SPACE FOR FINANCE

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Information and Financial Markets

- **Information plays a central role in financial markets:**
  - ✓ Asset prices = Discounted value of investors' **expectations (forecasts) of future cash-flows.**
  - ✓ ⇒ Forecasts of future cash-flows are important for identifying mispriced securities and portfolio decisions.
- **Forming forecasts require information ⇒Vibrant market for diverse and timely information in the financial industry**
  - ✓ **Sellers:** Data vendors (Bloomberg, Refinitiv etc.), Securities analysts, Alternative data providers, Trading platforms…
  - ✓ **Buyers:** Institutional investors, prop trading firms, professional forecasters (e.g., securities analysts)

Recent Trends

- **The market for financial information is experiencing important changes due to:**
  - ✓**Digitization ⇒ New sources** of financial information ("Alternative Data")
  - ✓**Progress in Computing Power ⇒New techniques to process vast amount of data** ("Artificial Intelligence")
- **Emergence of new data providers/information sellers challenging incumbents**

Alternative data

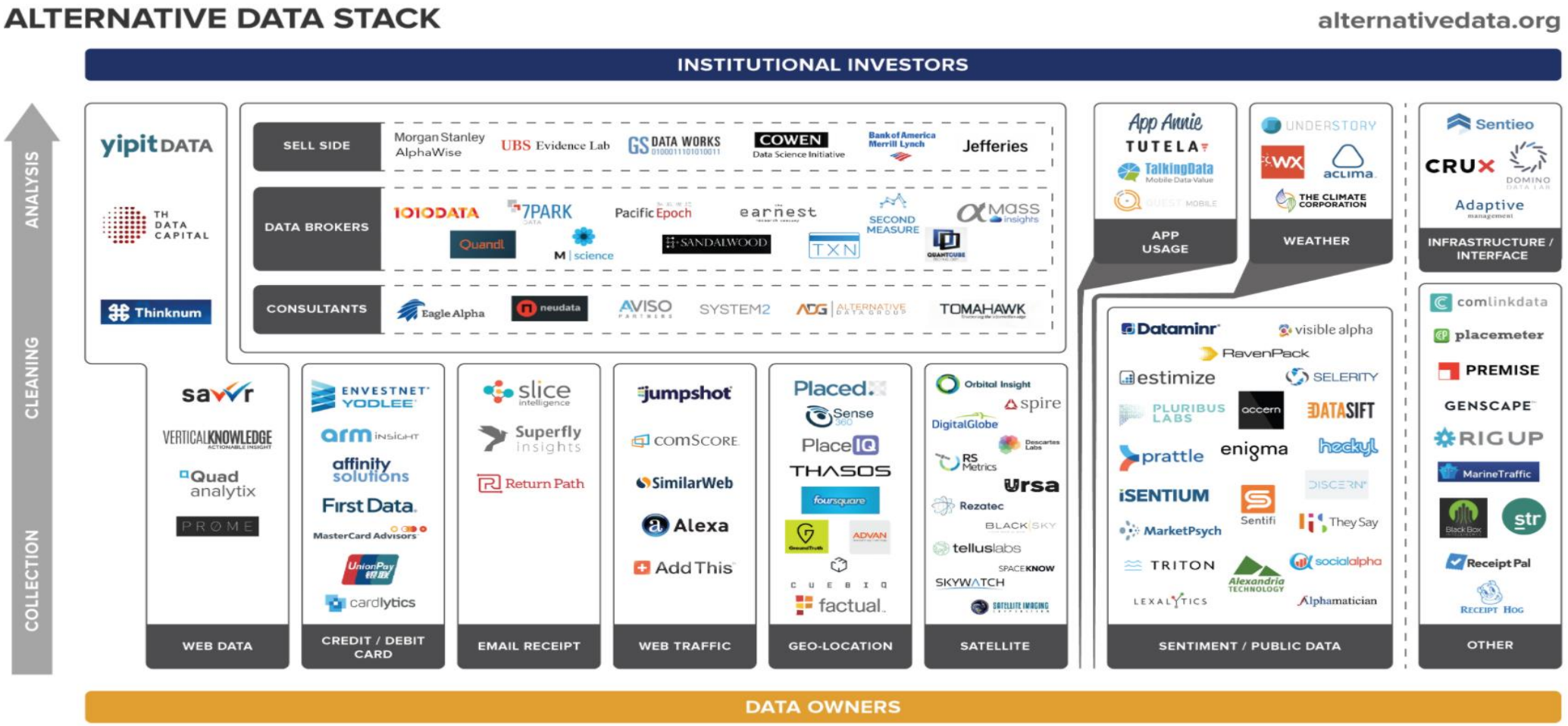
➢ Examples:

- ✓ Satellite Imagery (consumer traffic, inventory levels, plants levels data)
- ✓ **Social Media** (Tweeter, Facebook, StockTwits, Estimize, etc.). Consumer sentiment on products or stocks.
- ✓ **Point of Sale Data** (Merchant level transaction data, product level purchase data, pricing data etc.).
- ✓ **Web Traffic Data** (search, time spent on websites)
- ✓ **Geolocation data** (where people shop)
- ✓ **Webscrapped data** (job postings, employee satisfaction etc.)

Evidence that alternative data is used for forecasting future cash-flows

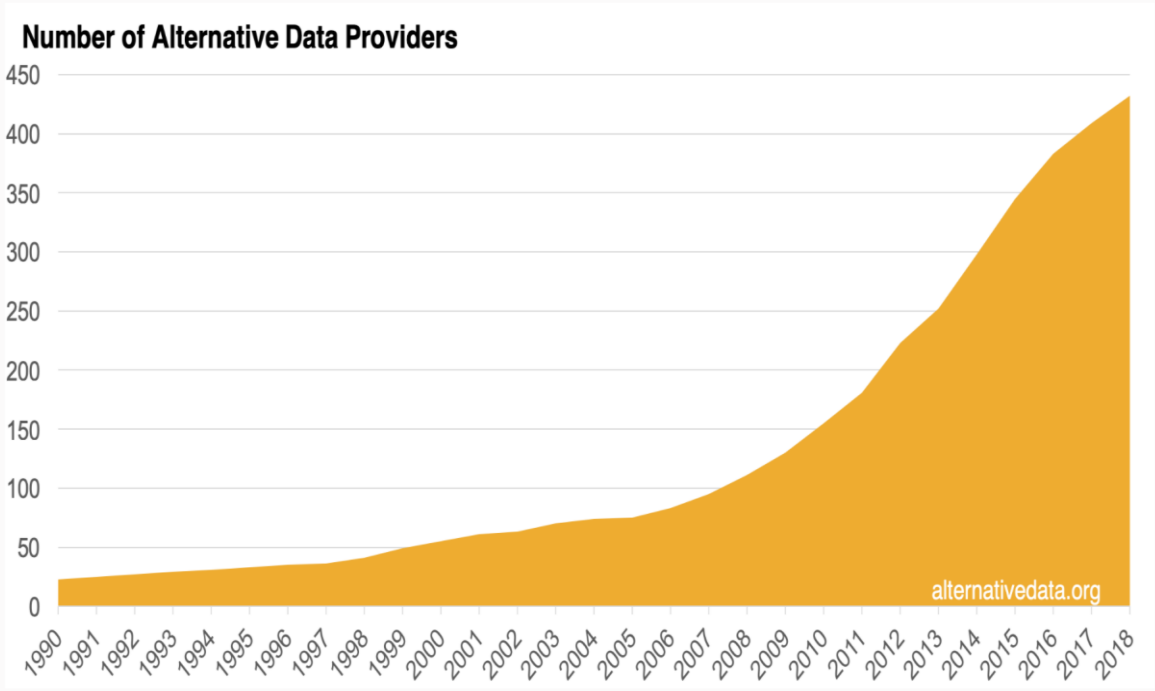
- ✓ Chi, Hwang, and Zheng (2021): An increasing percentage of securities analysts' reports refer to these data (especially sentiment and POS data).

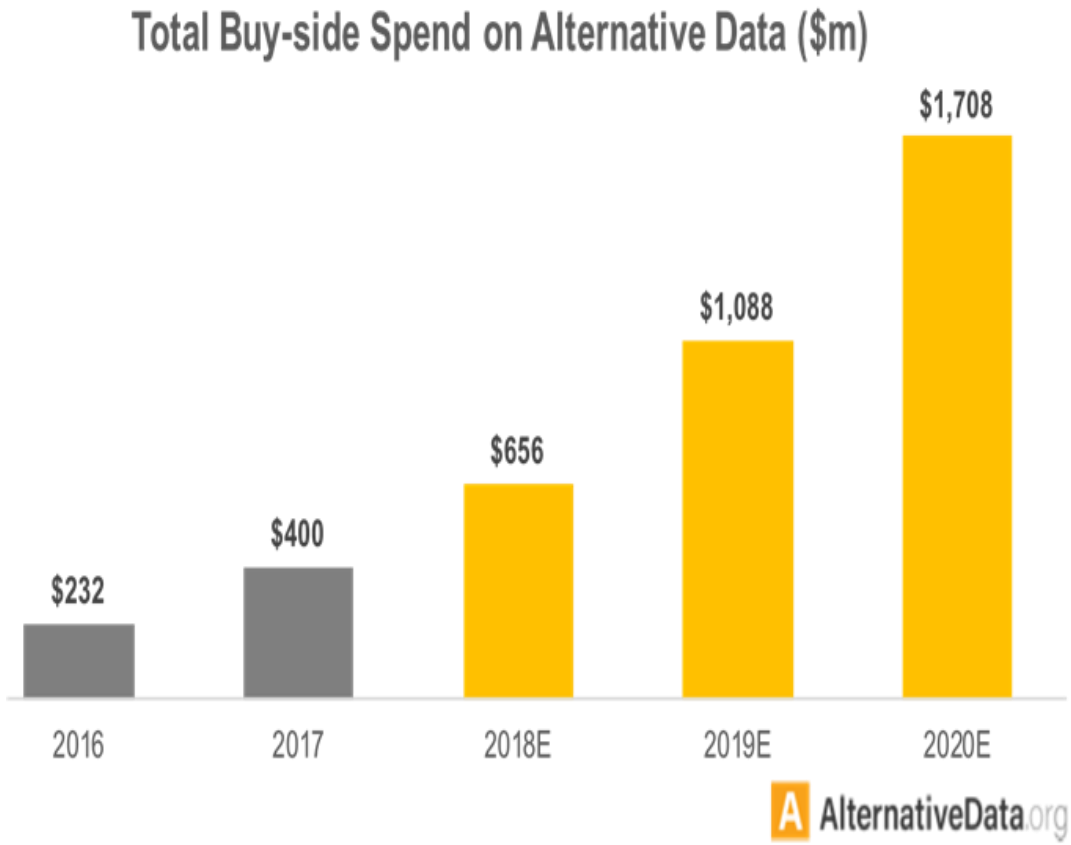
New Data Providers



New Data Providers

ALTERNATIVE DATA PROVIDERS:
445





Source: AlternativeData.org

OPEN ECONOMIC QUESTIONS

Is there information in alternative data?	Is this information valuable for buyers (institutional investors)?	Is this information valuable for all market participants?
• E.g. Can investors use satellite imagery to forecast future cash-flows? • Preliminary academic findings suggest this is the case (e.g., Katona et al. (2020))	• The answer is less clear. • Depends on the speed at which information in alternative data is reflected in prices. If too fast…not much value. • Trade-off for information sellers	• Not clear • Creates new sources of informational asymmetries • ⇒ Less liquid markets (see, Katona et al. (2020) for evidence)

Figure 2
Illustrative example of satellite imagery

This figure presents the parking lot satellite image of the Target store located at 4500 Macdonald Ave, Richmond CA 94805. The image was captured by RS Metrics on September 19, 2016 at 11:03am. The yellow line outlines the boundary of the parking lot associated with Target and the red dots indicate the occupied parking lot spaces. For this case, RS Metrics identifies 540 parking lot spaces with 146 of them filled.

Katona, Z., M. Painter, P. Patatoukas, and J. Zeng (2020). "On the capital market consequences of alternative data: Evidence from outer space". Working paper.

Alternative Data and Sustainable Finance

"Societies aim at balancing the negative impact of the pandemic and climate-change, directing financial resources into sustainable investments with limited negative external effects or even positive social and environmental outcomes. "

(ESA announcement of this conference)

Alternative Data and Sustainable Finance

- ✓ How to direct capital to sustainable investments, say investments that contribute to reduce environmental costs and risks for firms and societies?
- ✓ This requires asset prices to **reflect information** about the **physical costs** (damages due to climate hazards or disruption in supply chains) and **transition costs** (e.g., investment in new technologies to reduce environmental footprints, regulatory compliance costs) associated with climate change.

"If the capital market is to function smoothly in allocating resources, prices of securities must be good indicators of value" (G. Fama (1976))

- ✓ **Some corporate investments that aim at mitigating environmental risks are likely to payoff only in the long term.**
  - Incentives for firms to undertake these investments are greater if stock prices reflect their long-term gains.
  - Sharp adjustments in asset prices ("repricing") are more likely if investors' expectations only slowly reflect implications of climate changes risks.

Alternative Data and Sustainable Finance

Does information in alternative data (e.g., satellite imagery) make asset prices more informative about long term payoffs of corporate investments?

- At which horizon is alternative data informative?
- E.g., can satellite imagery help professional forecasters to improve forecasts of long run (> 3-5 years) effects of transition costs for firms?

Important question.

- If alternative data is only useful for short term forecasting, they are not likely to help here.
- Even worse, investments in alternative data may divert investment in information useful to form long-term forecasts…

Is satellite imagery useful for long horizon forecasting?

Alternative data and Forecasting Horizons

Foucault, Frésard and Dessaint (2020)

- Study empirically the effect of alternative data (social media) on the quality of earnings forecasts at various horizons (ranging from 1 to 5 years).
- Large sample of US public firms and analysts' forecasts
- Positive effect on the quality of short term forecasts
- But negative effect on the quality of long term forecasts.

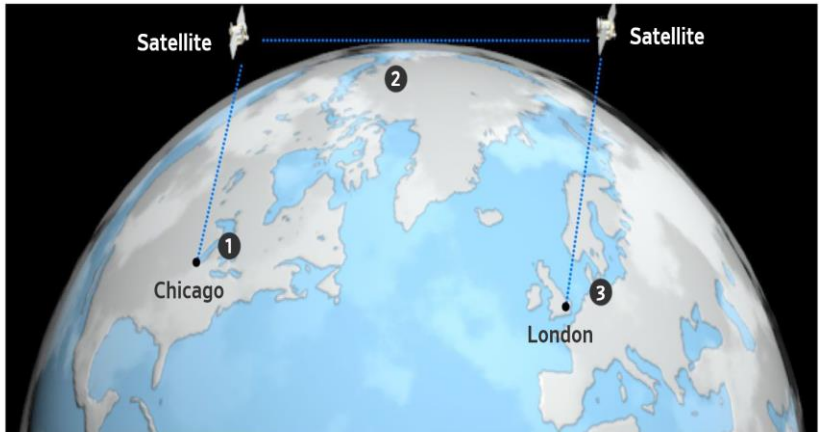
Raise questions about the effects of alternative data on the informativeness of stock prices at various horizons

- Academic research suggests a positive effect at short horizons (less than 1 year)
- But the jury is still out at longer horizon

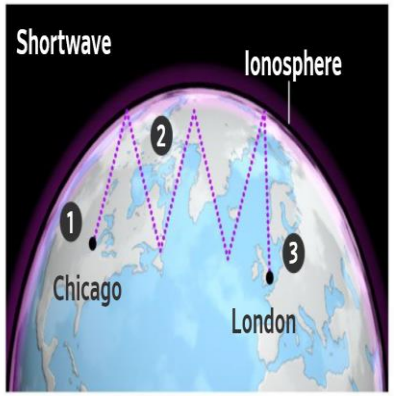
SPACE AND HIGH FREQUENCY TRADING

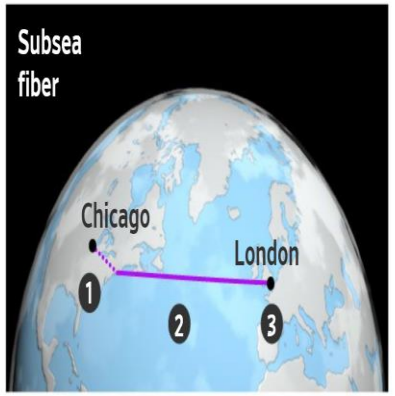
- Fast access to market data (trades and quotes) is important for some trading strategies.
  - ✓ Critical for **high frequency trading firms**
- Massive investments to reduce latencies in information transmission between financial centers (e.g., Chicago and New-York or London and New-York) using (i) **Fiber Optic Cables** or (ii) **Microwave Towers**.
  - ✓ **Ultra fast connections sold to high frequency trading firms**
- Recent discussions about using satellite transmissions (e.g., between the City and Wall Street); See "*High frequency traders eye satellites for ultimate speed boost*" (Wall Street Journal, April 1, 2021).

Potential technology



Current technology





SPACE AND HIGH FREQUENCY TRADING

- **Effects of high frequency traders on the quality of financial markets are much debated.**
  - ✓ Costs and benefits for other participants have been identified
  - ✓ E.g., evidence that high frequency traders can increase adverse selection costs and impair liquidity (see Shkilko and Sokolov (2020)).

- **In any case, the net benefit of investments in fast trading for society as a whole are questionable. There is a serious risk of overinvestment.**
  - ✓ Biais, Foucault, Moinas (2015)

CONCLUSION

- **Space and Finance:**
  - ✓Is satellite imagery/communication useful for forming forecasts about future asset cash-flows/returns and asset pricing?
    - Maybe. More academic research is needed on this.
  - ✓Is access to satellite imagery/communication good for the quality of financial markets (liquidity and price discovery)?
    - **Unclear: Risks** are that (i) it creates asymmetric information (bad for liquidity) and (ii) shift efforts in producing information from the long to the short horizons (bad for capital allocation to potentially useful projects with highly uncertain long term payoffs).

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