Economic Stability and Measurement

New techniques for gathering and analyzing information for monitoring financial and price stability

Roberto Rigobon
MIT Sloan, NBER
Agenda

• Changes in
  • Consumer engagement
  • Data generation

• Economic Measurement
  • Problems
  • Pillars of new measurements
Changes in Consumer Engagement

• The way consumers interact in virtual world
  • Information and Price comparison
  • Loyalty (lack of)
  • Personal goods and services (nano-services)
  • Information Sharing
Two very large changes in pricing behavior...

• Traditional
  • Product Attribute based
  • Value on Price obfuscation
    • Brick and Mortar stores

• Platform
  • Robo-Pricing pricing
  • Value on Data Organization
    • Amazon, Walmart, and Wayfair
    • Typically advertise a pricing strategy

• Quantum Prices
  • Price Clustering pricing
  • Value on Price Discrimination
    • Zara, H&M, Apple, and Ikea
    • Typically advertise prices
Paradigm in the organization of the data

• Start of Surveys?
  • 1400 BC Egypt middle kingdom
    • The Egyptians first used it to accurately divide land into plots for the purpose of taxation.
  • 120 BC
    • Greeks standardized procedures for conducting surveys.
  • 1 AC
    • Herod survey in Judea – First evil and questionably manipulated survey of population

• Very useful Paradigm
  • Geography
  • Socio-Economic Conditions
Netflix?

• Instead of approximating preferences, let's measure preferences

• People that like these movies might be very different in terms of geography and economic conditions
Netflix: Change in preferences
Bundle Products

• Sell the Soda to whom?
Facebook Profits

• Profits from:

Inflation depends on these prices

Inflation does not include the value of information
All goods, services and measures are affected

FOOD FOR THOUGHT

No Cash Needed At This Cafe. Students Pay The Tab With Their Personal Data

September 29, 2018 - 7:37 AM ET

CHAIEL SCHAFFEL

Inflation?

GDP?

Productivity?
Quantum Prices

Diego Aparicio
Roberto Rigobon
Price Clustering

Ralph Lauren

Uniqlo
Inflation Dynamics

Ralph Lauren

Uniqlo
Data generation processes and Data gathering

• New sources of data
  • Digital documentation of transactions with a service or manufacturing process
    • Credit card transaction, retail sales scanner data
  • Data from social network communication
    • Facebook, Twitter, Instagram
  • Data transmitted from software agents within mobile devices
    • GPS
  • Data from the internet of things
    • e-commerce: Web pages, price aggregators
    • Utility meter data, sensor data for traffic, air, water, soil quality
  • Biometric data
    • DNA
  • Human communication digital data
    • Emails, blogs, text
  • Digital video data
## Evolution in Data Sources

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<th>Surveys</th>
<th>Administrative</th>
<th>Big Data</th>
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| **Objective**  | Predetermined Question   | Internal Performance Evaluation | • Activity Documentation  
                                          • Individual Characterization  
                                          • Blending                      |
| **Data**       | • Targeted Data  
                                          • Structured          | • Non-targeted  
                                          • Structured           | • Non-targeted  
                                          • Non-structured        |
| **Relevance**  | Representative           | Somewhat Representative   | Not Representative                                     |
| **Curation**   | Well studied             | Well studied              | Not clear                                              |
| **Cost**       | Extremely Costly         | Costly                    | Cheap                                                  |
| **Privacy**    | Protected in the design  | Sensitivity embedded in the data itself | Sensitivity from the inferences that can be made from the data |
| **Intrusiveness** | Extremely intrusive | Intrusive | Non-intrusive |

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**Design**

**Organic**
Different Types of Data

- Data
  - Designed
    - Survey
    - Aggregate
  - Administrative
    - Public
    - Private
  - Organic
    - Aspirational
    - Transactional
Billion Prices Project

Everything with Alberto Cavallo
BPP: Countries covered
Billion Prices Project
Online Information and Indexes

Our Approach to Daily Inflation Statistics

1. Use scraping technology
2. Connect to thousands of online retailers every day
3. Find individual items
4. Store and process key item information in a database
5. Develop daily inflation statistics for ~20 countries

- Date
- Item
- Price
- Description
Argentina
USA
Making Sense of COVID-19’s economic cost

- Impact on
  - Unemployment
  - Wages
  - GDP
  - Inflation

- Massive changes in consumption and production patterns.
  - Are we ready to measure those correctly?
  - How long will the supply shock effects last?
Making Sense of COVID-19’s economic cost

• Inflation
Massive changes in relative prices
Different Countries
Same patterns!
What is the actual inflation?

• Expenditures share that have gone up
  • Food
  • Housing
  • Home entertainment
  • Home electronic equipment

• Expenditures that have gone down
  • Travel and Hospitality
  • Transportation
  • Entertainment (out of home)
Making decisions

• This is about inflation!
  • One of the best statistics we produce

• Can you imagine our level of ignorance regarding
  • GDP?
  • or household stress?
  • or discrimination and inequality?
  • or the number of people diagnosed with COVID?
Pillars of modern measures

1. Continuous Measurement of process
   • Timely measures

2. Non-intrusive
   • Can’t rely on surveys – needs electronic forms of data collection

3. Open source
   • Many could adopt the methodologies

4. Privacy protecting
   • Violations of privacy can be significantly harmful, especially when estimating hidden behavior that is morally questionable

5. Imperfect Measurement
   • To guarantee the previous 4 characteristics the measures need to be noisy.