discussion of
Agarwal and Somaini

Phil Haile
Yale University

September 26, 2014
Summary

- right approach to an important topic
  - active area of market design in practice affecting millions of students/families
  - details essential to good design
  - some dogma, some casual empiricism by theorists, but virtually no guidance from careful empirical work

- tour de force
  1. approximation results (limit game as $\epsilon$-eqm)
  2. novel nonparametric identification
  3. practical estimation approach
  4. careful empirical work on positive and normative questions.
The need in some mechanisms to strategize rather than merely reporting truthfully is often viewed as bad: difficult for anyone to strategies correctly and unfair to less sophisticated families. This has led to much attention to strategy-proofness, in particular Gale-Shapley “deferred acceptance.”

But DA allocates based only on *ordinal preferences*. In simple examples not too far from reality, equivalent to purely random admissions! Accounting for intensity of preferences can sometimes improve allocations substantially. Boston Mechanism or others that allow students to express *preferences over lotteries* (i.e., cardinal preferences) accomplish this (Abdulkadiroglu, Che and Yasuda, 2011). In practice, welfare ranking dependent on details.
Identification: Mapping Choices to Preferences

- setting has elements of discrete choice: student choice among finite set of possible rankings (lotteries)

Identification argument uses ideas from both random utility discrete choice and auctions, but also some novel and beautiful arguments. (Not that easy to discern in current draft, but stay tuned!)
Identification: Mapping Choices to Preferences

- setting has elements of discrete choice: student choice among finite set of possible rankings (lotteries)
- but have extra structure: preferences over (many) lotteries based on
  - preferences over (fewer) schools
  - equilibrium admissions probabilities
- equilibrium admission probabilities are “observables” that players optimize against—more like auctions
Identification: Mapping Choices to Preferences

- setting has elements of discrete choice: student choice among finite set of possible rankings (lotteries)
- but have extra structure: preferences over (many) lotteries based on
  - preferences over (fewer) schools
  - equilibrium admissions probabilities
- equilibrium admission probabilities are “observables” that players optimize against—more like auctions

Identification argument uses ideas from both random utility discrete choice and auctions, but also some novel and beautiful arguments. (Not that easy to discern in current draft, but stay tuned!)
Three Comments
1. Limit Game as an Approximation

Authors approximate the \( n \)-player game using game with continuum of players. In many applications this would assume away important and interesting strategic issues (e.g., oligopoly, auctions). Here I suspect it is ok but I am not sure...
1. Limit Game as an Approximation

Authors approximate the $n$-player game using game with continuum of players. In many applications this would assume away important and interesting strategic issues (e.g., oligopoly, auctions). Here I suspect it is ok but I am not sure...

A possible alternative: assume players play the $n$-player game but view preferences as drawn from a distribution, just as the econometrician does (more like Hortaçsu’s treatment of auctions)

- if nothing goes wrong, seems better since no fudging the game
- if something does go wrong—e.g., for finite $n$ there are strategic considerations that don’t vanish as $n$ grows—what does this say about the limit-game approximation?

Put differently, how is it that the approximation is both necessary and harmless?
2. Location, Location, Location?
Distance as exogenous variation in choice sets

Are home locations independent of preferences?

- plausible that housing location “exogenous enough” wrt preferences over some goods—e.g., hospitals, retailers; but schools may be a primary reason for choosing a housing location
2. Location, Location, Location?
Distance as exogenous variation in choice sets

Are home locations independent of preferences?

- plausible that housing location “exogenous enough” wrt preferences over some goods—e.g., hospitals, retailers; but schools may be a primary reason for choosing a housing location
- exogeneity of location *within a priority zone* is more plausible: focusing on this would eliminates exactly the RD variation but allow the rest
- possible robustness analysis: re-estimate using only within-zone variation in distance and/or allowing preferences to differ by zone.
3. Sophistication and Modeling

“Discrete Choice vs. Auctions”

- in discrete choice models, “preference shocks” can actually be device for introducing optimization error (old idea, occasionally remembered or rediscovered)
- this might be attractive here:
  - soften assumption that students/parents understand and optimize perfectly in (for them) a one-time game
  - explain choices that, strictly speaking, reject the current model
- current approach is more like auction modeling
  - random shocks are to “valuations” for each school which are multiplied by probabilities to get expected value of each lottery; no additional shocks to value of lottery.
3. Sophistication and Modeling

Is there a way to proceed using a model with shocks to the expected utility for each lottery?

\[ u_{i\ell} = \sum_j \rho_{ij\ell} v_{ij} + \epsilon_{i\ell} \]

where \( \rho_{ij\ell} \) is the admission probability at school \( j \) under lottery \( \ell \), \( v_{ij} \) is the random utility for school \( j \) (e.g., as in current version), and \( \epsilon_{i\ell} \) is a lottery-specific shock.

Here \( v_{ij} \) looks like a random coefficient on the student-lottery characteristics \( \rho_{ij\ell} \). The authors have a structure in mind for the joint distribution of \( (v_{i1}, \ldots, v_{iJ}) \) but otherwise this looks like fairly standard random coefficients discrete choice model (??)
Conclusion

This is a great project that combines some extremely creative theoretical work with serious empirical work on a question of wide interest to economists and policy makers.

There is really two important papers’ worth of material here already.

I look forward to reading the next versions.