Big Data in Central Banks

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Why Central Banks should care about Big Data?

- Three important aspects about the economy
  - Inflation
  - Economic Activity (GDP, demand, unemployment)
  - Financial Fragility

- Big Data can help provide complementary and timely measures in all these dimensions.
  - Measure faster, and in some circumstance better

What have I been doing? Measurement

Project	Objective
Billion Prices Project	Measure Inflation
Thousand Big Mac Indexes	Measure relative demand and real exchange rate
Aggregate Confusion	Measure ethical and corporate responsibility impact on communities and society
Contingent Financial Networks	Measure underlying network in banking and its instability. How many linear networks are needed?

Billion Prices Project

Our Approach to Daily Inflation Statistics

1. *Use scraping technology*



2. *Connect to thousands of online retailers every day*



3. *Find individual items*

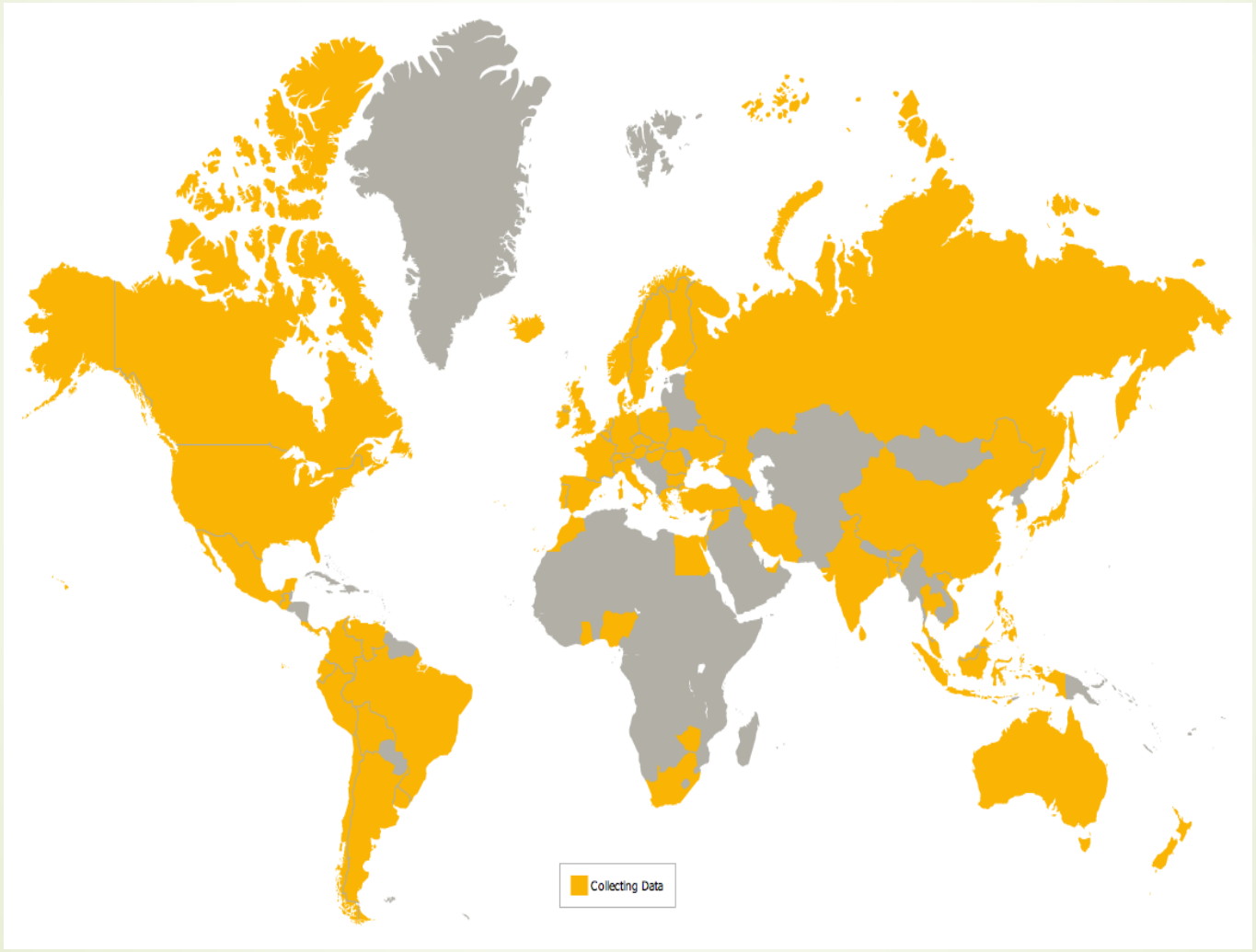


4. *Store and process key item information in a database*
   - *Date*
   - *Item*
   - *Price*
   - *Description*

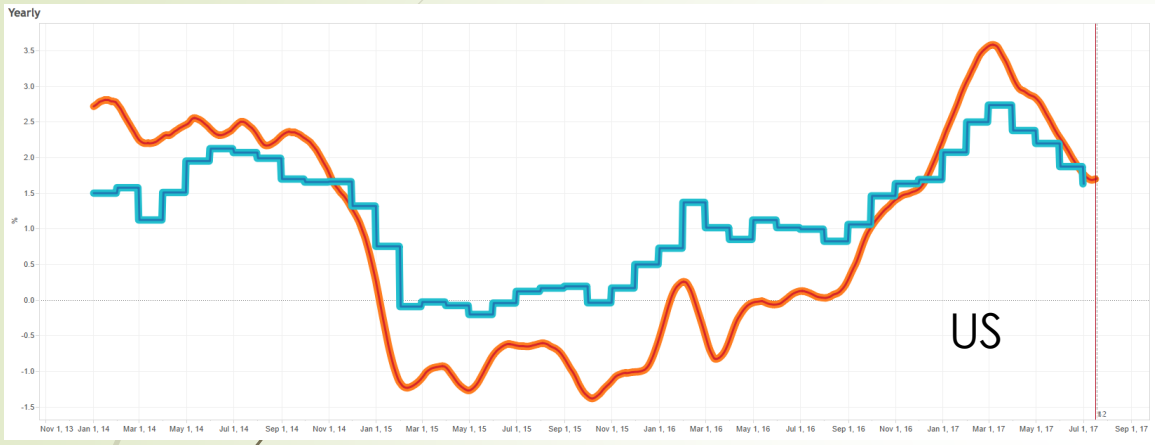
5. *Develop daily inflation statistics for ~20 countries*

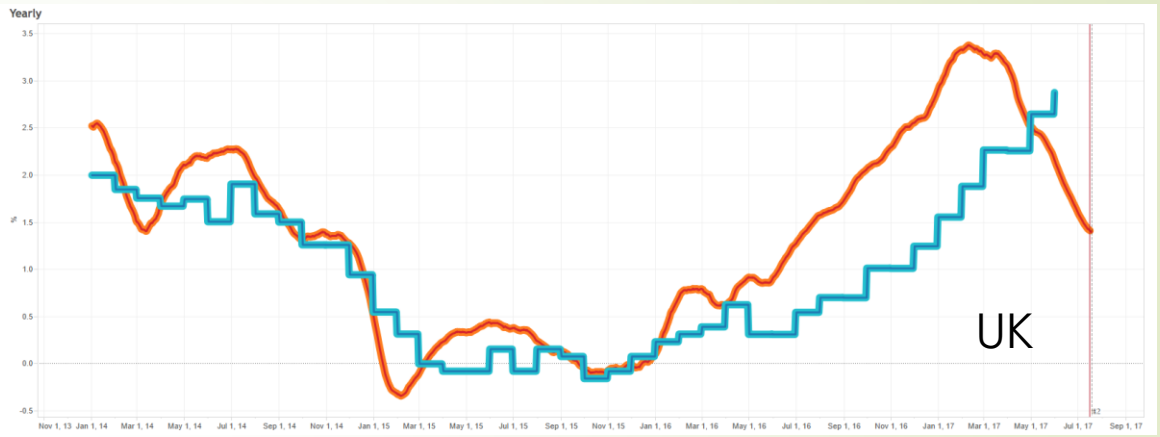


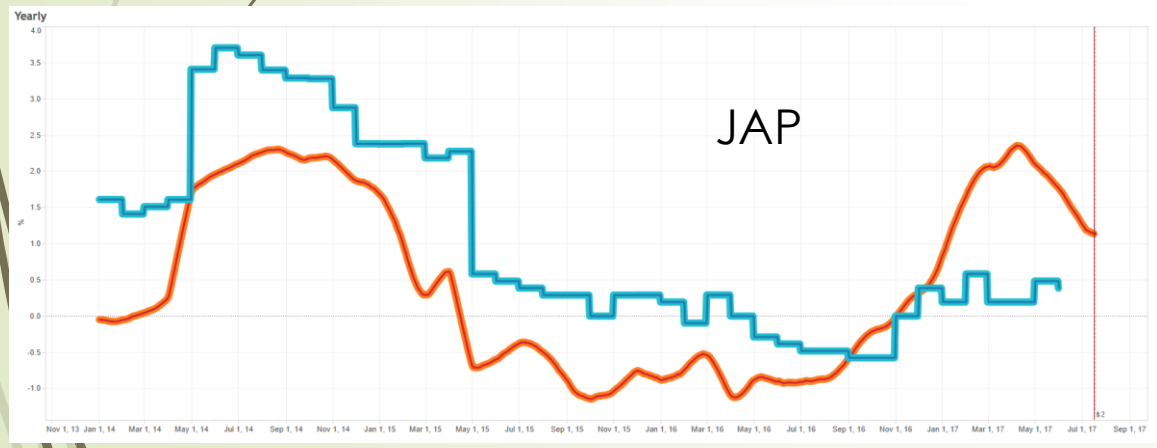
BPP: Countries covered

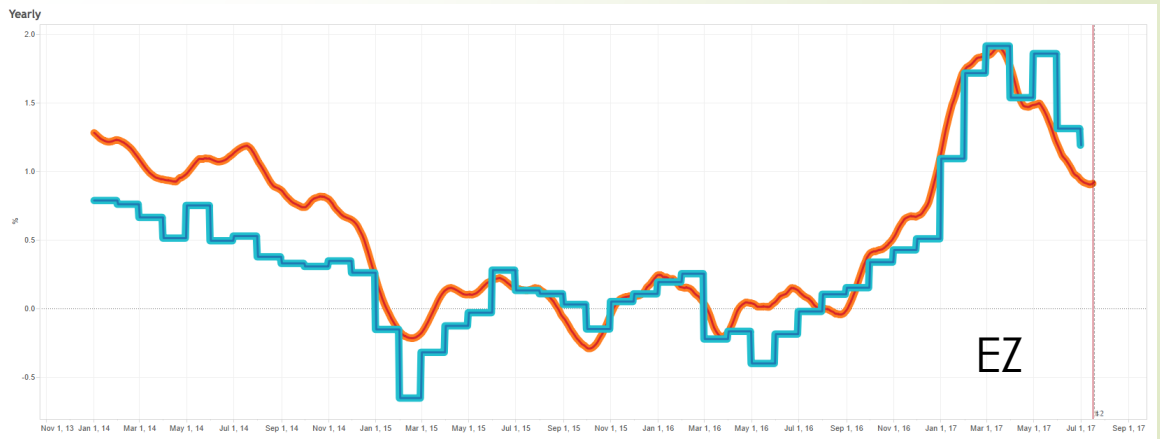


US, UK, Japan, and EZ Inflation

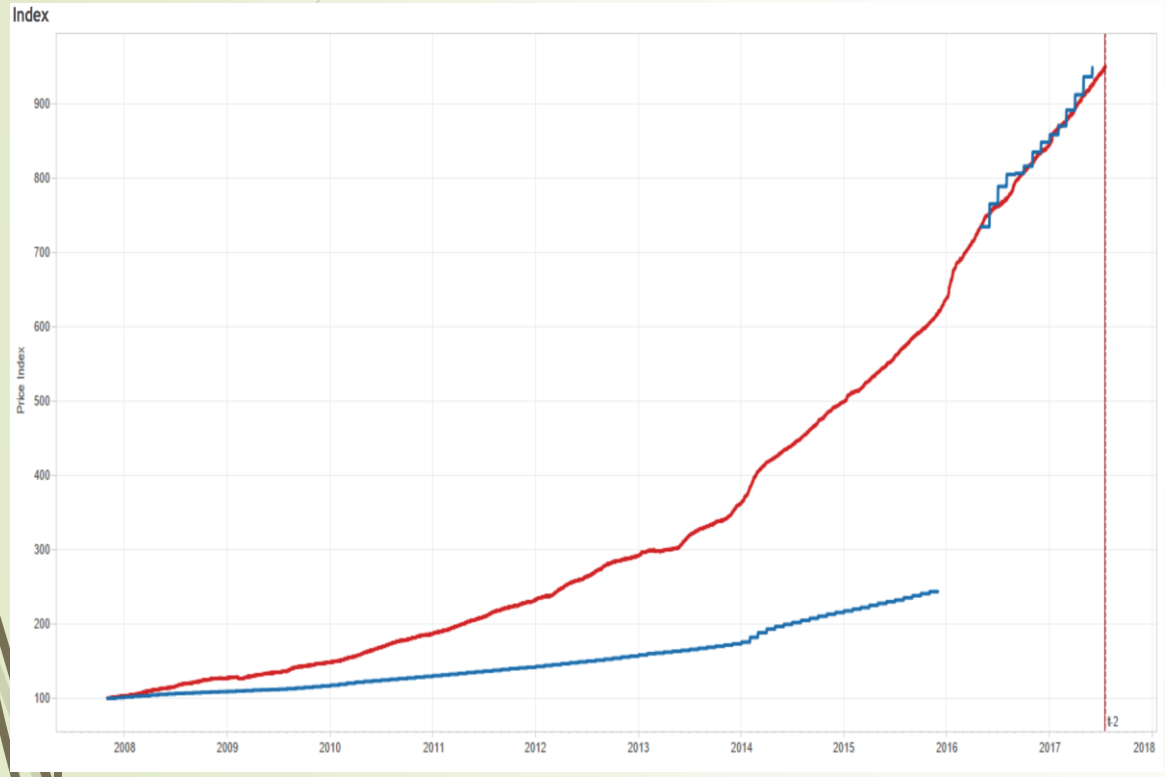


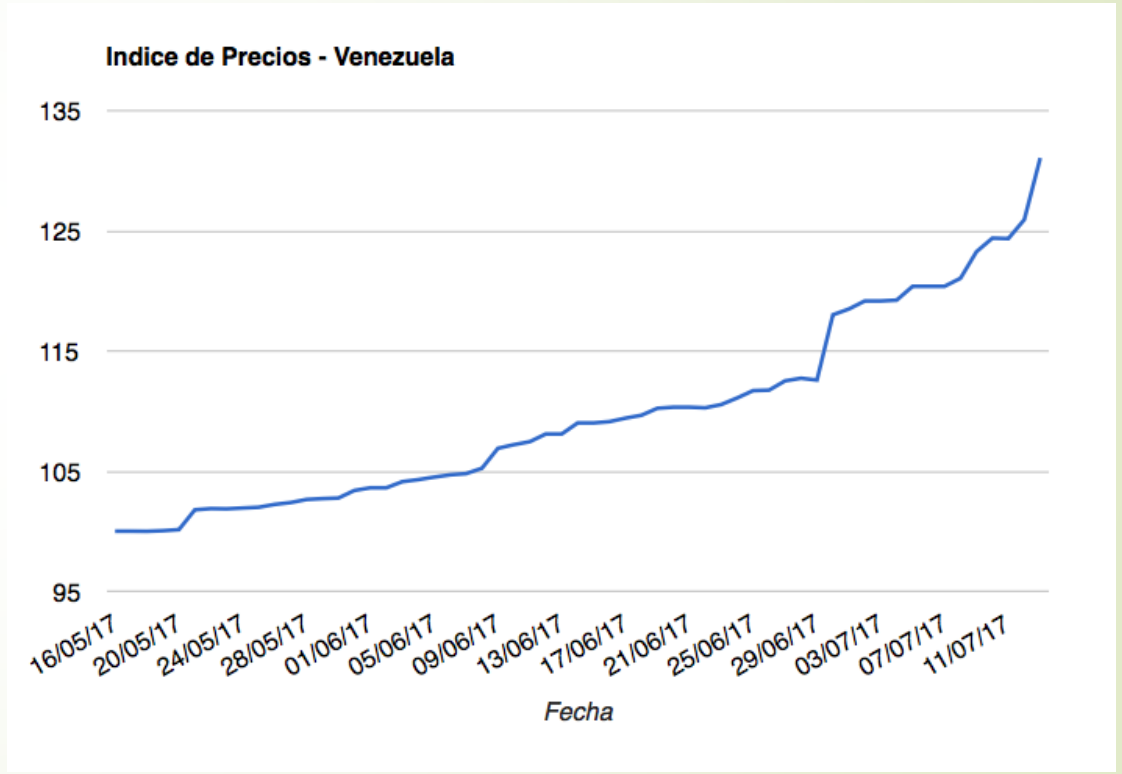






Also, in countries with problems… Argentina and Venezuela





Thousands Big Mac's Project



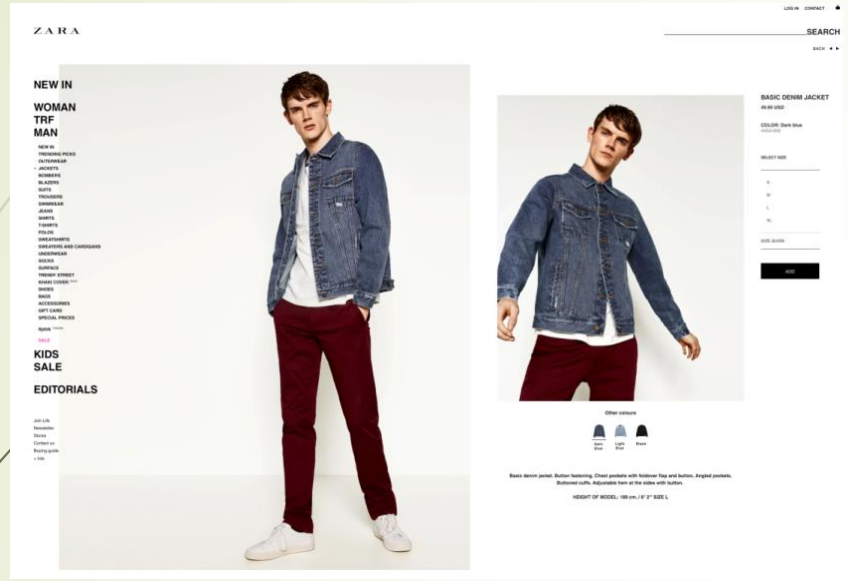
Compare prices for a bottle of Coke across countries

Apply similar approach to hundreds of products on a daily basis

PPP Indices

- Online prices represent an effective tool to measure PPP fluctuations
  - Identical items sold around the world
  - Detailed descriptions to achieve a nearly perfect matching
  - Daily Prices
- PPP indices:
  - More than 300 narrow product categories
  - With thousands individually matched items
  - In food, fuel, and electronics: we are missing clothing, personal care, household products.
  - Cars we will never match

Relative Prices



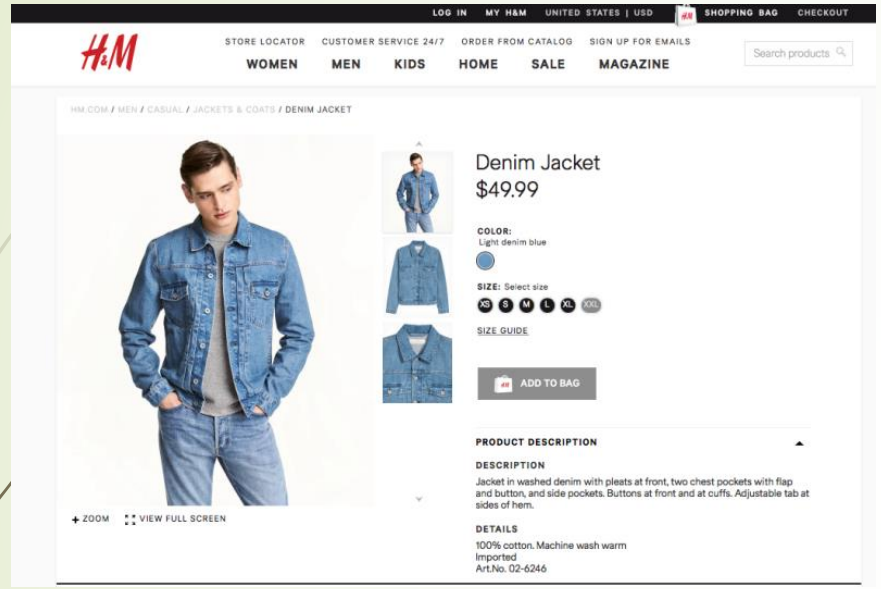
Price: 49.90
Product: 4081762

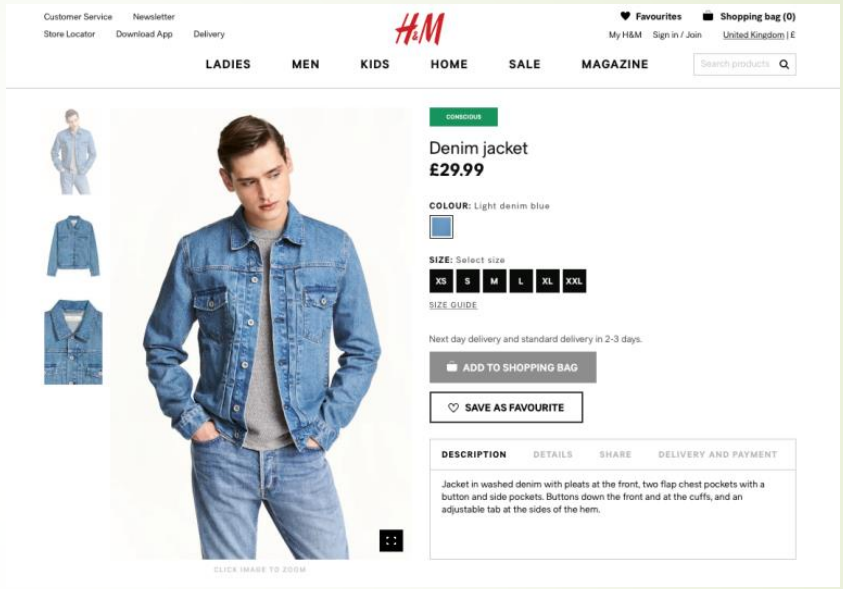


Price: 29.99
Product: 4081762

$$\frac{49.90}{29.99}=1.664$$

Relative Prices



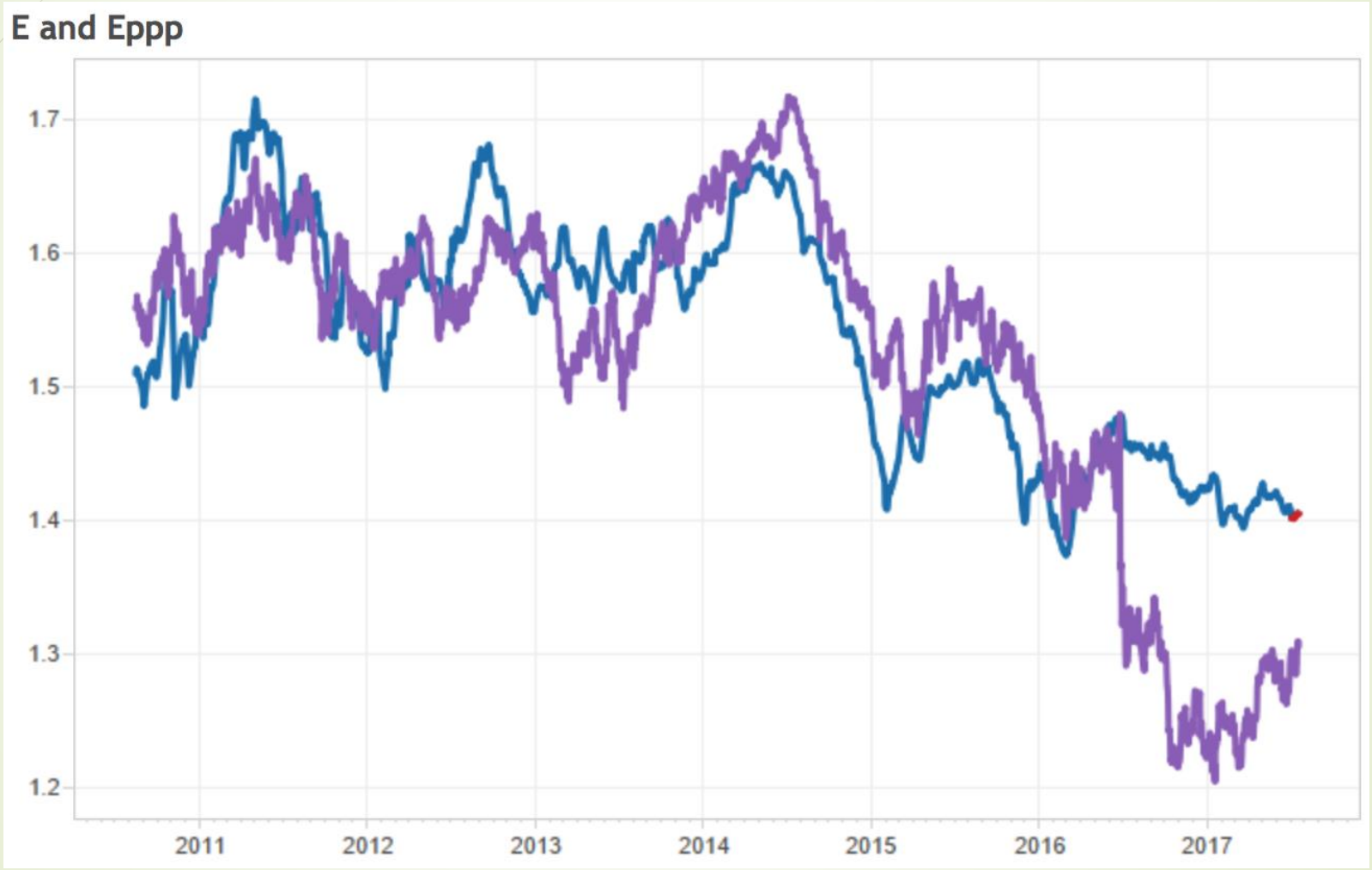


Price: 49.99
Product: 70136

Price: 29.99
Product: 70136

$$\frac{49.99}{29.99}=1.667$$

UK



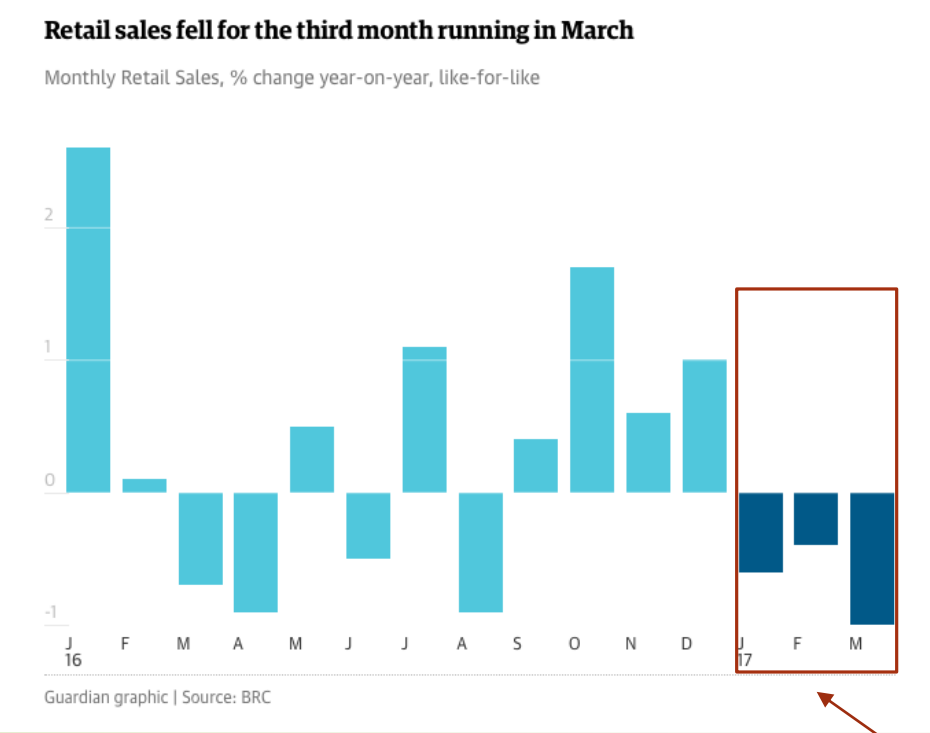
UK

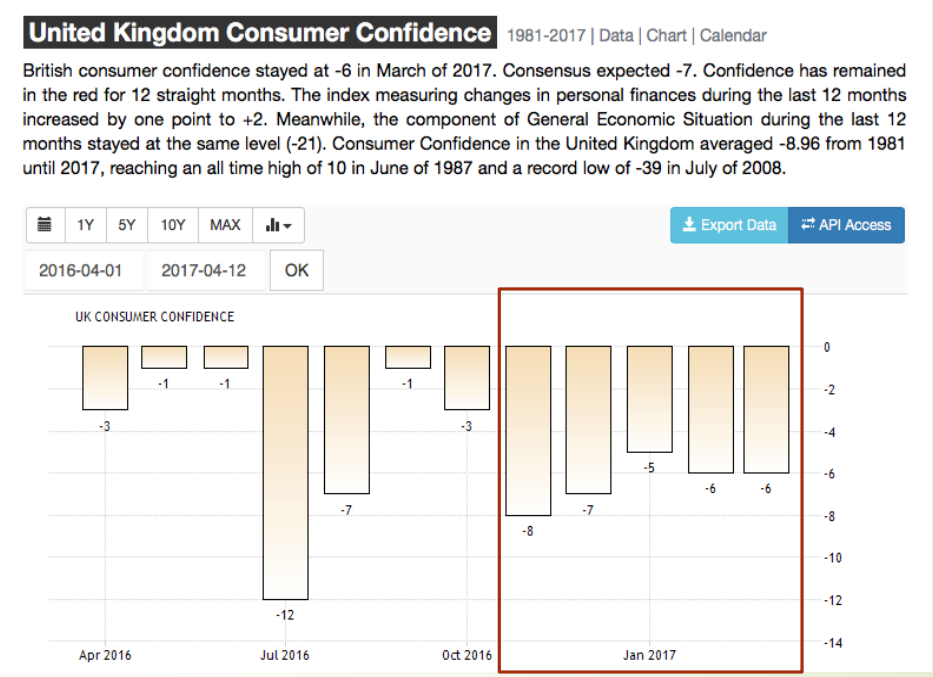




Weak demand

Official Data





We are all measuring the same

Measurement vs Forecasting: The Possibilities…

- Internet Prices — Measure Inflation
- International Relative Prices — Measure Relative Demands (retail)
- Electronic Tax Receipts — Measure daily GDP
- Credit Card Data — Measure Household Income Stress

- Ethical Behavior
- Environmental Impact
- Social Impact