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It is a pleasure to write a letter in support of promoting Ben Edelman to a tenured professorship at HBS.

To summarize my evaluation in advance: I cannot imagine not promoting him to tenure. Ben is an unusual individual in many respects. One can only marvel at his unbounded energy, the depth of his mind, and his creativity in the way that he frames economic problems. These are not the sort of skills one learns in classes or seminars. They are borne of an intense, innate curiosity about every facet of economic activity and a drive to make the world a better place.

Ben has been my colleague in the NOM group for ten years. I first met him as a student in an economic theory course I was teaching and have followed his education and career ever since.

In his research and teaching he has combined technical computer science, analytical economics, and an extraordinary knowledge of the dynamics of networked markets. He is creative and insightful in his research. He is able to communicate his ideas in a very practical sense to diverse audiences. He is extraordinarily productive in his research and writing.

At HBS and inside NOM he is a great colleague. He in constantly thinking of ways to improve operations and teaching. With extraordinary frequency, he has contributed to the growth of our best junior faculty members. Ben has coauthored papers with almost every one of our young colleagues in the field of organizational economics.

I have seen him teach several times – twice in his Online Economy course. He has a unique style, driven by the way he operates his "boards" which are driven by software of his own construction. The last time, in a wrap up lecture which surveyed a number of cases and teaching plans of his own design, the class gave him a standing ovation.

Below I will offer some observations about some of his papers: three that I was asked to comment on at his previous review, two written since then. I will also offer some thoughts on his extensive teaching notes, which are the best sets of teaching notes I have seen in many years, covering both Online Economy cases and LCA.

Papers written before the 2015 review:

(i) Internet Advertising and the Generalized Second-Price Auction (with Michael Ostrovsky and Michael Schwarz) AER
(ii) Pricing and Efficiency in the Market for IP Addresses (with Michael Schwarz) AEJ Micro
(iii) Price Coherence and Excessive Intermediation (with Julian Wright) QJE

"Internet Advertising…" is a widely cited paper and is justifiably famous. The paper is clean, insightful and genuinely new. It makes a brilliant theoretical connection between the auction process it studies and the assignment game analyzed many years ago by Shapley and Shubik. It relates to the classic work in the 1980s on two-sided matching with transfers, but, as the paper shows, the equilibria of position auctions on the internet are fundamentally different from what those models would predict. This is an example of a key theme that runs throughout Ben Edelman's work – seemingly small changes in a mechanism or a market design can cause large and important changes in outcomes, new strategic opportunities, and new pathways for malfeasance.

"Pricing and Efficiency…." This is a brilliant paper that has already had a lot of impact. It takes off from Ben's earlier independent work in "Running Out of Numbers: Scarcity of IP Addresses and What To Do About It", a 2009 HBS working paper. Ben and Michael Schwarz follow the logical consequence of IP address trading and point out that it creates a large and previously unstudied externality. IP address are originally assigned in large blocks and when some addresses are sold the routing of packets becomes very complicated and circuitous, placing burdens on the internet that did not exist in the original block structure. This externality is unpriced, of course. Only someone who understands the deep structure of the internet and who appreciates the natural economic incentives that a scarcity of IP addresses creates could have developed the theory in this paper.

"Price Coherence…." This paper may well be the most creative of all of Ben's papers. It is the closest to being pure economics. Yet it grows directly out of his case writing and advocacy related to two-sided markets such as the platforms on which airline tickets are sold to consumers. Unlike much of Ben's other work, he is not the originator of competitive policy studies in two-sided markets. There is an extensive prior literature. What Ben and his co-author Julian Wright bring to this problem is a clean, new definition: price coherence. This is the idea that a buyer who has the choice of purchasing either via an intermediary or directly from the seller may, by design, face the same price either way. When price coherence holds it is a self-imposed constraint on the two-sided system, seemingly guaranteeing the buyer that there can be no loss in using the platform. However, through a fascinating chain of competitive forces in this market, price coherence generates a series of interactions that had not been studied previously and which have counterintuitive effects.

In my opinion, a paper like "Price Coherence…" represents economic theory at its best. There is a necessary abstraction in the analysis, and not every aspect of a real market can be captured in the model. But in exchange one gains real insights into the process and is given a set of signposts to guide a more nuanced case-based analysis.

Papers written in the past two years:

(iv) Risk, Information, and Incentives in Online Affiliate Marketing, (with Wesley Brandi), Journal of Marketing Research

(v) Racial Discrimination in the Sharing Economy (with Michael Luca and Daniel Svirsky), AEJ Applied Economics, forthcoming

These two papers are not the high level economics of the three I have surveyed above. They are not intended to be that. They demonstrate other aspects of Ben's interests and character, both embodying valuable attributes that he will build on in the future.

"Risk Information and Incentives..." This paper has two parts.

The first part is a textbook introduction to the subject of affiliate marketing, a practice that is relatively new but now almost ubiquitous. It explores the structure of online marketing efforts by affiliates and the relationships between the marketers and the actual producers/sellers of goods and services. This part could well become a required reading in every MBA marketing class.

The second part of the paper deals with fraud. Ben is passionate about pursuing fraud in general (see e.g. his paper on typosquatting) and this new and different type of online fraud in particular. His coauthor, who I do not know, is the CEO of a company that is devoted exclusively to identifying and prosecuting this type of fraud.

What they do in this paper is the tip of a large iceberg. They catalog many of the types of frauds that are possible and classify their occurrence by the type of affiliate and the relationship between the affiliate and the seller. I am not the right person to evaluate how new this is as a research topic within the marketing literature, but it was an eye-opener for me. I am sure this paper will lead to a considerable amount of follow-up in the field.

"Racial Discrimination..." extends a large literature on racial discrimination in housing and employment to the online marketplace, specifically to Airbnb. It is a valuable piece of evidence about Ben's collegiality and value as a research collaborator. Even though it is not a major piece of research, I am very pleased to see it in this packet.

While the major themes of this paper have been studied before, the particular conclusions in this paper are new and interesting in both their positive and negative aspects. Racial discrimination appears to be universal in that it cannot be forecasted based on the characteristics of the proprietor or the property. At the same time, there appears to be a subset of hosts who discriminate, although who is in this set cannot be forecast based on observable characteristics. Ben and his coauthors, Mike Luca, our NOM colleague, and Daniel Sviersky, a Bus Ec graduate student, find that a typical act of discrimination, turning down a request from a seemingly African-American renter, is costly. The unit in question does not often get rented out to a white client instead. They show that this result is robust to the presentation of the application for rental and to other variables. The main interesting conclusion of this paper is that although racial discrimination has decreased markedly over time in traditional markets, the anonymity of the online process provides a type of "cover" for the proprietor that allows discrimination to continue at a high level.

The analysis is very thorough. Ben's contribution has been his refined understanding of how online markets work and in this way he has been a valuable member of this three-person team. Mike Luca is an acknowledged leader in the area of consumer ratings and information in the online market place; and Dan Sviersky has a JD and experience in anti-discrimination law – having served as a law clerk at the United States Court of Appeals for the Fourth Circuit. This paper adds to Ben's considerable volume of joint work with HBS colleagues and is a sign of his value as a collaborator and mentor.

Cases and Teaching Notes:

Prior to 2015:

Distribution at American Airlines, (A), (B), (C), (D) and the associated Teaching Note, 909-035

The market for airline reservations is very complicated. Unlike the general theory of price coherence, where a certain set of abstractions are used to make the model work, the history of airline reservations systems shows that this market defies theoretical analysis. It is something that needs explication via a multi-part case. The lessons to be drawn may never be directly applicable to any other market because all markets are different in essential institutional and strategic details. *American Airlines* can be used to illustrate many lessons and in the hands of a skilled instructor it is a great resource.

I thought Ben's teaching note for *American Airlines* was wonderful. American Airlines has more detail and more explicit lines of suggested questioning for the instructor than is typical in teaching notes. It shows a deep understanding of the industry and of this particular set of practices. It is written in a very generous and understanding way: The problem considered here is a bit of a hobby horse for Ben (no one knows more about airline ticketing practices than he does). But Ben recognizes that it will not be so dear to the hearts of other people who teach his case and he has written the teaching note so that it will have continuing value and will be deeply appreciated when used by others.

Since 2015:

Three Problems in Protecting Competition, (with Lena Goldberg), HBS case 917-012 and the associated teaching note 917-014

Of all the things that Ben has written in the two years since I last surveyed his work, the "Three Problems…." teaching note, which has become a part of LCA, is my favorite. I learned so much from reading it, primarily because it is concise, manageable, and directly addresses some major ethical questions. I wish this teaching note could be made available to economics graduate students in industrial organization. It is one of the best explications of patent law, both the theory and the actual litigation implications of the law, that I have ever seen.

My main question about this teaching note is "How can one do all of this in 80 minutes?" Ben offers a precise minute-by-minute guide, including an 8 minute Wrap. Each section of this guide could go on for hours. The only thing missing is a plan for how to cut the conversation off!

This teaching note demonstrates how much of a contributor Ben must have been in LCA. I did not see him teach a class in LCA myself, which I now regret. If I could relive last spring, knowing what I now know, I would definitely have gone to "Three Problems..." as taught by Ben.

Let me emphasize that the papers I have commented upon above are merely a selection of my favorites among literally dozens of others.

In summary, I hope very much that Ben Edelman will be promoted to tenure at the School. He has a good heart and a good mind. He has amply demonstrated the many ways that he can become a leader on our Faculty.

Yours sincerely,

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