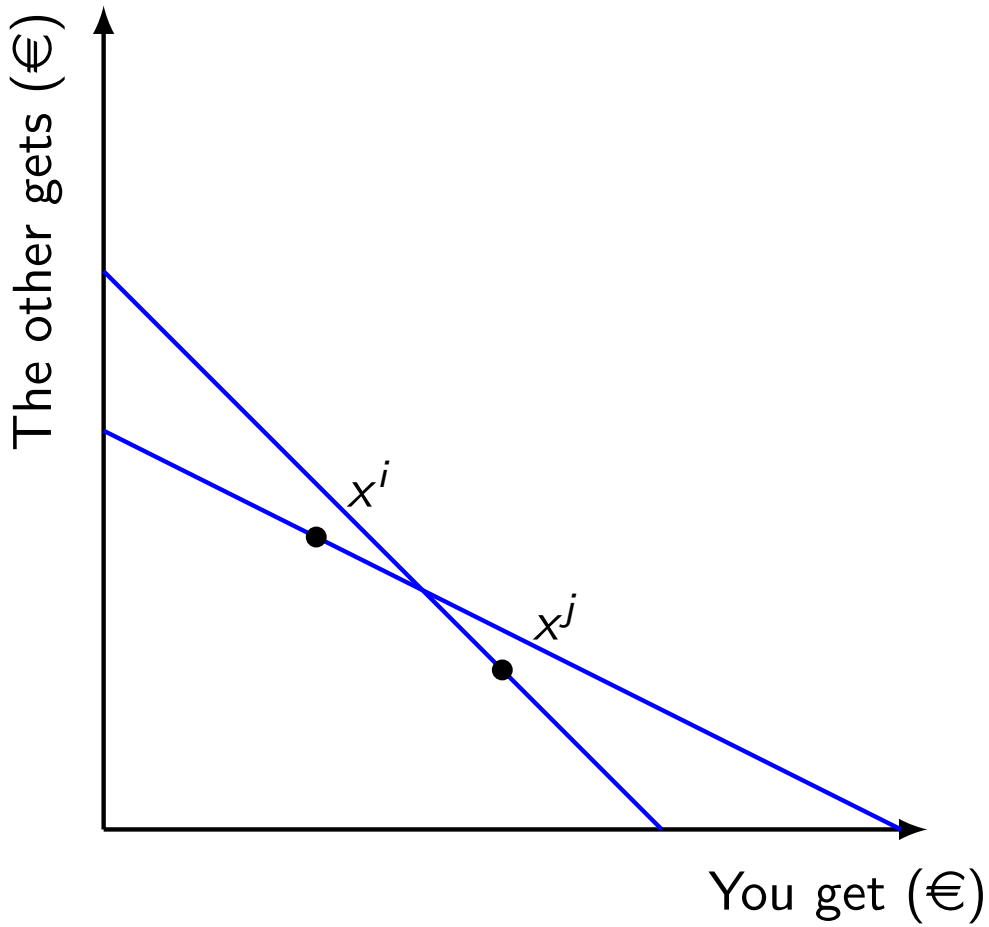
- Agreement is a partial order on the sets of choices
- N sets of choices $\{\Omega_i\}_{i=1}^{N}$ that satisfy GARP receptively.
- What is the minimal number of chain? (How many groups ?)

Computational Problem II

- Agreement is a partial order on a set of choices
- N choices
- What is the minimal number of groups ?

Thank you.

Efficiency



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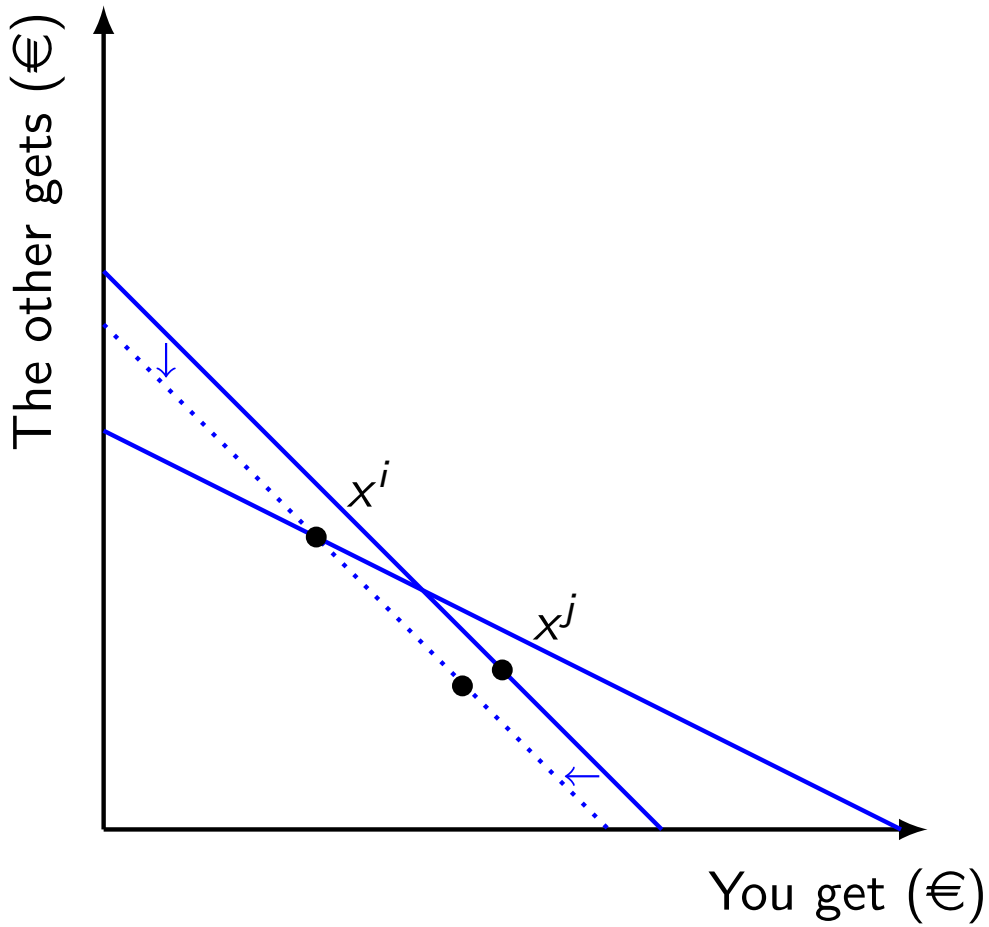
Efficiency



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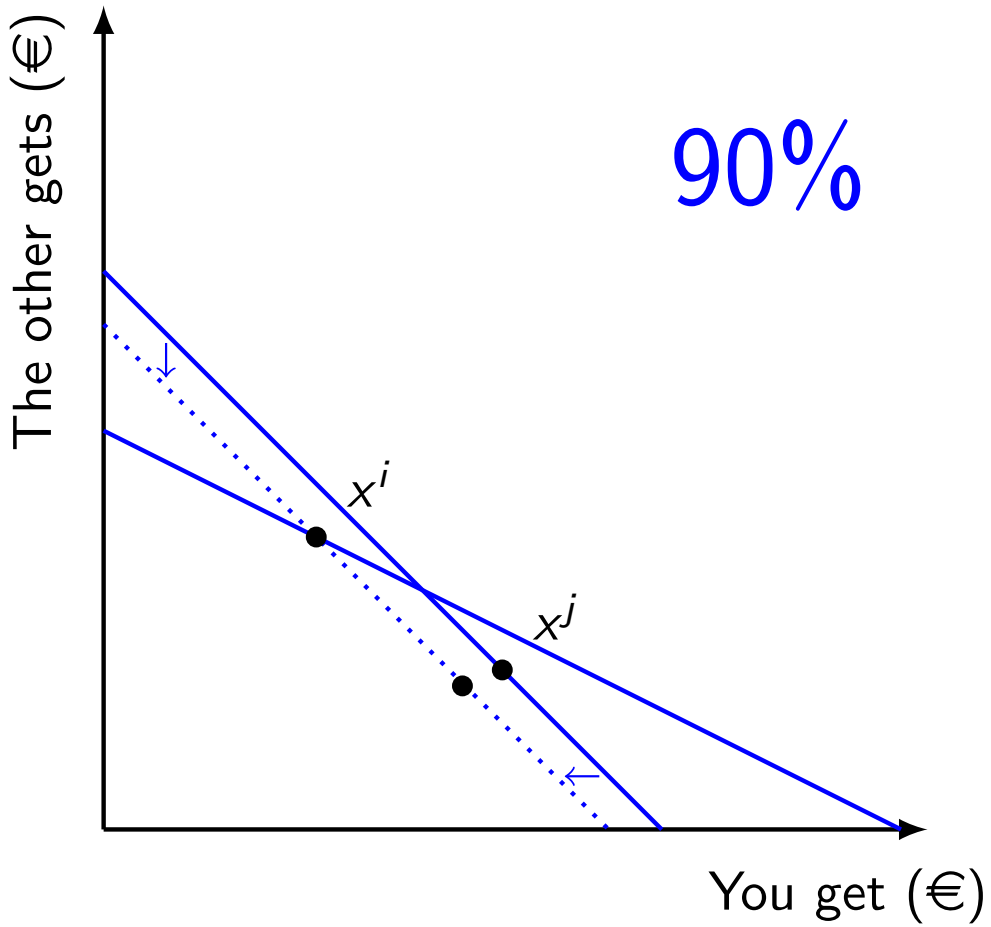
Efficiency



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