PSC 589: Social Choice, Bargaining, and Elections

University of Rochester

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Logistics

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Office Hours: Tuesday 1-3pm, Harkness 109D

Schedule: Tuesday 3:25-6:05pm, Harkness 112

Course Outline

The course covers models of elections and legislative bargaining, with a special focus on dynamics and incomplete information and the fundamental connections between the two modeling applications. We begin with background in social choice theory, which includes topics such as Arrow's theorem and the cycling theorems on majority voting and which is used in the later game-theoretic analyses. We then review the workhorse models of one-shot elections and policy making from the political economy literature. Then, after a brief review of abstract dynamic games, we extend the workhorse models to dynamic legislative bargaining (in which a status quo policy evolves endogenously over time) and repeated elections (in which politicians' choices or preferences are unobserved by voters). We end by considering computational tools in political economy. The course will consist of a mix of lectures, discussion, student presentation of assigned readings, and a proposal. Some of the analysis will require relatively advanced mathematics, but background will be provided as needed. Duggan's math survey, which is terse but hopefully efficient, provides the tools needed for the course, and then some; and the real math books cited in the survey of course offer a much deeper education in mathematics.

General Readings:

J. Duggan, 2012. *Basic Concepts in Mathematical Analysis: A Tourist Brochure.*

P. R. Halmos, 1970. *How to write mathematics*, L'Enseignement Mathématique, Vol.16, Zürich.

W. Thomson, 1999. *The Young Person's Guide to Writing Economic Theory*, Journal of Economic Literature, **36**, 157-183.

I. Social Choice

We cover basics of relations, preference, and choice. We then move to preference aggregation, with a focus on simple voting rules, and we review impossibility theorems of Arrow, Gibbard, and Nakamura. The majority top cycle and uncovered set are defined. Possibility results for value restriction will be proven and applied to models with single-peaked preferences and to voting over lotteries. We also survey results on majority cycling in the multidimensional spatial model.

Readings:

J. Duggan, 2013. *Abbreviated Notes on Social Choice.*

J. Duggan, 2013. *Theoretical Foundations of Political Economy,* Part 2, Chapters 1–6 (except 3).

J. Duggan, 2013. *Majority Voting Over Lotteries: Conditions for Existence of a Decisive Voter.*

J. Duggan and M. Fey, 2013. *Analytical Methods in Political Economy,* Chapters 17–20.

II. One-shot Elections and Bargaining

We cover Downsian models of elections under different assumptions on the objectives and information of the candidates, and we consider the effects of special interest groups. We focus particularly on existence and characterization of equilibrium outcomes. Next, we consider the problem of an agenda setter who can make a take it or leave it offer to a set of legislators with a fixed status quo, and then we endogenize the status quo by allowing an additional round of proposals following the rejection of any proposal. We also offer an interpretation of the take it or leave it offer game in terms of sequential move Downsian elections.

Readings:

J. Duggan, 2012. *A Survey of Equilibrium Analysis in Spatial Models of Elections.*

J. Duggan and J. Banks, 2006. *Probabilistic Voting in the Spatial Model of Elections: The Theory of O ce-Motivated Candidates,* in Social Choice and Strategic Decisions: Essays in Honor of Je rey S. Banks, D. Austen-Smith and J. Duggan, eds., New York: Springer.

J. Duggan and M. Jackson, 2006. *Mixed Strategy Equilibrium and Deep Covering in Multi-dimensional Electoral Competition.*

K. Roberts, 1977. "Voting over Income Tax Schedules," Journal of Public Economics, 8: 329–340.

A. Meltzer and S. Richard, 1981. "A Rational Theory of the Size of Government," Journal of Political Economy, 89: 914–927.

O. Carbonell-Nicolau and E. Ok, 2007. "Voting over Income Taxation," Journal of Economic Theory, 134: 249–286.

G. Grossman and E. Helpman, 1996. "Electoral Competition and Special Interest Politics," Review of Economic Studies, 63: 265–286.

A. Dixit, G. Grossman, and E. Helpman, 1997. "Common Agency and Coordination: General Theory and Application to Government Policy Making," Journal of Political Economy, 105: 752–769.

A. Rubinstein, 1982. "Perfect equilibrium in a bargaining model," Econometrica, 50: 97–109.

D. Baron and J. Ferejohn, 1989. "Bargaining in Legislatures," American Political Science Review,83: 1181–1206.

D. Ray and R. Vohra, 1999. A Theory of Endogenous Coalition Structures," Games and Economic Behavior, 26: 286–336.

J. Banks and J. Duggan, 2000. "A Bargaining Model of Collective Choice," American Political Science Review, 94: 73–88.

J. Banks and J. Duggan, 2006. "A General Bargaining Model of Legislative Policy-making," Quarterly Journal of Political Science, 1: 49–85.

S.-J. Cho and J. Duggan, 2009. "Bargaining Foundations of the Median Voter Theorem," Journal of Economic Theory, 144: 851–868.

D. Cardona and C. Ponsati, 2011. "Uniqueness of Stationary Equilibria in Bargaining One-dimensional Policies under (Super) Majority Rules," Games and Economic Behavior, 73: 65–75.

H. Eraslan and A. McLennan, 2013. "Uniqueness of stationary equilibrium payoffs in coalitional bargaining," Journal of Economic Theory, 148: 2195–2222.

J. F. Nash, 1950. "The bargaining problem," Econometrica, 18: 155–162.

III. Discounted Stochastic Games

We introduce the standard framework for analysis of dynamic interaction with a focus on existence of stationary Markov perfect equilibrium. We prove existence in games with finite sets of states and actions, and we consider difficulties that arise in games with general state and action spaces, illustrated with counterexamples from the literature. The main approaches to the existence problem will be surveyed, with special attention to the addition of noise to the model.

Readings:

P. Dutta and R. Sundaram, 1998. "The Equilibrium Existence Problem in General Markovian Games," in Mukul Majumdar, ed., Organizations with Incomplete Information: Essays in Economic Analysis, A Tribute to Roy Radner, Cambridge.

A. Nowak and T. Raghavan, 1992. "Existence of Stationary Correlated Equilibria with Symmetric Information for Discounted Games," Mathematics of Operations Research, 17: 519–526.

J. Duggan, 2011. "Noisy Stochastic Games," Econometrica, 80: 2017–2045.

Y. Levy, 2013. "Discounted Stochastic Games With No Stationary Nash Equilibrium: Two Examples," Econometrica, 81: 1973–2007.

Y. Levy and A. McLennan, 2015. "Corrigendum to "Discounted Stochastic Games With No Stationary Nash Equilibrium: Two Examples,"" Econometrica, 83: 1237–1253.

E. B. Dynkin and I. V. Evstigneev, 1977. "Regular Conditional Expectations of Correspondences," Theory of Probability and its Applications, 21: 325–338.

M.A. Khan, K. P. Rath, Y. N. Sun, 2006. "The DvoretzkyWaldWolfowitz theorem and purification in atomless finite-action games," International Journal of Game Theory, 34: 91–104.

W. He and Y. Sun, 2015. "Stationary Markov Perfect Equilibria in Discounted Stochastic Games."

VI. Dynamic Bargaining with Moving Status Quo

We return to the topic of bargaining, now with the addition of an endogenously evolving state variable. This complicates the strategic calculations of politicians (or other agents), and it raises difficulties for existence and characterization of equilibria. In addition to a small amount of work at the general level, we will review several applied papers that take a constructive approach to the analysis of a particular equilibrium selection. Of note is an interpretation of alternating move bargaining with a class of dynamic election models stemming from work of Kramer.

Readings:

J. Duggan and T. Kalandrakis, 2011. "Dynamic Legislative Policy Making" Journal of Economic Theory, 147: 1653–1688.

J. Duggan, 2011. "Coalitional Bargaining Equilibria."

T. Kalandrakis, 2004. "A Three-Player Dynamic Majoritarian Bargaining Game," Journal of Economic Theory, 116: 294–322.

T. Kalandrakis, 2009. "Minimum Winning Coalitions with Endogenous Status Quo," International Journal of Game Theory, 39: 617–643.

M. Battaglini and S. Coate, 2007. "Ine ciency in Legislative Policy- making: A Dynamic Analysis," American Economic Review, 97: 118–149.

M. Battaglini and S. Coate, 2008. "A Dynamic Theory of Public Spending, Tax.ation, and Debt," American Economic Review, 98: 201–236

P. Klein, P. Krusell, and J. Rios-Rull, 2008. "Time-Consistent Public Policy," Review of Economic Studies, 75: 789–808.

R. Laguno, 2009. "The Dynamic Reform of Political Institutions," Games and Economic Behavior, 67: 569–583.

J. Bai and R. Laguno, 2011. "On the Faustian Dynamics of Policy and Political Power," Review of Economic Studies, 78: 17–48.

D. Acemoglu, G. Egorov, and K. Sonin, 2012. "Dynamics and Stability of Constitutions, Coalitions, and Clubs."

S. Nunnari and J. Zapal, 2013. "Dynamic Policy Competition, Ideological Polarization, and the Value of Veto Rights."

T. R. Bowen, Y. Chen, and H. Eraslan, 2014. "Mandatory versus discretionary spending: The status quo effect," The American Economic Review, 104: 294–2974.

G. Kramer, 1977. "A Dynamical Model of Political Equilibrium," Journal of Economic Theory, 16: 310–334.

J.-G. Forand, 2010. "Two-party Competition with Persistent Policies."

V. Dynamic Elections with Incomplete Information

We consider models of dynamic elections in which the voters' choice of representative is characterized by moral hazard, adverse selection, or both. Of special interest are existence of equilibria that are stationary, in an appropriate sense, and the incentives of politicians to respond, in equilibrium, to the preferences of the median voter. At a technical level, we note similarities between moral hazard models and Downsian electoral competition with policy motivated candidates, and we exploit a useful isomorphism between adverse selection models and the Baron-Ferejohn model of bargaining.

Readings:

R. Barro, 1973. "The Control of Politicians: An Economic Model," Public Choice, 14: 19–42.

A. Alesina, 1988. "Credibility and Policy Convergence in a Two-party System with Rational Voters," American Economic Review, 78: 796–803.

J.-G. Forand, 2010. "Two-party Competition with Persistent Policies."

J. Duggan, 2000. "Repeated Elections with Asymmetric Information," Economics and Politics, 12: 109–136.

J. Banks and J. Duggan, 2008. "A Dynamic Model of Democratic Elections in Multidimensional Policy Spaces," Quarterly Journal of Political Science, 3: 269–299.

D. Bernhardt, L. Campuzano, and F. Squintani, 2009. "On the Benefits of Party Competition,"Games and Economic Behavior, 66: 685–707.

D. Bernhardt, O. Camera, and F. Squintani, 2011. "Competence and Ideology," Review of Economic Studies, 78: 487–522.

O. Camera, 2012. "Economic Policies of Heterogeneous Politicians."

J. Ferejohn, 1986. "Incumbent Performance and Electoral Control," Public Choice, 50: 5–25.

J. Banks and R. Sundaram, 1993. "Moral Hazard and Adverse Selection in a Model of Repeated Elections," in Political Economy: Institutions, Information, Competition, and Representation, eds W. Barnett et al., New York: Cambridge University Press.

J. Banks and R. Sundaram, 1998. "Optimal Retention in Agency Problems," Journal of Economic Theory, 82: 293–323.

VI. Computational Social Choice

We end by considering computational tools in social choice which adds an algorithmic perspective to the formal approach of social choice theory.

Readings:

Y. Chevaleyre, U. Endriss, J. Lang, and N. Maudet, 2007 (January). "A short introduction to computational social choice," in International Conference on Current Trends in Theory and Practice of Computer Science, Springer Berlin Heidelberg, 51–69.

F. Brandt, V. Conitzer, U. Endriss, J. Lang, A. D. Procaccia eds., 2016. *Handbook of Computational Social Choice*, Cambridge University Press.

T. Kalandrakis, 2014. Computation of equilibrium values in the Baron and Ferejohn bargaining model, *Games and Economic Behavior* **94**, 29-38.