### Friday October 11

**Jon M. Huntsman Hall | 8th Floor**

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<tr>
<td>12 p.m. to 12:45 p.m.</td>
<td>Lunch</td>
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| 12:45 p.m. to 1 p.m.  | Opening remarks
Professor Eric Bradlow, Chairperson, Wharton Marketing Department |
| 1 p.m. to 2 p.m.     | Session 1                                                            |
| **Buying data from consumer: The impact of monitoring programs in U.S. auto insurance** |                                                                 |
Yizhou Jin (Berkeley), Shoshana Vasserman (Stanford) | This paper studies the design and impact of auto-insurance monitoring programs, in which insurers incentivize consumers to have their driving behavior monitored for a short period of time. We acquire proprietary datasets from a major U.S. auto insurer, matched with price menus of the firm’s main competitors. We first estimate structural parameters for consumers’ monitoring opt-in choice and for their insurance demand using rich data variation in insurance claims, prices, contract space, and monitoring status. We then conduct counterfactual simulations using a dynamic pricing model that endogenizes the firm’s information set. We find three main results. (i) Data collection changes consumer behavior. Drivers become 30% safer when monitored, which boosts total surplus and alters the informativeness of the data. (ii) Safer drivers are more likely to opt in. But monitoring take-up is low due to both consumers’ innate disutility for being monitored and attractive outside options from other insurers. Nonetheless, introducing monitoring raises both consumer welfare and total surplus. (iii) Proprietary data facilitate higher markups but protect the firm’s ex-ante incentives to produce the data. A counterfactual equilibrium in which the firm must share monitoring data with competitors harms both profit and consumer welfare. This is because the firm offers smaller upfront incentives for monitoring opt-in, so that fewer drivers are monitored in equilibrium.  
*Presenter: Yizhou Jin*  
*Discussant: Raghu Iyengar (Penn)* |

| 2 p.m. to 3 p.m. | Session 2                                                            |
| **Prediction and congestion in two-sided markets: Economist versus machine matchmakers** |                                                                 |
Kuran-Ming Chen (Chicago), Yu-Wei Hsieh (USC), Ming-Jen Lin (National Taiwan University) | We study the welfare implications of deploying machine-learning recommender systems on two-sided platforms. While online platforms offer a large pool of potential partners, we find that the leading algorithms in practice create congestion and polarization—only a small portion of users are recommended. We propose the use of matching models in economics to solve the problem of congestion, which yields a class of equilibrium machine-learning algorithms. We apply our recommenders to an online-dating data that contains over 490,000 unique users. In the counterfactual simulations, our recommendation lists are more diversified and hence the matching process is accelerated by 100%. We show that applying a matching model may improve the prediction power of machine learning. The out-of-sample hit rate of our equilibrium recommender outperforms the baseline content filtering by a factor of 19.  
*Presenter: Yu-Wei Hsieh*  
*Discussant: Hanna Halaburda (NYU)* |
| 3 p.m. to 3:30 p.m. | Break                                                                |
### Session 3

**Targeted advertising and consumer inference**
Jiwoong Shin (Yale), Jungju Yu (City University of Hong Kong)

Using increasingly granular customer data, firms have improved their targeting capabilities to proactively reach customers who are not even aware of their needs or wants for the product. The mere fact that consumers get targeted by advertisements can affect their inference about the unknown utility from a product. We build a micro-model where multiple firms compete through targeted advertising, and consumers make inferences from targeted advertising about their unknown match value for the product category, as well as the advertising firm’s unobserved quality. We show that in equilibrium, upon being targeted by a firm, consumers make optimistic inferences about the product category, as well as the quality of the firm. With such improved beliefs, a targeted consumer is more likely to engage in costly search throughout the category. We find that the increase in consumer search creates advertising spillover beyond the level of the mere awareness effects of advertising, and firms’ equilibrium level of targeted advertising can be non-monotonic in the targeting accuracy. Also, we show that sometimes it can be optimal for firms to relinquish customer data, and instead engage in non-targeted advertising. The results provide insights into trade-offs between advertising reach and targeting accuracy.

*Presenter: Jungju Yu  
Discussant: Amin Sayedi (University of Washington)*

### Session 4

**Preference Externality Estimators: A Comparison of Border Approaches and IVs**
Xing Li (Peking University), Wesley Hartmann (Stanford), Tomomichi Amano (Harvard)

We document that identification strategies exploiting cross-border differences in treatment are a variant of the preference externality estimator more recently developed in the industrial organization literature. Waldfogel (1999) coined the term preference externality to describe how the aggregate tastes of heterogenous consumers can influence the products made available to one another within a common market. The externality forms the basis for an instrumental variable estimator where, after conditioning on observed preference determinants for a focal consumer type, the aggregate observables within the market, which vary by the preferences of other types, influence the focal type's "treatment" but are excluded from the focal type's outcome equation. Variation in treatment across geographic borders similarly arises from an externality where otherwise comparable individuals near a border face different policies because of different externalities from their respective aggregate regions. We use an advertising application to compare the border and IV implementations of preference externality estimators across three dimensions: i) identifying assumptions, ii) sacrifices in statistical power, and iii) local estimates of heterogenous effects.

*Presenter: Wesley Hartmann  
Discussant: Brad Shapiro (Chicago)*

### Cocktails and Dinner | Dick Wittink Award

*University of Pennsylvania Museum of Archaeology and Anthropology  
3260 Spruce Street | Egyptian Upper Gallery*
**Saturday, October 12**

*Jon M. Huntsman Hall | 8th Floor*

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<td>8 a.m. to 9 a.m.</td>
<td>Coffee and Continental Breakfast</td>
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<td>8:45 a.m. to 9:45 a.m.</td>
<td>Session 5</td>
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**The impact of soda taxes: Pass-through, tax avoidance and nutritional effects**
Stephan Seiler (UCLA), Anna Tuchman (Northwestern) and Song Yao (Washington University)

We analyze the impact of a tax on sweetened beverages, often referred to as a “soda tax,” using a unique dataset of prices, quantities sold, and nutritional information across several thousand taxed and untaxed beverages for a large set of stores in Philadelphia and its surrounding area. We find the tax is passed through at an average rate of 97%, leading to a 34% price increase. Demand in the taxed area decreases by 46% in response to the tax. We find no significant substitution to bottled water, but modest substitution to (untaxed) natural juices and a large amount of cross-shopping to stores outside of Philadelphia. Among taxed beverages, demand decreases more strongly for relatively healthier products. Due to cross-shopping and compositional changes in demand, we do not detect a significant reduction in calorie and sugar intake. Based on these findings, we discuss implications for optimal tax design.

*Presenter: Anna Tuchman
Discussant: Martin O’Connell (IFS)*

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<td>9:45 a.m. to 10:45 a.m.</td>
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**Learning to set prices**
Yufeng Huang (Rochester), Paul Ellickson (Rochester), Mitchell Lovett (Rochester)

How do firms adapt to new market conditions? We study the adaptation of retail prices in the Washington State liquor market where privatization led existing grocery chains to enter this market for the first time. We document large price changes across a broad range of products and provide novel evidence showing that these changes result from retailers learning about demand: prices absorb realized demand shocks, adjusting to better reflect demand primitives. We then estimate a structural model that imposes minimal assumptions on the optimality of observed prices. Comparing against the full-information optimal prices implied by the model, we find that learning continues to occur even years after firms enter the new market, and the limited demand information initially reduces profit by 9% compared to full information. Further, empirical pricing patterns suggest that retailers learn about the underlying distribution of customer preferences across vertically- and horizontally-differentiated products.

*Presenter: Yufeng Huang
Discussant: Kanishka Misra (UCSD)*

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<td>10:45 a.m. to 11:15 a.m.</td>
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<td>11:15 a.m. to 12:15 p.m.</td>
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**Measuring the welfare of intermediaries in vertical markets**
Javier Donna (OSU), Pedro Pereira (Autoridade da Concorrência), Tiago Pires, Andre Trindade (FGV EPGE Brazilian School of Economics and Finance)

We empirically investigate the welfare of intermediaries in oligopolistic markets, where intermediaries offer additional services. We exploit the unique circumstance that, in our empirical setting, consumers can purchase from manufacturers or intermediaries. We specify an equilibrium model, and estimate it using product-level data. The demand includes consumers with costly search and channel-specific preferences. The supply includes two distribution channels. One features bargaining about wholesale prices between manufacturers and intermediaries, and price competition among intermediaries. The other is vertically integrated. The model is used to simulate counterfactuals, where intermediaries do not offer additional services. We find that intermediaries increase welfare.

*Presenter: Andre Trindade
Discussant: Charlie Murry (Boston College)*
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| 12:15 p.m. to 1:30 p.m. | Lunch and Keynote  
Implementing Data Analytics and Machine Learning beyond FAAMG  
Florian Zettelmeyer (Northwestern) |
| 1:30 p.m. to 2:30 p.m. | Session 8  
Physician-industry interactions: persuasion and welfare  
Matthew Grennan (Penn) Kyle Myers (Harvard), Ashley Swanson (Columbia), Aaron Chatterji (Duke) |
| 2:30 p.m. to 3:30 p.m. | Session 9  
A method to estimate discrete choice models that is robust to consumer search  
Jason Abaluck (Yale); Giovanni Compiani (Berkeley) |
| 3:30 p.m. to 4 p.m. | Break |
| 4 p.m. to 5 p.m. | Session 10  
More than a penny’s worth: Left-digit bias and firm pricing  
Avner Strulov-Shlain (Chicago) |

**Physician-industry interactions: persuasion and welfare**  
Matthew Grennan (Penn) Kyle Myers (Harvard), Ashley Swanson (Columbia), Aaron Chatterji (Duke)

In markets where consumers seek expert advice regarding purchases, firms seek to influence experts, raising concerns about biased advice. Assessing firm-expert interactions requires identifying their causal impact on demand, amidst frictions like market power. We study pharmaceutical firms’ payments to physicians, leveraging instrumental variables based on regional spillovers from hospitals’ conflict-of-interest policies and market shocks due to patent expiration. We find that the average payment increases prescribing of the focal drug by 73 percent. Our structural model estimates indicate that payments decrease total surplus, unless payments are sufficiently correlated with information (vs. persuasion) or clinical gains not captured in demand.

*Presenter: Matt Grennan  
Discussant: Sarah Moshary (Chicago)*

**A method to estimate discrete choice models that is robust to consumer search**  
Jason Abaluck (Yale); Giovanni Compiani (Berkeley)

Can we distinguish from choice data alone whether consumers are informed about the attributes of goods? Surprisingly, we frequently can. Suppose the data generating process is a search model with a hidden attribute observed to the econometrician; consumers search goods in order of “visible utility” (based on non-hidden attributes) and then choose the good that maximizes utility among searched goods. Canonical models will be biased: the value of the hidden attribute will be understated because consumers will be unresponsive to variation in the attribute for goods that they do not search. An alternative method of recovering preferences using second derivatives of choice probabilities succeeds regardless of the search protocol and is thus robust to what consumers know when they choose. The approach nests the standard full information case. It is also general, requiring few assumptions on utility beyond those required to identify utility parameters in the existing literature. Our approach can be used to forecast how consumers will respond to information as well as to recover consumer preferences when consumers are imperfectly informed.

*Presenter: Giovanni Campiani  
Discussant: Amit Gandhi (Penn)*

**More than a penny’s worth: Left-digit bias and firm pricing**  
Avner Strulov-Shlain (Chicago)

Why do so many prices end with 99 cents? Firms arguably price at 99-ending prices because of left-digit bias, the tendency of consumers to perceive a $4.99 as much lower than $5.00. Using retail scanner data on thousands of products and dozens of retailers, I provide reduced-form support for this explanation. I then structurally estimate the magnitude of left-digit bias, and find that consumers respond to a 1-cent increase from a 99-ending price as if it were a 15-25 cent increase. Next, I analyze how firms should respond to left-digit biased demand. I solve and estimate a model that makes three key predictions: (1) prices should bunch at 99-ending prices; (2) there should be ranges of missing prices with low price-endings; (3) these ranges of missing prices should increase with the dollar digit. Qualitatively, these predictions hold. Firms respond to the bias with high shares of 99s and missing low-ending prices. Quantitatively, however, firms price as if the bias were much smaller and demand were more elastic, so they use dominated prices. I estimate percents of potential gross profits due to this misperception.

*Presenter: Avner Strulov-Shlain  
Discussant: Tat Chan (Washington University)*