Literature Report

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Abstract

Random Choice and Private Information

- Econometrica---2016---Jay Lu

We consider an agent who chooses an option after receiving some private information. This information, however, is unobserved by an analyst, so from the latter's perspective, choice is probabilistic or random. We provide a theory in which information can be fully identified from random choice. In addition, the analyst can perform the following inferences even when information is unobservable: (1) directly compute ex ante valuations of menus from random choice and vice versa, (2) assess which agent has better information by using choice dispersion as a measure of informativeness, (3) determine if the agent's beliefs about information are dynamically consistent, and (4) test to see if these beliefs are well-calibrated or rational.

Communication With Unknown Perspectives

- Econometrica---2016---Rajiv Sethi,Muhamet Yildiz

Consider a group of individuals with unobservable perspectives (subjective prior beliefs) about a sequence of states. In each period, each individual receives private information about the current state and forms an opinion (a posterior belief). She also chooses a target individual and observes the target's opinion. This choice involves a trade-off between well-informed targets, whose signals are precise, and well-understood targets, whose perspectives are well known. Opinions are informative about the target's perspective, so observed individuals become better understood over time. We identify a simple condition under which long-run behavior is history independent. When this fails, each individual restricts attention to a small set of experts and observes the most informed among these. A broad range of observational patterns can arise with positive probability, including opinion leadership and information segregation. In an application to areas of expertise, we show how these mechanisms generate own field bias and large field dominance.

The Dynamics of Inequality

- Econometrica---2016---Xavier Gabaix,Jean-Michel Lasry,Pierre-Louis Lions,Benjamin Moll

The past forty years have seen a rapid rise in top income inequality in the United States. While there is a large number of existing theories of the Pareto tail of the long-run income distributions, almost none of these address the fast rise in top inequality observed in the data. We show that standard theories, which build on a random growth mechanism, generate transition dynamics that are too slow relative to those observed in the data. We then suggest two parsimonious deviations from the canonical model that can explain such changes: “scale dependence” that may arise from changes in skill prices, and “type dependence,” that is, the presence of some “high-growth types.” These deviations are consistent with theories in which the increase in top income inequality is driven by the rise of “superstar” entrepreneurs or managers.

Market-Triggered Changes in Capital Structure: Equilibrium Price Dynamics

- Econometrica---2016---Paul Glasserman,Behzad Nouri

We analyze the internal consistency of using the market price of a firm's equity to trigger a contractual change in the firm's capital structure, given that the value of the equity itself depends on the firm's capital structure. Of particular interest is the case of contingent capital for banks, in the form of debt that converts to equity, when conversion is triggered by a decline in the bank's stock price. We analyze the problem of existence and uniqueness of equilibrium values for a firm's liabilities in this context, meaning values consistent with a market-price trigger. Discrete-time dynamics allow multiple equilibria. In contrast, we show that the possibility of multiple equilibria can largely be ruled out in continuous time, where the price of the triggering security adjusts in anticipation of breaching the trigger. Our main condition for existence of an equilibrium requires that the consequences of triggering a conversion be consistent with the direction in which the trigger is crossed. For the design of contingent capital with a stock price trigger, this condition may be interpreted to mean that conversion should be disadvantageous to shareholders, and it is satisfied by setting the trigger sufficiently high. Uniqueness follows provided the trigger is sufficiently accessible by all candidate equilibria. We illustrate precise formulations of these conditions with a variety of applications.

Conditional Linear Combination Tests for Weakly Identified Models

- Econometrica---2016---Isaiah Andrews

We introduce the class of conditional linear combination tests, which reject null hypotheses concerning model parameters when a data-dependent convex combination of two identification-robust statistics is large. These tests control size under weak identification and have a number of optimality properties in a conditional problem. We show that the conditional likelihood ratio test of Moreira, 2003 is a conditional linear combination test in models with one endogenous regressor, and that the class of conditional linear combination tests is equivalent to a class of quasi-conditional likelihood ratio tests. We suggest using minimax regret conditional linear combination tests and propose a computationally tractable class of tests that plug in an estimator for a nuisance parameter. These plug-in tests perform well in simulation and have optimal power in many strongly identified models, thus allowing powerful identification-robust inference in a wide range of linear and nonlinear models without sacrificing efficiency if identification is strong.

Credibility of Confidence Sets in Nonstandard Econometric Problems

- Econometrica---2016---Ulrich K. Müller,Andriy Norets

Confidence intervals are commonly used to describe parameter uncertainty. In nonstandard problems, however, their frequentist coverage property does not guarantee that they do so in a reasonable fashion. For instance, confidence intervals may be empty or extremely short with positive probability, even if they are based on inverting powerful tests. We apply a betting framework and a notion of bet-proofness to formalize the “reasonableness” of confidence intervals as descriptions of parameter uncertainty, and use it for two purposes. First, we quantify the violations of bet-proofness for previously suggested confidence intervals in nonstandard problems. Second, we derive alternative confidence sets that are bet-proof by construction. We apply our framework to several non-standard problems involving weak instruments, near unit roots, and moment inequalities. We find that previously suggested confidence intervals are not bet-proof, and numerically determine alternative bet-proof confidence sets.

Identifying Latent Structures in Panel Data

- Econometrica---2016---Liangjun Su,Zhentao Shi,Peter C. B. Phillips

This paper provides a novel mechanism for identifying and estimating latent group structures in panel data using penalized techniques. We consider both linear and nonlinear models where the regression coefficients are heterogeneous across groups but homogeneous within a group and the group membership is unknown. Two approaches are considered—penalized profile likelihood (PPL) estimation for the general nonlinear models without endogenous regressors, and penalized GMM (PGMM) estimation for linear models with endogeneity. In both cases, we develop a new variant of Lasso called classifier-Lasso (C-Lasso) that serves to shrink individual coefficients to the unknown group-specific coefficients. C-Lasso achieves simultaneous classification and consistent estimation in a single step and the classification exhibits the desirable property of uniform consistency. For PPL estimation, C-Lasso also achieves the oracle property so that group-specific parameter estimators are asymptotically equivalent to infeasible estimators that use individual group identity information. For PGMM estimation, the oracle property of C-Lasso is preserved in some special cases. Simulations demonstrate good finite-sample performance of the approach in both classification and estimation. Empirical applications to both linear and nonlinear models are presented.

Backward Induction Foundations of the Shapley Value

- Econometrica---2016---Ben McQuillin,Robert Sugden

We present a noncooperative game model of coalitional bargaining, closely based on that of Gul (1989) but solvable by backward induction. In this game, Gul's condition of "value additivity" does not suffice to ensure the existence of a subgame perfect Nash equilibrium that supports the Shapley value, but a related condition—"no positive value-externalities"—does. Multiple equilibria can arise only in the event of ties, and with a mild restriction on tie-break rules these equilibria all support the Shapley value.

A Theory of Macroprudential Policies in the Presence of Nominal Rigidities

- Econometrica---2016---Emmanuel Farhi,Iván Werning

We propose a theory of monetary policy and macroprudential interventions in financial markets. We focus on economies with nominal rigidities in goods and labor markets and subject to constraints on monetary policy, such as the zero lower bound or fixed exchange rates. We identify an aggregate demand externality that can be corrected by macroprudential interventions in financial markets. Ex post, the distribution of wealth across agents affects aggregate demand and output. Ex ante, however, these effects are not internalized in private financial decisions. We provide a simple formula for the required financial interventions that depends on a small number of measurable sufficient statistics. We also characterize optimal monetary policy. We extend our framework to incorporate pecuniary externalities, providing a unified approach to both externalities. Finally, we provide a number of applications which illustrate the relevance of our theory.

Female Labor Supply, Human Capital, and Welfare Reform

- Econometrica---2016---Richard Blundell,Monica Costa Dias,Costas Meghir,Jonathan Shaw

We estimate a dynamic model of employment, human capital accumulation—including education, and savings for women in the United Kingdom, exploiting tax and benefit reforms, and use it to analyze the effects of welfare policy. We find substantial elasticities for labor supply and particularly for lone mothers. Returns to experience, which are important in determining the longer-term effects of policy, increase with education, but experience mainly accumulates when in full-time employment. Tax credits are welfare improving in the U.K., increase lone-mother labor supply and marginally reduce educational attainment, but the employment effects do not extend beyond the period of eligibility. Marginal increases in tax credits improve welfare more than equally costly increases in income support or tax cuts.

An Empirical Equilibrium Model of a Decentralized Asset Market

- Econometrica---2016---Alessandro Gavazza

I estimate a search-and-bargaining model of a decentralized market to quantify the effects of trading frictions on asset allocations, asset prices, and welfare, and to quantify the effects of intermediaries that facilitate trade. Using business-aircraft data, I find that, relative to the Walrasian benchmark, 18.3 percent of the assets are misallocated; prices are 19.2 percent lower; and the aggregate welfare losses equal 23.9 percent. Dealers play an important role in reducing trading frictions: In a market with no dealers, a larger fraction of assets would be misallocated, and prices would be higher. However, dealers reduce aggregate welfare because their operations are costly, and they impose a negative externality by decreasing the number of agents' direct transactions.

Robust Confidence Regions for Incomplete Models

- Econometrica---2016---Larry Epstein,Hiroaki Kaido,Kyoungwon Seo

Call an economic model incomplete if it does not generate a probabilistic prediction even given knowledge of all parameter values. We propose a method of inference about unknown parameters for such models that is robust to heterogeneity and dependence of unknown form. The key is a Central Limit Theorem for belief functions; robust confidence regions are then constructed in a fashion paralleling the classical approach. Monte Carlo simulations support tractability of the method and demonstrate its enhanced robustness relative to existing methods.

Consistent Probabilistic Social Choice

- Econometrica---2016---Florian Brandl,Felix Brandt,Hans Georg Seedig

Two fundamental axioms in social choice theory are consistency with respect to a variable electorate and consistency with respect to components of similar alternatives. In the context of traditional non-probabilistic social choice, these axioms are incompatible with each other. We show that in the context of probabilistic social choice, these axioms uniquely characterize a function proposed by Fishburn (1984). Fishburn's function returns so-called maximal lotteries, that is, lotteries that correspond to optimal mixed strategies in the symmetric zero-sum game induced by the pairwise majority margins. Maximal lotteries are guaranteed to exist due to von Neumann's Minimax Theorem, are almost always unique, and can be efficiently computed using linear programming.

The Effect of Changes in Risk Attitude on Strategic Behavior

- Econometrica---2016---Jonathan Weinstein

We study families of normal-form games with fixed preferences over pure action profiles but varied preferences over lotteries. That is, we subject players' utilities to monotone but nonlinear transformations and examine changes in the rationalizable set and set of equilibria. Among our results: The rationalizable set always grows under concave transformations (risk aversion) and shrinks under convex transformations (risk love). The rationalizable set reaches an upper bound under extreme risk aversion, and lower bound under risk love, and both of these bounds are characterized by elimination processes. For generic two-player games, under extreme risk love or aversion, all Nash equilibria are close to pure and the limiting set of equilibria can be described using preferences over pure action profiles.

A Note on Comparative Ambiguity Aversion and Justifiability

- Econometrica---2016---Pierpaolo Battigalli,S. Cerreia-Vioglio,F. Maccheroni,Massimo Marinacci,Simone Cerreia-Vioglio

We consider a decision maker who ranks actions according to the smooth ambiguity criterion of Klibanoff, Marinacci, and Mukerji (2005). An action is justifiable if it is a best reply to some belief over probabilistic models. We show that higher ambiguity aversion expands the set of justifiable actions. A similar result holds for risk aversion. Our results follow from a generalization of the duality lemma of Wald (1949) and Pearce (1984).

Farms, Families, and Markets: New Evidence on Completeness of Markets in Agricultural Settings

- Econometrica---2016---Daniel LaFave,Duncan Thomas

The farm household model has played a central role in improving the understanding of small-scale agricultural households and non-farm enterprises. Under the assumptions that all current and future markets exist and that farmers treat all prices as given, the model simplifies households' simultaneous production and consumption decisions into a recursive form in which production can be treated as independent of preferences of household members. These assumptions, which are the foundation of a large literature in labor and development, have been tested and not rejected in several important studies including Benjamin (1992). Using multiple waves of longitudinal survey data from Central Java, Indonesia, this paper tests a key prediction of the recursive model: demand for farm labor is unrelated to the demographic composition of the farm household. The prediction is unambiguously rejected. The rejection cannot be explained by contamination due to unobserved heterogeneity that is fixed at the farm level, local area shocks, or farm-specific shocks that affect changes in household composition and farm labor demand. We conclude that the recursive form of the farm household model is not consistent with the data. Developing empirically tractable models of farm households when markets are incomplete remains an important challenge.

Large Market Asymptotics for Differentiated Product Demand Estimators With Economic Models of Supply

- Econometrica---2016---Timothy B. Armstrong

IO economists often estimate demand for differentiated products using data sets with a small number of large markets. This paper addresses the question of consistency and asymptotic distributions of instrumental variables estimates as the number of products increases in some commonly used models of demand under conditions on economic primitives. I show that, in a Bertrand–Nash equilibrium, product characteristics lose their identifying power as price instruments in the limit in certain cases, leading to inconsistent estimates. The reason is that product characteristic instruments achieve identification through correlation with markups, and, depending on the model of demand, the supply side can constrain markups to converge to a constant quickly relative to sampling error. I find that product characteristic instruments can yield consistent estimates in many of the cases I consider, but care must be taken in modeling demand and choosing instruments. A Monte Carlo study confirms that the asymptotic results are relevant in market sizes of practical importance.

From Bottom of the Barrel to Cream of the Crop: Sequential Screening With Positive Selection

- Econometrica---2016---Jean Tirole

In a number of interesting environments, dynamic screening involves positive selection: in contrast with Coasian dynamics, only the most motivated remain over time. The paper provides conditions under which the principal's commitment optimum is time consistent and uses this result to derive testable predictions under permanent or transient shocks. It also identifies environments in which time consistency does not hold despite positive selection, and yet simple equilibrium characterizations can be obtained.

Market Microstructure Invariance: Empirical Hypotheses

- Econometrica---2016---Albert S. Kyle,Anna Obizhaeva

Using the intuition that financial markets transfer risks in business time, “market microstructure invariance” is defined as the hypotheses that the distributions of risk transfers (“bets”) and transaction costs are constant across assets when measured per unit of business time. The invariance hypotheses imply that bet size and transaction costs have specific, empirically testable relationships to observable dollar volume and volatility. Portfolio transitions can be viewed as natural experiments for measuring transaction costs, and individual orders can be treated as proxies for bets. Empirical tests based on a data set of 400,000+ portfolio transition orders support the invariance hypotheses. The constants calibrated from structural estimation imply specific predictions for the arrival rate of bets (“market velocity”), the distribution of bet sizes, and transaction costs.

Robust Contracts in Continuous Time

- Econometrica---2016---Jianjun Miao,Alejandro Rivera

We study a continuous-time contracting problem under hidden action, where the principal has ambiguous beliefs about the project cash flows. The principal designs a robust contract that maximizes his utility under the worst-case scenario subject to the agent's incentive and participation constraints. Robustness generates endogenous belief heterogeneity and induces a tradeoff between incentives and ambiguity sharing so that the incentive constraint does not always bind. We implement the optimal contract by cash reserves, debt, and equity. In addition to receiving ordinary dividends when cash reserves reach a threshold, outside equity holders also receive special dividends or inject cash in the cash reserves to hedge against model uncertainty and smooth dividends. The equity premium and the credit yield spread generated by ambiguity aversion are state dependent and high for distressed firms with low cash reserves.

Insider Trading, Stochastic Liquidity, and Equilibrium Prices

- Econometrica---2016---Pierre Collin-Dufresne,Vyacheslav Fos

We extend Kyle's (1985) model of insider trading to the case where noise trading volatility follows a general stochastic process. We determine conditions under which, in equilibrium, price impact and price volatility are both stochastic, driven by shocks to uninformed volume even though the fundamental value is constant. The volatility of price volatility appears ‘excessive’ because insiders choose to trade more aggressively (and thus more information is revealed) when uninformed volume is higher and price impact is lower. This generates a positive relation between price volatility and trading volume, giving rise to an endogenous subordinate stochastic process for prices.

Why Doesn't Technology Flow From Rich to Poor Countries?

- Econometrica---2016---Harold L. Cole,Jeremy Greenwood,Juan Sanchez

What is the role of a country's financial system in determining technology adoption? To examine this, a dynamic contract model is embedded into a general equilibrium setting with competitive intermediation. The terms of finance are dictated by an intermediary's ability to monitor and control a firm's cash flow, in conjunction with the structure of the technology that the firm adopts. It is not always profitable to finance promising technologies. A quantitative illustration is presented where financial frictions induce entrepreneurs in India and Mexico to adopt less-promising ventures than in the United States, despite lower input prices.

Unemployment and Business Cycles

- Econometrica---2016---Lawrence J. Christiano,Martin Eichenbaum,Mathias Trabandt

We develop and estimate a general equilibrium search and matching model that accounts for key business cycle properties of macroeconomic aggregates, including labor market variables. In sharp contrast to leading New Keynesian models, we do not impose wage inertia. Instead we derive wage inertia from our specification of how firms and workers negotiate wages. Our model outperforms a variant of the standard New Keynesian Calvo sticky wage model. According to our estimated model, there is a critical interaction between the degree of price stickiness, monetary policy, and the duration of an increase in unemployment benefits.

Conditional Inference With a Functional Nuisance Parameter

- Econometrica---2016---Isaiah Andrews,Anna Mikusheva

This paper shows that the problem of testing hypotheses in moment condition models without any assumptions about identification may be considered as a problem of testing with an infinite-dimensional nuisance parameter. We introduce a sufficient statistic for this nuisance parameter in a Gaussian problem and propose conditional tests. These conditional tests have uniformly correct asymptotic size for a large class of models and test statistics. We apply our approach to construct tests based on quasi-likelihood ratio statistics, which we show are efficient in strongly identified models and perform well relative to existing alternatives in two examples.

Generalized Method of Integrated Moments for High-Frequency Data

- Econometrica---2016---Jia Li,Dacheng Xiu

We propose a semiparametric two-step inference procedure for a finite-dimensional parameter based on moment conditions constructed from high-frequency data. The population moment conditions take the form of temporally integrated functionals of state-variable processes that include the latent stochastic volatility process of an asset. In the first step, we nonparametrically recover the volatility path from high-frequency asset returns. The nonparametric volatility estimator is then used to form sample moment functions in the second-step GMM estimation, which requires the correction of a high-order nonlinearity bias from the first step. We show that the proposed estimator is consistent and asymptotically mixed Gaussian and propose a consistent estimator for the conditional asymptotic variance. We also construct a Bierens-type consistent specification test. These infill asymptotic results are based on a novel empirical-process-type theory for general integrated functionals of noisy semimartingale processes.

A Dynamic Model of Demand for Houses and Neighborhoods

- Econometrica---2016---Patrick Bayer,Robert McMillan,Alvin Murphy,Christopher Timmins

This paper develops a dynamic model of neighborhood choice along with a computationally light multi-step estimator. The proposed empirical framework captures observed and unobserved preference heterogeneity across households and locations in a flexible way. We estimate the model using a newly assembled data set that matches demographic information from mortgage applications to the universe of housing transactions in the San Francisco Bay Area from 1994 to 2004. The results provide the first estimates of the marginal willingness to pay for several non-marketed amenities—neighborhood air pollution, violent crime, and racial composition—in a dynamic framework. Comparing these estimates with those from a static version of the model highlights several important biases that arise when dynamic considerations are ignored.

Buy, Keep, or Sell: Economic Growth and the Market for Ideas

- Econometrica---2016---Ufuk Akcigit,Murat Celik,Jeremy Greenwood

An endogenous growth model is developed where each period firms invest in researching and developing new ideas. An idea increases a firm's productivity. By how much depends on the technological propinquity between an idea and the firm's line of business. Ideas can be bought and sold on a market for patents. A firm can sell an idea that is not relevant to its business or buy one if it fails to innovate. The developed model is matched up with stylized facts about the market for patents in the United States. The analysis gauges how efficiency in the patent market affects growth.

Time-Varying Risk Premium in Large Cross-Sectional Equity Data Sets

- Econometrica---2016---Patrick Gagliardini,Elisa Ossola,Olivier Scaillet

We develop an econometric methodology to infer the path of risk premia from a large unbalanced panel of individual stock returns. We estimate the time-varying risk premia implied by conditional linear asset pricing models where the conditioning includes both instruments common to all assets and asset-specific instruments. The estimator uses simple weighted two-pass cross-sectional regressions, and we show its consistency and asymptotic normality under increasing cross-sectional and time series dimensions. We address consistent estimation of the asymptotic variance by hard thresholding, and testing for asset pricing restrictions induced by the no-arbitrage assumption. We derive the restrictions given by a continuum of assets in a multi-period economy under an approximate factor structure robust to asset repackaging. The empirical analysis on returns for about ten thousand U.S. stocks from July 1964 to December 2009 shows that risk premia are large and volatile in crisis periods. They exhibit large positive and negative strays from time-invariant estimates, follow the macroeconomic cycles, and do not match risk premia estimates on standard sets of portfolios. The asset pricing restrictions are rejected for a conditional four-factor model capturing market, size, value, and momentum effects.

No-Bubble Condition: Model-Free Tests in Housing Markets

- Econometrica---2016---Stefano Giglio,Matteo Maggiori,Johannes Stroebel

We test for the existence of housing bubbles associated with a failure of the transversality condition that requires the present value of payments occurring infinitely far in the future to be zero. The most prominent such bubble is the classic rational bubble. We study housing markets in the United Kingdom and Singapore, where residential property ownership takes the form of either leaseholds or freeholds. Leaseholds are finite-maturity, pre-paid, and tradeable ownership contracts with maturities often exceeding 700 years. Freeholds are infinite-maturity ownership contracts. The price difference between leaseholds with extremely-long maturities and freeholds reflects the present value of a claim to the freehold after leasehold expiry, and is thus a direct empirical measure of the transversality condition. We estimate this price difference, and find no evidence of failures of the transversality condition in housing markets in the U.K. and Singapore, even during periods when a sizable bubble was regularly thought to be present.

Berk–Nash Equilibrium: A Framework for Modeling Agents With Misspecified Models

- Econometrica---2016---Ignacio Esponda,Demian Pouzo

We develop an equilibrium framework that relaxes the standard assumption that people have a correctly specified view of their environment. Each player is characterized by a (possibly misspecified) subjective model, which describes the set of feasible beliefs over payoff-relevant consequences as a function of actions. We introduce the notion of a Berk–Nash equilibrium: Each player follows a strategy that is optimal given her belief, and her belief is restricted to be the best fit among the set of beliefs she considers possible. The notion of best fit is formalized in terms of minimizing the Kullback–Leibler divergence, which is endogenous and depends on the equilibrium strategy profile. Standard solution concepts such as Nash equilibrium and self-confirming equilibrium constitute special cases where players have correctly specified models. We provide a learning foundation for Berk–Nash equilibrium by extending and combining results from the statistics literature on misspecified learning and the economics literature on learning in games.

Reputational Bargaining and Deadlines

- Econometrica---2016---Jack Fanning

I highlight how reputational concerns provide a natural explanation for "deadline effects," the high frequency of deals prior to a deadline in bargaining. Rational agents imitate the demands of obstinate behavioral types and engage in brinkmanship in the face of uncertainty about the deadline's arrival. I also identify how surplus is divided when the prior probability of behavioral types is vanishingly small. If behavioral types are committed to fixed demands, outcomes converge to the Nash bargaining solution regardless of agents' respective impatience. If behavioral types can adopt more complex demand strategies, outcomes converge to the solution of an alternating offers game without behavioral types for the deadline environment.

Utilitarian Preferences With Multiple Priors

- Econometrica---2016---Shiri Alon,Gabi Gayer

This paper proposes a method for aggregating individual preferences in the context of uncertainty. Individuals are assumed to abide by Savage's model of Subjective Expected Utility, in which everyone has his/her own utility and subjective probability. Disagreement on probabilities among individuals gives rise to uncertainty at the societal level, and thus society may entertain a set of probabilities rather than only one. We assume that social preference admits a Maxmin Expected Utility representation. In this context, two Pareto-type conditions are shown to be equivalent to social utility being a weighted average of individual utilities and the social set of priors containing only weighted averages of individual priors. Thus, society respects consensus among individuals' beliefs and does not add ambiguity beyond disagreement on beliefs. We also deal with the case in which society does not rule out any individual belief.

Menu-Dependent Stochastic Feasibility

- Econometrica---2016---Richard L. Brady,John Rehbeck

We examine the role of stochastic feasibility in consumer choice using a random conditional choice set rule (RCCSR) and uniquely characterize the model from conditions on stochastic choice data. Feasibility is modeled to permit correlation in availability of alternatives. This provides a natural way to examine substitutability/complementarity. We show that an RCCSR generalizes the random consideration set rule of [Manzini and Mariotti, 2014]. We then relate this model to existing literature. In particular, an RCCSR is not a random utility model.

Individual Heterogeneity and Average Welfare

- Econometrica---2016---Jerry A. Hausman,Whitney K. Newey

Individual heterogeneity is an important source of variation in demand. Allowing for general heterogeneity is needed for correct welfare comparisons. We consider general heterogeneous demand where preferences and linear budget sets are statistically independent. Only the marginal distribution of demand for each price and income is identified from cross-section data where only one price and income is observed for each individual. Thus, objects that depend on varying price and/or income for an individual are not generally identified, including average exact consumer surplus. We use bounds on income effects to derive relatively simple bounds on the average surplus, including for discrete/continuous choice. We also sketch an approach to bounding surplus that does not use income effect bounds. We apply the results to gasoline demand. We find tight bounds for average surplus in this application, but wider bounds for average deadweight loss.

A Geometric Approach to Nonlinear Econometric Models

- Econometrica---2016---Isaiah Andrews,Anna Mikusheva

Conventional tests for composite hypotheses in minimum distance models can be unreliable when the relationship between the structural and reduced-form parameters is highly nonlinear. Such nonlinearity may arise for a variety of reasons, including weak identification. In this note, we begin by studying the problem of testing a “curved null” in a finite-sample Gaussian model. Using the curvature of the model, we develop new finite-sample bounds on the distribution of minimum-distance statistics. These bounds allow us to construct tests for composite hypotheses which are uniformly asymptotically valid over a large class of data generating processes and structural models.

Shadow Insurance

- Econometrica---2016---Ralph S. J. Koijen,Motohiro Yogo

Life insurers use reinsurance to move liabilities from regulated and rated companies that sell policies to shadow reinsurers, which are less regulated and unrated off-balance-sheet entities within the same insurance group. U.S. life insurance and annuity liabilities ceded to shadow reinsurers grew from $11 billion in 2002 to $364 billion in 2012. Life insurers using shadow insurance, which capture half of the market share, ceded 25 cents of every dollar insured to shadow reinsurers in 2012, up from 2 cents in 2002. By relaxing capital requirements, shadow insurance could reduce the marginal cost of issuing policies and thereby improve retail market efficiency. However, shadow insurance could also reduce risk-based capital and increase expected loss for the industry. We model and quantify these effects based on publicly available data and plausible assumptions.

Usage-Based Pricing and Demand for Residential Broadband

- Econometrica---2016---Aviv Nevo,John Turner,Jonathan W. Williams

We estimate demand for residential broadband using high-frequency data from subscribers facing a three-part tariff. The three-part tariff makes data usage during the billing cycle a dynamic problem, thus generating variation in the (shadow) price of usage. We provide evidence that subscribers respond to this variation, and we use their dynamic decisions to estimate a flexible distribution of willingness to pay for different plan characteristics. Using the estimates, we simulate demand under alternative pricing and find that usage-based pricing eliminates low-value traffic. Furthermore, we show that the costs associated with investment in fiber-optic networks are likely recoverable in some markets, but that there is a large gap between social and private incentives to invest.

Prices, Markups, and Trade Reform

- Econometrica---2016---Jan De Loecker,Pinelopi K. Goldberg,Amit K. Khandelwal,Nina Pavcnik

This paper examines how prices, markups, and marginal costs respond to trade liberalization. We develop a framework to estimate markups from production data with multi-product firms. This approach does not require assumptions on the market structure or demand curves faced by firms, nor assumptions on how firms allocate their inputs across products. We exploit quantity and price information to disentangle markups from quantity-based productivity, and then compute marginal costs by dividing observed prices by the estimated markups. We use India’s trade liberalization episode to examine how firms adjust these performance measures. Not surprisingly, we find that trade liberalization lowers factory-gate prices and that output tariff declines have the expected pro-competitive effects. However, the price declines are small relative to the declines in marginal costs, which fall predominantly because of the input tariff liberalization. The reason for this incomplete cost pass-through to prices is that firms offset their reductions in marginal costs by raising markups. Our results demonstrate substantial heterogeneity and variability in markups across firms and time and suggest that producers benefited relative to consumers, at least immediately after the reforms.

The Political Economy of Moral Conflict: An Empirical Study of Learning and Law Enforcement Under Prohibition

- Econometrica---2016---Camilo García-Jimeno

The U.S. Prohibition experience shows a remarkable policy reversal. In only 14 years, a drastic shift in public opinion required two constitutional amendments. I develop and estimate a model of endogenous law enforcement, determined by beliefs about the Prohibition-crime nexus and alcohol-related moral views. In turn, the policy outcomes shape subsequent learning about Prohibition enforcement costs. I estimate the model through maximum likelihood on Prohibition Era city-level data on police enforcement, crime, and alcohol-related legislation. The model can account for the variation in public opinion changes, and the heterogeneous responses of law enforcement and violence across cities. Results show that a 15% increase in the homicide rate can be attributed to Prohibition enforcement. The subsequent learning-driven adjustment of local law enforcement allowed for the alcohol market to rebound to 60% of its pre-Prohibition size. I conclude with counterfactual exercises exploring the welfare implications of policy learning, prior beliefs, preference polarization, and alternative political environments. Results illustrate the importance of incorporating the endogenous nature of law enforcement into our understanding of policy failure and policy success.

A Rational Theory of Mutual Funds' Attention Allocation

- Econometrica---2016---Marcin Kacperczyk,Stijn Van Nieuwerburgh,Laura Veldkamp

The question of whether and how mutual fund managers provide valuable services for their clients motivates one of the largest literatures in finance. One candidate explanation is that funds process information about future asset values and use that information to invest in high-valued assets. But formal theories are scarce because information choice models with many assets are difficult to solve as well as difficult to test. This paper tackles both problems by developing a new attention allocation model that uses the state of the business cycle to predict information choices, which in turn, predict observable patterns of portfolio investments and returns. The predictions about fund portfolios' covariance with payoff shocks, cross-fund portfolio and return dispersion, and their excess returns are all supported by the data. These findings offer new evidence that some investment managers have skill and that attention is allocated rationally.

Stochastic Learning Dynamics and Speed of Convergence in Population Games

- Econometrica---2016---Itai Arieli,H. Peyton Young

We study how long it takes for large populations of interacting agents to come close to Nash equilibrium when they adapt their behavior using a stochastic better reply dynamic. Prior work considers this question mainly for 2×2 games and potential games; here we characterize convergence times for general weakly acyclic games, including coordination games, dominance solvable games, games with strategic complementarities, potential games, and many others with applications in economics, biology, and distributed control. If players' better replies are governed by idiosyncratic shocks, the convergence time can grow exponentially in the population size; moreover, this is true even in games with very simple payoff structures. However, if their responses are sufficiently correlated due to aggregate shocks, the convergence time is greatly accelerated; in fact, it is bounded for all sufficiently large populations. We provide explicit bounds on the speed of convergence as a function of key structural parameters including the number of strategies, the length of the better reply paths, the extent to which players can influence the payoffs of others, and the desired degree of approximation to Nash equilibrium.

Elite Recruitment and Political Stability: The Impact of the Abolition of China's Civil Service Exam

- Econometrica---2016---Ying Bai,Ruixue Jia

This paper studies how the abolition of an elite recruitment system—China's civil exam system that lasted over 1,300 years—affects political stability. Employing a panel data set across 262 prefectures and exploring the variations in the quotas on the entry-level exam candidates, we find that higher quotas per capita were associated with a higher probability of revolution participation after the abolition and a higher incidence of uprisings in 1911 that marked the end of the 2,000 years of imperial rule. This finding is robust to various checks including using the number of small rivers and short-run exam performance before the quota system as instruments. The patterns in the data appear most consistent with the interpretation that in regions with higher quotas per capita under the exam system, more would-be elites were negatively affected by the abolition. In addition, we document that modern human capital in the form of those studying in Japan also contributed to the revolution and that social capital strengthened the effect of quotas on revolution participation.

Inefficient Investment Waves

- Econometrica---2016---Zhiguo He,Péter Kondor

We show that firms' individually optimal liquidity management results in socially inefficient boom-and-bust patterns. Financially constrained firms decide on the level of their liquid resources facing cash-flow shocks and time-varying investment opportunities. Firms' liquidity management decisions generate simultaneous waves in aggregate cash holdings and investment, even if technology remains constant. These investment waves are not constrained efficient in general, because the social and private value of liquidity differs. The resulting pecuniary externality affects incentives differentially depending on the state of the economy, and often overinvestment occurs during booms and underinvestment occurs during recessions. In general, policies intended to mitigate underinvestment raise prices during recessions, making overinvestment during booms worse. However, a well-designed price-support policy will increase welfare in both booms and recessions.

Matching on the Estimated Propensity Score

- Econometrica---2016---Alberto Abadie,Guido Imbens

Propensity score matching estimators (Rosenbaum and Rubin (1983)) are widely used in evaluation research to estimate average treatment effects. In this article, we derive the large sample distribution of propensity score matching estimators. Our derivations take into account that the propensity score is itself estimated in a first step, prior to matching. We prove that first step estimation of the propensity score affects the large sample distribution of propensity score matching estimators, and derive adjustments to the large sample variances of propensity score matching estimators of the average treatment effect (ATE) and the average treatment effect on the treated (ATET). The adjustment for the ATE estimator is negative (or zero in some special cases), implying that matching on the estimated propensity score is more efficient than matching on the true propensity score in large samples. However, for the ATET estimator, the sign of the adjustment term depends on the data generating process, and ignoring the estimation error in the propensity score may lead to confidence intervals that are either too large or too small.

IV Quantile Regression for Group-Level Treatments, With an Application to the Distributional Effects of Trade

- Econometrica---2016---Denis Chetverikov,Bradley Larsen,Christopher Palmer

We present a methodology for estimating the distributional effects of an endogenous treatment that varies at the group level when there are group-level unobservables, a quantile extension of Hausman and Taylor, 1981. Because of the presence of group-level unobservables, standard quantile regression techniques are inconsistent in our setting even if the treatment is independent of unobservables. In contrast, our estimation technique is consistent as well as computationally simple, consisting of group-by-group quantile regression followed by two-stage least squares. Using the Bahadur representation of quantile estimators, we derive weak conditions on the growth of the number of observations per group that are sufficient for consistency and asymptotic zero-mean normality of our estimator. As in Hausman and Taylor, 1981, micro-level covariates can be used as internal instruments for the endogenous group-level treatment if they satisfy relevance and exogeneity conditions. Our approach applies to a broad range of settings including labor, public finance, industrial organization, urban economics, and development; we illustrate its usefulness with several such examples. Finally, an empirical application of our estimator finds that low-wage earners in the United States from 1990 to 2007 were significantly more affected by increased Chinese import competition than high-wage earners.

Large Contests

- Econometrica---2016---Wojciech Olszewski,Ron Siegel

We consider contests with many, possibly heterogeneous, players and prizes, and show that the equilibrium outcomes of such contests are approximated by the outcomes of mechanisms that implement the assortative allocation in an environment with a single agent that has a continuum of possible types. This makes it possible to easily approximate the equilibria of contests whose exact equilibrium characterization is complicated, as well as the equilibria of contests for which there is no existing equilibrium characterization.

Consumption Commitments and Habit Formation

- Econometrica---2016---Raj Chetty,Adam Szeidl

We analyze the implications of household-level adjustment costs for the dynamics of aggregate consumption. We show that an economy in which agents have “consumption commitments” is approximately equivalent to a habit formation model in which the habit stock is a weighted average of past consumption if idiosyncratic risk is large relative to aggregate risk. Consumption commitments can thus explain the empirical regularity that consumption is excessively sensitive and excessively smooth, findings that are typically attributed to habit formation. Unlike habit formation and other theories, but consistent with empirical evidence, the consumption commitments model also predicts that excess sensitivity and smoothness vanish for large shocks. These results suggest that behavior previously attributed to habit formation may be better explained by adjustment costs. We develop additional testable predictions to further distinguish the commitment and habit models and show that the two models have different welfare implications.

Money and Credit Redux

- Econometrica---2016---Chao Gu,Fabrizio Mattesini,Randall Wright

We analyze money and credit as competing payment instruments in decentralized exchange. In natural environments, we show the economy does not need both: if credit is easy, money is irrelevant; if credit is tight, money is essential, but credit becomes irrelevant. Changes in credit conditions are neutral because real balances respond endogenously to keep total liquidity constant. This is true for both exogenous and endogenous debt limits and policy limits, secured and unsecured lending, and general pricing mechanisms. While we show how to overturn some of these results, the benchmark model suggests credit might matter less than people think.

Asset Markets With Heterogeneous Information

- Econometrica---2016---Pablo Kurlat

This paper studies competitive equilibria of economies where assets are heterogeneous and traders have heterogeneous information about them. Markets are defined by a price and a procedure for clearing trades, and any asset can, in principle, be traded in any market. Buyers can use their information to impose acceptance rules which specify which assets they are willing to trade in each market. The set of markets where trade takes place is derived endogenously. The model can be applied to find conditions under which these economies feature fire sales, contagion, and flights to quality.

Information in Tender Offers With a Large Shareholder

- Econometrica---2016---Mehmet Ekmekci,Nenad Kos

We study takeovers of firms whose ownership structure is a mixture of minority block-holders and small shareholders. We show that the combination of dispersed private information on the side of small shareholders and the presence of a large shareholder can facilitate profitable takeovers. Furthermore, our analysis implies that even if some model of takeovers predicts a profit for the raider, for example, due to private benefits, the profit will be underestimated unless the large shareholder and the dispersion of information among the small shareholders are modeled.

The Role of Automatic Stabilizers in the U.S. Business Cycle

- Econometrica---2016---Alisdair McKay,Ricardo Reis

Most countries have automatic rules in their tax-and-transfer systems that are partly intended to stabilize economic fluctuations. This paper measures their effect on the dynamics of the business cycle. We put forward a model that merges the standard incomplete-markets model of consumption and inequality with the new Keynesian model of nominal rigidities and business cycles, and that includes most of the main potential stabilizers in the U.S. data and the theoretical channels by which they may work. We find that the conventional argument that stabilizing disposable income will stabilize aggregate demand plays a negligible role in the dynamics of the business cycle, whereas tax-and-transfer programs that affect inequality and social insurance can have a larger effect on aggregate volatility. However, as currently designed, the set of stabilizers in place in the United States has had little effect on the volatility of aggregate output fluctuations or on their welfare costs despite stabilizing aggregate consumption. The stabilizers have a more important role when monetary policy is constrained by the zero lower bound, and they affect welfare significantly through the provision of social insurance.

Financial Health Economics

- Econometrica---2016---Ralph S. J. Koijen,Tomas J. Philipson,Harald Uhlig

We provide a theoretical and empirical analysis of the link between financial and real health care markets. This link is important as financial returns drive investment in medical research and development (R&D), which, in turn, affects real spending growth. We document a “medical innovation premium” of 4–6% annually for equity returns of firms in the health care sector. We interpret this premium as compensating investors for government-induced profit risk, and we provide supportive evidence for this hypothesis through company filings and abnormal return patterns surrounding threats of government intervention. We quantify the implications of the premium for the growth in real health care spending by calibrating our model to match historical trends, predicting the share of gross domestic product (GDP) devoted to health care to be 32% in the long run. Policies that had removed government risk would have led to more than a doubling of medical R&D and would have increased the current share of health care spending by more than 3% of GDP.

Search With Adverse Selection

- Econometrica---2016---Stephan Lauermann,Asher Wolinsky

This paper analyzes a sequential search model with adverse selection. We study information aggregation by the price—how close the equilibrium prices are to the full-information prices—when search frictions are small. We identify circumstances under which prices fail to aggregate information well even when search frictions are small. We trace this to a strong form of the winner’s curse that is present in the sequential search model. The failure of information aggregation may result in inefficient allocations.

Relational Incentive Contracts With Persistent Private Information

- Econometrica---2016---James Malcomson

This paper investigates relational incentive contracts with continuous, privately observed agent types that are persistent over time. With fixed agent types, full separation is not possible when continuation equilibrium payoffs following revelation are on the Pareto frontier of attainable payoffs. This result is related to the ratchet effect in that: (1) a type imitating a less productive type receives an information rent, and (2) with full separation, one imitating a more productive type receives the same future payoff as that more productive type. However, the reason for (2) is fundamentally different than with the ratchet effect. It arises from the dynamic enforcement requirement in relational contracts, not from the principal having all the bargaining power, and applies whatever the distribution between principal and agent of the future gains from the relationship (i.e., whatever the point on the Pareto frontier). This result extends to sufficiently persistent types under certain conditions.

Equilibrium Labor Turnover, Firm Growth, and Unemployment

- Econometrica---2016---Melvyn G. Coles,Dale Mortensen

This paper considers equilibrium quit turnover in a frictional labor market with costly hiring by firms, where large firms employ many workers and face both aggregate and firm specific productivity shocks. There is exogenous firm turnover as new (small) startups enter the market over time, while some existing firms fail and exit. Individual firm growth rates are disperse and evolve stochastically. The paper highlights how dynamic monopsony, where firms trade off lower wages against higher (endogenous) employee quit rates, yields excessive job-to-job quits. Such quits directly crowd out the reemployment prospects of the unemployed. With finite firm productivity states, stochastic equilibrium is fully tractable and can be computed using standard numerical techniques.

Comment on "Constrained Optimization Approaches to Estimation of Structural Models"

- Econometrica---2016---Fedor Iskhakov,Jinhyuk Lee,John Rust,Bertel Schjerning,Kyoungwon Seo

We revisit the comparison of mathematical programming with equilibrium constraints (MPEC) and nested fixed point (NFXP) algorithms for estimating structural dynamic models by Su and Judd (2012). Their implementation of the nested fixed point algorithm used successive approximations to solve the inner fixed point problem (NFXP-SA). We redo their comparison using the more efficient version of NFXP proposed by Rust (1987), which combines successive approximations and Newton–Kantorovich iterations to solve the fixed point problem (NFXP-NK). We show that MPEC and NFXP are similar in speed and numerical performance when the more efficient NFXP-NK variant is used.

Moral Hazard in High Office and the Dynamics of Aristocracy

- Econometrica---2015---Roger B. Myerson

Both aristocratic privileges and constitutional constraints in traditional monarchies can be derived from a ruler's incentive to minimize expected costs of moral-hazard rents for high officials. We consider a dynamic moral-hazard model of governors serving a sovereign prince, who must deter them from rebellion and hidden corruption which could cause costly crises. To minimize costs, a governor's rewards for good performance should be deferred up to the maximal credit that the prince can be trusted to pay. In the long run, we find that high officials can become an entrenched aristocracy with low turnover and large claims on the ruler. Dismissals for bad performance should be randomized to avoid inciting rebellions, but the prince can profit from reselling vacant offices, and so his decisions to dismiss high officials require institutionalized monitoring. A soft budget constraint that forgives losses for low-credit governors can become efficient when costs of corruption are low.

The Economics of Density: Evidence From the Berlin Wall

- Econometrica---2015---Gabriel Ahlfeldt,Stephen Redding,Daniel Sturm,Nikolaus Wolf

This paper develops a quantitative model of internal city structure that features agglomeration and dispersion forces and an arbitrary number of heterogeneous city blocks. The model remains tractable and amenable to empirical analysis because of stochastic shocks to commuting decisions, which yield a gravity equation for commuting flows. To structurally estimate agglomeration and dispersion forces, we use data on thousands of city blocks in Berlin for 1936, 1986, and 2006 and exogenous variation from the city's division and reunification. We estimate substantial and highly localized production and residential externalities. We show that the model with the estimated agglomeration parameters can account both qualitatively and quantitatively for the observed changes in city structure. We show how our quantitative framework can be used to undertake counterfactuals for changes in the organization of economic activity within cities in response, for example, to changes in the transport network.

Leverage and Default in Binomial Economies: A Complete Characterization

- Econometrica---2015---Ana Fostel,John Geanakoplos

Our paper provides a complete characterization of leverage and default in binomial economies with financial assets serving as collateral. Our Binomial No-Default Theorem states that any equilibrium is equivalent (in real allocations and prices) to another equilibrium in which there is no default. Thus actual default is irrelevant, though the potential for default drives the equilibrium and limits borrowing. This result is valid with arbitrary preferences and endowments, contingent or noncontingent promises, many assets and consumption goods, production, and multiple periods. We also show that only no-default equilibria would be selected if there were the slightest cost of using collateral or handling default. Our Binomial Leverage Theorem shows that equilibrium Loan to Value (LTV) for noncontingent debt contracts is the ratio of the worst-case return of the asset to the riskless gross rate of interest. In binomial economies, leverage is determined by down risk and not by volatility.

Entry and Exit in OTC Derivatives Markets

- Econometrica---2015---Andrew Atkeson,Andrea Eisfeldt,Pierre-Olivier Weill

We develop a parsimonious model to study the equilibrium and socially optimal decisions of banks to enter, trade in, and possibly exit, an OTC market. Although we endow all banks with the same trading technology, banks' optimal entry and trading decisions endogenously lead to a realistic market structure composed of dealers and customers with distinct trading patterns. We decompose banks' entry incentives into incentives to hedge risk and incentives to make intermediation profits. We show that dealer banks enter more than is socially optimal. In the face of large negative shocks, they may also exit more than is socially optimal when markets are not perfectly resilient.

Promotion, Turnover, and Compensation in the Executive Labor Market

- Econometrica---2015---George-Levi Gayle,Limor Golan,Robert A. Miller

This paper develops a generalized Roy model with human capital accumulation, moral hazard, and career concerns. We identify and estimate the model with a large panel that matches data on publicly listed firms to information on their executives. The structural estimates obtained are used to decompose the firm-size pay gap. We find that although total compensation and incentive pay increase with firm size, certainty-equivalent pay decreases with firm size. In larger firms, and for more highly ranked executives, weaker signal quality about effort results in higher risk premiums. This risk premium accounts for roughly 80 percent of the firm-size gap in total compensation. Larger firms are also willing to pay more than smaller ones to attract executives. Finally, the estimated coefficients on human capital accumulation from formal education and experience gained from different firms are individually significant, but their collective effect on firm-size pay differentials nets out.

Stochastic Choice and Revealed Perturbed Utility

- Econometrica---2015---Drew Fudenberg,Ryota Iijima,Tomasz Strzalecki

Perturbed utility functions—the sum of expected utility and a nonlinear perturbation function—provide a simple and tractable way to model various sorts of stochastic choice. We provide two easily understood conditions each of which characterizes this representation: One condition generalizes the acyclicity condition used in revealed preference theory, and the other generalizes Luce's IIA condition. We relate the discrimination or selectivity of choice rules to properties of their associated perturbations, both across different agents and across decision problems. We also show that these representations correspond to a form of ambiguity-averse preferences for an agent who is uncertain about her true utility.

Identification Properties of Recent Production Function Estimators

- Econometrica---2015---Daniel Ackerberg,Kevin Caves,Garth Frazer

This paper examines some of the recent literature on the estimation of production functions. We focus on techniques suggested in two recent papers, Olley and Pakes (1996) and Levinsohn and Petrin (2003). While there are some solid and intuitive identification ideas in these papers, we argue that the techniques can suffer from functional dependence problems. We suggest an alternative approach that is based on the ideas in these papers, but does not suffer from the functional dependence problems and produces consistent estimates under alternative data generating processes for which the original procedures do not.

Inference on Causal Effects in a Generalized Regression Kink Design

- Econometrica---2015---David Card,David S. Lee,Zhuan Pei,Andrea Weber

We consider nonparametric identification and estimation in a nonseparable model where a continuous regressor of interest is a known, deterministic, but kinked function of an observed assignment variable. We characterize a broad class of models in which a sharp "Regression Kink Design" (RKD or RK Design) identifies a readily interpretable treatment-on-the-treated parameter (Florens, Heckman, Meghir, and Vytlacil (2008)). We also introduce a "fuzzy regression kink design" generalization that allows for omitted variables in the assignment rule, noncompliance, and certain types of measurement errors in the observed values of the assignment variable and the policy variable. Our identifying assumptions give rise to testable restrictions on the distributions of the assignment variable and predetermined covariates around the kink point, similar to the restrictions delivered by Lee (2008) for the regression discontinuity design. Using a kink in the unemployment benefit formula, we apply a fuzzy RKD to empirically estimate the effect of benefit rates on unemployment durations in Austria.

Equivalence Between Out-of-Sample Forecast Comparisons and Wald Statistics

- Econometrica---2015---Peter Hansen,Allan Timmermann

We demonstrate the asymptotic equivalence between commonly used test statistics for out-of-sample forecasting performance and conventional Wald statistics. This equivalence greatly simplifies the computational burden of calculating recursive out-of-sample test statistics and their critical values. For the case with nested models, we show that the limit distribution, which has previously been expressed through stochastic integrals, has a simple representation in terms of χ-super-2-distributed random variables and we derive its density. We also generalize the limit theory to cover local alternatives and characterize the power properties of the test.

A Theory of the Stakeholder Corporation

- Econometrica---2015---Michael Magill,Martine Quinzii,Jean Rochet

There is a widely held view within the general public that large corporations should act in the interests of a broader group of agents than just their shareholders (the stakeholder view). This paper presents a framework where this idea can be justified. The point of departure is the observation that a large firm typically faces endogenous risks that may have a significant impact on the workers it employs and the consumers it serves. These risks generate externalities on these stakeholders which are not internalized by shareholders. As a result, in the competitive equilibrium, there is under-investment in the prevention of these risks. We suggest that this under-investment problem can be alleviated if firms are instructed to maximize the total welfare of their stakeholders rather than shareholder value alone (stakeholder equilibrium). The stakeholder equilibrium can be implemented by introducing new property rights (employee rights and consumer rights) and instructing managers to maximize the total value of the firm (the value of these rights plus shareholder value). If there is only one firm, the stakeholder equilibrium is Pareto optimal. However, this is not true with more than one firm and/or heterogeneous agents, which illustrates some of the limits of the stakeholder model.

Knightian Analysis of the Vickrey Mechanism

- Econometrica---2015---Alessandro Chiesa,Silvio Micali,Zeyuan Allen Zhu

We analyze the Vickrey mechanism for auctions of multiple identical goods when the players have both Knightian uncertainty over their own valuations and incomplete preferences. In this model, the Vickrey mechanism is no longer dominant-strategy, and we prove that all dominant-strategy mechanisms are inadequate. However, we also prove that, in undominated strategies, the social welfare produced by the Vickrey mechanism in the worst case is not only very good, but also essentially optimal.

Strategic Learning and the Topology of Social Networks

- Econometrica---2015---Elchanan Mossel,Allan Sly,Omer Tamuz

We consider a group of strategic agents who must each repeatedly take one of two possible actions. They learn which of the two actions is preferable from initial private signals and by observing the actions of their neighbors in a social network. We show that the question of whether or not the agents learn efficiently depends on the topology of the social network. In particular, we identify a geometric “egalitarianism” condition on the social network that guarantees learning in infinite networks, or learning with high probability in large finite networks, in any equilibrium. We also give examples of nonegalitarian networks with equilibria in which learning fails.

Truthful Equilibria in Dynamic Bayesian Games

- Econometrica---2015---Johannes Hörner,Satoru Takahashi,Nicolas Vieille

This paper characterizes an equilibrium payoff subset for dynamic Bayesian games as discounting vanishes. Monitoring is imperfect, transitions may depend on actions, types may be correlated, and values may be interdependent. The focus is on equilibria in which players report truthfully. The characterization generalizes that for repeated games, reducing the analysis to static Bayesian games with transfers. With independent private values, the restriction to truthful equilibria is without loss, except for the punishment level: if players withhold their information during punishment-like phases, a folk theorem obtains.

Efficient Competition Through Cheap Talk: The Case of Competing Auctions

- Econometrica---2015---Kyungmin Kim,Philipp Kircher

We consider a large market where auctioneers with private reservation values compete for bidders by announcing cheap-talk messages. If auctioneers run efficient first-price auctions, then there always exists an equilibrium in which each auctioneer truthfully reveals her type. The equilibrium is constrained efficient, assigning more bidders to auctioneers with larger gains from trade. The choice of the trading mechanism is crucial for the result. Most notably, the use of second-price auctions (equivalently, ex post bidding) leads to the nonexistence of any informative equilibrium. We examine the robustness of our finding in various dimensions, including finite markets and equilibrium selection.

Poverty and Self-Control

- Econometrica---2015---B. Douglas Bernheim,Debraj Ray,Şevin Yeltekin

We argue that poverty can perpetuate itself by undermining the capacity for self-control. In line with a distinguished psychological literature, we consider modes of self-control that involve the self-imposed use of contingent punishments and rewards. We study settings in which consumers with quasi-hyperbolic preferences confront an otherwise standard intertemporal allocation problem with credit constraints. Our main result demonstrates that low initial assets can limit self-control, trapping people in poverty, while individuals with high initial assets can accumulate indefinitely. Thus, even temporary policies that initiate accumulation among the poor may be effective. We examine implications concerning the effect of access to credit on saving, the demand for commitment devices, the design of financial accounts to promote accumulation, and the variation of the marginal propensity to consume across income from different sources. We also explore the nature of optimal self-control, demonstrating that it has a simple and behaviorally plausible structure that is immune to self-renegotiation.

The Value of Free Water: Analyzing South Africa's Free Basic Water Policy

- Econometrica---2015---Andrea Szabo

This paper analyzes South Africa's Free Basic Water Policy, under which households receive a free water allowance equal to the World Health Organization's recommended minimum. I estimate residential water demand, evaluate the welfare effects of free water, and provide optimal price schedules derived from a social planner's problem. I use a data set of monthly metered billing data for 60,000 households for 2002–2009 from a particularly disadvantaged suburb of Pretoria, with rich price variation across 20 different nonlinear tariff schedules. I find that the free allowance acts as a lump-sum subsidy, without large effects on water consumption. However, it is possible to reallocate the current subsidy to form an optimal tariff without a free allowance, which would increase welfare while leaving the water provider's profit unchanged. This optimal tariff would also reduce the number of households consuming low quantities of water, a desirable policy goal according to the WHO.

Sign Restrictions, Structural Vector Autoregressions, and Useful Prior Information

- Econometrica---2015---Christiane Baumeister,James Hamilton

This paper makes the following original contributions to the literature. (i) We develop a simpler analytical characterization and numerical algorithm for Bayesian inference in structural vector autoregressions (VARs) that can be used for models that are overidentified, just-identified, or underidentified. (ii) We analyze the asymptotic properties of Bayesian inference and show that in the underidentified case, the asymptotic posterior distribution of contemporaneous coefficients in an n-variable VAR is confined to the set of values that orthogonalize the population variance–covariance matrix of ordinary least squares residuals, with the height of the posterior proportional to the height of the prior at any point within that set. For example, in a bivariate VAR for supply and demand identified solely by sign restrictions, if the population correlation between the VAR residuals is positive, then even if one has available an infinite sample of data, any inference about the demand elasticity is coming exclusively from the prior distribution. (iii) We provide analytical characterizations of the informative prior distributions for impulse-response functions that are implicit in the traditional sign-restriction approach to VARs, and we note, as a special case of result (ii), that the influence of these priors does not vanish asymptotically. (iv) We illustrate how Bayesian inference with informative priors can be both a strict generalization and an unambiguous improvement over frequentist inference in just-identified models. (v) We propose that researchers need to explicitly acknowledge and defend the role of prior beliefs in influencing structural conclusions and we illustrate how this could be done using a simple model of the U.S. labor market.

Sharing Rule Identification for General Collective Consumption Models

- Econometrica---2015---Laurens Cherchye,Bram De Rock,Arthur Lewbel,Frederic Vermeulen

We propose a method to set identify bounds on the sharing rule for a general collective household consumption model. Unlike the effects of distribution factors, the level of the sharing rule cannot be uniquely identified without strong assumptions on preferences across households. Our new results show that, though not point identified without these assumptions, strong bounds on the sharing rule can be obtained. We get these bounds by applying revealed preference restrictions implied by the collective model to the household's continuous aggregate demand functions. We obtain informative bounds even if nothing is known about whether each good is public, private, or assignable within the household, though having such information tightens the bounds. We apply our method to US PSID data, obtaining narrow bounds that yield useful conclusions regarding the effects of income and wages on intrahousehold resource sharing, and on the prevalence of individual (as opposed to household level) poverty.

A Test for Instrument Validity

- Econometrica---2015---Toru Kitagawa

This paper develops a specification test for instrument validity in the heterogeneous treatment effect model with a binary treatment and a discrete instrument. The strongest testable implication for instrument validity is given by the condition for nonnegativity of point-identifiable compliers' outcome densities. Our specification test infers this testable implication using a variance-weighted Kolmogorov–Smirnov test statistic. The test can be applied to both discrete and continuous outcome cases, and an extension of the test to settings with conditioning covariates is provided.

Identifying Higher-Order Rationality

- Econometrica---2015---Terri Kneeland

Strategic choice data from a carefully chosen set of ring-network games are used to obtain individual-level estimates of higher-order rationality. The experimental design exploits a natural exclusion restriction that is considerably weaker than the assumptions underlying alternative designs in the literature. In our data set, 93 percent of subjects are rational, 71 percent are rational and believe others are rational, 44 percent are rational and hold second-order beliefs that others are rational, and 22 percent are rational and hold at least third-order beliefs that others are rational.

Equilibria in Health Exchanges: Adverse Selection versus Reclassification Risk

- Econometrica---2015---Ben Handel,Igal Hendel,Michael D. Whinston

This paper studies regulated health insurance markets known as exchanges, motivated by the increasingly important role they play in both public and private insurance provision. We develop a framework that combines data on health outcomes and insurance plan choices for a population of insured individuals with a model of a competitive insurance exchange to predict outcomes under different exchange designs. We apply this framework to examine the effects of regulations that govern insurers' ability to use health status information in pricing. We investigate the welfare implications of these regulations with an emphasis on two potential sources of inefficiency: (i) adverse selection and (ii) premium reclassification risk. We find substantial adverse selection leading to full unraveling of our simulated exchange, even when age can be priced. While the welfare cost of adverse selection is substantial when health status cannot be priced, that of reclassification risk is five times larger when insurers can price based on some health status information. We investigate several extensions including (i) contract design regulation, (ii) self-insurance through saving and borrowing, and (iii) insurer risk adjustment transfers.

Trade Credit and the Propagation of Corporate Failure: An Empirical Analysis

- Econometrica---2015---Tor Jacobson,Erik Schedvin

Using an exhaustive data set on claims held by trade creditors (suppliers) on failed trade debtors (customers), we quantify the importance of trade credit chains for the propagation of corporate bankruptcy. We show that trade creditors experience significant trade credit losses due to trade debtor failures and that creditors' bankruptcy risks increase in the size of incurred losses. By exploring the roles of financial constraints and creditor-debtor dependences, we infer that the trade credit failure propagation mechanism is driven by both credit losses and demand shrinkage. Finally, we show that the documented propagation mechanism constitutes a significant part of the overall bankruptcy frequency, suggesting that it has measurable implications for the aggregate level.

Dynamic Marriage Matching: An Empirical Framework

- Econometrica---2015---Eugene Choo

This paper develops a new model for empirically analyzing dynamic matching in the marriage market and then applies that model to recent changes in the U.S. marriage distribution. Its primary objective is to estimate gains by age from being married today (till death of at least one spouse) relative to remaining single for that same time period. An empirical methodology that relies on the model's equilibrium outcomes identifies the marriage gains using a single cross-section of observed aggregate matches. This behavioral dynamic model rationalizes a new marriage matching function. The model also solves the inverse problem of computing the vector of aggregate marriages, given a new distribution of available single individuals and estimated preferences. Finally, this paper develops a simple test of the model's empirical validity. Using aggregate data of new marriages and available single men and women in the United States over two decades from 1970 to 1990, I investigate the changes in marriage gains over this period.

Commitment, Flexibility, and Optimal Screening of Time Inconsistency

- Econometrica---2015---Simone Galperti

This paper develops a theory of optimal provision of commitment devices to people who value both commitment and flexibility and whose preferences differ in the degree of time inconsistency. If time inconsistency is observable, both a planner and a monopolist provide devices that help each person commit to the efficient level of flexibility. However, the combination of unobservable time inconsistency and preference for flexibility causes an adverse-selection problem. To solve this problem, the monopolist and (possibly) the planner curtail flexibility in the device for a more inconsistent person at both ends of the efficient choice range; moreover, they may have to add unused options to the device for a less inconsistent person and also distort his actual choices. This theory has normative and positive implications for private and public provision of commitment devices.

Savage in the Market

- Econometrica---2015---Federico Echenique,Kota Saito

We develop a behavioral axiomatic characterization of subjective expected utility (SEU) under risk aversion. Given is an individual agent's behavior in the market: assume a finite collection of asset purchases with corresponding prices. We show that such behavior satisfies a "revealed preference axiom" if and only if there exists a SEU model (a subjective probability over states and a concave utility function over money) that accounts for the given asset purchases.

Power Enhancement in High-Dimensional Cross-Sectional Tests

- Econometrica---2015---Jianqing Fan,Yuan Liao,Jiawei Yao

We propose a novel technique to boost the power of testing a high-dimensional vector H : θ = 0 against sparse alternatives where the null hypothesis is violated by only a few components. Existing tests based on quadratic forms such as the Wald statistic often suffer from low powers due to the accumulation of errors in estimating high-dimensional parameters. More powerful tests for sparse alternatives such as thresholding and extreme value tests, on the other hand, require either stringent conditions or bootstrap to derive the null distribution and often suffer from size distortions due to the slow convergence. Based on a screening technique, we introduce a "power enhancement component," which is zero under the null hypothesis with high probability, but diverges quickly under sparse alternatives. The proposed test statistic combines the power enhancement component with an asymptotically pivotal statistic, and strengthens the power under sparse alternatives. The null distribution does not require stringent regularity conditions, and is completely determined by that of the pivotal statistic. The proposed methods are then applied to testing the factor pricing models and validating the cross-sectional independence in panel data models.

Linear Regression for Panel With Unknown Number of Factors as Interactive Fixed Effects

- Econometrica---2015---Hyungsik Moon,Martin Weidner

In this paper, we study the least squares (LS) estimator in a linear panel regression model with unknown number of factors appearing as interactive fixed effects. Assuming that the number of factors used in estimation is larger than the true number of factors in the data, we establish the limiting distribution of the LS estimator for the regression coefficients as the number of time periods and the number of cross-sectional units jointly go to infinity. The main result of the paper is that under certain assumptions, the limiting distribution of the LS estimator is independent of the number of factors used in the estimation as long as this number is not underestimated. The important practical implication of this result is that for inference on the regression coefficients, one does not necessarily need to estimate the number of interactive fixed effects consistently.

A Test of Exogeneity Without Instrumental Variables in Models With Bunching

- Econometrica---2015---Carolina Caetano

This paper presents a test of the exogeneity of a single explanatory variable in a multivariate model. It does not require the exogeneity of the other regressors or the existence of instrumental variables. The fundamental maintained assumption is that the model must be continuous in the explanatory variable of interest. This test has power when unobservable confounders are discontinuous with respect to the explanatory variable of interest, and it is particularly suitable for applications in which that variable has bunching points. An application of the test to the problem of estimating the effects of maternal smoking in birth weight shows evidence of remaining endogeneity, even after controlling for the most complete covariate specification in the literature.

Impatience versus Incentives

- Econometrica---2015---Marcus Opp,John Y. Zhu

This paper studies the dynamics of long-term contracts in repeated principal–agent relationships with an impatient agent. Despite the absence of exogenous uncertainty, Pareto-optimal dynamic contracts generically oscillate between favoring the principal and favoring the agent.

Tight Revenue Bounds With Possibilistic Beliefs and Level-k Rationality

- Econometrica---2015---Jing Chen,Silvio Micali,Rafael Pass

Mechanism design enables a social planner to obtain a desired outcome by leveraging the players' rationality and their beliefs. It is thus a fundamental, but yet unproven, intuition that the higher the level of rationality of the players, the better the set of obtainable outcomes. In this paper, we prove this fundamental intuition for players with possibilistic beliefs, a model long considered in epistemic game theory. Specifically, • We define a sequence of monotonically increasing revenue benchmarks for single-good auctions, G-super-0⩽G-super-1⩽G-super-2⩽ , where each G-super-i is defined over the players' beliefs and G-super-0 is the second-highest valuation (i.e., the revenue benchmark achieved by the second-price mechanism). • We (1) construct a single, interim individually rational, auction mechanism that, without any clue about the rationality level of the players, guarantees revenue G-super-k if all players have rationality levels ⩾k+1, and (2) prove that no such mechanism can guarantee revenue even close to G-super-k when at least two players are at most level-k rational.

A Dynamic Reinterpretation of Nash Bargaining With Endogenous Threats

- Econometrica---2015---Dilip Abreu,David Pearce

This paper concerns the two-stage game introduced in Nash (1953). It formalizes a suggestion made (but not pursued) by Nash regarding equilibrium selection in that game, and hence offers an arguably more solid foundation for the "Nash bargaining with endogenous threats" solution. Analogous reasoning is then applied to an infinite horizon game to provide equilibrium selection in two-person repeated games with contracts. In this setting, issues about enforcement of threats are much less problematic than in Nash's static setting. The analysis can be extended to stochastic games with contracts.

Investment and Competitive Matching

- Econometrica---2015---Georg Nöldeke,Larry Samuelson

We study markets in which agents first make investments and are then matched into potentially productive partnerships. Equilibrium investments and the equilibrium matching will be efficient if agents can simultaneously negotiate investments and matches, but we focus on markets in which agents must first sink their investments before matching. Additional equilibria may arise in this sunk-investment setting, even though our matching market is competitive. These equilibria exhibit inefficiencies that we can interpret as coordination failures. All allocations satisfying a constrained efficiency property are equilibria, and the converse holds if preferences satisfy a separability condition. We identify sufficient conditions (most notably, quasiconcave utilities) for the investments of matched agents to satisfy an exchange efficiency property as well as sufficient conditions (most notably, a single crossing property) for agents to be matched positive assortatively, with these conditions then forming the core of sufficient conditions for the efficiency of equilibrium allocations.

Large Matching Markets as Two-Sided Demand Systems

- Econometrica---2015---Konrad Menzel

This paper studies two-sided matching markets with non-transferable utility when the number of market participants grows large. We consider a model in which each agent has a random preference ordering over individual potential matching partners, and agents' types are only partially observed by the econometrician. We show that in a large market, the inclusive value is a sufficient statistic for an agent's endogenous choice set with respect to the probability of being matched to a spouse of a given observable type. Furthermore, while the number of pairwise stable matchings for a typical realization of random utilities grows at a fast rate as the number of market participants increases, the inclusive values resulting from any stable matching converge to a unique deterministic limit. We can therefore characterize the limiting distribution of the matching market as the unique solution to a fixed-point condition on the inclusive values. Finally we analyze identification and estimation of payoff parameters from the asymptotic distribution of observable characteristics at the level of pairs resulting from a stable matching.

Tenable Strategy Blocks and Settled Equilibria

- Econometrica---2015---Roger Myerson,Jörgen Weibull

When people interact in familiar settings, social conventions usually develop so that people tend to disregard alternatives outside the convention. For rational players to usually restrict attention to a block of conventional strategies, no player should prefer to deviate from the block when others are likely to act conventionally and rationally inside the block. We explore two set-valued concepts, coarsely and finely tenable blocks, that formalize this notion for finite normal-form games. We then identify settled equilibria, which are Nash equilibria with support in minimal tenable blocks. For a generic class of normal-form games, our coarse and fine concepts are equivalent, and yet they differ from standard solution concepts on open sets of games. We demonstrate the nature and power of the solutions by way of examples. Settled equilibria are closely related to persistent equilibria but are strictly more selective on an open set of games. With fine tenability, we obtain invariance under the insertion of a subgame with a unique totally mixed payoff-equivalent equilibrium, a property that other related concepts have not satisfied.

The Farsighted Stable Set

- Econometrica---2015---Debraj Ray,Rajiv Vohra

Harsanyi (1974) criticized the von Neumann–Morgenstern (vNM) stable set for its presumption that coalitions are myopic about their prospects. He proposed a new dominance relation incorporating farsightedness, but retained another feature of the stable set: that a coalition S can impose any imputation as long as its restriction to S is feasible for it. This implicitly gives an objecting coalition complete power to arrange the payoffs of players elsewhere, which is clearly unsatisfactory. While this assumption is largely innocuous for myopic dominance, it is of crucial significance for its farsighted counterpart. Our modification of the Harsanyi set respects “coalitional sovereignty.” The resulting farsighted stable set is very different from both the Harsanyi and the vNM sets. We provide a necessary and sufficient condition for the existence of a farsighted stable set containing just a single-payoff allocation. This condition roughly establishes an equivalence between core allocations and the union of allocations over all single-payoff farsighted stable sets. We then conduct a comprehensive analysis of the existence and structure of farsighted stable sets in simple games. This last exercise throws light on both single-payoff and multi-payoff stable sets, and suggests that they do not coexist.

Sieve Wald and QLR Inferences on Semi/Nonparametric Conditional Moment Models

- Econometrica---2015---Xiaohong Chen,Demian Pouzo

This paper considers inference on functionals of semi/nonparametric conditional moment restrictions with possibly nonsmooth generalized residuals, which include all of the (nonlinear) nonparametric instrumental variables (IV) as special cases. These models are often ill-posed and hence it is difficult to verify whether a (possibly nonlinear) functional is root-n estimable or not. We provide computationally simple, unified inference procedures that are asymptotically valid regardless of whether a functional is root-n estimable or not. We establish the following new useful results: (1) the asymptotic normality of a plug-in penalized sieve minimum distance (PSMD) estimator of a (possibly nonlinear) functional; (2) the consistency of simple sieve variance estimators for the plug-in PSMD estimator, and hence the asymptotic chi-square distribution of the sieve Wald statistic; (3) the asymptotic chi-square distribution of an optimally weighted sieve quasi likelihood ratio (QLR) test under the null hypothesis; (4)

the asymptotic tight distribution of a non-optimally weighted sieve QLR statistic under the null; (5) the consistency of generalized residual bootstrap sieve Wald and QLR tests; (6) local power properties of sieve Wald and QLR tests and of their bootstrap versions; (7) asymptotic properties of sieve Wald and SQLR for functionals of increasing dimension. Simulation studies and an empirical illustration of a nonparametric quantile IV regression are presented.

Parametric Inference and Dynamic State Recovery From Option Panels

- Econometrica---2015---Torben Andersen,Nicola Fusari,Viktor Todorov

We develop a new parametric estimation procedure for option panels observed with error. We exploit asymptotic approximations assuming an ever increasing set of option prices in the moneyness (cross-sectional) dimension, but with a fixed time span. We develop consistent estimators for the parameters and the dynamic realization of the state vector governing the option price dynamics. The estimators converge stably to a mixed-Gaussian law and we develop feasible estimators for the limiting variance. We also provide semiparametric tests for the option price dynamics based on the distance between the spot volatility extracted from the options and one constructed nonparametrically from high-frequency data on the underlying asset. Furthermore, we develop new tests for the day-by-day model fit over specific regions of the volatility surface and for the stability of the risk-neutral dynamics over time. A comprehensive Monte Carlo study indicates that the inference procedures work well in empirically realistic settings. In an empirical application to S&P 500 index options, guided by the new diagnostic tests, we extend existing asset pricing models by allowing for a flexible dynamic relation between volatility and priced jump tail risk. Importantly, we document that the priced jump tail risk typically responds in a more pronounced and persistent manner than volatility to large negative market shocks.

Grouped Patterns of Heterogeneity in Panel Data

- Econometrica---2015---Stéphane Bonhomme,Elena Manresa

This paper introduces time-varying grouped patterns of heterogeneity in linear panel data models. A distinctive feature of our approach is that group membership is left unrestricted. We estimate the parameters of the model using a “grouped fixed-effects” estimator that minimizes a least squares criterion with respect to all possible groupings of the cross-sectional units. Recent advances in the clustering literature allow for fast and efficient computation. We provide conditions under which our estimator is consistent as both dimensions of the panel tend to infinity, and we develop inference methods. Finally, we allow for grouped patterns of unobserved heterogeneity in the study of the link between income and democracy across countries.

Identification of Nonseparable Models Using Instruments With Small Support

- Econometrica---2015---Alexander Torgovitsky

I consider nonparametric identification of nonseparable instrumental variables models with continuous endogenous variables. If both the outcome and first stage equations are strictly increasing in a scalar unobservable, then many kinds of continuous, discrete, and even binary instruments can be used to point-identify the levels of the outcome equation. This contrasts sharply with related work by Imbens and Newey, 2009 that requires continuous instruments with large support. One implication is that assumptions about the dimension of heterogeneity can provide nonparametric point-identification of the distribution of treatment response for a continuous treatment in a randomized controlled experiment with partial compliance.

Identification of Nonseparable Triangular Models With Discrete Instruments

- Econometrica---2015---Xavier D’Haultfoeuille,Philippe Février

We study the identification through instruments of a nonseparable function that relates a continuous outcome to a continuous endogenous variable. Using group and dynamical systems theories, we show that full identification can be achieved under strong exogeneity of the instrument and a dual monotonicity condition, even if the instrument is discrete. When identified, the model is also testable. Our results therefore highlight the identifying power of strong exogeneity when combined with monotonicity restrictions.

The Economics of Counterfeiting

- Econometrica---2015---Elena Quercioli,Lones Smith

We develop a strategic theory of counterfeiting as a multi-market large game. Bad guys choose whether to counterfeit, and what quality to produce. Opposing them is a continuum of good guys who select a costly verification effort. In equilibrium, counterfeiters produce better quality at higher notes, but verifiers try sufficiently harder that verification still improves. We develop a graphical framework for deducing comparative statics. Passed and counterfeiting rates vanish for low and high notes. Our predictions are consistent with time series and cross-sectional patterns in a unique data set assembled largely from the Secret Service.

Corrigendum to “Discounted Stochastic Games With No Stationary Nash Equilibrium: Two Examples”

- Econometrica---2015---Yehuda John Levy,Andrew McLennan

Levy (2013) presented examples of discounted stochastic games that do not have stationary equilibria. The second named author has pointed out that one of these examples is incorrect. In addition to describing the details of this error, this note presents a new example by the first named author that succeeds in demonstrating that discounted stochastic games with absolutely continuous transitions can fail to have stationary equilibria.

Voting Technology, Political Responsiveness, and Infant Health: Evidence From Brazil

- Econometrica---2015---Thomas Fujiwara

This paper studies the introduction of electronic voting technology in Brazilian elections. Estimates exploiting a regression discontinuity design indicate that electronic voting reduced residual (error-ridden and uncounted) votes and promoted a large de facto enfranchisement of mainly less educated citizens. Estimates exploiting the unique pattern of the technology’s phase-in across states over time suggest that, as predicted by political economy models, it shifted government spending toward health care, which is particularly beneficial to the poor. Positive effects on both the utilization of health services (prenatal visits) and newborn health (low-weight births) are also found for less educated mothers, but not for the more educated.

How Is Power Shared in Africa?

- Econometrica---2015---Patrick Francois,Ilia Rainer,Francesco Trebbi

Is African politics characterized by concentrated power in the hands of a narrow group (ethnically determined) that then fluctuates from one extreme to another via frequent coups? Employing data on the ethnicity of cabinet ministers since independence, we show that African ruling coalitions are surprisingly large and that political power is allocated proportionally to population shares across ethnic groups. This holds true even restricting the analysis to the subsample of the most powerful ministerial posts. We argue that the likelihood of revolutions from outsiders and coup threats from insiders are major forces explaining allocations within these regimes. Alternative allocation mechanisms are explored. Counterfactual experiments that shed light on the role of Western policies in affecting African national coalitions and leadership group premia are performed.

Democratization Under the Threat of Revolution: Evidence From the Great Reform Act of 1832

- Econometrica---2015---Toke S. Aidt,Raphael Franck

We examine the link between the threat of violence and democratization in the context of the Great Reform Act passed by the British Parliament in 1832. We geo-reference the so-called Swing riots, which occurred between the 1830 and 1831 parliamentary elections, and compute the number of these riots that happened within a 10 km radius of the 244 English constituencies. Our empirical analysis relates this constituency-specific measure of the threat perceptions held by the 344,000 voters in the Unreformed Parliament to the share of seats won in each constituency by pro-reform politicians in 1831. We find that the Swing riots induced voters to vote for pro-reform politicians after experiencing first-hand the violence of the riots.

Sentiments and Aggregate Demand Fluctuations

- Econometrica---2015---Jess Benhabib,Pengfei Wang,Yi Wen

We formalize the Keynesian insight that aggregate demand driven by sentiments can generate output fluctuations under rational expectations. When production decisions must be made under imperfect information about demand, optimal decisions based on sentiments can generate stochastic self-fulfilling rational expectations equilibria in standard economies without persistent informational frictions, externalities, nonconvexities, or strategic complementarities in production. The models we consider are deliberately simple, but could serve as benchmarks for more complicated equilibrium models with additional features.

Time Horizon and Cooperation in Continuous Time

- Econometrica---2015---Maria Bigoni,Marco Casari,Andrzej Skrzypacz,Giancarlo Spagnolo

We study social dilemmas in (quasi-) continuous-time experiments, comparing games with different durations and termination rules. We discover a stark qualitative contrast in behavior in continuous time as compared to previously studied behavior in discrete-time games: cooperation is easier to achieve and sustain with deterministic horizons than with stochastic ones, and end-game effects emerge, but subjects postpone them with experience. Analysis of individual strategies provides a basis for a simple reinforcement learning model that proves to be consistent with this evidence. An additional treatment lends further support to this explanation.

Nonparametric Welfare Analysis for Discrete Choice

- Econometrica---2015---Debopam Bhattacharya

We consider empirical measurement of equivalent variation (EV) and compensating variation (CV) resulting from price change of a discrete good using individual-level data when there is unobserved heterogeneity in preferences. We show that for binary and unordered multinomial choice, the marginal distributions of EV and CV can be expressed as simple closed-form functionals of conditional choice probabilities under essentially unrestricted preference distributions. These results hold even when the distribution and dimension of unobserved heterogeneity are neither known nor identified, and utilities are neither quasilinear nor parametrically specified. The welfare distributions take simple forms that are easy to compute in applications. In particular, average EV for a price rise equals the change in average Marshallian consumer surplus and is smaller than average CV for a normal good. These nonparametric point-identification results fail for ordered choice if the unit price is identical for all alternatives, thereby providing a connection to Hausman–Newey's (2014) partial identification results for the limiting case of continuous choice.

Dynamic Logit With Choice Aversion

- Econometrica---2015---Drew Fudenberg,Tomasz Strzalecki

We characterize a generalization of discounted logistic choice that incorporates a parameter to capture different views the agent might have about the costs and benefits of larger choice sets. The discounted logit model used in the empirical literature is the special case that displays a “preference for flexibility” in the sense that the agent always prefers to add additional items to a menu. Other cases display varying levels of “choice aversion,” where the agent prefers to remove items from a menu if their ex ante value is below a threshold. We show that higher choice aversion, as measured by dislike of bigger menus, also corresponds to an increased preference for putting off decisions as late as possible.

Cautious Expected Utility and the Certainty Effect

- Econometrica---2015---Simone Cerreia-Vioglio,David Dillenberger,Pietro Ortoleva,Simone Cerreia-Vioglio

Many violations of the independence axiom of expected utility can be traced to subjects' attraction to risk-free prospects. The key axiom in this paper, negative certainty independence ([Dillenberger, 2010]), formalizes this tendency. Our main result is a utility representation of all preferences over monetary lotteries that satisfy negative certainty independence together with basic rationality postulates. Such preferences can be represented as if the agent were unsure of how to evaluate a given lottery p; instead, she has in mind a set of possible utility functions over outcomes and displays a cautious behavior: she computes the certainty equivalent of p with respect to each possible function in the set and picks the smallest one. The set of utilities is unique in a well defined sense. We show that our representation can also be derived from a “cautious” completion of an incomplete preference relation.

A Polynomial Optimization Approach to Principal–Agent Problems

- Econometrica---2015---Philipp Renner,Karl Schmedders

This paper presents a new method for the analysis of moral hazard principal–agent problems. The new approach avoids the stringent assumptions on the distribution of outcomes made by the classical first-order approach and instead only requires the agent's expected utility to be a rational function of the action. This assumption allows for a reformulation of the agent's utility maximization problem as an equivalent system of equations and inequalities. This reformulation in turn transforms the principal's utility maximization problem into a nonlinear program. Under the additional assumptions that the principal's expected utility is a polynomial and the agent's expected utility is rational in the wage, the final nonlinear program can be solved to global optimality. The paper also shows how to first approximate expected utility functions that are not rational by polynomials, so that the polynomial optimization approach can be applied to compute an approximate solution to nonpolynomial problems. Finally, the paper demonstrates that the polynomial optimization approach extends to principal–agent models with multidimensional action sets.

Nearly Optimal Tests When a Nuisance Parameter Is Present Under the Null Hypothesis

- Econometrica---2015---Graham Elliott,Ulrich K. Müller,Mark W. Watson

This paper considers nonstandard hypothesis testing problems that involve a nuisance parameter. We establish an upper bound on the weighted average power of all valid tests, and develop a numerical algorithm that determines a feasible test with power close to the bound. The approach is illustrated in six applications: inference about a linear regression coefficient when the sign of a control coefficient is known; small sample inference about the difference in means from two independent Gaussian samples from populations with potentially different variances; inference about the break date in structural break models with moderate break magnitude; predictability tests when the regressor is highly persistent; inference about an interval identified parameter; and inference about a linear regression coefficient when the necessity of a control is in doubt.

Bootstrap Testing of Hypotheses on Co-Integration Relations in Vector Autoregressive Models

- Econometrica---2015---Giuseppe Cavaliere,Heino Bohn Nielsen,Anders Rahbek

It is well known that the finite-sample properties of tests of hypotheses on the co-integrating vectors in vector autoregressive models can be quite poor, and that current solutions based on Bartlett-type corrections or bootstrap based on unrestricted parameter estimators are unsatisfactory, in particular in those cases where also asymptotic χ-super-2 tests fail most severely. In this paper, we solve this inference problem by showing the novel result that a bootstrap test where the null hypothesis is imposed on the bootstrap sample is asymptotically valid. That is, not only does it have asymptotically correct size, but, in contrast to what is claimed in existing literature, it is consistent under the alternative. Compared to the theory for bootstrap tests on the co-integration rank (Cavaliere, Rahbek, and Taylor, 2012), establishing the validity of the bootstrap in the framework of hypotheses on the co-integrating vectors requires new theoretical developments, including the introduction of multivariate Ornstein–Uhlenbeck processes with random (reduced rank) drift parameters. Finally, as documented by Monte Carlo simulations, the bootstrap test outperforms existing methods.

Estimation of Nonparametric Models With Simultaneity

- Econometrica---2015---Rosa Matzkin

We introduce methods for estimating nonparametric, nonadditive models with simultaneity. The methods are developed by directly connecting the elements of the structural system to be estimated with features of the density of the observable variables, such as ratios of derivatives or averages of products of derivatives of this density. The estimators are therefore easily computed functionals of a nonparametric estimator of the density of the observable variables. We consider in detail a model where to each structural equation there corresponds an exclusive regressor and a model with one equation of interest and one instrument that is included in a second equation. For both models, we provide new characterizations of observational equivalence on a set, in terms of the density of the observable variables and derivatives of the structural functions. Based on those characterizations, we develop two estimation methods. In the first method, the estimators of the structural derivatives are calculated by a simple matrix inversion and matrix multiplication, analogous to a standard least squares estimator, but with the elements of the matrices being averages of products of derivatives of nonparametric density estimators. In the second method, the estimators of the structural derivatives are calculated in two steps. In a first step, values of the instrument are found at which the density of the observable variables satisfies some properties. In the second step, the estimators are calculated directly from the values of derivatives of the density of the observable variables evaluated at the found values of the instrument. We show that both pointwise estimators are consistent and asymptotically normal.

Necessity Is the Mother of Invention: Input Supplies and Directed Technical Change

- Econometrica---2015---W Hanlon

This study provides causal evidence that a shock to the relative supply of inputs to production can (1) affect the direction of technological progress and (2) lead to a rebound in the relative price of the input that became relatively more abundant (the strong induced-bias hypothesis). I exploit the impact of the U.S. Civil War on the British cotton textile industry, which reduced supplies of cotton from the Southern United States, forcing British producers to shift to lower-quality Indian cotton. Using detailed new data, I show that this shift induced the development of new technologies that augmented Indian cotton. As these new technologies became available, I show that the relative price of Indian/U.S. cotton rebounded to its pre-war level, despite the increased relative supply of Indian cotton. This is the first paper to establish both of these patterns empirically, lending support to the two key predictions of leading directed technical change theories.

Consumption Dynamics During Recessions

- Econometrica---2015---David Berger,Joseph Vavra

Are there times when durable spending is less responsive to economic stimulus? We argue that aggregate durable expenditures respond more sluggishly to economic shocks during recessions because microeconomic frictions lead to declines in the frequency of households' durable adjustment. We show this by first using indirect inference to estimate a heterogeneous agent incomplete markets model with fixed costs of durable adjustment to match consumption dynamics in PSID microdata. We then show that aggregating this model delivers an extremely procyclical Impulse Response Function (IRF) of durable spending to aggregate shocks. For example, the response of durable spending to an income shock in 1999 is estimated to be almost twice as large as if it occurred in 2009. This procyclical IRF holds in response to standard business cycle shocks as well as in response to various policy shocks, and it is robust to general equilibrium. After estimating this robust theoretical implication of micro frictions, we provide additional direct empirical evidence for its importance using both cross-sectional and time-series data.

Consumer Heterogeneity and Paid Search Effectiveness: A Large-Scale Field Experiment

- Econometrica---2015---Thomas Blake,Chris Nosko,Steven Tadelis

Internet advertising has been the fastest growing advertising channel in recent years, with paid search ads comprising the bulk of this revenue. We present results from a series of large-scale field experiments done at eBay that were designed to measure the causal effectiveness of paid search ads. Because search clicks and purchase intent are correlated, we show that returns from paid search are a fraction of non-experimental estimates. As an extreme case, we show that brand keyword ads have no measurable short-term benefits. For non-brand keywords, we find that new and infrequent users are positively influenced by ads but that more frequent users whose purchasing behavior is not influenced by ads account for most of the advertising expenses, resulting in average returns that are negative.

A Characterization of Rationalizable Consumer Behavior

- Econometrica---2015---Philip Reny

For an arbitrary data set D = {(p, x)} (+ -super-m {0}) × + -super-m, finite or infinite, it is shown that the following three conditions are equivalent: (a) D satisfies GARP; (b) D can be rationalized by a utility function; (c) D can be rationalized by a utility function that is quasiconcave, nondecreasing, and that strictly increases when all its coordinates strictly increase. Examples of infinite data sets satisfying GARP are provided for which every utility rationalization fails to be lower semicontinuous, upper semicontinuous, or concave. Thus condition (c) cannot be substantively improved upon.

Agency Models With Frequent Actions

- Econometrica---2015---Tomasz Sadzik,Ennio Stacchetti

The paper analyzes dynamic principal–agent models with short period lengths. The two main contributions are: (i) an analytic characterization of the values of optimal contracts in the limit as the period length goes to 0, and (ii) the construction of relatively simple (almost) optimal contracts for fixed period lengths. Our setting is flexible and includes the pure hidden action or pure hidden information models as special cases. We show how such details of the underlying information structure affect the optimal provision of incentives and the value of the contracts. The dependence is very tractable and we obtain sharp comparative statics results. The results are derived with a novel method that uses a quadratic approximation of the Pareto boundary of the equilibrium value set.

Time and No Lotteries: An Axiomatization of Maxmin Expected Utility

- Econometrica---2015---Asen Kochov

This paper axiomatizes an intertemporal version of the maxmin expected-utility model. It employs two axioms specific to a dynamic setting. The first requires that smoothing consumption across states of the world is more beneficial to the individual than smoothing consumption across time. Such behavior is viewed as the intertemporal manifestation of ambiguity aversion. The second axiom extends Koopmans' notion of stationarity from deterministic to stochastic environments.

Trade Dynamics in the Market for Federal Funds

- Econometrica---2015---Gara Afonso,Ricardo Lagos

We develop a model of the market for federal funds that explicitly accounts for its two distinctive features: banks have to search for a suitable counterparty, and once they meet, both parties negotiate the size of the loan and the repayment. The theory is used to answer a number of positive and normative questions: What are the determinants of the fed funds rate? How does the market reallocate funds? Is the market able to achieve an efficient reallocation of funds? We also use the model for theoretical and quantitative analyses of policy issues facing modern central banks.

Moment Inequalities and Their Application

- Econometrica---2015---Ariel Pakes,J. Porter,Kate Ho,Joy Ishii

This paper provides conditions under which the inequality constraints generated by either single agent optimizing behavior or the best response condition of multiple agent problems can be used as a basis for estimation and inference. An application illustrates how the use of these inequality constraints can simplify the analysis of complex behavioral models.

Time Consistency: Stationarity and Time Invariance

- Econometrica---2015---Yoram Halevy

A sequence of experiments documents static and dynamic “preference reversals” between sooner-smaller and later-larger rewards, when the sooner reward could be immediate. The theoretically motivated design permits separate identification of time consistent, stationary, and time invariant choices. At least half of the subjects are time consistent, but only three-quarters of them exhibit stationary choices. About half of subjects with time inconsistent choices have stationary preferences. These results challenge the view that present-bias preferences are the main source of time inconsistent choices.

Bayesian Learning, Smooth Approximate Optimal Behavior, and Convergence to ε-Nash Equilibrium

- Econometrica---2015---Yuichi Noguchi

In this paper, I construct players' prior beliefs and show that these prior beliefs lead the players to learn to play an approximate Nash equilibrium uniformly in any infinitely repeated slightly perturbed game with discounting and perfect monitoring. That is, given any $\varepsilon > 0$, there exists a (single) profile of players' prior beliefs that leads play to almost surely converge to an ε-Nash equilibrium uniformly for any (finite normal form) stage game with slight payoff perturbation and any discount factor less than 1.

A Comment on “Can Relaxation of Beliefs Rationalize the Winner's Curse?: An Experimental Study”

- Econometrica---2015---Miguel A. Costa-Gomes,Makoto Shimoji

Ivanov, Levin, and Niederle (2010) use a common-value second-price auction experiment to reject beliefs-based explanations for the winner's curse. ILN's conclusion, however, stems from the misuse of theoretical arguments. Beliefs-based models are even compatible with some observations from ILN's experiment.

The Intrinsic Value of Decision Rights

- Econometrica---2014---Björn Bartling,Ernst Fehr,Holger Herz

Philosophers, psychologists, and economists have long argued that certain decision rights carry not only instrumental value but may also be valuable for their own sake. The ideas of autonomy, freedom, and liberty derive their intuitive appeal—at least partly—from an assumed positive intrinsic value of decision rights. Providing clean evidence for the existence of this intrinsic value and measuring its size, however, is intricate. Here, we develop a method capable of achieving these goals. The data reveal that the large majority of our subjects intrinsically value decision rights beyond their instrumental benefit. The intrinsic valuation of decision rights has potentially important consequences for corporate governance, human resource management, and optimal job design: it may explain why managers value power, why employees appreciate jobs with task discretion, why individuals sort into self-employment, and why the reallocation of decision rights is often very difficult and cumbersome. Our method and results may also prove useful in developing an empirical revealed preference foundation for concepts such as "freedom of choice" and "individual autonomy."

Information Frictions in Trade

- Econometrica---2014---Treb Allen

It is costly to learn about market conditions elsewhere, especially in developing countries. This paper examines how such information frictions affect trade. Using data on regional agricultural trade in the Philippines, I first document a number of observed patterns in trade flows and prices that suggest the presence of information frictions. I then incorporate information frictions into a perfect competition trade model by embedding a process whereby heterogeneous producers engage in a costly sequential search process to determine where to sell their produce. I show that introducing information frictions reconciles the theory with the observed patterns in the data. Structural estimation of the model finds that information frictions are quantitatively important: roughly half the observed regional price dispersion is due to information frictions. Furthermore, incorporating information frictions improves the out-of-sample predictive power of the model.

Inferring Labor Income Risk and Partial Insurance From Economic Choices

- Econometrica---2014---Fatih Guvenen,Anthony A. Smith

This paper uses the information contained in the joint dynamics of individuals' labor earnings and consumption-choice decisions to quantify both the amount of income risk that individuals face and the extent to which they have access to informal insurance against this risk. We accomplish this task by using indirect inference to estimate a structural consumption–savings model, in which individuals both learn about the nature of their income process and partly insure shocks via informal mechanisms. In this framework, we estimate (i) the degree of partial insurance, (ii) the extent of systematic differences in income growth rates, (iii) the precision with which individuals know their own income growth rates when they begin their working lives, (iv) the persistence of typical labor income shocks, (v) the tightness of borrowing constraints, and (vi) the amount of measurement error in the data. In implementing indirect inference, we find that an auxiliary model that approximates the true structural equations of the model (which are not estimable) works very well, with negligible small sample bias. The main substantive findings are that income shocks are moderately persistent, systematic differences in income growth rates are large, individuals have substantial amounts of information about their income growth rates, and about one-half of income shocks are smoothed via partial insurance. Putting these findings together, the amount of uninsurable lifetime income risk that individuals perceive is substantially smaller than what is typically assumed in calibrated macroeconomic models with incomplete markets.

Forced Coexistence and Economic Development: Evidence From Native American Reservations

- Econometrica---2014---Christian Dippel

Studying Native American reservations, and their historical formation, I find that their forced integration of autonomous polities into a system of shared governance had large negative long-run consequences, even though the affected people were ethnically and linguistically homogenous. Reservations that combined multiple subtribal bands when they were formed are 30% poorer today, even when conditioning on pre-reservation political traditions. The results hold with tribe fixed effects, identifying only off within-tribe variation across reservations. I also provide estimates from an instrumental variable strategy based on historical mining rushes that led to exogenously more centralized reservations. Data on the timing of economic divergence and on contemporary political conflict suggest that the primary mechanism runs from persistent social divisions through the quality of local governance to the local economic environment.

Structural Change and the Kaldor Facts in a Growth Model With Relative Price Effects and Non-Gorman Preferences

- Econometrica---2014---Timo Boppart

U.S. data reveal three facts: (1) the share of goods in total expenditure declines at a constant rate over time, (2) the price of goods relative to services declines at a constant rate over time, and (3) poor households spend a larger fraction of their budget on goods than do rich households. I provide a macroeconomic model with non-Gorman preferences that rationalizes these facts, along with the aggregate Kaldor facts. The model is parsimonious and admits an analytical solution. Its functional form allows a decomposition of U.S. structural change into an income and substitution effect. Estimates from micro data show each of these effects to be of roughly equal importance.

What Explains the 2007–2009 Drop in Employment?

- Econometrica---2014---Atif Mian,Amir Sufi

We show that deterioration in household balance sheets, or the housing net worth channel, played a significant role in the sharp decline in U.S. employment between 2007 and 2009. Counties with a larger decline in housing net worth experience a larger decline in non-tradable employment. This result is not driven by industry-specific supply-side shocks, exposure to the construction sector, policy-induced business uncertainty, or contemporaneous credit supply tightening. We find little evidence of labor market adjustment in response to the housing net worth shock. There is no significant expansion of the tradable sector in counties with the largest decline in housing net worth. Further, there is little evidence of wage adjustment within or emigration out of the hardest hit counties.

Survival versus Profit Maximization in a Dynamic Stochastic Experiment

- Econometrica---2014---Ryan Oprea

Subjects in a laboratory experiment withdraw earnings from a cash reserve evolving according to an arithmetic Brownian motion in near-continuous time. Aggressive withdrawal policies expose subjects to risk of bankruptcy, but the policy that maximizes expected earnings need not maximize the odds of survival. When profit maximization is consistent with high rates of survival (HS parameters), subjects adjust decisively towards the optimum. When survival and profit maximization are sharply at odds (LS parameters), subjects persistently (and sub-optimally) hoard excess cash in an evident effort to improve survival rates. The design ensures that this hoarding is not due to standard risk aversion. Analysis of period-to-period adjustments in strategies suggests instead that hoarding is due to a widespread bias towards survival in the subject population. Robustness treatments varying feedback, parameters, and framing fail to eliminate the bias.

Bounded Memory and Biases in Information Processing

- Econometrica---2014---Andrea Wilson

Before choosing among two actions with state-dependent payoffs, a Bayesian decision-maker with a finite memory sees a sequence of informative signals, ending each period with fixed chance. He summarizes information observed with a finite-state automaton. I characterize the optimal protocol as an equilibrium of a dynamic game of imperfect recall; a new player runs each memory state each period. Players act as if maximizing expected payoffs in a common finite action decision problem. I characterize equilibrium play with many multinomial signals. The optimal protocol rationalizes many behavioral phenomena, like "stickiness," salience, confirmation bias, and belief polarization.

Robust Nonparametric Confidence Intervals for Regression-Discontinuity Designs

- Econometrica---2014---Sebastian Calonico,Matias Cattaneo,Rocio Titiunik

In the regression-discontinuity (RD) design, units are assigned to treatment based on whether their value of an observed covariate exceeds a known cutoff. In this design, local polynomial estimators are now routinely employed to construct confidence intervals for treatment effects. The performance of these confidence intervals in applications, however, may be seriously hampered by their sensitivity to the specific bandwidth employed. Available bandwidth selectors typically yield a "large" bandwidth, leading to data-driven confidence intervals that may be biased, with empirical coverage well below their nominal target. We propose new theory-based, more robust confidence interval estimators for average treatment effects at the cutoff in sharp RD, sharp kink RD, fuzzy RD, and fuzzy kink RD designs. Our proposed confidence intervals are constructed using a bias-corrected RD estimator together with a novel standard error estimator. For practical implementation, we discuss mean squared error optimal bandwidths, which are by construction not valid for conventional confidence intervals but are valid with our robust approach, and consistent standard error estimators based on our new variance formulas. In a special case of practical interest, our procedure amounts to running a quadratic instead of a linear local regression. More generally, our results give a formal justification to simple inference procedures based on increasing the order of the local polynomial estimator employed. We find in a simulation study that our confidence intervals exhibit close-to-correct empirical coverage and good empirical interval length on average, remarkably improving upon the alternatives available in the literature. All results are readily available in R and STATA using our companion software packages described in Calonico, Cattaneo, and Titiunik (2014d, 2014b).

Fixed-Smoothing Asymptotics in a Two-Step Generalized Method of Moments Framework

- Econometrica---2014---Yixiao Sun

This paper develops the fixed-smoothing asymptotics in a two-step generalized method of moments (GMM) framework. Under this type of asymptotics, the weighting matrix in the second-step GMM criterion function converges weakly to a random matrix and the two-step GMM estimator is asymptotically mixed normal. Nevertheless, the Wald statistic, the GMM criterion function statistic, and the Lagrange multiplier statistic remain asymptotically pivotal. It is shown that critical values from the fixed-smoothing asymptotic distribution are high order correct under the conventional increasing-smoothing asymptotics. When an orthonormal series covariance estimator is used, the critical values can be approximated very well by the quantiles of a noncentral F distribution. A simulation study shows that statistical tests based on the new fixed-smoothing approximation are much more accurate in size than existing tests.

Implementation With Contingent Contracts

- Econometrica---2014---Rahul Deb,Debasis Mishra

We study dominant strategy incentive compatibility in a mechanism design setting with contingent contracts where the payoff of each agent is observed by the principal and can be contracted upon. Our main focus is on the class of linear contracts (one of the most commonly used contingent contracts) which consist of a transfer and a flat rate of profit sharing. We characterize outcomes implementable by linear contracts and provide a foundation for them by showing that, in finite type spaces, every social choice function that can be implemented using a more general nonlinear contingent contract can also be implemented using a linear contract. We then qualitatively describe the set of implementable outcomes. We show that a general class of social welfare criteria can be implemented. This class contains social choice functions (such as the Rawlsian) which cannot be implemented using (uncontingent) transfers. Under additional conditions, we show that only social choice functions in this class are implementable.

Fiscal Rules and Discretion Under Persistent Shocks

- Econometrica---2014---Marina Halac,Pierre Yared

This paper studies the optimal level of discretion in policymaking. We consider a fiscal policy model where the government has time-inconsistent preferences with a present bias toward public spending. The government chooses a fiscal rule to trade off its desire to commit to not overspend against its desire to have flexibility to react to privately observed shocks to the value of spending. We analyze the optimal fiscal rule when the shocks are persistent. Unlike under independent and identically distributed shocks, we show that the ex ante optimal rule is not sequentially optimal, as it provides dynamic incentives. The ex ante optimal rule exhibits history dependence, with high shocks leading to an erosion of future fiscal discipline compared to low shocks, which lead to the reinstatement of discipline. The implied policy distortions oscillate over time given a sequence of high shocks, and can force the government to accumulate maximal debt and become immiserated in the long run.

Experimental Games on Networks: Underpinnings of Behavior and Equilibrium Selection

- Econometrica---2014---Gary Charness,Francesco Feri,Miguel A. Meléndez-Jiménez,Matthias Sutter,Miguel Ángel Meléndez-Jiménez

In this paper, we describe a series of laboratory experiments that implement specific examples of a general network structure. Specifically, actions are either strategic substitutes or strategic complements, and participants have either complete or incomplete information about the structure of a random network. Since economic environments typically have a considerable degree of complementarity or substitutability, this framework applies to a wide variety of settings. We examine behavior and equilibrium selection. The degree of equilibrium play is striking, in particular with incomplete information. Behavior closely resembles the theoretical equilibrium whenever this is unique; when there are multiple equilibria, general features of networks, such as connectivity, clustering, and the degree of the players, help to predict informed behavior in the lab. People appear to be strongly attracted to maximizing aggregate payoffs (social efficiency), but there are forces that moderate this attraction: (1) people seem content with (in the aggregate) capturing only the lion's share of the efficient profits in exchange for reduced exposure to loss, and (2) uncertainty about the network structure makes it considerably more difficult to coordinate on a demanding, but efficient, equilibrium that is typically implemented with complete information.

Underinvestment in a Profitable Technology: The Case of Seasonal Migration in Bangladesh

- Econometrica---2014---Gharad Bryan,Shyamal Chowdhury,Ahmed Mobarak

Hunger during pre-harvest lean seasons is widespread in the agrarian areas of Asia and Sub-Saharan Africa. We randomly assign an \$8.50 incentive to households in rural Bangladesh to temporarily out-migrate during the lean season. The incentive induces 22% of households to send a seasonal migrant, their consumption at the origin increases significantly, and treated households are 8–10 percentage points more likely to re-migrate 1 and 3 years after the incentive is removed. These facts can be explained qualitatively by a model in which migration is risky, mitigating risk requires individual-specific learning, and some migrants are sufficiently close to subsistence that failed migration is very costly. We document evidence consistent with this model using heterogeneity analysis and additional experimental variation, but calibrations with forward-looking households that can save up to migrate suggest that it is difficult for the model to quantitatively match the data. We conclude with extensions to the model that could provide a better quantitative accounting of the behavior.

Identification in Differentiated Products Markets Using Market Level Data

- Econometrica---2014---Steven Berry,Philip Haile

We present new identification results for nonparametric models of differentiated products markets, using only market level observables. We specify a nonparametric random utility discrete choice model of demand allowing rich preference heterogeneity, product/market unobservables, and endogenous prices. Our supply model posits nonparametric cost functions, allows latent cost shocks, and nests a range of standard oligopoly models. We consider identification of demand, identification of changes in aggregate consumer welfare, identification of marginal costs, identification of firms' marginal cost functions, and discrimination between alternative models of firm conduct. We explore two complementary approaches. The first demonstrates identification under the same nonparametric instrumental variables conditions required for identification of regression models. The second treats demand and supply in a system of nonparametric simultaneous equations, leading to constructive proofs exploiting exogenous variation in demand shifters and cost shifters. We also derive testable restrictions that provide the first general formalization of Bresnahan's (1982) intuition for empirically distinguishing between alternative models of oligopoly competition. From a practical perspective, our results clarify the types of instrumental variables needed with market level data, including tradeoffs between functional form and exclusion restrictions.

Identification Using Stability Restrictions

- Econometrica---2014---Leandro Magnusson,Sophocles Mavroeidis

This paper studies inference in models that are identified by moment restrictions. We show how instability of the moments can be used constructively to improve the identification of structural parameters that are stable over time. A leading example is macroeconomic models that are immune to the well-known (Lucas (1976)) critique in the face of policy regime shifts. This insight is used to develop novel econometric methods that extend the widely used generalized method of moments (GMM). The proposed methods yield improved inference on the parameters of the new Keynesian Phillips curve.

Mechanism Design With Ambiguous Communication Devices

- Econometrica---2014---Subir Bose,Ludovic Renou

This paper considers mechanism design problems in environments with ambiguity-sensitive individuals. The novel idea is to introduce ambiguity in mechanisms so as to exploit the ambiguity sensitivity of individuals. Deliberate engineering of ambiguity, through ambiguous mediated communication, can allow (partial) implementation of social choice functions that are not incentive compatible with respect to prior beliefs. We provide a complete characterization of social choice functions partially implementable by ambiguous mechanisms.

Random Choice as Behavioral Optimization

- Econometrica---2014---Faruk Gul,Paulo Natenzon,Wolfgang Pesendorfer

We develop an extension of Luce's random choice model to study violations of the weak axiom of revealed preference. We introduce the notion of a stochastic preference and show that it implies the Luce model. Then, to address well-known difficulties of the Luce model, we define the attribute rule and establish that the existence of a well-defined stochastic preference over attributes characterizes it. We prove that the set of attribute rules and random utility maximizers are essentially the same. Finally, we show that both the Luce and attribute rules have a unique consistent extension to dynamic problems.vskip=-17.5pt]Author: please provide at least three Key Words that describe the article.

Consistency of Higher Order Risk Preferences

- Econometrica---2014---Cary Deck,Harris Schlesinger

Risk aversion (a second-order risk preference) is a time-proven concept in economic models of choice under risk. More recently, the higher order risk preferences of prudence (third-order) and temperance (fourth-order) also have been shown to be quite important. While a majority of the population seems to exhibit both risk aversion and these higher order risk preferences, a significant minority does not. We show how both risk-averse and risk-loving behaviors might be generated by a simple type of basic lottery preference for either (1) combining "good" outcomes with "bad" ones, or (2) combining "good with good" and "bad with bad," respectively. We further show that this dichotomy is fairly robust at explaining higher order risk attitudes in the laboratory. In addition to our own experimental evidence, we take a second look at the extant laboratory experiments that measure higher order risk preferences and we find a fair amount of support for this dichotomy. Our own experiment also is the first to look beyond fourth-order risk preferences, and we examine risk attitudes at even higher orders.

Perceived Ambiguity and Relevant Measures

- Econometrica---2014---Peter Klibanoff,Sujoy Mukerji,Kyoungwon Seo

We axiomatize preferences that can be represented by a monotonic aggregation of subjective expected utilities generated by a utility function and some set of i.i.d. probability measures over a product state space, S-super-∞. For such preferences, we define relevant measures, show that they are treated as if they were the only marginals possibly governing the state space, and connect them with the measures appearing in the aforementioned representation. These results allow us to interpret relevant measures as reflecting part of perceived ambiguity, meaning subjective uncertainty about probabilities over states. Under mild conditions, we show that increases or decreases in ambiguity aversion cannot affect the relevant measures. This property, necessary for the conclusion that these measures reflect only perceived ambiguity, distinguishes the set of relevant measures from the leading alternative in the literature. We apply our findings to a number of well-known models of ambiguity-sensitive preferences. For each model, we identify the set of relevant measures and the implications of comparative ambiguity aversion.

A Practical Two-Step Method for Testing Moment Inequalities

- Econometrica---2014---Joseph P. Romano,Azeem Shaikh,Michael Wolf

This paper considers the problem of testing a finite number of moment inequalities. We propose a two-step approach. In the first step, a confidence region for the moments is constructed. In the second step, this set is used to provide information about which moments are "negative." A Bonferonni-type correction is used to account for the fact that, with some probability, the moments may not lie in the confidence region. It is shown that the test controls size uniformly over a large class of distributions for the observed data. An important feature of the proposal is that it remains computationally feasible, even when the number of moments is large. The finite-sample properties of the procedure are examined via a simulation study, which demonstrates, among other things, that the proposal remains competitive with existing procedures while being computationally more attractive.

A Model of the Consumption Response to Fiscal Stimulus Payments

- Econometrica---2014---Greg Kaplan,Giovanni L. Violante

A wide body of empirical evidence finds that approximately 25 percent of fiscal stimulus payments (e.g., tax rebates) are spent on nondurable household consumption in the quarter that they are received. To interpret this fact, we develop a structural economic model where households can hold two assets: a low-return liquid asset (e.g., cash, checking account) and a high-return illiquid asset that carries a transaction cost (e.g., housing, retirement account). The optimal life-cycle pattern of portfolio choice implies that many households in the model are “wealthy hand-to-mouth”: they hold little or no liquid wealth despite owning sizable quantities of illiquid assets. Therefore, they display large propensities to consume out of additional transitory income, and small propensities to consume out of news about future income. We document the existence of such households in data from the Survey of Consumer Finances. A version of the model parameterized to the 2001 tax rebate episode yields consumption responses to fiscal stimulus payments that are in line with the evidence, and an order of magnitude larger than in the standard “one-asset” framework. The model's nonlinearities with respect to the rebate size and the prevailing aggregate economic conditions have implications for policy design.

How Responsive Is Investment in Schooling to Changes in Redistributive Policies and in Returns?

- Econometrica---2014---Ran Abramitzky,Victor Lavy

This paper uses an unusual pay reform to test the responsiveness of investment in schooling to changes in redistribution schemes that increase the rate of return to education. We exploit an episode where different Israeli kibbutzim shifted from equal sharing to productivity-based wages in different years and find that students in kibbutzim that reformed earlier invested more in high school education and, in the long run, also in post-secondary schooling. We further show that the effect is mainly driven by students in kibbutzim that reformed to a larger degree. Our findings support the prediction that education is highly responsive to changes in the redistribution policy.

Understanding Mechanisms Underlying Peer Effects: Evidence From a Field Experiment on Financial Decisions

- Econometrica---2014---Leonardo Bursztyn,Florian Ederer,Bruno Ferman,Noam Yuchtman

Using a high-stakes field experiment conducted with a financial brokerage, we implement a novel design to separately identify two channels of social influence in financial decisions, both widely studied theoretically. When someone purchases an asset, his peers may also want to purchase it, both because they learn from his choice (“social learning”) and because his possession of the asset directly affects others' utility of owning the same asset (“social utility”). We randomize whether one member of a peer pair who chose to purchase an asset has that choice implemented, thus randomizing his ability to possess the asset. Then, we randomize whether the second member of the pair: (i) receives no information about the first member, or (ii) is informed of the first member's desire to purchase the asset and the result of the randomization that determined possession. This allows us to estimate the effects of learning plus possession, and learning alone, relative to a (no information) control group. We find that both social learning and social utility channels have statistically and economically significant effects on investment decisions. Evidence from a follow-up survey reveals that social learning effects are greatest when the first (second) investor is financially sophisticated (financially unsophisticated); investors report updating their beliefs about asset quality after learning about their peer's revealed preference; and, they report motivations consistent with “keeping up with the Joneses” when learning about their peer's possession of the asset. These results can help shed light on the mechanisms underlying herding behavior in financial markets and peer effects in consumption and investment decisions.

Firms, Destinations, and Aggregate Fluctuations

- Econometrica---2014---Julian di Giovanni,Andrei Levchenko,Isabelle Mejean

This paper uses a data base covering the universe of French firms for the period 1990–2007 to provide a forensic account of the role of individual firms in generating aggregate fluctuations. We set up a simple multisector model of heterogeneous firms selling to multiple markets to motivate a theoretically founded decomposition of firms' annual sales growth rate into different components. We find that the firm-specific component contributes substantially to aggregate sales volatility, mattering about as much as the components capturing shocks that are common across firms within a sector or country. We then decompose the firm-specific component to provide evidence on two mechanisms that generate aggregate fluctuations from microeconomic shocks highlighted in the recent literature: (i) when the firm size distribution is fat-tailed, idiosyncratic shocks to large firms directly contribute to aggregate fluctuations, and (ii) aggregate fluctuations can arise from idiosyncratic shocks due to input–output linkages across the economy. Firm linkages are approximately three times as important as the direct effect of firm shocks in driving aggregate fluctuations.

Land Use Regulation and Welfare

- Econometrica---2014---Matthew Turner,Andrew Haughwout,Wilbert van der Klaauw

We evaluate the effect of land use regulation on the value of land and on welfare. Our estimates are based on a decomposition of the effects of regulation into three components: an own-lot effect, which reflects the cost of regulatory constraints to the owner of a parcel; an external effect, which reflects the value of regulatory constraints on one's neighbors; a supply effect, which reflects the effect of regulated scarcity of developable land. Using this decomposition, we arrive at a novel strategy for estimating a plausibly causal effect of land use regulation on land value and welfare. This strategy exploits cross-border changes in development, prices, and regulation in regions near municipal borders. Our estimates suggest large negative effects of regulation on the value of land and welfare in these regions.

No-Betting-Pareto Dominance

- Econometrica---2014---Itzhak Gilboa,Larry Samuelson,David Schmeidler

We argue that the notion of Pareto dominance is not as compelling in the presence of uncertainty as it is under certainty. In particular, voluntary trade based on differences in tastes is commonly accepted as desirable, because tastes cannot be wrong. By contrast, voluntary trade based on incompatible beliefs may indicate that at least one agent entertains mistaken beliefs. We propose and characterize a weaker, No-Betting, notion of Pareto domination which requires, on top of unanimity of preference, the existence of shared beliefs that can rationalize such preference for each agent.

Endogenous Liquidity and Defaultable Bonds

- Econometrica---2014---Zhiguo He,Konstantin Milbradt

This paper studies the interaction between default and liquidity for corporate bonds that are traded in an over-the-counter secondary market with search frictions. Bargaining with dealers determines a bond's endogenous liquidity, which depends on both the firm fundamental and the time-to-maturity of the bond. Corporate default decisions interact with the endogenous secondary market liquidity via the rollover channel. A default-liquidity loop arises: Assuming a relative illiquid secondary bond market in default, earlier endogenous default worsens a bond's secondary market liquidity, which amplifies equity holders' rollover losses, which in turn leads to earlier endogenous default. Besides characterizing in closed form the full interdependence between liquidity and default for credit spreads, our calibrated model can jointly match empirically observed credit spreads and liquidity measures of bonds across different rating classes.

Preemptive Policy Experimentation

- Econometrica---2014---Steven Callander,Patrick Hummel

We develop a model of experimentation and learning in policymaking when control of power is temporary. We demonstrate how an early office holder who would otherwise not experiment is nonetheless induced to experiment when his hold on power is temporary. This preemptive policy experiment is profitable for the early office holder as it reveals information about the policy mapping to his successor, information that shapes future policy choices. Thus policy choices today can cast a long shadow over future choices purely through information transmission and absent any formal institutional constraints or real state variables. The model we develop utilizes a recent innovation that represents the policy mapping as the realized path of a Brownian motion. We provide a precise characterization of when preemptive experimentation emerges in equilibrium and the form it takes. We apply the model to several well known episodes of policymaking, reinterpreting the policy choices as preemptive experiments.

Complex Questionnaires

- Econometrica---2014---Jacob Glazer,Ariel Rubinstein

We study a principal–agent model in which the agent is boundedly rational in his ability to understand the principal's decision rule. The principal wishes to elicit an agent's true profile so as to determine whether or not to grant him a certain request. The principal designs a questionnaire and commits himself to accepting certain responses. In designing such a questionnaire, the principal takes into account the bounded rationality of the agent and wishes to reduce the success probability of a dishonest agent who is trying to game the system. It is shown that the principal can construct a sufficiently complex questionnaire that will allow him to respond optimally to agents who tell the truth and at the same time to almost eliminate the probability that a dishonest agent will succeed in cheating.

Corrigendum to "Teachers, Schools, and Academic Achievement"

- Econometrica---2014---Steven G. Rivkin,Eric Hanushek,John Kain

2014

Trade Liberalization and Labor Market Dynamics

- Econometrica---2014---Rafael Dix-Carneiro

This paper estimates a structural dynamic equilibrium model of the Brazilian labor market in order to study trade-induced transitional dynamics. The model features a multi-sector economy with overlapping generations, heterogeneous workers, endogenous accumulation of sector-specific experience, and costly switching of sectors. The model's estimates yield median costs of mobility ranging from 1.4 to 2.7 times annual average wages, but a high dispersion of these costs across the population. In addition, sector-specific experience is imperfectly transferable across sectors, leading to additional barriers to mobility. Using the estimated model for counterfactual trade liberalization experiments, the main findings are: (1) there is a large labor market response following trade liberalization but the transition may take several years; (2) potential aggregate welfare gains are significantly reduced due to the delayed adjustment; (3) trade-induced welfare effects depend on initial sector of employment and on worker demographics such as age and education. The experiments also highlight the sensitivity of the transitional dynamics with respect to assumptions regarding the mobility of capital.

Dynamic Financial Constraints: Distinguishing Mechanism Design From Exogenously Incomplete Regimes

- Econometrica---2014---Alexander Karaivanov,Robert M. Townsend

We formulate and solve a range of dynamic models of constrained credit/insurance that allow for moral hazard and limited commitment. We compare them to full insurance and exogenously incomplete financial regimes (autarky, saving only, borrowing and lending in a single asset). We develop computational methods based on mechanism design, linear programming, and maximum likelihood to estimate, compare, and statistically test these alternative dynamic models with financial/information constraints. Our methods can use both cross-sectional and panel data and allow for measurement error and unobserved heterogeneity. We estimate the models using data on Thai households running small businesses from two separate samples. We find that in the rural sample, the exogenously incomplete saving only and borrowing regimes provide the best fit using data on consumption, business assets, investment, and income. Family and other networks help consumption smoothing there, as in a moral hazard constrained regime. In contrast, in urban areas, we find mechanism design financial/information regimes that are decidedly less constrained, with the moral hazard model fitting best combined business and consumption data. We perform numerous robustness checks in both the Thai data and in Monte Carlo simulations and compare our maximum likelihood criterion with results from other metrics and data not used in the estimation. A prototypical counterfactual policy evaluation exercise using the estimation results is also featured.

Democracy, Redistribution, and Political Participation: Evidence From Sweden 1919–1938

- Econometrica---2014---Björn Tyrefors Hinnerich,Per Pettersson-Lidbom,Per Pettersson-Lidbom

In this paper, we compare how two different types of political regimes—direct versus representative democracy—redistribute income toward the relatively poor segments of society after the introduction of universal and equal suffrage. Swedish local governments are used as a testing ground since this setting offers a number of attractive features for a credible impact evaluation. Most importantly, we exploit the existence of a population threshold, which partly determined a local government's choice of democracy to implement a regression-discontinuity design. The results indicate that direct democracies spend 40–60 percent less on public welfare. Our interpretation is that direct democracy may be more prone to elite capture than representative democracy since the elite's potential to exercise de facto power is likely to be greater in direct democracy after democratization.

Residential Location, Work Location, and Labor Market Outcomes of Immigrants in Israel

- Econometrica---2014---Moshe Buchinsky,Chemi Gotlibovski,Osnat Lifshitz

We develop and estimate a comprehensive dynamic programming (DP) model for the joint decisions of residential location, employment location, occupational choices, and labor market outcomes. We use data on immigrants from the former Soviet Union (FSU). We provide an extensive empirical evaluation of policies that have been designed to affect the residential and employment location decisions of the migrant population. The results shed new, and important, light on several issues regarding this group of immigrants. We find large regional differences in wages for the white-collar workers, but only little differences for the blue-collar workers. A careful examination of a number of policy measures indicate that a direct subsidy, in the form of a lump-sum transfer, is most effective in achieving the government stated goal of inducing people to reside in the northern region of the Galilee and southern region of the Negev. Other policies, such as rental and wage subsidies, can also be quite effective, but these are more difficult to administer.

Decentralized Trading With Private Information

- Econometrica---2014---Mikhail Golosov,Guido Lorenzoni,Aleh Tsyvinski

The paper studies how asset prices are determined in a decentralized market with asymmetric information about asset values. We consider an economy in which a large number of agents trade two assets in bilateral meetings. A fraction of the agents has private information about the asset values. We show that, over time, uninformed agents can elicit information from their trading partners by making small offers. This form of experimentation allows the uninformed agents to acquire information as long as there are potential gains from trade in the economy. As a consequence, the economy converges to a Pareto efficient allocation.

Certifiable Pre-Play Communication: Full Disclosure

- Econometrica---2014---Jeanne Hagenbach,Frederic Koessler,Eduardo Perez

This article asks when communication with certifiable information leads to complete information revelation. We consider Bayesian games augmented by a pre-play communication phase in which announcements are made publicly. We first characterize the augmented games in which there exists a fully revealing sequential equilibrium with extremal beliefs (i.e., any deviation is attributed to a single type of the deviator). Next, we define a class of games for which existence of a fully revealing equilibrium is equivalent to a richness property of the evidence structure. This characterization enables us to provide different sets of sufficient conditions for full information disclosure that encompass and extend all known results in the literature, and are easily applicable. We use these conditions to obtain new insights in games with strategic complementarities, voting with deliberation, and persuasion games with multidimensional types.

How Portable Is Level-0 Behavior? A Test of Level-k Theory in Games With Non-Neutral Frames

- Econometrica---2014---Shaun Hargreaves Heap,David Rojo Arjona,Robert Sugden

We test the portability of level-0 assumptions in level-k theory in an experimental investigation of behavior in Coordination, Discoordination, and Hide and Seek games with common, non-neutral frames. Assuming that level-0 behavior depends only on the frame, we derive hypotheses that are independent of prior assumptions about salience. Those hypotheses are not confirmed. Our findings contrast with previous research which has fitted parameterized level-k models to Hide and Seek data. We show that, as a criterion of successful explanation, the existence of a plausible model that replicates the main patterns in these data has a high probability of false positives.

Stochastic Choice and Consideration Sets

- Econometrica---2014---Paola Manzini,Marco Mariotti

We model a boundedly rational agent who suffers from limited attention. The agent considers each feasible alternative with a given (unobservable) probability, the attention parameter, and then chooses the alternative that maximizes a preference relation within the set of considered alternatives. We show that this random choice rule is the only one for which the impact of removing an alternative on the choice probability of any other alternative is asymmetric and menu independent. Both the preference relation and the attention parameters are identified uniquely by stochastic choice data.

On Confidence Intervals for Autoregressive Roots and Predictive Regression

- Econometrica---2014---Peter Phillips

Local to unity limit theory is used in applications to construct confidence intervals (CIs) for autoregressive roots through inversion of a unit root test (Stock (1991)). Such CIs are asymptotically valid when the true model has an autoregressive root that is local to unity (ρ = 1 + c/n), but are shown here to be invalid at the limits of the domain of definition of the localizing coefficient c because of a failure in tightness and the escape of probability mass. Failure at the boundary implies that these CIs have zero asymptotic coverage probability in the stationary case and vicinities of unity that are wider than O(n-super- 1/3). The inversion methods of Hansen (1999) and Mikusheva (2007) are asymptotically valid in such cases. Implications of these results for predictive regression tests are explored. When the predictive regressor is stationary, the popular Campbell and Yogo (2006) CIs for the regression coefficient have zero coverage probability asymptotically, and their predictive test statistic Q erroneously indicates predictability with probability approaching unity when the null of no predictability holds. These results have obvious cautionary implications for the use of the procedures in empirical practice.

Hazardous Times for Monetary Policy: What Do Twenty-Three Million Bank Loans Say About the Effects of Monetary Policy on Credit Risk-Taking?

- Econometrica---2014---Gabriel Jimenez,Steven Ongena,Jose-Luis Peydro,Jesús Saurina

We identify the effects of monetary policy on credit risk-taking with an exhaustive credit register of loan applications and contracts. We separate the changes in the composition of the supply of credit from the concurrent changes in the volume of supply and quality, and the volume of demand. We employ a two-stage model that analyzes the granting of loan applications in the first stage and loan outcomes for the applications granted in the second stage, and that controls for both observed and unobserved, time-varying, firm and bank heterogeneity through time firm and time bank fixed effects. We find that a lower overnight interest rate induces lowly capitalized banks to grant more loan applications to ex ante risky firms and to commit larger loan volumes with fewer collateral requirements to these firms, yet with a higher ex post likelihood of default. A lower long-term interest rate and other relevant macroeconomic variables have no such effects.

Non-Manipulable House Allocation With Rent Control

- Econometrica---2014---Tommy Andersson,Lars-Gunnar Svensson

In many real-life house allocation problems, rents are bounded from above by price ceilings imposed by a government or a local administration. This is known as rent control. Because some price equilibria may be disqualified given such restrictions, this paper proposes an alternative equilibrium concept, called rationing price equilibrium, tailored to capture the specific features of housing markets with rent control. An allocation rule that always selects a rationing price equilibrium is defined, and it is demonstrated to be constrained efficient and (group) non-manipulable for “almost all” preference profiles. In its bounding cases, the rule reduces to a number of well-known mechanisms from the matching literature. In this sense, the housing market with rent control investigated in this paper integrates several of the predominant matching models into a more general framework.

Stable Matching With Incomplete Information

- Econometrica---2014---Qingmin Liu,George Mailath,Andrew Postlewaite,Larry Samuelson

We formulate a notion of stable outcomes in matching problems with one-sided asymmetric information. The key conceptual problem is to formulate a notion of a blocking pair that takes account of the inferences that the uninformed agent might make. We show that the set of stable outcomes is nonempty in incomplete-information environments, and is a superset of the set of complete-information stable outcomes. We then provide sufficient conditions for incomplete-information stable matchings to be efficient. Lastly, we define a notion of price-sustainable allocations and show that the set of incomplete-information stable matchings is a subset of the set of such allocations.

Preference Aggregation With Incomplete Information

- Econometrica---2014---Christopher Chambers,Takashi Hayashi

We show in an environment of incomplete information that monotonicity and the Pareto property applied only when there is common knowledge of Pareto dominance imply (i) there must exist a common prior over the smallest common knowledge event, and (ii) aggregation must be ex ante and ex post utilitarian with respect to that common prior and individual von Neumann–Morgenstern utility indices.

Dynamic Mechanism Design: A Myersonian Approach

- Econometrica---2014---Alessandro Pavan,Ilya Segal,Juuso Toikka

We study mechanism design in dynamic quasilinear environments where private information arrives over time and decisions are made over multiple periods. We make three contributions. First, we provide a necessary condition for incentive compatibility that takes the form of an envelope formula for the derivative of an agent's equilibrium expected payoff with respect to his current type. It combines the familiar marginal effect of types on payoffs with novel marginal effects of the current type on future ones that are captured by "impulse response functions." The formula yields an expression for dynamic virtual surplus that is instrumental to the design of optimal mechanisms and to the study of distortions under such mechanisms. Second, we characterize the transfers that satisfy the envelope formula and establish a sense in which they are pinned down by the allocation rule ("revenue equivalence"). Third, we characterize perfect Bayesian equilibrium-implementable allocation rules in Markov environments, which yields tractable sufficient conditions that facilitate novel applications. We illustrate the results by applying them to the design of optimal mechanisms for the sale of experience goods ("bandit auctions").

Dynamic Preference for Flexibility

- Econometrica---2014---R. Vijay Krishna,Philipp Sadowski

We consider a decision maker who faces dynamic decision situations that involve intertemporal trade-offs, as in consumption–savings problems, and who experiences taste shocks that are transient contingent on the state of the world. We axiomatize a recursive representation of choice over state contingent infinite horizon consumption problems, where uncertainty about consumption utilities depends on the observable state and the state follows a subjective Markov process. The parameters of the representation are the subjective process that governs the evolution of beliefs over consumption utilities and the discount factor; they are uniquely identified from behavior. We characterize a natural notion of greater preference for flexibility in terms of a dilation of beliefs. An important special case of our representation is a recursive version of the Anscombe–Aumann model with parameters that include a subjective Markov process over states and state-dependent utilities, all of which are uniquely identified.

Returns to Tenure or Seniority?

- Econometrica---2014---Ioan Sebastian Buhai,Miguel Portela,C. N. Teulings,Aico van Vuuren

This study documents two empirical facts using matched employer–employee data for Denmark and Portugal. First, workers who are hired last, are the first to leave the firm. Second, workers' wages rise with seniority, where seniority is defined as a worker's tenure relative to the tenure of his colleagues. Controlling for tenure, the probability of a worker leaving the firm decreases with seniority. The increase in expected seniority with tenure explains a large part of the negative duration dependence of the separation hazard. Conditional on ten years of tenure, the wage differential between the 10th and the 90th percentiles of the seniority distribution is 1.1–1.4 percentage points in Denmark and 2.3–3.4 in Portugal.

Macroeconomic Implications of Agglomeration

- Econometrica---2014---Morris Davis,Jonas Fisher,Toni Whited

Cities exist because of the productivity gains that arise from clustering production and workers, a process called agglomeration. How important is agglomeration for aggregate growth? This paper constructs a dynamic stochastic general equilibrium model of cities and uses it to estimate the effect of local agglomeration on aggregate growth. We combine aggregate time-series and city-level panel data to estimate the model's parameters via generalized method of moments. The estimates imply a statistically and economically significant impact of local agglomeration on the growth rate of per capita consumption, raising it by about 10%.

Optimal Test for Markov Switching Parameters

- Econometrica---2014---Marine Carrasco,Liang Hu,Werner Ploberger

This paper proposes a class of optimal tests for the constancy of parameters in random coefficients models. Our testing procedure covers the class of Hamilton's models, where the parameters vary according to an unobservable Markov chain, but also applies to nonlinear models where the random coefficients need not be Markov. We show that the contiguous alternatives converge to the null hypothesis at a rate that is slower than the standard rate. Therefore, standard approaches do not apply. We use Bartlett-type identities for the construction of the test statistics. This has several desirable properties. First, it only requires estimating the model under the null hypothesis where the parameters are constant. Second, the proposed test is asymptotically optimal in the sense that it maximizes a weighted power function. We derive the asymptotic distribution of our test under the null and local alternatives. Asymptotically valid bootstrap critical values are also proposed.

Local Identification of Nonparametric and Semiparametric Models

- Econometrica---2014---Xiaohong Chen,Victor Chernozhukov,Sokbae (Simon) Lee,Whitney K. Newey

In parametric, nonlinear structural models, a classical sufficient condition for local identification, like Fisher (1966) and Rothenberg (1971), is that the vector of moment conditions is differentiable at the true parameter with full rank derivative matrix. We derive an analogous result for the nonparametric, nonlinear structural models, establishing conditions under which an infinite dimensional analog of the full rank condition is sufficient for local identification. Importantly, we show that additional conditions are often needed in nonlinear, nonparametric models to avoid nonlinearities overwhelming linear effects. We give restrictions on a neighborhood of the true value that are sufficient for local identification. We apply these results to obtain new, primitive identification conditions in several important models, including nonseparable quantile instrumental variable (IV) models and semiparametric consumption-based asset pricing models.

Identifying Treatment Effects Under Data Combination

- Econometrica---2014---Yanqin Fan,Robert Sherman,Matthew Shum

We consider the identification of counterfactual distributions and treatment effects when the outcome variables and conditioning covariates are observed in separate data sets. Under the standard selection on observables assumption, the counterfactual distributions and treatment effect parameters are no longer point identified. However, applying the classical monotone rearrangement inequality, we derive sharp bounds on the counterfactual distributions and policy parameters of interest.

Expected Uncertain Utility Theory

- Econometrica---2014---Faruk Gul,Wolfgang Pesendorfer

We introduce and analyze expected uncertain utility (EUU) theory. A prior and an interval utility characterize an EUU decision maker. The decision maker transforms each uncertain prospect into an interval-valued prospect that assigns an interval of prizes to each state. She then ranks prospects according to their expected interval utilities. We define uncertainty aversion for EUU, use the EUU model to address the Ellsberg Paradox and other ambiguity evidence, and relate EUU theory to existing models.

Optimal Taxes on Fossil Fuel in General Equilibrium

- Econometrica---2014---Mikhail Golosov,John Hassler,Per Krusell,Aleh Tsyvinski

We analyze a dynamic stochastic general-equilibrium (DSGE) model with an externality—through climate change—from using fossil energy. Our central result is a simple formula for the marginal externality damage of emissions (or, equivalently, for the optimal carbon tax). This formula, which holds under quite plausible assumptions, reveals that the damage is proportional to current GDP, with the proportion depending only on three factors: (i) discounting, (ii) the expected damage elasticity (how many percent of the output flow is lost from an extra unit of carbon in the atmosphere), and (iii) the structure of carbon depreciation in the atmosphere. Thus, the stochastic values of future output, consumption, and the atmospheric CO 2 concentration, as well as the paths of technology (whether endogenous or exogenous) and population, and so on, all disappear from the formula. We find that the optimal tax should be a bit higher than the median, or most well-known, estimates in the literature. We also formulate a parsimonious yet comprehensive and easily solved model allowing us to compute the optimal and market paths for the use of different sources of energy and the corresponding climate change. We find coal—rather than oil—to be the main threat to economic welfare, largely due to its abundance. We also find that the costs of inaction are particularly sensitive to the assumptions regarding the substitutability of different energy sources and technological progress.

Price Setting With Menu Cost for Multiproduct Firms

- Econometrica---2014---Fernando Alvarez,Francesco Lippi

We model the decisions of a multiproduct firm that faces a fixed “menu” cost: once it is paid, the firm can adjust the price of all its products. We characterize analytically the steady state firm's decisions in terms of the structural parameters: the variability of the flexible prices, the curvature of the profit function, the size of the menu cost, and the number of products sold. We provide expressions for the steady state frequency of adjustment, the hazard rate of price adjustments, and the size distribution of price changes, all in terms of the structural parameters. We study analytically the impulse response of aggregate prices and output to a monetary shock. The size of the output response and its duration both increase with the number of products; they more than double as the number of products goes from 1 to 10, quickly converging to the response of Taylor's staggered price model.

The Elite Illusion: Achievement Effects at Boston and New York Exam Schools

- Econometrica---2014---Atila Abdulkadiroğlu,Joshua Angrist,Parag Pathak

Parents gauge school quality in part by the level of student achievement and a school's racial and socioeconomic mix. The importance of school characteristics in the housing market can be seen in the jump in house prices at school district boundaries where peer characteristics change. The question of whether schools with more attractive peers are really better in a value-added sense remains open, however. This paper uses a fuzzy regression-discontinuity design to evaluate the causal effects of peer characteristics. Our design exploits admissions cutoffs at Boston and New York City's heavily over-subscribed exam schools. Successful applicants near admissions cutoffs for the least selective of these schools move from schools with scores near the bottom of the state SAT score distribution to schools with scores near the median. Successful applicants near admissions cutoffs for the most selective of these schools move from above-average schools to schools with students whose scores fall in the extreme upper tail. Exam school students can also expect to study with fewer nonwhite classmates than unsuccessful applicants. Our estimates suggest that the marked changes in peer characteristics at exam school admissions cutoffs have little causal effect on test scores or college quality.

Short-Run Subsidies and Long-Run Adoption of New Health Products: Evidence From a Field Experiment

- Econometrica---2014---Pascaline Dupas

Short-run subsidies for health products are common in poor countries. How do they affect long-run adoption? A common fear among development practitioners is that one-off subsidies may negatively affect long-run adoption through reference-dependence: People might anchor around the subsidized price and be unwilling to pay more for the product later. But for experience goods, one-off subsidies could also boost long-run adoption through learning. This paper uses data from a two-stage randomized pricing experiment in Kenya to estimate the relative importance of these effects for a new, improved antimalarial bed net. Reduced form estimates show that a one-time subsidy has a positive impact on willingness to pay a year later inherit. To separately identify the learning and anchoring effects, we estimate a parsimonious experience-good model. Estimation results show a large, positive learning effect but no anchoring. We black then discuss the types of products and the contexts inherit for which these results may apply.

Islamic Rule and the Empowerment of the Poor and Pious

- Econometrica---2014---Erik Meyersson

Does Islamic political control affect women's empowerment? Several countries have recently experienced Islamic parties coming to power through democratic elections. Due to strong support among religious conservatives, constituencies with Islamic rule often tend to exhibit poor women's rights. Whether this reflects a causal relationship or a spurious one has so far gone unexplored. I provide the first piece of evidence using a new and unique data set of Turkish municipalities. In 1994, an Islamic party won multiple municipal mayor seats across the country. Using a regression discontinuity (RD) design, I compare municipalities where this Islamic party barely won or lost elections. Despite negative raw correlations, the RD results reveal that, over a period of six years, Islamic rule increased female secular high school education. Corresponding effects for men are systematically smaller and less precise. In the longer run, the effect on female education remained persistent up to 17 years after, and also reduced adolescent marriages. An analysis of long-run political effects of Islamic rule shows increased female political participation and an overall decrease in Islamic political preferences. The results are consistent with an explanation that emphasizes the Islamic party's effectiveness in overcoming barriers to female entry for the poor and pious.

Competition for a Majority

- Econometrica---2014---Paulo Barelli,Srihari Govindan,Robert Wilson

We define the class of two-player zero-sum games with payoffs having mild discontinuities, which in applications typically stem from how ties are resolved. For such games, we establish sufficient conditions for existence of a value of the game, maximin and minimax strategies for the players, and a Nash equilibrium. If all discontinuities favor one player, then a value exists and that player has a maximin strategy. A property called payoff approachability implies existence of an equilibrium, and that the resulting value is invariant: games with the same payoffs at points of continuity have the same value and -equilibria. For voting games in which two candidates propose policies and a candidate wins election if a weighted majority of voters prefer his proposed policy, we provide tie-breaking rules and assumptions about voters' preferences sufficient to imply payoff approachability. These assumptions are satisfied by generic preferences if the dimension of the space of policies exceeds the number of voters; or with no dimensional restriction, if the electorate is sufficiently large. Each Colonel Blotto game is a special case in which each candidate allocates a resource among several constituencies and a candidate gets votes from those allocated more than his opponent offers; in this case, for simple-majority rule we prove existence of an equilibrium with zero probability of ties.

Identification in Auctions With Selective Entry

- Econometrica---2014---Matthew Gentry,Tong Li

This paper considers nonparametric identification of a two-stage entry and bidding game we call the Affiliated-Signal (AS) model. This model assumes that potential bidders have private values, observe signals of their values prior to entry, and then choose whether to undertake a costly entry process, but imposes only minimal structure on the relationship between signals and values. It thereby nests a wide range of entry processes, including in particular the Samuelson (1985) and Levin and Smith (1994) models as special cases. Working within the AS model, we map variation in factors affecting entry behavior (potential competition or entry costs) into identified bounds on model fundamentals. These bounds are constructive, collapse to point identification when available entry variation is continuous, and can readily be refined to produce the pointwise sharp identified set. We then extend our core results to accommodate nonseparable unobserved auction-level heterogeneity and potential endogeneity of entry shifters, thereby establishing a formal identification framework for structural analysis of auctions with selective entry.

Entropic Latent Variable Integration via Simulation

- Econometrica---2014---Susanne Schennach

This paper introduces a general method to convert a model defined by moment conditions that involve both observed and unobserved variables into equivalent moment conditions that involve only observable variables. This task can be accomplished without introducing infinite-dimensional nuisance parameters using a least favorable entropy-maximizing distribution. We demonstrate, through examples and simulations, that this approach covers a wide class of latent variables models, including some game-theoretic models and models with limited dependent variables, interval-valued data, errors-in-variables, or combinations thereof. Both point- and set-identified models are transparently covered. In the latter case, the method also complements the recent literature on generic set-inference methods by providing the moment conditions needed to construct a generalized method of moments-type objective function for a wide class of models. Extensions of the method that cover conditional moments, independence restrictions, and some state-space models are also given.

Asymptotically Efficient Estimation of Models Defined by Convex Moment Inequalities

- Econometrica---2014---Hiroaki Kaido,Andres Santos

This paper examines the efficient estimation of partially identified models defined by moment inequalities that are convex in the parameter of interest. In such a setting, the identified set is itself convex and hence fully characterized by its support function. We provide conditions under which, despite being an infinite dimensional parameter, the support function admits √n-consistent regular estimators. A semiparametric efficiency bound is then derived for its estimation, and it is shown that any regular estimator attaining it must also minimize a wide class of asymptotic loss functions. In addition, we show that the “plug-in” estimator is efficient, and devise a consistent bootstrap procedure for estimating its limiting distribution. The setting we examine is related to an incomplete linear model studied in Beresteanu and Molinari (2008) and Bontemps, Magnac, and Maurin (2012), which further enables us to establish the semiparametric efficiency of their proposed estimators for that problem.

Comment on “The Law of Large Demand for Information”

- Econometrica---2014---Yaron Azrieli

Say that one information structure is eventually Blackwell sufficient for another if, for every large enough n, an n-sample from the first is Blackwell sufficient (Blackwell (1951, 1954)) for an n-sample from the second. This note shows that eventual Blackwell sufficiency lies strictly between (one-shot) Blackwell sufficiency and the ordering of information structures formulated by Moscarini and Smith (2002), and thus offers a new criterion for comparing experiments. A characterization of eventual Blackwell sufficiency in terms of the one-shot experiments remains an open question.

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