RATIONALIZING MISTAKES IN SCHOOL CHOICE MECHANISMS

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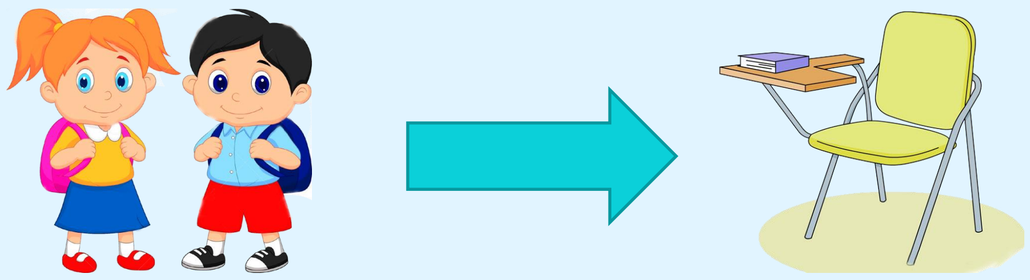
Introduction

A school choice mechanism consists in a process through which every year new students are assigned to the available seats in public schools.



- It is not always possible to assign all students to their top choice.
- Different mechanisms have been studied to increase efficiency.
- The Boston Mechanism (BM) is the most popular student-placement mechanism in school-choice programs around the world.

Aims

- To analyze the data from Sabadell school choice in 2016 and compare it with previous empirical studies.
- Understanding the behavior of parents when choosing schools for their children, and rationalizing their mistakes in a specific scenario.

Data

- The data concerning the admission process for seats in P3 for the academic year 2016-17 in the schools of Sabadell .
- The data come from the "Departament d'Ensenyament de la Generalitat de Catalunya". Extra data provided by the "Secció del Cadastre de l'Ajuntament de Sabadell" were used for the analysis.

The Boston Mechanism

It was used in Boston until 2005, and is the one used in the Catalan municipalities. Its distinctive trait is that, from the preferences of the parents, the 1st options are considered in the 1st round, the 2nd options in the 2nd round and so forth. This makes the decision of what school to list in 1st option very important, as it may imply the loss of place in a school where we have a higher priority than someone else because they have listed it in a higher position.

The mechanism is not strategy-proof, which means that parents have incentives to not reveal their real preferences, but to list what they believe will maximize their probability of entering in a particular school. In order to gain by manipulating the ranking, it is necessary to know how the process works, creating a gap between sophisticated and sincere parents. However, the BM enables us to observe how much parents prefer one school over the others, making the tie-breaking more efficient.

The model

With the data provided, a model was constructed and analyzed using a Probit with Instrumental Variables due to the presence of an endogeneity.

Mistakes

Of three different types:

1. Rank an over-demanded school.
2. List very few schools.
3. Rank a school in which they have less priority than needed to enter.

The probability of making at least one of these mistakes was used as the dependent variable.

Dependent variables

The variables constructed and used in the model were:

- **Dist_worst:** distance in minutes from the address to the worst-case scenario (i.e. the school listed by the student as their last option).
- **Wealth**: average price in €/m^2 of the cadastral island where the address is located (proxy for sophistication of the parents).
- **Pop1415_worst:** average popularity between the years 2014-2015 for the school listed as their worst-case scenario (proxy for quality of worst-case school).
- **Points:** total points earned by the student in the general criteria for their top choice school (priority).

Results

Probit model with endogenous regressors
ML, using observations 1-1884
Dependent Variable: GeneralMistake
Instrumented: Pop1415_worst
Instruments: Const, Dist_worst, sq_Dist_worst, Wealth, Points, sq_Points, Pop1415_1

	Coefficient	Standard deviation	z	p-value	
Const	**-0.306395**	**0.167875**	**-1.825**	**0.0680**	*
Dist_worst	-0.00156112	0.00215299	-0.7251	0.4684	
sq_Dist_worst	2.46121e-06	8.84631e-06	0.2782	0.7808	
Wealth	-4.72352e-05	0.00030582	-0.1545	0.8773	
Points	**-0.616842**	**0.199432**	**-3.093**	**0.0020**	***
sq_Points	**0.309088**	**0.153214**	**2.017**	**0.0437**	**
Pop1415_worst	**1.82284**	**0.581883**	**3.133**	**0.0017**	***

Log-likelihood	-659.1800	Akaike criterion	1350.3599
Schwarz criterion	1439.0184	Hannan-Quinn	1383.0119
Conditional ll	-1217.8196	Cragg-Donald stat.	101.392

Overall test (Wald) = 17.1268 (6 df, p-value = 0.0088)
Endogeneity test (Wald) = 14.8633 (1 df, p-value = 0.0001)

Conclusions

- When the lowest level of utility that could be attained increases, so does the probability of committing a mistake, because the potential utility gain is reduced, rendering thinking of the best possible strategy not cost-effective. This idea is consistent with the results found in the model in relation with the popularity (quality) of the worst school. Same conclusions should be obtained from the distance variable, although it does not have any effect on this model.
- The cost of strategizing varies for every family. For more resourceful families, it is easier to strategize. However, our model shows that this does not affect the possibility of committing a mistake either.
- The variable points measure the uncertainty of the utility obtained by playing a particular strategy. If they increase, the information needed decreases, and hence the probability of entering the top choice increases, rendering thinking of the best possible strategy not cost-effective. This is opposed to what was found in the model, since when the variable points increase, the probability of committing a mistake decreases. This could occur because parents who earn a considerable amount of points list only one option, and hence do not make the mistake.
- More sophisticated decision theory models could be presented in the future.

Selected references

- Abdulkadiroğlu, Pathak, Roth and Sönmez (2006) "Changing the Boston School Choice Mechanism". *NBER WP.*
- Abdulkadiroğlu and Sönmez (2003) "School Choice: A Mechanism Design Approach". *American Economic Review*
- Pathak and Sönmez, (2008) "Leveling the Playing Field: Sincere and Sophisticated Players in the Boston Mechanism". *American Economic Review*.