



**DISCUSSION OF:
THE VALUE OF INFORMATION IN
COMPETITIVE MARKETS: THE IMPACT
OF BIG DATA ON SMALL AND MEDIUM-
SIZED ENTERPRISES**

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BOUNDLESS

OVERVIEW

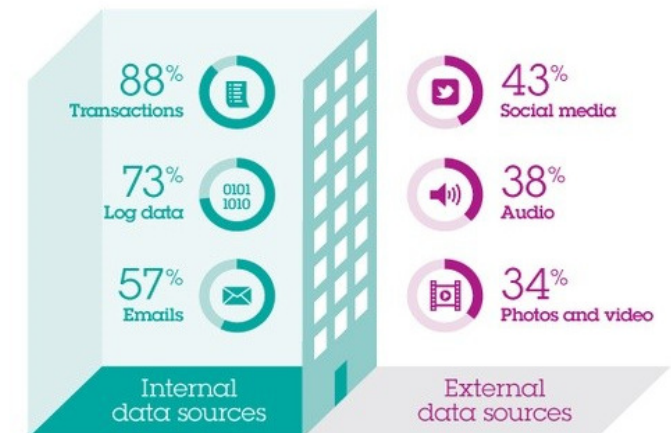
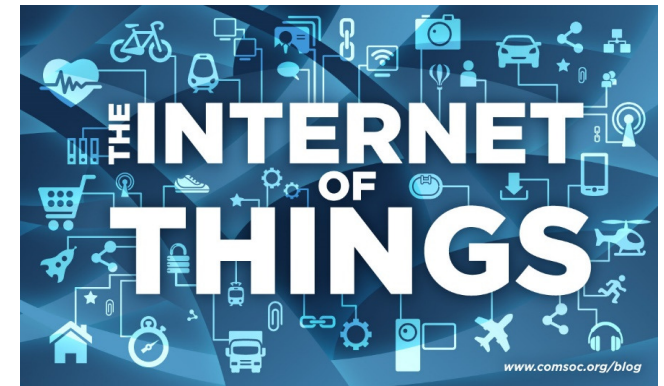
- **Question:** What is the value of “Big Data” for SMEs?
- **Large Representative Sample:** 310,000 firms with POS in Spain
- **Treatment:** large bank provides monthly reports free of charge on credit card transactions of:
 - Own firm’s clientele
 - Competitors’ clientele
- **Moderate Adoption:** 7,100 adopters
- **Big Impact:** Adoption increases revenue by 4-9% (IV and [LATE](#))
- **Mechanism:** New revenue sources + better resource allocation ([more here?](#))
- **Heterogeneity:** Smaller firms benefit the most
- **Surprises:** No variation by “sophistication” ([cool measure!](#)) or local competition ([noisy](#))

WHAT IS BIG DATA?

- A “data hairball” (Lisa Arthur, *Forbes*, 8/1/13)
- “Big data is new and ‘ginormous’ and scary – very, very scary” (Lisa Arthur, *Forbes*, 8/15/2013)
- Data so large it’s difficult to process using traditional database or software techniques (Wikipedia)
- “Volume, Variety & Velocity” (Doug Laney, Gartner)
- “The oil of the 21st Century...”

...and **analytics** is the combustion engine”

- Peter Sondergaard, Gartner



HOW IS DATA USED?

- Value of information associated with how it is used in “Data-Driven Decision Making” (Brynjolfsson, Hitt, and Kim 2011)
- Management and Organizational Practices Survey (MOPS) Brynjolfsson and McElheran (2016 & 2019) and Brynjolfsson, Jin, and McElheran (2020)
- **“Big Use of Small Data”**
 - High availability of data
 - High use of data in decision making
 - Predictive analytics
 - Organizational complements
 - Fit with business processes

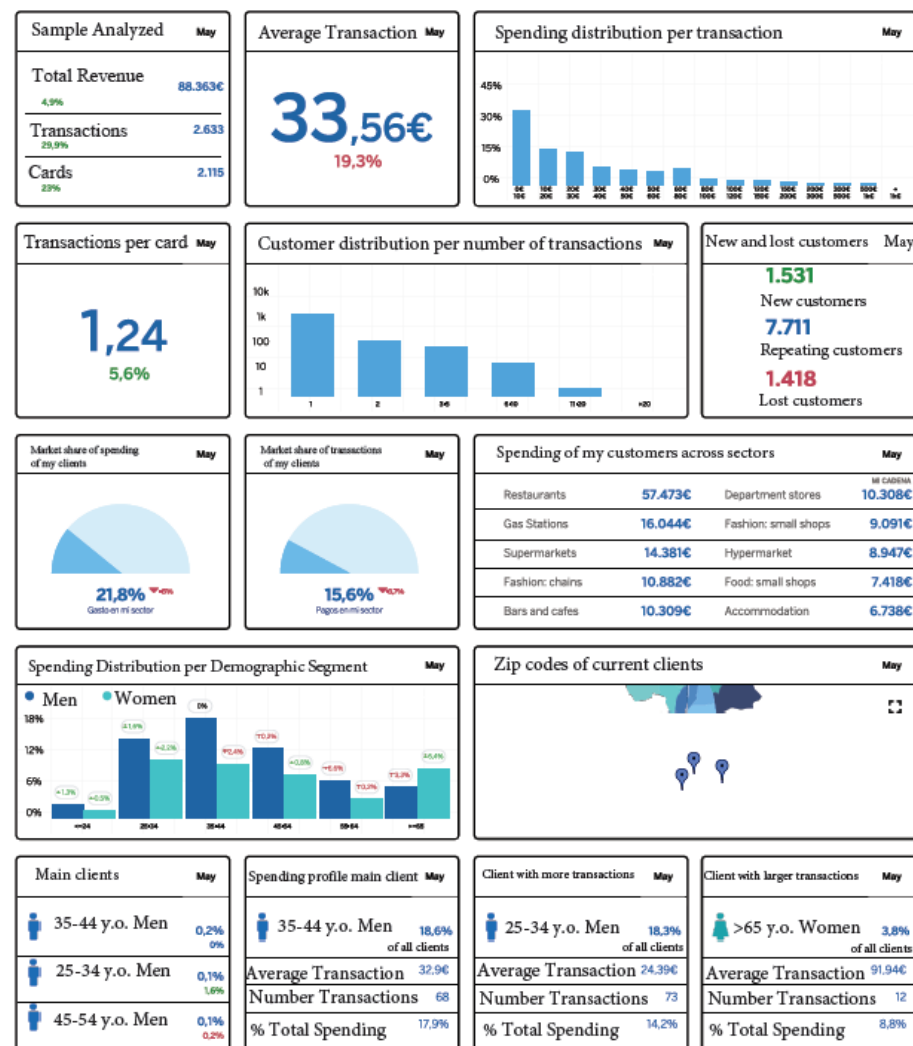
Vs

“SMALL USE OF BIG DATA”

- Scale of data unavailable to a single SME
- Free!
- Easy to absorb
- Outsourced Data Viz Capabilities

Vs

- Descriptive (not predictive) analytics
- “Rearview mirror”
- Not tailored to the firm
- Available to competitors



BIG QUESTION

“If this is so great, why isn’t everyone doing it?”

WHAT CAN DRIVE NON-ADOPTION HERE?

- **High costs**
 - High fixed costs + lack of scale economies
 - Adjustment costs (co-invention)
- **Low returns**
 - Poor value creation (e.g., bad fit)
 - Poor value capture (e.g., market structure prevents firm from reaping ROI)
 - Being too “late to the party”
- **Other barriers**
 - Awareness/inattention challenges
 - Low levels of complements
- **Other techniques**

IMPLICATIONS, PART 1

- Adopters will be firms where:
 - Free reports overcome **fixed costs** of adoption (**low EOS**)
 - Some is better than none (“**laggards**”)
 - Enthusiasm of local bank employees affects decision to adopt (**managerial inattention?**)
 - **Imitation** of competitors is desirable (**market positioning and “fit”**)

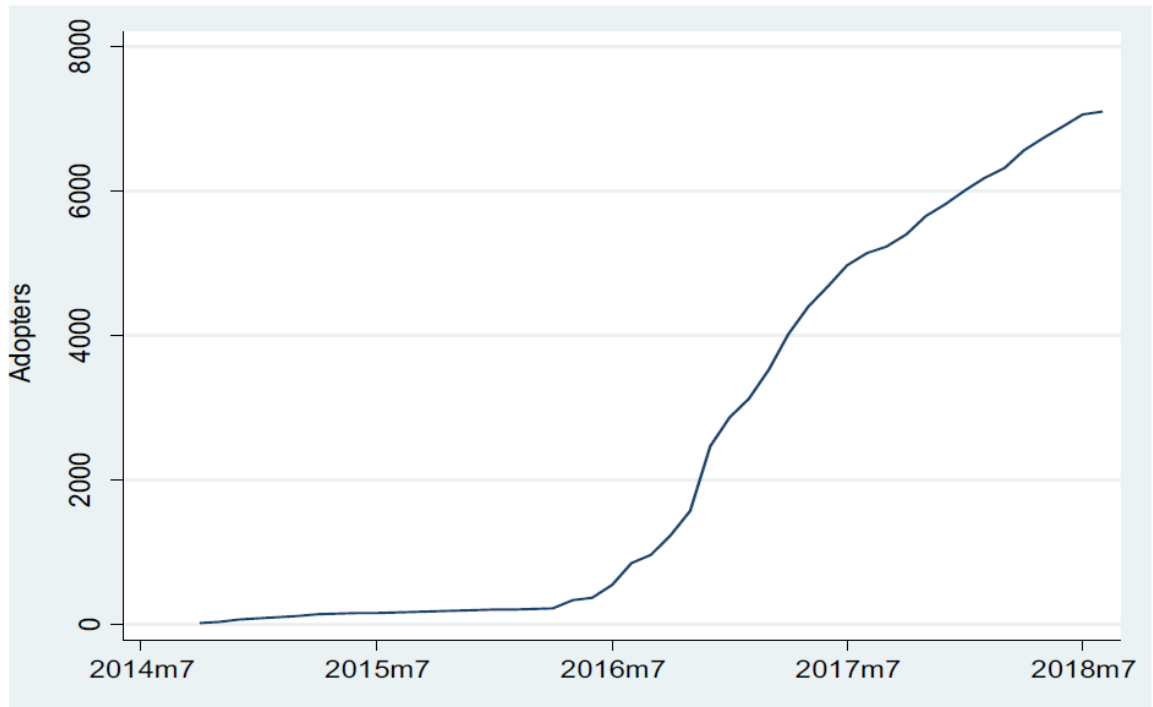
IMPLICATIONS, PART 2

- Non-adopters will be those that:
 - Are already great at this (**very competent**)
 - *No difference by “sophistication” → what were they doing before?*
 - Cannot even make use of this (**very incompetent**)
 - *So, the average might be similar, per Table 1, must mask key heterogeneity*
 - Pursue differentiation (**optimally non-adopting**)
 - *This will bias downward the differential returns*
 - *This will complicate the policy and managerial recommendations...*

SUGGESTIONS

- Look among those that eventually adopt
- Compare early vs late as in Athey and Stern (2000)
- Drop pilot?
- More on size heterogeneity of non-adopters?

Figure 1: Number of adopters over time

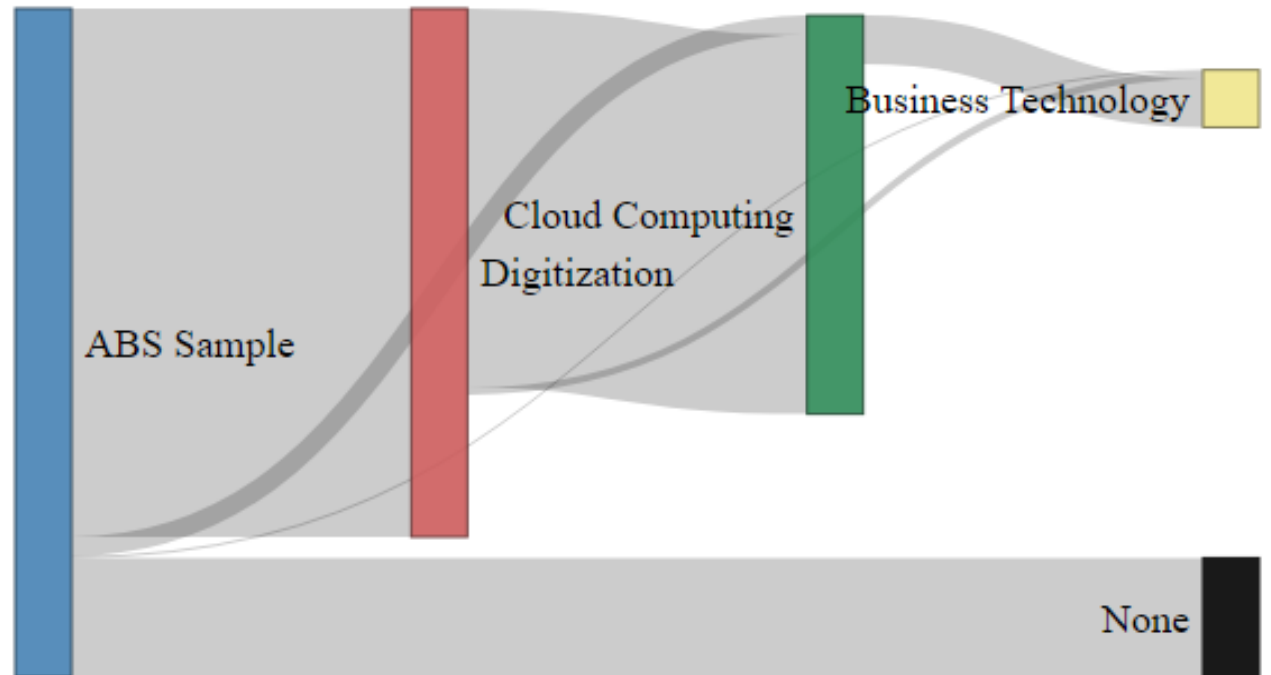


OUTCOMES & SHORT-TERM IMPLICATIONS

- Increased competence at the low end of the competence distribution
- Increased imitation and business stealing
- Increased resource allocation efficiency
- Increased sales to **underserved customer segments**
 - Underrepresented geographic areas
 - Underrepresented gender-age groups

LONG-TERM IMPLICATIONS?

What happens when firms access outsourced analytics capabilities without the building blocks?



CONTRIBUTION

- Under-studied part of firm size distribution
- Clean “before and after” in large data set
- Great “existence proof” of benefits to smaller firms
- Care taken with identification
- Important visibility to mechanisms
- Great inspiration for follow-on work!

THANK YOU!

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