#### Value of Data:

#### There's No Such Thing As A Free Lunch in the Digital Economy

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# **Motivation**

# Value of Data

Example 1: Apple: share consumer data with app developers/30% commission/Revenue: US \$42.8 billion in past decade

Example 2: Farecast – analytics service/acquisition price: **US \$110 million** by Microsoft in 2006

vs. ITA Software – data owner

/acquisition price **US \$700 million** by Google in 2008

- Data driven business models
- Online platform companies



# **Outline of the Talk**

Eight types of online platforms: 8 case studies

Definition of Online Platforms (European Commission, 2015): "an online platform is an undertaking operating in two- or multi-sided markets, which uses the internet to enable interactions between two or more distinct but interdependent groups of users so as to generate value for at least one of the groups."

- Analyzed dimensions: business model, data flow, value creation for consumers, value creation for third parties, and how the online platform company monetize its data
- Creation of the Value of Data and Data Value Chain
- Valuation of Data
- Welfare
- Key findings and future trends



#### **Type I: E-commerce Online Platform**

(2) Value Creation: Get access to one of the world's largest E-commerce markets (1) Data: Get better demand forecast Clickstreams, purchases, Logistics consulting and reviews, and locations management services Over 100 million prime Other data targeting services users (1)(2)**Amazon Third-party** Consumers Marketplace Sellers (3) Value Capture: Value Creation: Commissions (30%), and data Shopping benefits such as time targeting services revenue saving, cheaper prices, more F-commerce: 10% of U.S. selections, recommendations, retail sales/Amazon: 43%

market share/3<sup>rd</sup> party Sellers: 50.5% of Amazon e-commerce

2017 US commission: US

\$41.8 billion; Adv Rev: US \$3 billion; 2018 Premium Data

Service Rev US \$18 billion (e)

Bureau of Economic Analysis
U.S. DEPARTMENT OF COMMERCE

etc.

#### **Type II: Online Resource Sharing Platform**

- 1 Data:
- Clickstreams, purchases, locations, and reviews
- Number of Listed
   Properties: 28.9 million
- Number of Destinations: 137,791
- Number of Countries: 229

2 Value Creation:

- Pricing strategy, demand forecast, access to one of the world's largest online travel markets, and other data targeting services
- Help reduce the inventory of highly perishable goods or monetize underutilized rooms

**Consumers** 

Booking.com

n |

Hotels, Owners of Private Properties, Rental Cars, and Cruises, etc.

4 Value Creation:

(1)

- Time saving, discount rates, lower transaction costs, package offers, more selections, recommendations, and reviews, etc.
- (3) Value Capture:

(2)

- Commissions/shared revenues (15%),and data targeting services revenue
- 2017 US \$11.8 billion (reservation sales); over 1.5 million rooms reserved per night
- Advertising and other revenues < 7% of total sales</li>



#### **Type III: E-financial Service Online Platform**

#### 1 Data:

- Clickstreams, daily consumption and lending behaviors, locations, and bank account information
- Number of Users: 870
  million active users globally
  (mainly in China)
- More than 200 banks, 60 insurance companies, and over 700.000 stores

Consumers Microbusinesses 2 Value Creation:

- Cheaper credit ranking/risk management, and data targeting services
- Help banks reach customers that previously have no credit history
- Targeting demand and credit score services to vendors such as hotels

**Ant Financial** 

Third Party Sellers; Banks; Institutional Investors; Asset Managers; Charities

- 4 Value Creation:
- Help consumer get cheaper loans
- Easier and flexible payment methods
- Faster solution for credit

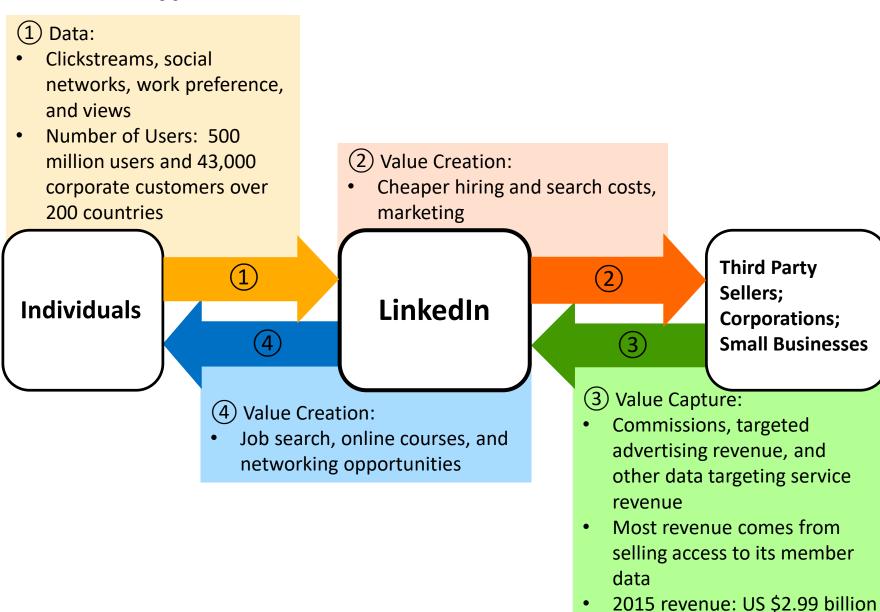
3 Value Capture:

(2)

- revenue, advertising revenue, and other data targeting service revenues
- 2017 estimated net profit from Alipay: US \$1 billion (54.3% market share in China)



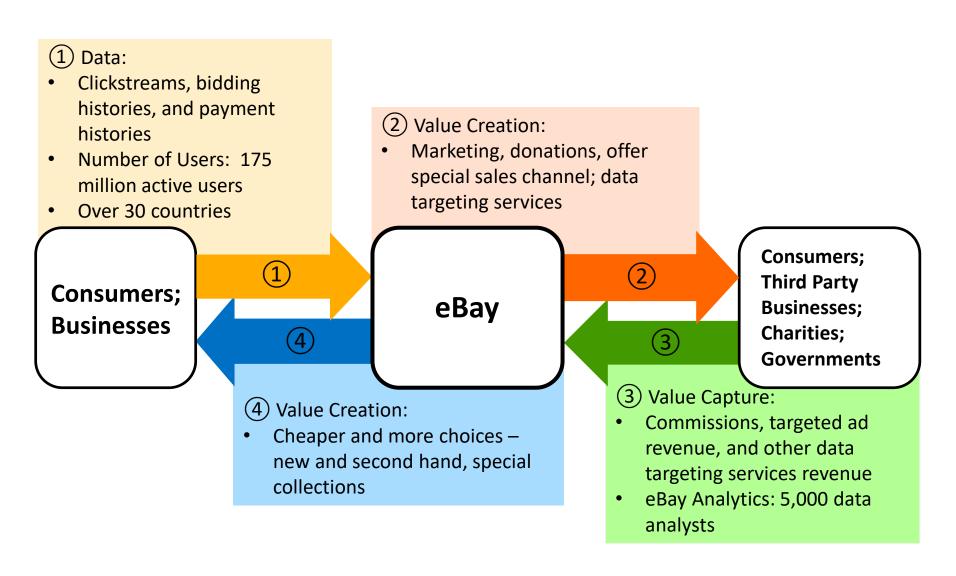
#### **Type IV: Online Social Network Service Platform**



2016 Microsoft purchased LinkedIn for US \$26.4 billion

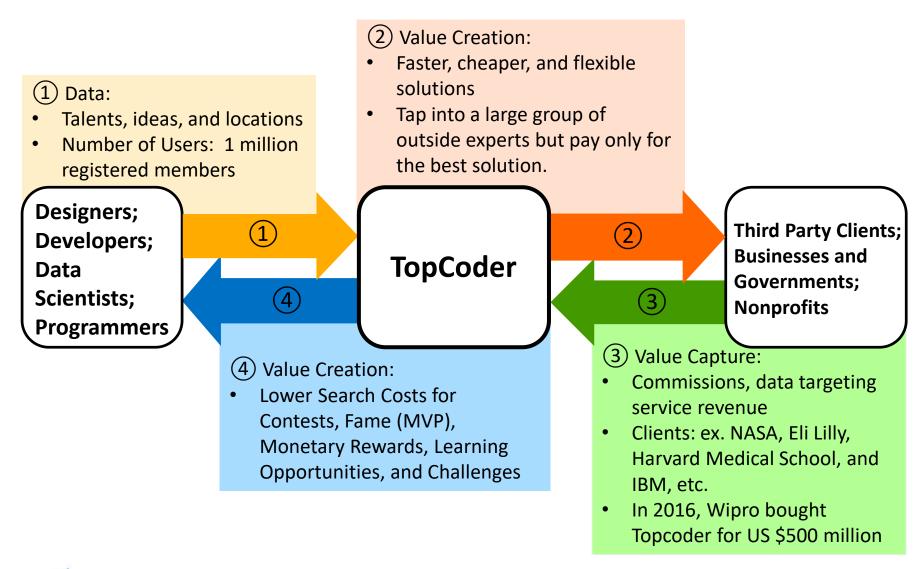


#### Type V: Online Auction/Matching Platform



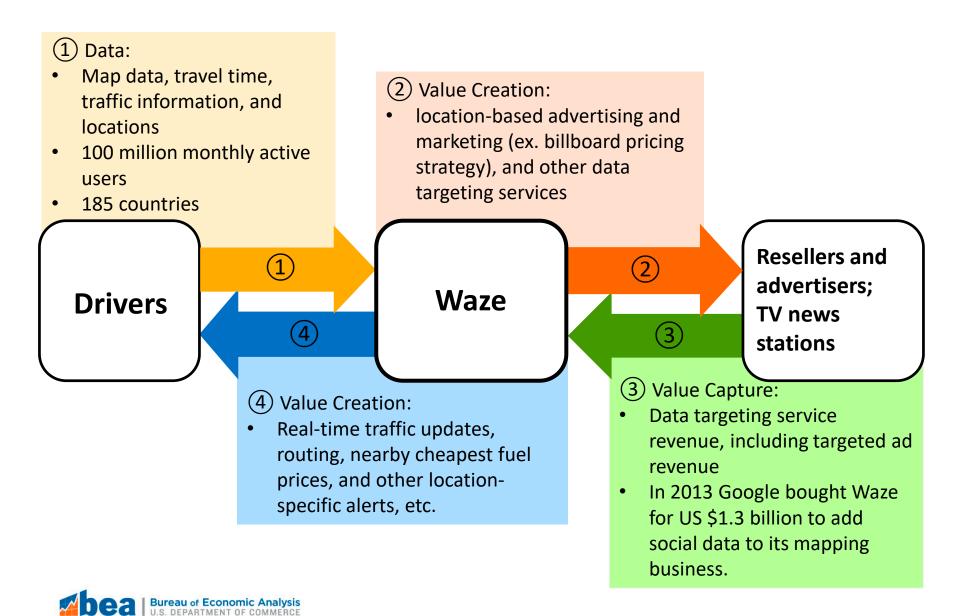


#### Type VI: Online Competitive Crowdsourcing Platform

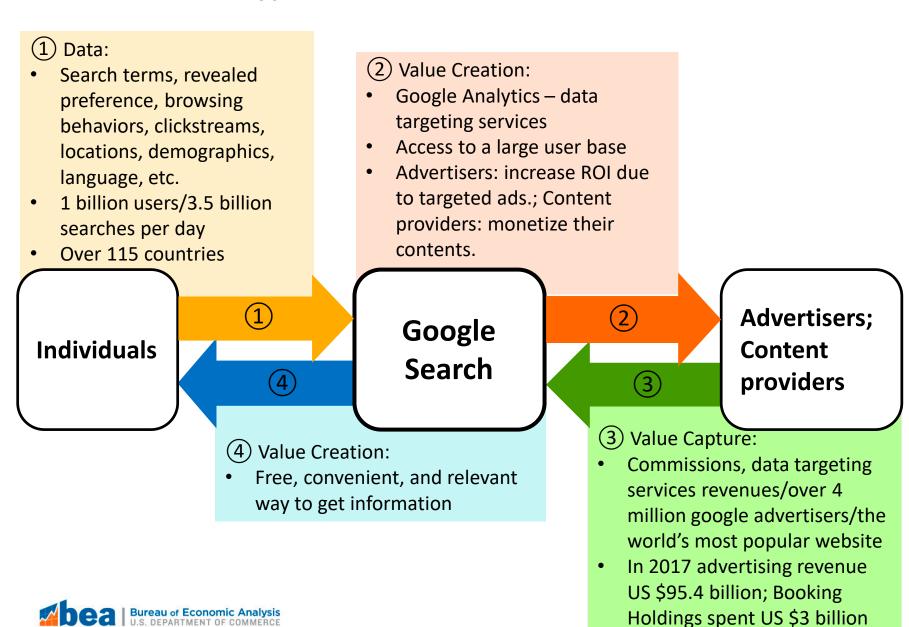




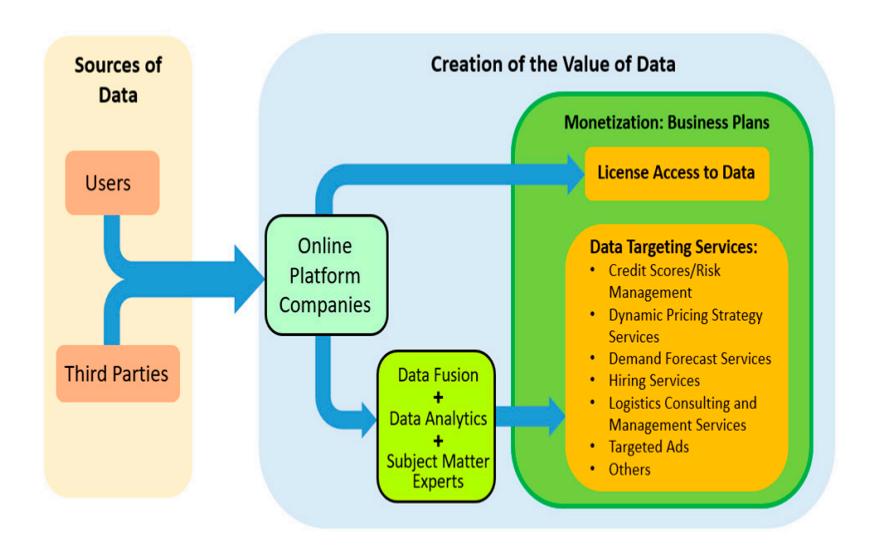
#### Type VII: Online Noncompetitive Crowdsourcing Platform



#### **Type VIII: Online Search Platform**

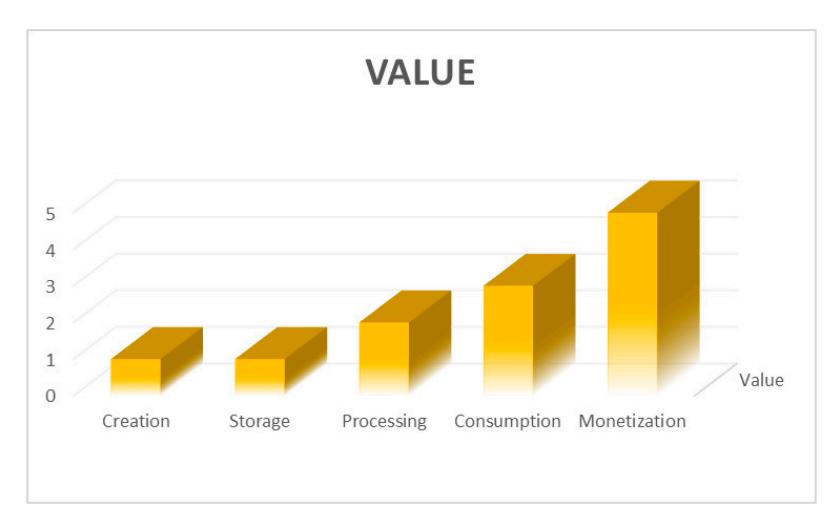


# The Creation of the Value of Data





# **Data Value Chain**



Source: Visconti et al. (2017)



# **Conventional Measurement Approaches**

- Cost-Based Approach
   Seriously underestimates
- Market-Based Approach
   M&A Cases: we have not found impacts
   Mispriced issue
- Income-Based Approach
   Lacks data
   Only for licensing access to data



# Estimated Value of Data Based on Data-Driven Business Model

Data: Selling, general and administrative (SG&A) expenditures (Eisfeldt and Papanikolaou, 2013)

Methodologies: 1) Forward looking profit model for depreciation – Li and Hall (2018)

2) Stock of data-driven business model (Hall, 1993)

Type of Online Platform	Company	Annual Commission or Licensing Access to Data	Value Based on Data-driven Business Model	Merger & Acquisition Price
E-commerce	Amazon	Commission Revenue: US \$41.8 billion (2017) Premium Data Service Revenue: US \$18 billion (2018)*	US \$125 billion; Annual Growth Rate: 35%	
Online Resource Sharing	Booking	US \$11.8 billion (2017)	US \$15.7 billion; Annual Growth Rate: 40%	
E-financial Service	Ant Financial	No public financial statement.		
Social Network Service	LinkedIn	US \$2.99 billion (2015)**		US \$26.4 billion by Microsoft in 2016
Auction/Matching	eBay		US \$16 billion; Annual Growth Rate: 30%	
Competitive Crowdsourcing	Topcoder	No public financial statement.		US \$500 million by Wipro in 2016
Non-competitive Crowdsourcing	Waze	No public financial statement.		US \$1.3 billion by Google in 2013
Search	Google	US \$95.4 billion (2017)***	US \$48.2 billion; Annual Growth Rate: 21.8%	



#### **Discussion on Welfare**

# Scenario I: Identity of a consumer is disclosed

- 1) Privacy Breach or Identify Theft (Acquisti et al., 2016)
- 2) Dynamic Pricing Discrimination

Scenario II: Identity of a consumer is not revealed or used by the service provider

Data Network Effect
Decreasing returns to scale?

Creative destruction phenomenon (Li, Nirei, and Yamana, 2018)

Data sharing (Jones and Tonetti, 2018)



# **Conclusion**

- Online platform companies are data companies and our initial estimations show that the value of data they created can be tremendous.
- Data is an asset.
- Online platform companies can vary in the degree of the vertical integration in the data value chain.
- The variation can determine how they monetize their data and how much economic benefits they can capture.
- Policy implications:

Corporate: investment, outsourcing, and competition strategies

Nation: trade and growth policy



