Statistical Office and Big Data
“Blending into the future”

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Big Data

- Opportunity
  - New technologies and consumer practices allows us to expand the data collected
    - Timely
    - Detailed
    - Large
- Challenge
  - How to combine the new data sources with the old ones?

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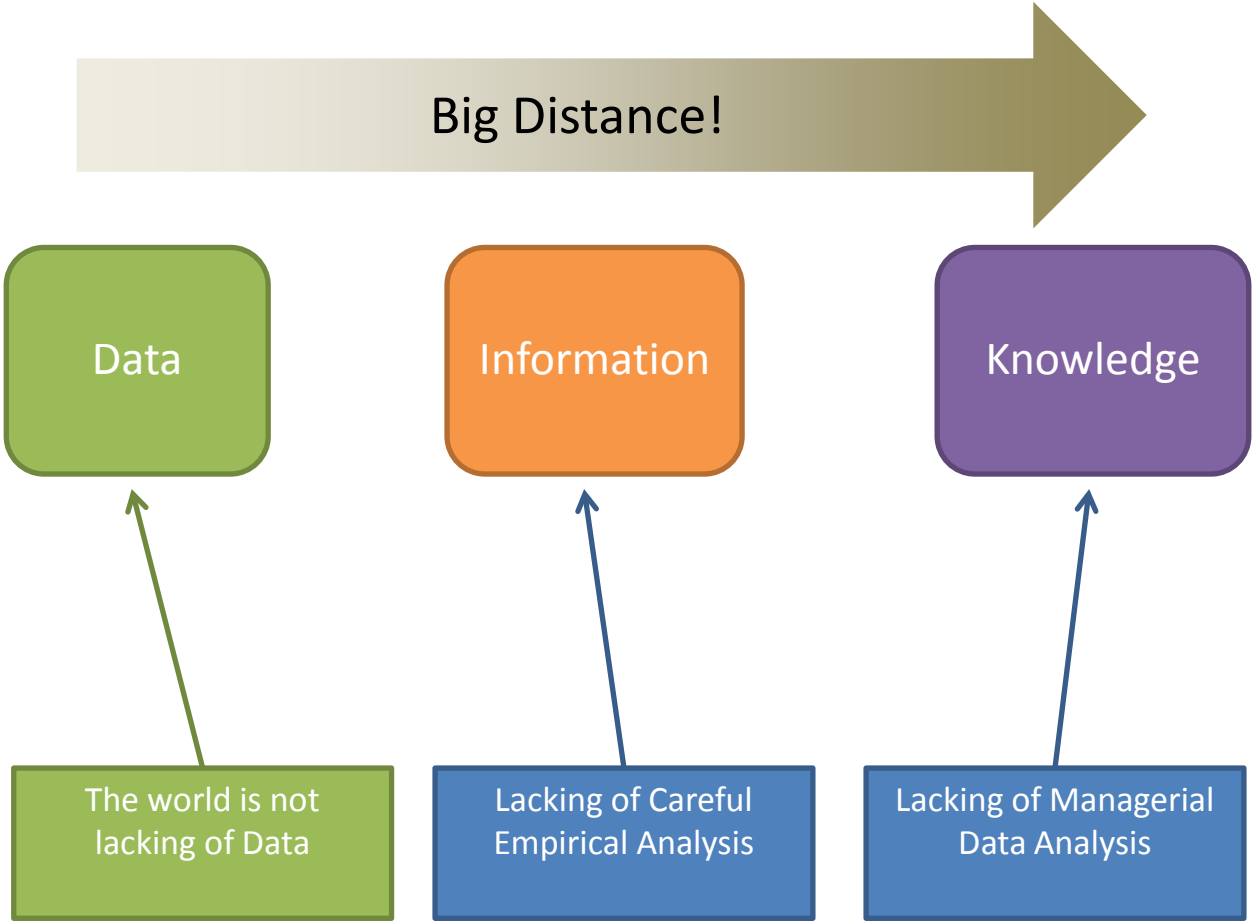

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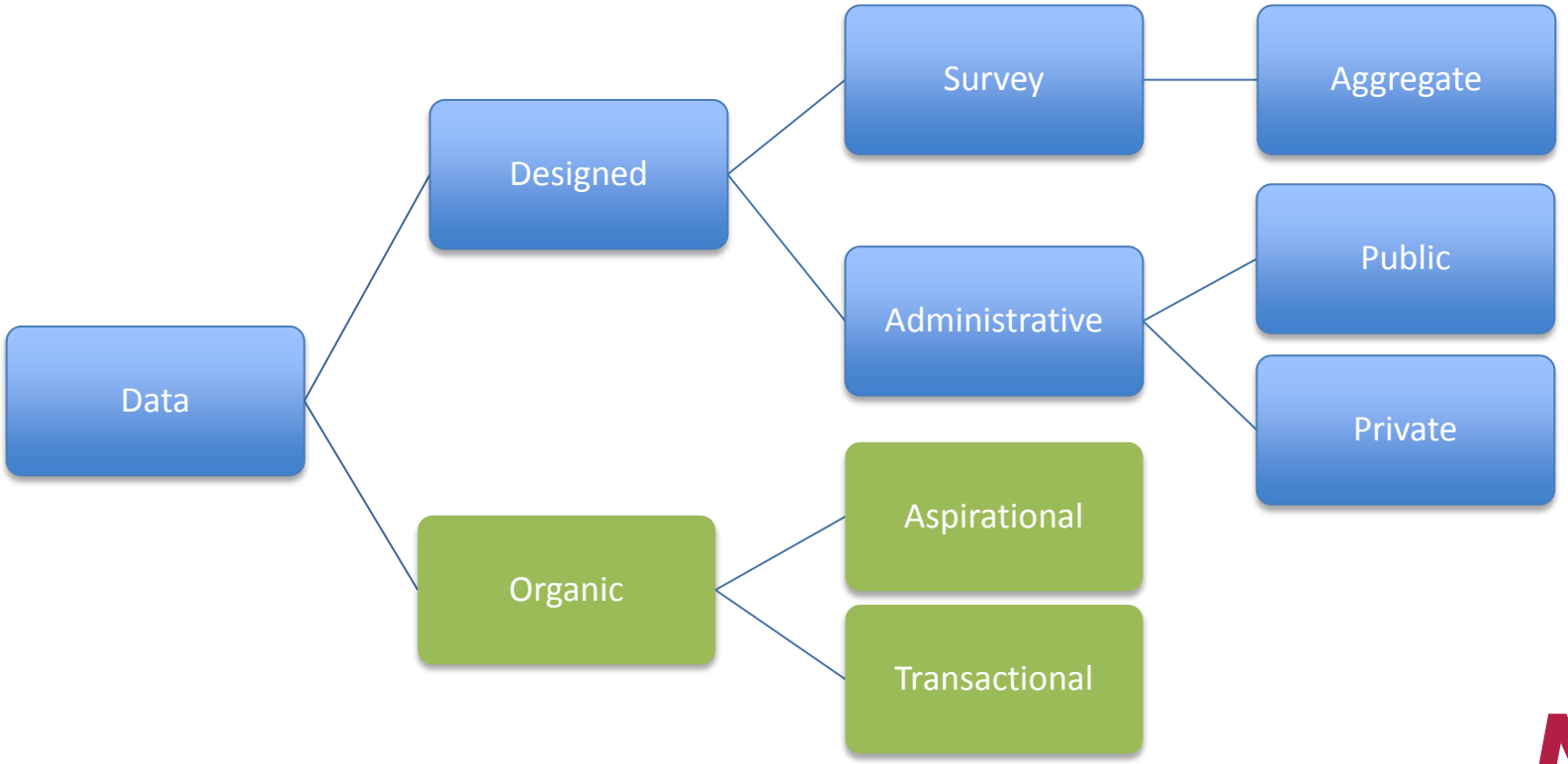
Different Types of Data



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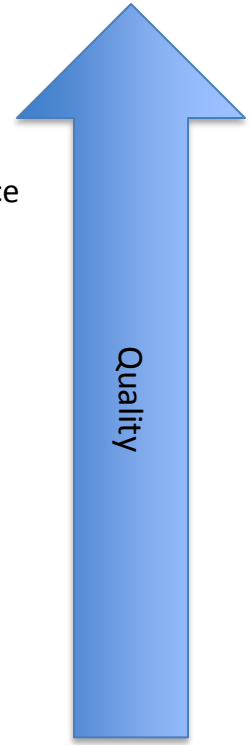
Organic Data

- Biometric data
- CCTV digital data
- Transactions
  - scanner, credit card, utility usage, health service
- Web pages
  - Scrapping, searches
- Mobile devices
  - GPS-associated data, network development
  - Texts, Blogs, Emails
- Internet of things
  - weather sensors, road sensors, appliances
- Social networks
  - Twitter, Instagram, Facebook



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Problems in the Data

- Typical Survey Quality Evaluation
  - Representativeness
    - Coverage
    - Sampling
    - Non-response
  - Measurement
    - Validity of procedure (or measure)
    - Measurement error
    - Processing

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Requirements

Weaknesses that matter

	Survey	Estimation	Forecasting	Measurement
Representativeness				✓
Selection Bias		✓		✓
Reliability and Consistency	✓		✓	✓
Transparency on Data Collection and Treatment	✓	✓		✓
Errors-in-variables		✓	✓	✓
Aspirational (Transactional)	✓	✓		✓
Private (as opposed to public)	✓		✓	✓
Model Uncertainty and Behavioral Changes			✓	✓

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Measurement

- Official Statistical Offices
  - Federal Statistics
    - GDP, Labor Market Conditions (Unemployment), Inflation, Real Estate, etc.
  - Tremendous challenges
    - Response rates
    - Cost and Budgets
    - Political Manipulation
- Blending organic and designed data
  - Use the big data “good” properties of organic data
  - Use survey data to correct for the biases and the “missing” observations in the big data

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Online Inflation Rates

Billion Prices Project

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

- *Date*
- *Item*
- *Price*
- *Description*

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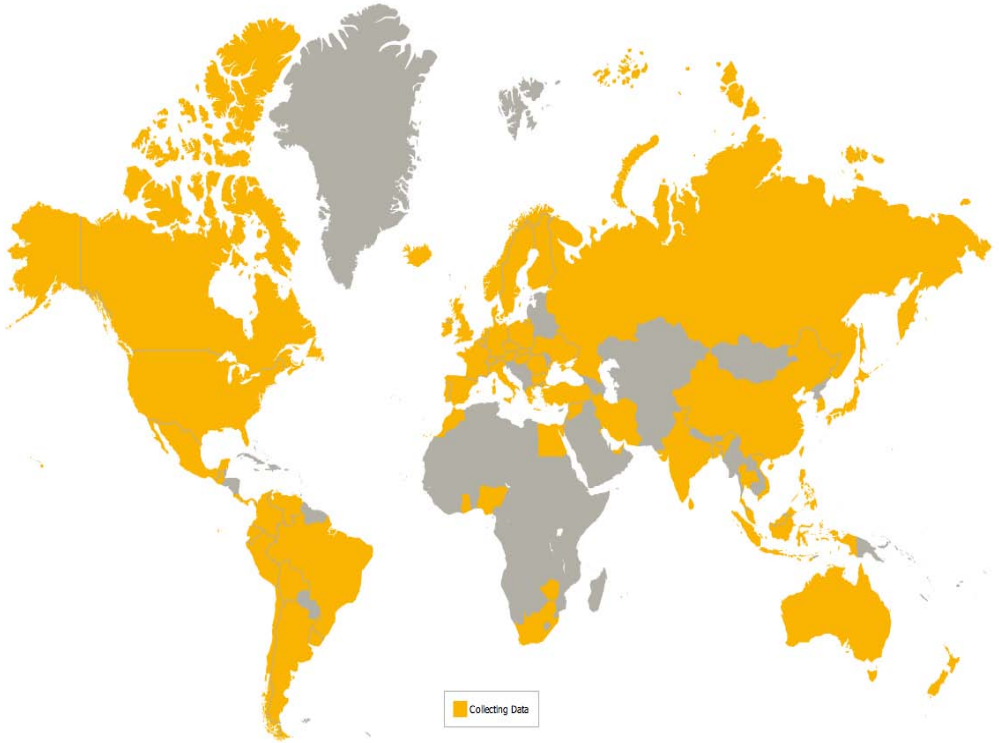
Countries covered



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USA

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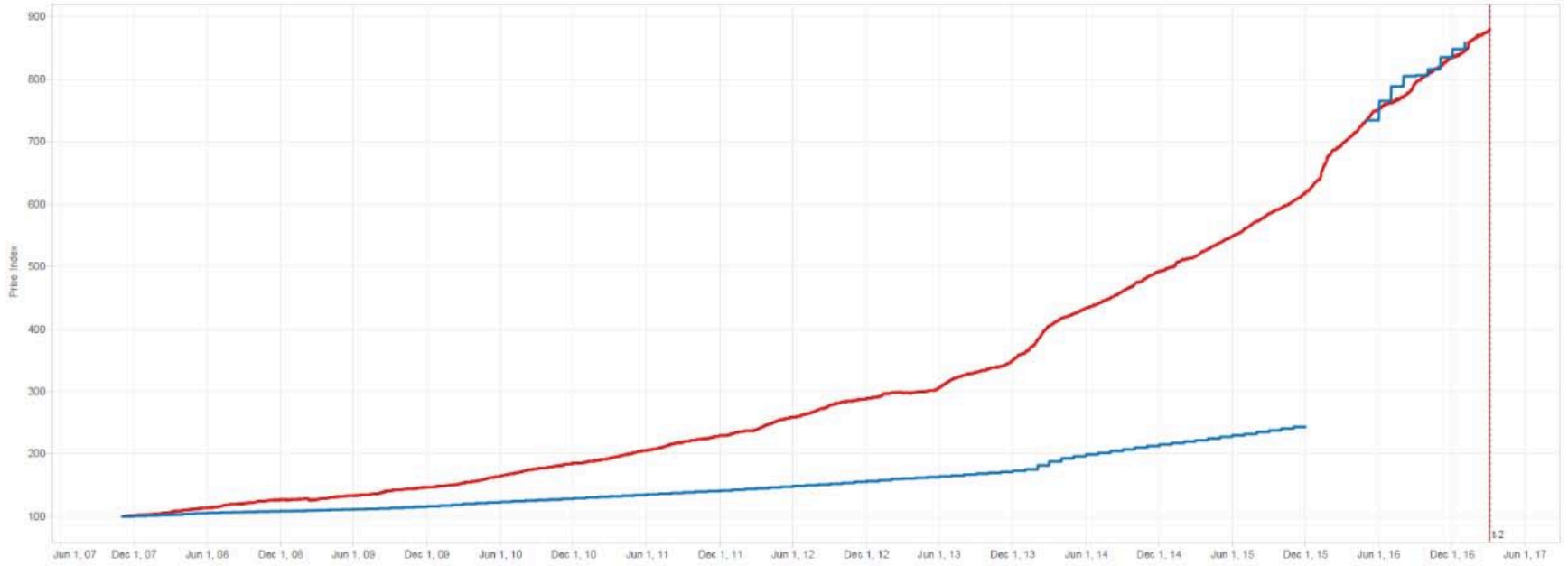
Argentina



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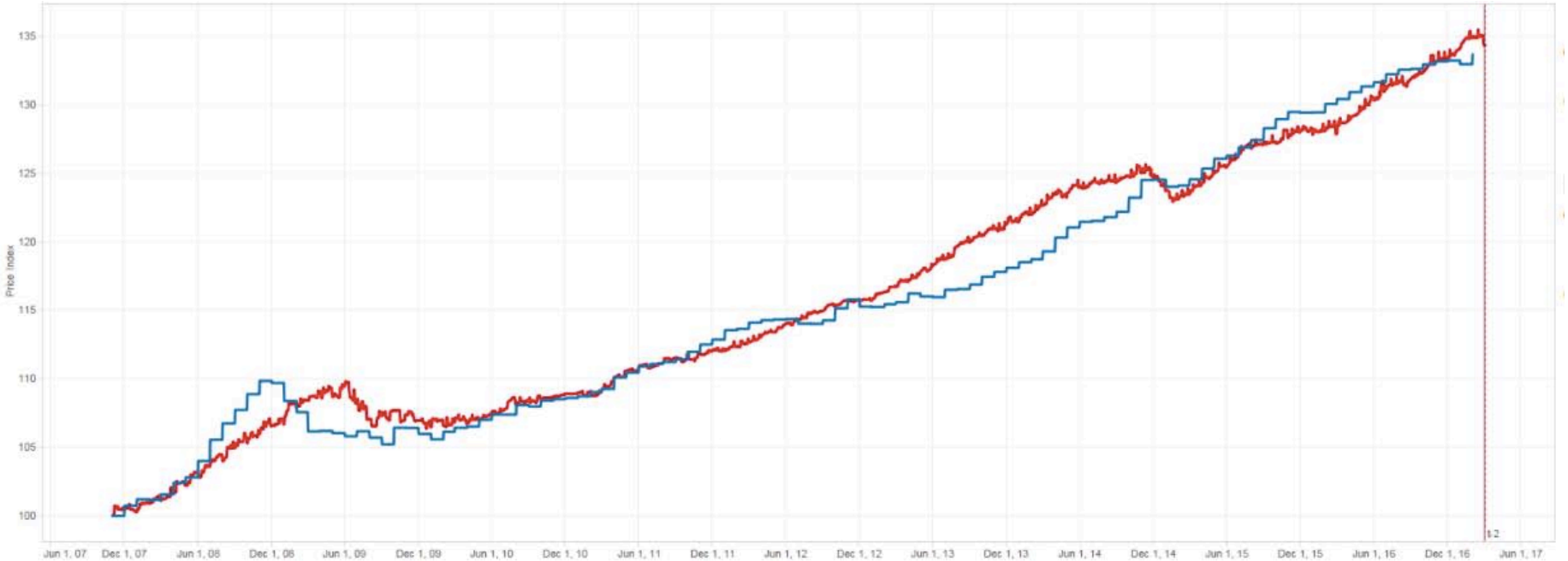
Chile



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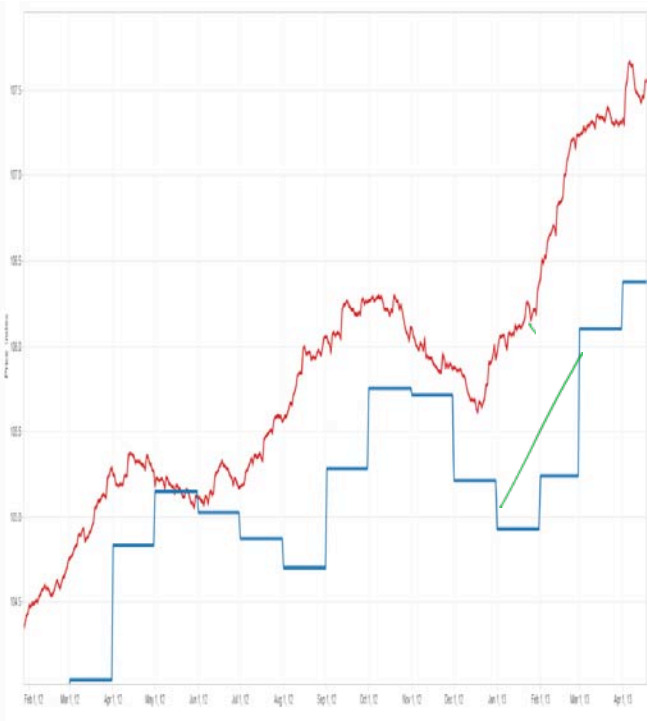
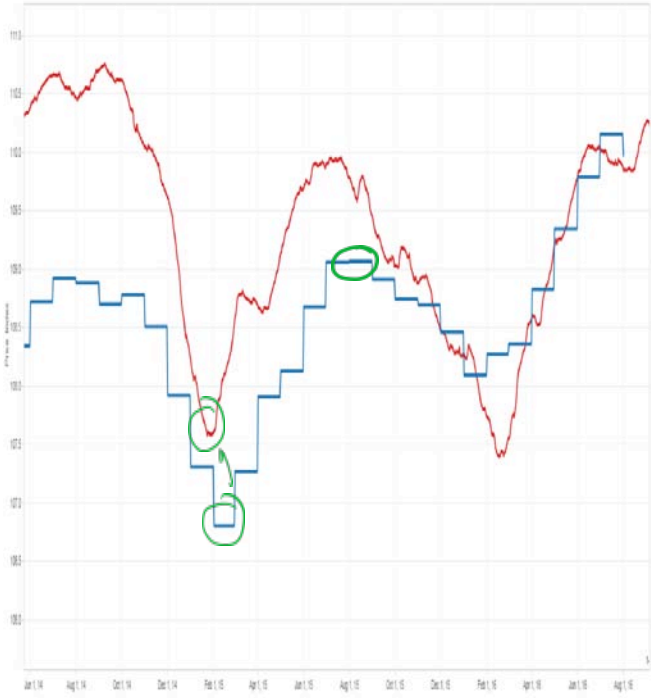
USA: Anticipation





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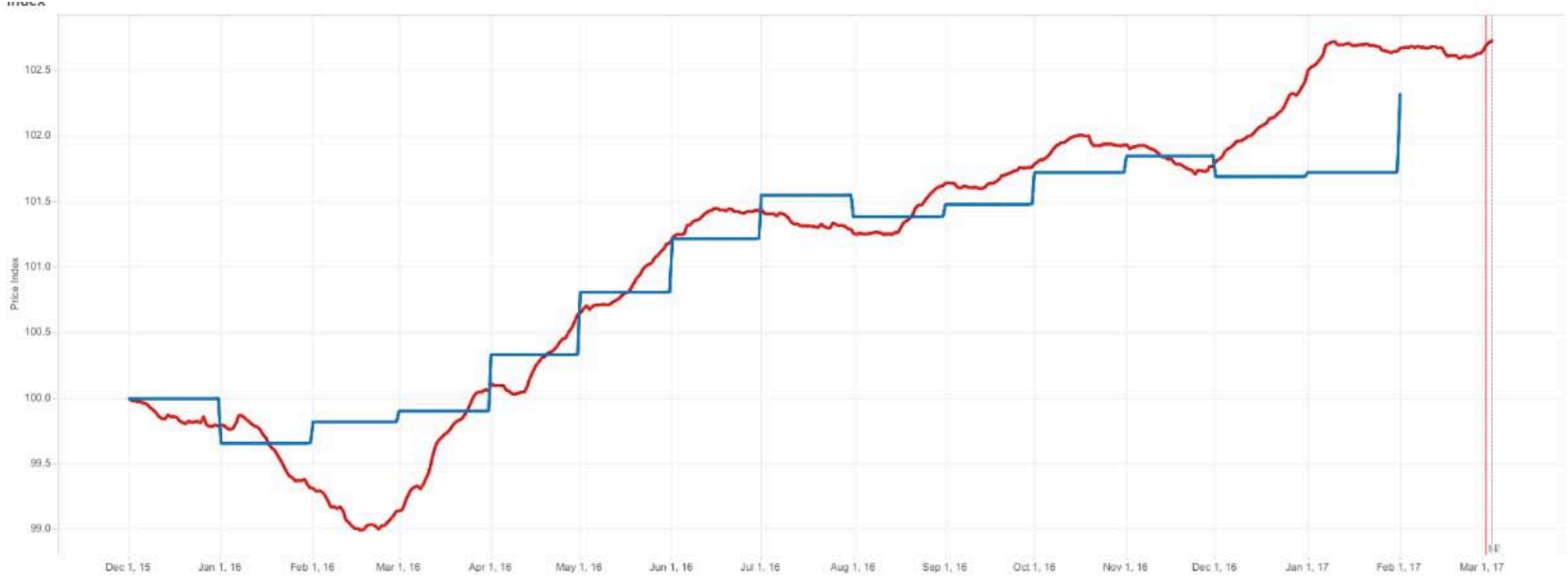
Just happened again!



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In Summary

- Big Data sources (organic data) represents a huge opportunity
  - Understand the weaknesses in the data
- Measurement
  - Statistical offices will not be substituted
  - Blending the data sources is the way to the future

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