Economics 970
Harvard University

Modeling Wars with Game Theory
Syllabus

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Spring 2013

1 General Information

- Meeting time and location: Monday, Wednesday 10-11:30 (Sever Hall, Room 212)

- Office hours: Monday 5:30-6:30 (61 Kirkland Street)

- Please check the syllabus regularly as it is subject to change (although I will not change readings less than a week before they are required and I will notify you of any change by email)

2 Description

Will China's rise be peaceful? Is the world becoming more peaceful? Do trade and/or democracy promote peace? Can the European Union survive without an external threat such as the Soviet Union? Could climate change lead to conflict between the US and Canada? Why did the US invade Iraq but not North Korea?

My view is that game theory and clean but simple modeling can help us answer questions like these. Not only do I wish to convince you of this by the end of the course, but I would like to have you on board by building your own model in the final project, and testing it using some dataset (e.g. MID, ICB) or one in-depth case study (in which case you will need to cite historical sources).

This is an ambitious course. As you can see from the syllabus, many recent papers in top economics journals are war models. We will discuss these papers, as well as related work in the political science literature. Most of you will probably have a proper mathematical and economic background but no political science background. There are a lot of interesting good ideas in international relations that were developed non-mathematically. So I will try to explain basic concepts like the democratic peace theory, audience costs, the security dilemma or offensive realism to you throughout the course.

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3   Quantitative Level

The quantitative level is 2. However, people have different backgrounds. If you feel your math is not all that strong, that is no reason not to take this seminar. If you are really interested or have an advantage somewhere else (e.g. you *do* know what the security dilemma is or why Waltz argued a bipolar world would be peaceful; or you are willing to learn a lot on the go) then I would very much encourage you to take the tutorial!

4   Requirements

Attendance of classes is mandatory. You may miss one class without penalty, any further classes missed will be penalized by lowering your letter grade by one third (e.g. from A to $A-$ or from $A-$ to $B+$).

What matters most is the final paper you produce. It is worth 50% of the grade. Neither the model proposal nor the empirical exercise or even the presentation of your work in our little conference at the end of the semester is binding you to any topic, your final paper *can* be completely different. Ideally, in fact, it will be a little different as your ideas will evolve. However in research it is mostly true that nothing comes from nothing, so if your final paper is completely different from your previous ideas then you will not be able to use the feedback that you had received from your classmates and me.

In the final paper (as in the other assignments as well), I will put value on both hard work (e.g. you derive more variants of your models) and hard thinking (e.g. you have an original, creative and well-thought-out idea).

4.1   Presentation (10%) (2nd-5th weeks)

Each of you will be required to present a paper that is either on the syllabus or is closely connected to the course material (and is approved by me). The presentation should be about 20 minutes. It should not be simply limited to an overview of the paper, but you should discuss the limitations and extensions of the paper. You should also write down your thoughts on these limitations and extensions in maximum 1 page, which is due before the class you are presenting in.

4.2   Model Proposal (10%): Due at the start of the 9th meeting (5th week)

I would like you to set up a model of conflict with well-defined players, strategies and interactional environment, and then have solved the game with an appropriate solution concept. I will also want you to derive at least one comparative static: how would changing one interesting parameter in the model would affect endogenous choice variables and equilibrium outcomes (e.g. war/peace; share of the resource).

Pages: no hard-and-fast rule, maybe around 4 pages, if you do all of the above in 1 page, no need to use a bigger font though. Feel free to further develop your ideas, the better the proposal, the better the feedback I can give you. But do not exceed a maximum of 8 pages.

4.3 Empirical Proposal (10%): Due at the start of the 15th meeting (8th week)

This is due after we had discuss the databases available (you can of course be creative and use a different database) and many papers with empirical results. This will need to include at least one regression and critical evaluation of the results. The regression equation should be clearly stated. You will need to specify for each independent/dependent variable where you get the data from and evaluate concept validity. Ideally you are testing the comparative static derived in your model proposal. Even if you get opposite results, that will not lower your grade! Discuss results, and potential problems such as endogeneity and omitted variable bias. You will need to submit all files you have used such as data, program files and codes and make sure I can rerun it and check any results.

This cannot be a case study, it needs to be statistics (in your final paper you may opt for a case study).

This should be no more than 4 pages, regression tables should be included and they do not count toward the 4 pages. In sum: specify briefly what hypothesis you want to test, discuss data and data quality succinctly and then evaluate your regression(s).

4.4 Presentation of the Paper (10%): 19th and 20th meeting (10th week)

We will have a little conference organized around your papers. Each of you will also be assigned to be a discussant of a classmate's paper, to whom you should send your final slides at least 2 days in advance. Presentation of the paper will earn 5% of the grade, 5% will be earned through being a good (i.e. useful for the paper-writer) discussant and providing good feedback to others during the conference.

4.5 Class Participation (10%)

I will reward you for generally being well-prepared and raising interesting points during section.

4.6 Final Paper (50%): hard deadline 6th May Monday 5pm

This should be 15-18 pages. You will write a paper that makes an original contribution to our understanding of conflict, whether building a new model, extending an existing one. Modeling is more important than the empirical analysis, however you should include some test of your model.

Your empirical analysis should at least include one critically evaluated regression OR a case study of a war of your choosing. I allow you to do either because there is no consensus on which one is better (I am conflicted myself), and actually there is a lot of synergy if you want to use both (which you should not in this course, it will be hard enough to do either of them well). If you choose the case study, you will have to cite at least two books written by credible historians (or if it is a current case, at least two experts (e.g. an Economist article or an editorial with a distinct author or a blog-post by an expert (who cannot be you...) would count as one).

4.7　Late Policy

You can submit either the model or the empirical exercise a week late (exactly 7 days) if you need to with no questions asked or penalties, but only one of them, as long as you email me before the deadline. The presentation, for obvious reasons, cannot be late.

Generally, the penalty for lateness is the lowering of your letter grade by one third each day (e.g. from A to $A-$ or from $A-$ to $B+$). For the final paper, the penalty is a full grade each day (e.g. from A to B).

5　Schedule and Readings

Do not worry if you do not understand everything in the papers assigned.

The first four weeks are more focused on modeling skills, while from the fifth week onwards focus will be on both modeling and econometrics. The last three meetings aim to give you more tools to model domestic politics.

The modern approach to modeling wars is through bargaining theory. Therefore after a short review of game theory, we will discuss the simplest bargaining framework between two actors, then add time, further actors and, in the second part of the course, domestic politics in a number of ways.

5.1　Review of Game Theory

1. **Review of Game Theory (Nash equilibrium, backward induction, Subgame Perfect Equilibium, repeated games),** *Feb 4 (M)*

   - recommended: M. Osborne. *An Introduction to Game Theory.* Oxford University Press, 2003, chapters 2-5, chapter 14

   - review of approaches to international relations theory: S. Walt. International relations: One world, many theories. *Foreign Policy*, pages pp.29–46, 1998. `http://faculty.maxwell.syr.edu/hpschmitz/PSC124/PSC124Readings/WaltOneWorldM` `pdf`

2. **Special Topics/Review of Game Theory (Perfect Bayesian Equilibrium, signaling games, Markov Perfect Equilibrium),** *Feb 6 (W)*

   - R. Gibbons. An introduction to applicable game theory. *The Journal of Economic Perspectives*, 11:pp.127–49, 1997 `http://pluto.fss.buffalo.edu/classes/` `psc/fczagare/PSC%20504/Gibbons.pdf`

   - recommended: M. Osborne. *An Introduction to Game Theory.* Oxford University Press, 2003, chapters 9-10

   - recommended: D. Acemoglu and J. Robinson. *Economic Origins of Dictatorship and Democracy.* Cambridge University Press, 2006 section 5.6 or D. Fudenberg and J. Tirole. *Game Theory.* MIT Press, 1991, chapter 13.1

5.2 Unitary States as Actors

5.2.1 One-Shot Two-Actor Models

3. **One-shot Bargaining Models of War I.,** *Feb 11 (M)*
   Concepts discussed: realism, liberalism, constructivism, anarchy, balance of power, focal point

   - J. D. Fearon. Rationalist explanations for war. *International Organization*, Vol. 49(No. 3):pp. 379–414, Summer 1995
   - Thomas Schelling's Nobel Prize lecture: `http://www.nobelprize.org/nobel_prizes/economics/laureates/2005/schelling-lecture.pdf` or T. C. Schelling. *The Strategy of Conflict*. Harvard University Press, 1960

4. **One-shot Bargaining Models of War II: uncertainty and issue indivisibility in bargaining,** *Feb 13 (W)*
   Concepts discussed: misperceptions, spiral model, deterrence, brinkmanship

   - R. Powell. *In the Shadow of Power: States and Strategies in International Politics*. Princeton University Press, 1999, Chapter 3
   - S. Baliga and T. Sjostrom. The strategy of manipulating conflict. *American Economic Review*, Forthcoming, 2012. `http://www.kellogg.northwestern.edu/faculty/baliga/htm/provocation.pdf`

5.2.2 Repeated Two-Actor Models

5. **Repeated Bargaining Models of War: commitment problems,** *Feb 20 (W)*
   Concepts discussed: hegemonic stability, power transitions theory, institutions, reputation

   - R. Powell. *In the Shadow of Power: States and Strategies in International Politics*. Princeton University Press, 1999, Chapter 4
   - R. Axelrod. The emergence of cooperation among egoists. *American Political Science Review*, 75:pp.306–18, 1981
   - for the more mathematical-minded (optional): A. Rubinstein. Perfect equilibrium in a bargaining model. *Econometrica*, Vol. 50(No. 1):pp. 97–110, 1982

6. **Multiple Stages of Fighting,** *Feb 25 (M)*
   Concepts discussed: first-striker advantage, offense-defense balance, security dilemma

   - S. Chassang and G. Padroimiquel. Conflict and deterrence under strategic risk. *Quarterly Journal of Economics*, 2010. `http://www.princeton.edu/~chassang/papers/deterrence.pdf`
   - B. L. Slantchev. Feigning weakness. *International Organization*, 64:pp.357–88, 2010. available at: `http://slantchev.ucsd.edu/published/pdf/FeignWeak-0050.pdf`

7. **War Initiation and Termination,** *Feb 27 (W)*

- D. Acemoglu and A. Wolitzky. Cycles of distrust: An economic model. *working paper*, 2012. `http://economics.mit.edu/files/7914`

- B. L. Slantchev. Borrowed power: Debt finance and the resort to arms. *American Political Science Review*, 106(4), November 2012. `http://slantchev.ucsd.edu/published/pdf/BorrowedPower-006A.pdf`

5.2.3 Multiple-actor Models

8. **Multiple unitary states as actors,** *March 4 (M)*
Concepts discussed: polarity, internal and external balancing, buckpassing, bandwagoning, balancing, chain-ganging

   - J. Hirshleifer. Anarchy and its breakdown. *Journal of Political Economy*, 103: pp.26–53, 1995. `http://www.econ.ucla.edu/people/papers/Hirshleifer/Hirshleifer167.pdf`

   - S. Chassang and G. Padroimiquel. Defensive weapons and defensive alliances. *American Economic Review*, 99:pp.282–86, 2009. `http://personal.lse.ac.uk/padro/defensiveWeaponsPaper.pdf`

5.3 Datasets

9. **Datasets (COW Militarized Interstate Disputes (MID), International Crisis Behavior (ICB), Polity, Eugene),** *March 6 (W)*
Concepts discussed: republican liberalism, democratic peace, commercial liberalism, trade and peace

   model proposal due
   explore: `www.correlatesofwar.org` and `http://www.cidcm.umd.edu/icb/` and what will be very helpful (thanks to Scott Bennett and Allan Stam): `http://www.eugenesoftware.org/`

   - M. R. Sarkees, F. W. Wayman, and J. D. Singer. Inter-state, intra-state, and extra-state wars: A comprehensive look at their distribution over time, 1816 1997. *International Studies Quarterly*, 47:pp.49–70, 2003

5.4 Non-Unitary Actors: Domestic and Foreign Policy Interactions

5.4.1 Domestic Institutions

10. **Elites and Citizens,** *March 11 (M)*
Concepts discussed: audience costs, normative and institutional explanations for democratic peace

    - B. Bueno de Mesquita, J. Morrow, R. Siverson, and A. Smith. An institutional explanation of the democratic peace. *American Political Science Review*, 93: pp.791–807, 1999

- A. Debs and H. E. Goemans. Regime type, the fate of leaders, and war. *American Political Science Review*, 104:pp.430–45, 2010

11. **Media and Public Opinion,** *March 13 (W)*
Concepts discussed: rally-around-the-flag phenomenon, diversionary war, media indexing hypothesis, soft news, CNN effect

- M. A. Baum. Sex, lies, and war: How soft news brings foreign policy to the inattentive public. *American Political Science Review*, 96:pp.91–109, 2002
- N. S. Paola Conconi and M. Zanardi. Democratic peace and electoral accountability. *Working Paper.* `http://www.ecares.org/ecare/personal/conconi$/web/DP.pdf`

12. **Intra-elite competition,** *March 25 (M)*
Concepts discussed: hardliners, softliners, cartelization, overexpansion, standard operating procedure, garrison state

- R. Putnam. Diplomacy and domestic politics: The logic of two-level games. *International Organization*, 42:pp.427–460, 1988
- M. O. Jackson and M. Morelli. Political bias and war. *American Economic Review*, 97:pp.1353–73, 2007

5.4.2 Economic Relations

13. **Economic Relations: Trade,** *March 27 (W)*
Concepts discussed: Heckscher-Ohlin model, Stolper-Samuelson theorem, guns vs. butter

- P. Martin, T. Mayer, and M. Thoenig. Make trade not war? *Review of Economic Studies*, 75:pp.865–900, 2008
- H. Hegre, J. Oneal, and B. Russett. Trade does promote peace: New simultaneous estimates of the reciprocal effects of trade and conflict. *Journal of Peace Research*, 47:pp.763–74, 2010

14. **Economic Relations: Interest groups,** *April 1 (M)*

- E. Gartzke. The capitalist peace. *American Journal of Political Science*, 51: pp.166–91, 2007
- B. Fordham. Revisionism reconsidered: Exports and american intervention in world war i. *International Organization*, 61:pp.277–310, 2007

5.4.3 Identity and Culture

15. **Ethnicity,** *April 3 (W)*
Concepts discussed: social identity theory, culture vs. identity, ethnicity culture of anarchy, norm, role theory
empirical proposal due

    - J. D. Fearon and D. D. Laitin. Explaining interethnic cooperation. *American Political Science Review*, 90(4):pp715–735, December 1996
    - E. L. Glaeser. The political economy of hatred. *Quarterly Journal of Economics*, pages pp.45–86, 2005

16. **Civil Wars and Ethnicity,** *April 8 (M)*
Concepts discussed: greed vs. grievance, ethnicity

    - P. Collier and A. Hoeffler. Greed and grievance in civil war. *Oxford Economic Papers*, 56:pp.563–95, 2004
    - J. D. Fearon and D. Laitin. Ethnicity, insurgency, and civil war. *American Political Science Review*, 97:pp.75–90, 2003

5.4.4 Terrorist groups

17. **Terrorism,** *April 10 (W)*

    - E. Bueno de Mesquita. Quality of terror. *American Journal of Political Science*, 49:pp.515–30, 2005
    - E. Bueno de Mesquita. Politics and suboptimal provision of counterterror. *International Organization*, pages pp.9–36, 2007

5.4.5 Diffusion

18. **Diffusion,** *April 15 (M)*
Concepts discussed: globalization, socialization, norm entrepreneur

    - K. S. Gleditsch and M. D. Ward. Diffusion and the international context of democratization. *International Organization*, 60:pp.911–933, 2006
    - B. Simmons and Z. Elkins. The globalization of liberalization: Policy diffusion in the international political economy. *American Political Science Review*, 98: pp.781–810, 2004

5.5 Presentations of Your Own Research

19. **Presentations I.** *April 17 (W)*

20. **Presentations II.** *April 22 (M)*

5.6   Modeling Domestic Politics

21. **Institutions,** *April 24 (W)*

    - D. Acemoglu and J. Robinson. *Economic Origins of Dictatorship and Democracy.* Cambridge University Press, 2006 Chapters 2, 5

22. **Institutions and Globalization,** *April 29 (M)*

    - D. Acemoglu and J. Robinson. *Economic Origins of Dictatorship and Democracy.* Cambridge University Press, 2006 Chapters 6, 10

23. **The Size and Number of Nations,** *May 1 (W)*

    - A. Alesina and E. Spolaore. On the number and size of nations. *Quarterly Journal of Economics*, pages pp. 1027–56, November 1997