Consistency and conflicts among policy objectives: the school choice problem

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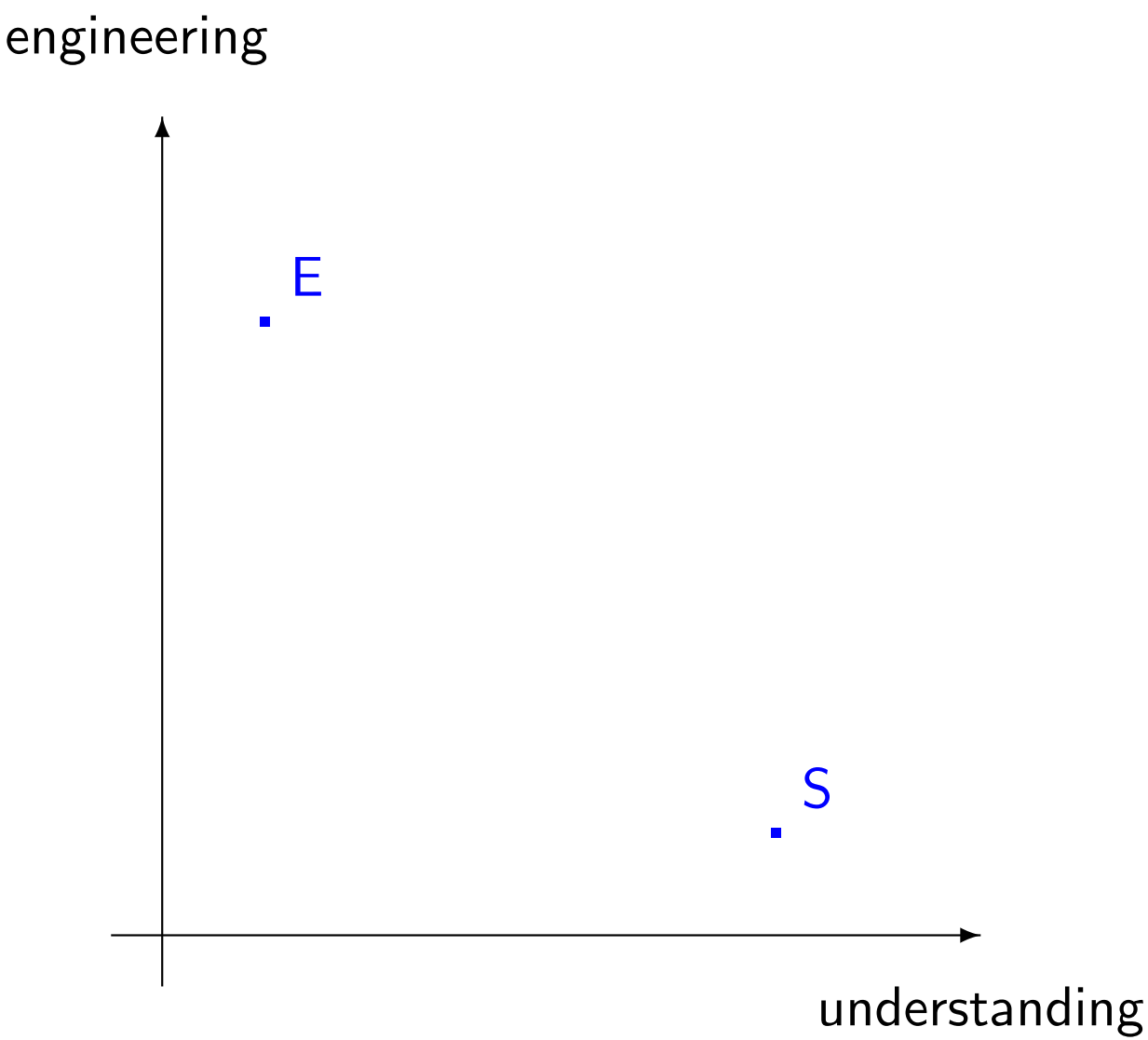
ECARES, Brussels, January 2009

Objectives:

1. E: the design of a fair schooling system: how?
2. state a couple of results (and a suggestion),
3. contrast this approach to sociologists' approach.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- E: cut the cake in pieces! For instance:
  1. how to allocate school seats when there are not enough?
  2. how many schools to build and where to locate them?
  3. why do regions, municipalities or neighbourhoods tend to be sociologically homogenous with the consequence of huge school differences across regions or neighbourhoods?
  4. how do public and private schools interact and what are the consequences on the quality of schools?
- Next: exemplify approach 1., and explain the cutting: The advantage of cutting in pieces comes from the fact that once the question at hand is sufficiently simple, formal tools can be used, which turns out to be necessary to reach practical recommendation.

How to allocate school seats when there are not enough?

Objective: find an assignment mechanism that satisfies normative properties:

- general properties for collective decision making (efficiency, ...),
- specific properties (drawn from public debates, ...)

Ingredients:

- students,
- schools,
- preferences of students over schools,
- preferences of schools over students,
- number of available seats in schools.
- example:

1	2	3	$A(1)$	$B(1)$	$C(1)$
A	C	A	2	1	$2,3$
B	B	B	$1,3$	$2,3$	1
C	A	C			

- What are school preferences?

- Property 1: Pareto efficiency (PE)

1	2	3	$A(1)$	$B(1)$	$C(1)$
A	C	A	2	1	$2,3$
B	B	B	$1,3$	$2,3$	1
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- Property 1: Pareto efficiency (PE)

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Towards property 2: *Assume two students have the same preferences and only one seat is available: who should get it?*

Three possible answers:

- the student who deserves it most;
- assign the seat to one student and ask her to monetary compensate the student who do not receive the seat;
- use lottery to allocate the seat, that is, give students an equal probability of getting it.

Last answer $\Rightarrow$ there will be "envy".

- Property 2: No Justified Envy (NJE)
- No student should envy a student who is assigned to a school where the former one has a higher priority.
- Equivalent to Stability.
- There are solutions: can they be implemented?

- Property 3: Strategy-Proofness (SP) (also called Non Manipulability)
- All students should have an interest in announcing their preferences truthfully; or, no student should be able to gain (that is, be assigned a school she prefers) by misreporting her preferences.
- Information one has about others' preferences is irrelevant.
- Result 1: no assignment mechanism satisfies Pareto Efficiency, No Justified Envy and Strategy-Proofness.
- Interpretation: a political choice: drop (at least) one.

- Result 2: There exist mechanisms satisfying Pareto Efficiency and Strategy-Proofness.
- An example: the Top Trading Cycles Mechanism (Abdulkadiroglu Sonmez 2003):
- first, school determine their priorities using lotteries;
- second, students report their preferences;
- third, students who have the highest priorities are allowed to trade the schools for which they have the highest priorities in case all of them gain from trading;
- fourth, once these students are removed, it proceeds in a similar way with the students who have the highest priorities among those who remain, etc.

- Example:

1	2	3	$A(1)$	$B(1)$	$C(1)$
A	C	A	2	1	$2,3$
B	B	B	$1,3$	$2,3$	1
C	A	C			

- Break ties, using lotteries:

1	2	3	$A(1)$	$B(1)$	$C(1)$
A	C	A	2	1	3
B	B	B	1	3	2
C	A	C	3	2	1

- All agents point their preferred match: 1A2C3A; there is a cycle, A2C3A: agents 2 and 3 exchange their priorities in A and C; then 1 is assigned to B:

1	2	3	$A(1)$	$B(1)$	$C(1)$
A	C	A	2	1	3
B	B	B	1	3	2
C	A	C	3	2	1

E: the ultimate variable = the level of satisfaction of students' preferences (individualistic); + a centralised mechanism

A solution to the current situation in FCB:

- consider that the mechanism that has been used up to now was a way to assign priorities to schools;
- allow students to exchange their priority rights according to the TTCM!

This mechanism

- leads to an efficient assignment,
- is strategy-proof,
- guarantees to each student to be assigned to a school that she (weakly) prefers to the one she is assigned to, now.

Conclusion:

- economists simplify the questions so as to make it fit the way agents themselves raise them and so as to be able to apply formal tools;
- normative properties;
- either impossibilities or mechanisms.