

## GRADUATE LECTURE IN MONOTONE COMPARATIVE STATICS

The aim of this lecture is to give a quick and accessible introduction to the theory of monotone comparative statics and its applications. The central concept in this theory is the *single crossing property*. I will show how the property holds in a variety of optimization problems and consider the senses in which it is (or is not) preserved under uncertainty. I will explain how the theory of monotone comparative statics is used in the study of (single-agent) optimization problems, in supermodular games, and in Bayesian games with monotone decision rules. If there is time, I will also briefly consider concepts related to the single crossing property, like *single-peakedness*, and the more general *interval dominance order* recently developed in Quah and Strulovici (2009).

Students who plan on attending this lecture should also aim to attend the seminar I am giving on the day before the lecture. This is not absolutely essential, but will be helpful.

Material for this lecture are drawn from the following key readings:

- Athey, S. (2001): "Single Crossing Properties and the Existence of Pure Strategy Equilibria in Games of Incomplete Information," *Econometrica*, 69(4), 861-890.
- Karlin, S. and Y. Rinott (1980): "Classes of Orderings of Measures and Related Correlation Inequalities. I. Multivariate totally positive distributions," *Journal of Multivariate Analysis*, 10, 467-498.
- Milgrom, P. and J. Roberts (1990): "Rationalizability, Learning, and Equilibrium in Games with Strategic Complementarities," *Econometrica*, 58(6), 1255-1277.
- Milgrom, P. and J. Roberts (1990): "The Economics of Modern Manufacturing: Technology, Strategy, and Organization," *American Economics Review*, 80(3), 511-528.
- Milgrom, P. and C. Shannon (1994): "Monotone Comparative Statics," *Econometrica*, 62(1), 157-180.
- Quah, J. K.-H. and B. Strulovici (2009): "Comparative Statics, Informativeness, and the Interval Dominance Order," *Econometrica*, 77(6), 1949-1992.
- Quah, J. K.-H. and B. Strulovici (2011): "Aggregating the single crossing property." To appear, *Econometrica* (available on journal website).
- Reny, P. J. and S. Zamir (2004): "On the Existence of Pure Strategy Monotone Equilibria in Asymmetric First-Price Auctions," *Econometrica*, 72(4), 1105-1125.
- Vives, X. (1990): "Nash Equilibrium with Strategic Complementarities," *Journal of Mathematical Economics*, 19, 305-21.

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