

## Fabio Michelucci: Research Outline

My main research interest is in the theoretical understanding of market mechanisms and the design of better functioning ones. I have started to focus on auction markets, and I have recently turned my attention also to other environments such as contests. My own view of the literature on auctions is that while it is vast overall, for the sake of obtaining seemingly more general results, it has been overly focused on settings where information aggregates smoothly, and efficient allocation is achievable. In the first two research areas described below, I discuss how I have tried to fill this gap by providing models that, though less general, are aimed to address environments that are relevant in real applications and which have been neglected to date.

More recently, I have also incorporated ideas from behavioral economics into my agenda and run experiments aimed at testing specific designs and behavioral hypotheses. This is described in Research Area 3 below. Finally, Research Area 4 presents some recent work on contests.

A theme that unifies most of my research projects (both those that have been concluded, and those ongoing and planned) relates to the extent that a mechanism discloses information and what its strategic consequences are. Below I divide my research papers, classifying them in various areas, but when possible I stress the unifying theme identified above.

- **Research Area 1: Second Best Efficiency and the Open Ascending Auction. (3 papers)**

This is a research project that I have been working on with Hernando-Veciana for some years. In this project we have shown that there are very relevant situations in which the first best efficient allocation is not feasible (markets with an incumbent), provided a characterization of the second best, and analyzed whether the open ascending auction performs well in this environment. It is often believed that the open ascending auction is a natural candidate to aggregate information and to achieve an efficient outcome, and indeed its use has been advocated for privatizations, one of the market applications we have in mind. Our work shows that while this is generally the case for situations with two bidders, with more than two bidders the fact that auction is “open” and provides immediate disclosure of information regarding who has dropped to all active bidders leads to rushes (i.e. all active bidders quitting simultaneously), which we show to be incompatible with the second best. In this respect we can view this project as contributing to the literature about the effects of market transparency, as one can argue that the open ascending auction is the most “transparent” format. We go on to propose a two stage sealed bid mechanism that releases less information across stages and implements the second best, thus showing that some degree of “opaqueness” is indeed optimal. It is a contribution on its own to have been able to provide a tractable model of rushes where unambiguous predictions about their effects can be drawn. In fact, rushes are pervasive in many markets, but their effect is *a priori* ambiguous. I believe that there is scope for further work in this area, for instance, focusing more on information aggregation rather than efficiency. Finally, the paper on *EL* shows that the second best may require not allocate the object in order to maximize ex-ante efficiency.

**“Second Best Efficiency and the English Auctions”** with Angel Hernando-Veciana. In *Games and Economic Behavior* 73 (2011) 496–506.

We study the second best in a single unit sale to two bidders. This is the allocation that maximizes the expected social surplus subject to the bidders’ incentive compatible constraints when the first best is not implementable. We prove that Maskin’s (1992) result that any first best allocation that is

deterministic and monotone can be implemented with the English auction carries over to the second best.

**"On the Optimality of Not Allocating"**, with Angel Hernando-Veciana, In *Economics Letters* 125 (2014), 233-235.

We show that the commitment to not allocate may be exploited by a seller/social planner to increase the expected social surplus that can be achieved in the sale of an indivisible unit.

**"Inefficient Rushes in Auctions"**, with Angel Hernando-Veciana, Under Review by the *Rand Journal of Economics*.

We challenge the common view that the open ascending auction is the most efficient auction in a realistic setting for privatizations, public tenders and takeover contests with an incumbent. Our first main result shows that the open ascending auction is prone to rushes, i.e. all active bidders quitting simultaneously, that undermine its efficiency. In fact, we provide conditions under which the open ascending auction is the least efficient of the standard auctions. Interestingly, the efficiency of the open ascending auction is improved by reduction of the amount of publically available information. Our second main result is that the maximum expected social surplus is generated in a multi-stage auction commonly used in privatizations.

• **Research Area 2: Manipulating Information in Open Ascending Auction. (4 papers)**

This research project also focuses on the open ascending auction. This project has a common theme with the work I described in Area 1. I remarked above that the fact that the open ascending auction releases all new available information instantaneously may sometimes be detrimental to efficiency. We show that bidders might have an incentive to manipulate the natural flow of information that is released in the open ascending auction. This fact is ignored by most of the auction literature because the open ascending auction is modeled as a clock (or Japanese) auction where bidders can only be active or quit. Our insight that bidders have an incentive to alter the flow of information and hide the exact drop out price of some opponents provides a new rationale for jump bidding, a very relevant and documented phenomenon in auctions and other settings such as corporate takeovers. All existing models focused on signaling explanations. Ettinger and I have two follow up papers that exploit this new idea of information manipulation Both are summed up below. I also have a solo paper that follows the standard signaling explanation, which I am currently revising. It studies the implication of signaling when the signal conveys information not only about some private value component but also a common value component.

**"Hiding Information in Open Auctions with Jump Bids"** with David Ettinger, In the *Economic Journal* (2015), forthcoming.

We analyze a rationale for hiding information in open ascending auction formats. We focus on the incentives for a bidder to call a price higher than the highest standing one in order to prevent the remaining active bidders from aggregating more accurate information by observing the exact drop out values of opponents who exit the auction. We show that the decision to allow jump bids or not can have a drastic impact on revenue and efficiency<sup>2</sup>

**"Creating a Winner's Curse via Jump Bids"**, with David Ettinger. R&R at *Review of Economic Design*).

We show that a bidder can use jump bids to create a winner's curse and preserve an informational advantage that would otherwise disappear in the course of the open ascending auction. Two novel features of equilibrium jump bids are also derived. First, the jump bid may partially reveal the value of the signal that the jump bid intends to hide. Second, the probability to call a price might decrease with the type of bidder who places the jump bid.

**"Manipulating Information with Reserve Prices"**, with David Ettinger (work in progress)

We introduce a novel motive for the use of a reserve price as an instrument to raise auction revenues. The effect that we stress is of inducing coarser information aggregation. Perhaps surprisingly, in our setting the use of a reserve price increases both entry and efficiency.

**"Signaling in a Private and Common Value Environment"** (new draft in progress)

I study an auction setting with two bidders, one of whom is better informed regarding the realization of a common value component of the object on sale. I analyze the incentives to place a pre-emptive bid that discourages information acquisition and show how such incentives vary with the relative size of the common component and on whether the informed bidder knows how her value decomposes into a private and a common value part or not. I also evaluate the effects of a jump bid on the auction's revenue and efficiency.

• **Research Area 3: The Effect of Feedback on Market Behavior (2 papers + more work planned)**

The paper in *JEBO* (see below) analyses the question of whether specific provision of ex-post feedback can have an impact in one shot first price auctions. An *AER* paper by Filiz-Ozbay and Ozbay (2007) showed experimentally that this is the case and proposed an anticipated regret explanation. Their result is a very important for market design and we wanted deepen its understanding. I had sketched a theory based on manipulation of ex post beliefs that, unlike the regret theory, could provide theoretical predictions for other types of feedback, with the idea of searching for the optimal feedback type and testing it experimentally. However, we found that the result in the *AER* paper is not robust and therefore dropped the theoretical approach. The paper in *JEBO* has become a robustness check of the effect of feedback in a one shot first price auction environment. The answer is negative, but important for market design.

The paper with Jehiel and Katuscak (close to first submission) is part of a related but rather new way of looking at the effect of historical market information on bidding behavior that we hope can open up a new and interesting research area. The idea is that a long term auctioneer who has access to a lot of bidding data could provide selective information to bidders if he were to know that the selection would affect behavior in the direction of increasing his revenues. We conjecture theoretically that providing only past winning bids as opposed to all bids would induce a selection bias that generates higher revenues. We then present the result of an experiment that confirms the prediction of the selection bias theory. Our results highlight the importance of historical market information in shaping bidders' beliefs and behavior. Our approach differs from most of the existing work on feedback in auctions that consider only feedback about the outcome of auctions the bidder

has directly played and therefore focuses on the issue of perfecting bidding behavior rather than influencing beliefs about the behavior of opponents. The market design implications of selective historical information provision are potentially very important and deserve further study in order to develop a better understanding of what types of feedback manipulations matter. While I highlight below some ideas we are already pursuing for a couple of additional auction papers, I believe the implications may extend well beyond the auction literature.

**"Does Feedback Really Matter in One-Shot First-Price Auctions?"** with Peter Katuscak and Miroslav Zajicek, *Journal of Economic Behavior and Organization*, 119 (2015), 139-152

Does the type of posterior feedback affect decisions in one-shot environments? We revisit this question in first-price auction markets. We consider three feedback types: minimal (only knowing whether winning or not), loser (also knowing the winning bid) and winner (knowing the second highest bid if winning). Filiz-Ozbay and Ozbay ("Auction with Anticipated Regret: Theory and Experiments," *American Economic Review*, 2007, 54(4), 809-819) find that loser (as opposed to minimal or winner) feedback increases bids. We use three novel protocols and additionally replicate theirs. Using a sample of 624 subjects, we find that bidders' ex ante knowledge of posterior feedback type has no systematic effect on the average bid/value ratios.

**"How to Boost Revenues in FPAs? The Magic of Disclosing Only Winning bids from Past Auctions"**, with Philippe Jehiel and Peter Katuscak (work in progress)

We consider a long-term auctioneer who repeatedly sells identical or similar items and might disclose selective information about past bids. We conjecture that when presented with information about historical winning bids, some bidders mistakenly best-respond to that distribution, failing to realize that winning bids are not representative of all bids. In the steady state, this selection bias results in higher auction revenues relative to when all bids are presented. Our experimental test confirms the qualitative predictions of the selection bias theory. On the theory side, the findings challenge the predictive power of the Bayesian Nash Equilibrium based on rational bidders. On the market design side, they underline the role of historical market information as a key design choice.

**New Projects on Historical Market Information**, with Philippe Jehiel and Peter Katuscak

In the paper above, the type of the object for which historical information was given was fixed, while what changed was the selection of bids offered. Another important type of manipulation of feedback is one that affects the very own definition of the object on sale. Suppose for instance that you want to buy a house in neighborhood X, which is composed of 2 streets, A and B. You might prefer street A or B, but your beliefs about the distribution of prices in A and B also matter. If historical information about prices is available only at the neighborhood level, X, you are likely to simply best respond to the joint distribution of prices. In fact, you may well think that there is no difference between the two streets. Instead, if historical information is provided at the street level, now buyers will appreciate the difference between A and B and the two markets will be fully separate. That is, by manipulating historical information, one can segment a market. It is a theoretical question to see when this is optimal (we have some preliminary results) and then to test it experimentally.

A second type of manipulation of feedback involves providing aggregate feedback about past bidding of two ex ante asymmetric type of bidders, a strong and a weak one. The insight here is that

aggregate feedback might act as a “level of field” device, which has relevant consequences if we think of it in terms of an environment where an affirmative action might be relevant. Given the applications we have in mind, we might run this project in an APA or contest environment.

• **Research Area 4: Contests (1 paper + more work planned)**

This is also a new and ongoing project. The theme of the first paper below is Experimentation and Selection. We have so far an incomplete draft available, but the main results have been developed and provide interesting new insights. While our leading application is a dynamic campaign contribution, the model is written in a more general form to accommodate for other applications. The main idea is the following. Suppose a principal has some input (*money* in the lobby application or in a R&D set up, *time* in other applications) that he can allocate to one of two agents, or both, and that boosts the chances of his success in the contest among the two agents (e.g. politicians who want to win an election). The problem for the principal is that he does not know which is the more able agent, but he can use the outcome after the first period to update his beliefs. The model has two periods to capture the dynamic incentives behind the decision to whom and when to give. We are able to present a model in which, despite all players being risk neutral and that the way the principal input is translated into higher chances of success naturally biases towards contributions to only one agent, delivers an equilibrium with equal contributions in the first period.

The campaign contribution application fits particularly nicely because hedging contributions are indeed observed and not well explained. Furthermore, all models we are aware of are static and therefore ours would fill an important gap in the literature and address important policy questions. Our main result is due to a combination of moral hazard and a hold up problem. There are numerous extensions we can perform later, the most obvious being to add a competing principal (another lobby in the political economy application). We can also further adapt the model to better fit IO applications.

**"Electoral Competition with Dynamic Campaign Contributions,"** with Andrea Mattozzi  
(work in progress, see draft available, complete draft coming soon).

We study a two-period dynamic principal agent model in which two agents with different abilities compete in a contest for a single prize by exerting effort. A risk-neutral principal can affect the outcome of the contest by dividing a given budget between agents in each period. The principal net payoff depends on the relative share of the budget given to the winner of the contest. Since agents' abilities are not observable and effort levels not contractible, the principal faces a trade-off between experimentation and selection. The results we derive are consistent with a number of stylized facts regarding the dynamics of US campaign contributions.

**"Transparency in Dynamic Contests"**, with Levent Celik (work in progress, very preliminary).

The objective of this project is to study the effect of varying the coarseness of feedback about some interim performance measure on the overall effort level in a two period contest game. The leading applications we have in mind are education (e.g. optimal disclosure policies of a midterm exams) or the theory of organizations (interim performance evaluations, e.g. ranking of a sales person among his peers). The project is at the very early stages.