

Big Data – Consumers and Firms

The eBay Story

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The broken beginning...



When asked if he understood that the laser pointer was broken, the buyer said
“Of course, I’m a collector of broken laser pointers”

The Mystery of Mary.



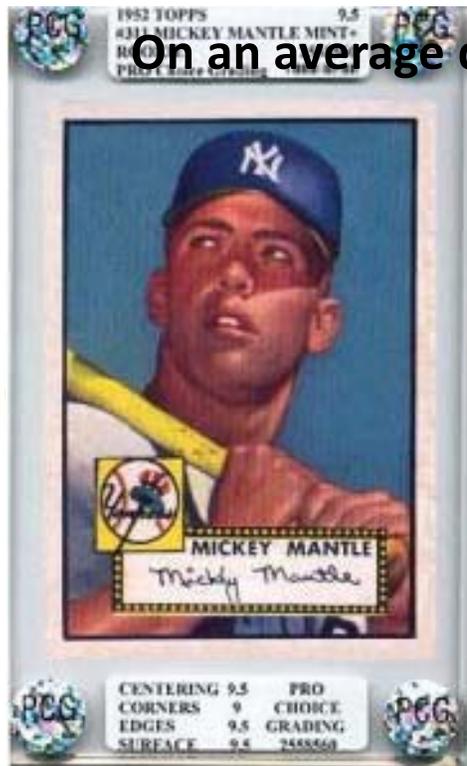
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Velocity of Trade

eBay users trade about \$2,200 worth of goods on the site every second.



On an average day on eBay...

A vehicle sells every 1.6 minutes

A part or accessory sells every 2 seconds

Diamond jewelry sells every 68 seconds

A pair of shoes sells every 7 seconds

A trading card sells every 5 seconds

Scale of Data

- ~150M active buyers
- 75% buy new items
- 7 out of 10 are fixed price items
- Mobile is growing fast: \$20B volume in 2013
- 700M live listings
- ~400 million queries issued a day
- 4 out of 5 items are listed as “not-cataloged”
- Over 50K categories in which items are listed
- 2B+ Page views a day
- 50 Petabytes of data
- Most buyers buy in 1-2 categories
- Most sellers sell in 1-2 categories

The eBay Nation

- 1.6M+ families make a living on the platform
- 40% Germans on the German platform
- 1600+ Australian eBay Millionaires selling to 8 million buyers
- By population would be the 5th largest country in the world
- By Economy size would be 52nd largest economy

Use the Data for?

- Internal Analytics and better product offerings for both sides of platform participants
 - Sellers (listing/shipping assistance, opportunities, analytics)
 - Buyers (search tools, recommendations)
- Policy design and understand effects of platform or external policies (e.g. Internet Sales Tax, Reputation rules, Global Shipping Programs)

Testing and Being Tested

- Testing the users
 - User Studies
 - A/B tests
 - When you have a large active site users can test you as well
 - A large number of experiments by market participants
 - Can this be used to better understand marketplace features or answer some economic questions?
 - How do users internalize shipping costs or sales tax information?
 - What market mechanism increases buyer participation and conversion?
- (ref: Einav, Kuchler, Levin, Sundaresan AEJ-Micro 2014)

Motivation for Shifts in Trade: Internet Sales Tax

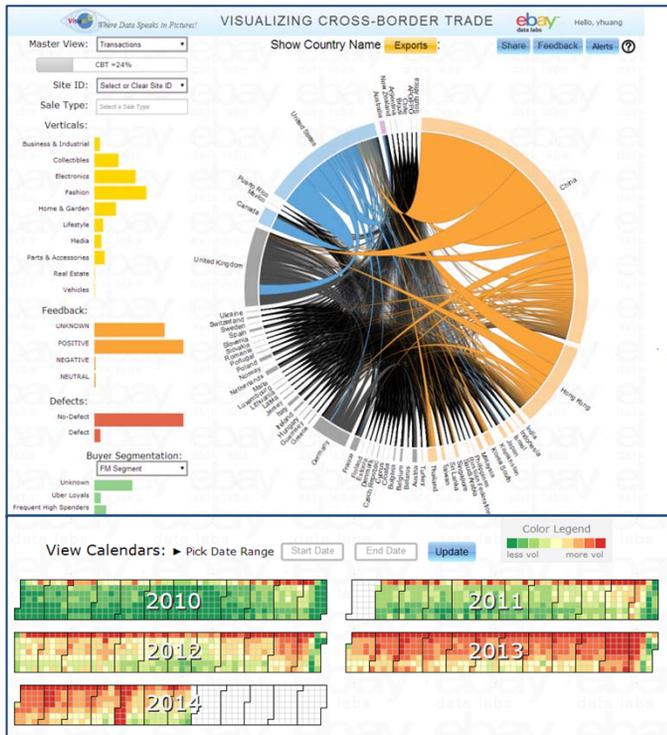
- How important are sales taxes in shifting **consumers**
 - a. From Offline to Online Shopping and vice versa
 - b. From Instate to Out-of-State Online Shopping and vice versa
- How sensitive are **retailers** in switching state boundaries in choice of where to locate?
- Approach
 - Micro (item level) using “tax surprises”
 - Macro (state / county level) using trade flows
- Elasticity of 3% where 1% rate change cause 3% substitution

Ref. Einav, Knoepfle, Levin, Sundaresan AER 2013

Promoting Global Trade

- President Obama announced the National Export Initiative to promote American Exports (2010 State of the Union Address)
- Goal and Top Priority: Improve conditions that affect private sector's ability to export
- Adoption of New Technology
- In 2014, US Dept of Commerce announced a partnership with eBay to promote Cross-Border Trade, especially from American SMBs.
- Also in EU: prioritized Digital Single Market (DSM) in the Digital Agenda for Europe (DAE): by 2015, 50% population buy online; 20% buy cross-border; 33% SME's conduct online purchases.
- SMEs make up a large proportion of world economy
 - In 2011, 58% of gross value added in EU comes from SMEs
- In OECD countries, SMEs = 99% of enterprises and 67% of employment. But less than 5% export

Cross Border Trade @ eBay



- In 2013, eBay CBT was over 45B\$ representing about a quarter of the company's enabled commerce volume.
- Micro-Firms doing business on eBay, 97% of those with < \$10K annual sales sell internationally.
- Enablers
 - Export friendly policies (ePacket in china)
 - Lower supply chain costs can increase e-commerce CBT by over 60% (source : WEF)
- Barriers to trade
 - Language diversity
 - VAT changes (EU)
 - Import/export restrictions
 - Currency changes
 - Shipping time
 - Differences in standards

eBay's Global Shipping Program

- Introduced in October 2012;
- US sellers opt in and out of the program
- Once opted in, sellers only responsible for shipping items to a US hub
- Professionals deal with international shipping and custom forms etc.
 - Reduced trade cost and uncertainty of import laws and wait time
- Experienced sellers may not participate

Question

- Change in trade volume and elasticity w.r.t. trade costs
- Overall welfare changes due to GSP
- Effects on enrolled sellers
- Understand “Inducement effect” for non-exporters
 - Do non-exporters become exporters?
- Change in market concentration
 - How did the competition change?
- Sellers’ Listing Decision: GSP vs Non-GSP
 - Why not use GSP?

Data

- Data
 - eBay: Listing and transaction-level trade data after 2012. Staged launch of the program across countries.
 - CEPII (distance data trade cost variable), WTO, and IMF: Distance, RTA, Legal System, Colonial ties, GDP

Methodology

- Top-down Approach: Estimate change in total welfare using gravity models on aggregate bilateral trade flows between country pairs
- Bottom-Up Approach: Regression discontinuity designs that use listing-level data to study the effects of GSP on individual sellers, market concentration in each market, and seller's listing decisions.

