

## Reading list on modeling issues in mechanism design

Gabriel Carroll, [gdc@stanford.edu](mailto:gdc@stanford.edu)

Version: March 20, 2016

This is a list of papers on robustness and modeling issues in mechanism design, intended to help students and others get an overview of the questions that have been studied in this area and the findings so far. Enough people have asked for reading suggestions that I have decided to make this list public. It makes no claim to be exhaustive, and while it touches on some related topics, it omits others, such as mechanism design for agents with specific but “non-standard” preferences.

This list presumes familiarity with contract theory and mechanism design, including basics of implementation theory, at the level of a typical second-year PhD course in North America. In a few cases, papers on this list depend for context on earlier work that might not be part of such a course; I have listed the relevant background papers.

# 1 Maxmin optimality across uncertain environments

## 1.1 Uncertain preferences or technologies

- Frankel, “Aligned delegation,” *American Economic Review* 2014
- Garrett, “Robustness of simple menus of contracts in cost-based procurement,” *Games and Economic Behavior* 2014
  - Background: Laffont & Tirole, “Using cost observation to regulate firms,” *Journal of Political Economy* 1986, or Rogerson, “Simple menus of contracts in cost-based procurement and regulation,” *American Economic Review* 2003
- Bergemann & Schlag, “Pricing without priors,” *Journal of the European Economic Association* 2008
- Bergemann & Schlag, “Robust monopoly pricing,” *Journal of Economic Theory* 2011
- Carroll, “Robustness and linear Contracts,” *American Economic Review* 2015
- Carroll, “Robust incentives for information acquisition,” unpublished
- Carroll, “Robustness and separation in multidimensional screening,” unpublished

## 1.2 Uncertain higher-order beliefs

- Bergemann & Morris, “Robust mechanism design,” *Econometrica* 2005
- Chung & Ely, “Foundations of dominant-strategy mechanisms,” *Review of Economic Studies* 2007
- Bergemann & Morris, “An ascending auction for interdependent values,” *American Economic Review (Papers & Proceedings)* 2007
- Brooks, “Surveying and selling: belief and surplus extraction in auctions,” unpublished
- Chen, Micali, & Pass, “Tight revenue bounds with possibilistic beliefs and level- $k$  rationality,” *Econometrica* 2015

## 2 Approximately optimal mechanisms

- Segal, “Optimal pricing mechanisms with unknown demand,” *American Economic Review* 2003
- Chassang, “Calibrated incentive contracts,” *Econometrica* 2013
- Azar, Chen & Micali, “Crowdsourced Bayesian auctions,” *Innovations in Theoretical Computer Science* 2012
- Chawla, Hartline, Malec, & Sivan, “Multi-parameter mechanism design and sequential posted pricing,” *Symposium on the Theory of Computing* 2010
- Roughgarden, “Approximately optimal mechanism design: motivation, examples, and lessons learned,” *SIGEcom Exchanges* 2015 (survey paper)
- Babioff, Immorlica, Lucier, & Weinberg, “A simple and approximately optimal mechanism for an additive buyer,” *Foundations of Computer Science* 2014
  - Background: Hart & Nisan, “Approximate revenue maximization with multiple items,” unpublished
- Feldman, Gravin, & Lucier, “Combinatorial auctions via posted prices,” *Symposium on Discrete Algorithms* 2015

### 3 Local robustness

- Madarasz & Prat, “Sellers with misspecified models,” unpublished
- Carroll & Meng, “Locally robust contracts for moral hazard,” *Journal of Mathematical Economics* 2016
- Aghion, Fudenberg, Holden, Kunimoto, & Tercieux, “Subgame-perfect implementation under information perturbations,” *Quarterly Journal of Economics* 2012
- Chung & Ely, “Implementation with near-complete information,” *Econometrica* 2003
  - Background: Palfrey & Srivastava, “Nash implementation using undominated strategies,” *Econometrica* 1991

### 4 Alternative solution concepts

#### 4.1 Undominated or iteratively-undominated strategies

- Börgers, “Undominated strategies and coordination in normal-form games,” *Social Choice and Welfare* 1991
- Yamashita, “Implementation in weakly undominated strategies: Optimality of second-price auction and posted-price mechanism,” *Review of Economic Studies* 2015
  - Background: Hagerty & Rogerson, “Robust trading mechanisms,” *Journal of Economic Theory* 1987
- Babioff, Lavi, & Pavlov, “Single value combinatorial auctions and implementation in undominated strategies,” *Symposium on Discrete Algorithms* 2006
- Bergemann & Morris, “Robust implementation in direct mechanisms,” *Review of Economic Studies* 2009
- Börgers & Smith, “Robustly ranking mechanisms,” *American Economic Review (Papers & Proceedings)* 2012
- Börgers & Smith, “Robust mechanism design and dominant strategy voting rules,” *Theoretical Economics* 2012

- Chiesa, Micali & Zhu, “Mechanism design with approximate valuations,” *Innovations in Theoretical Computer Science* 2012

## 4.2 Evolutionary implementation

- Sandholm, “Negative externalities and evolutionary implementation,” *Review of Economic Studies* 2005
- Sandholm, “Pigouvian pricing and stochastic evolutionary implementation,” *Journal of Economic Theory* 2007
- Healy & Mathevet, “Designing stable mechanisms for economic environments,” *Theoretical Economics* 2012
- Cabrales, “Adaptive dynamics and the implementation problem with complete information,” *Journal of Economic Theory* 1999

## 4.3 Ease of strategic optimization

- Li, “Obviously strategy-proof mechanisms,” unpublished
- Brânzei & Procaccia, “Verifiably truthful mechanisms,” *Innovations in Theoretical Computer Science* 2015

# 5 Other related topics

## 5.1 Collusion-resilience

- Che & Kim, “Robustly collusion-proof implementation,” *Econometrica* 2006
- Laffont & Martimort, “Mechanism design with collusion and correlation,” *Econometrica* 2000
- Chen & Micali, “Collusive dominant-strategy truthfulness,” *Journal of Economic Theory* 2012
- Goldberg & Hartline, “Collusion-resistant mechanisms for single-parameter agents,” *Symposium on Discrete Algorithms* 2005

## 5.2 Communication demands of mechanisms

- Nisan & Segal, “The communication requirements of efficient allocations and supporting prices,” *Journal of Economic Theory* 2006
- Segal, “The communication requirements of social choice rules and supporting budget sets,” *Journal of Economic Theory* 2007
- Fadel & Segal, “The communication cost of selfishness,” *Journal of Economic Theory* 2009

## 5.3 Mechanism design with privacy concerns

- Izmalkov, Micali, & Lepinski, “Perfect implementation,” *Games and Economic Behavior* 2011
- Pai & Roth, “Privacy and mechanism design,” *SIGEcom Exchanges* 2013 (survey paper)