

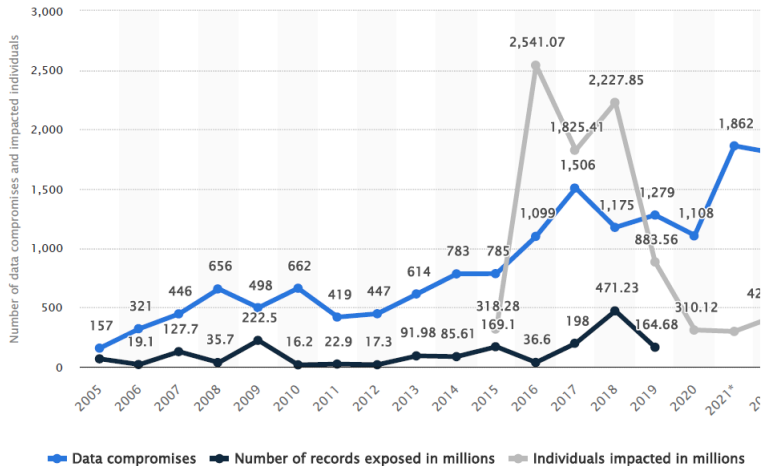
(Under) Investment in Cyber Skills and Data Protection Enforcement: Evidence from Activity Logs of the UK Information Commissioner's Office

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IIOC 2023

Data breaches are on the rise



Details: United States; Identity Theft Resource Center; 2005 to 2022; data compromises include data breaches, data exposures, and data leaks; individuals impacted may go beyond the United States

Main idea

- Cybercrimes create large social costs
- Firms may be able to prevent them by investing in cybersecurity
- Since firms do not bear the costs of cybercrimes, these costs can be viewed as an externality of under-investment in cybersecurity
- Question: Do stricter data protection laws and enforcement cause increased firm investment in cybersecurity?
- Nice! Important and timely

Approach

- DID design
 - “*Treatment*”: Some industries were targeted more heavily by regulators
 - Determined based on cutoff of constructed regulatory exposure index
 - Firm not necessarily targeted; just in targeted industry
 - *Time*: Two increases in regulatory strength in 2015 and 2018
 - *Not* relative to specific intervention
 - Outcome: Share of industry job postings that mention cybersecurity
- Identification
 - High exposure (“treated”) and low exposure (“untreated”) industries are comparable ex-ante (parallel trends)
 - There are no time-varying shocks that are contemporaneous to the regulatory changes (confounds)
- Large effect: high-exposure industries see positive divergence in hiring share after the policy change

Big picture: What is the effect of interest?

- Question answered: Do firms in industries that are heavily targeted by regulators increase cybersecurity hiring?
- Other questions important for policy:
 - How quickly do responses come relative to the timing of a specific intervention? And how long do they last?
 - How important are direct effects vs. spillovers?
 - Direct: Firm A is fined; firm A responds
 - Indirect: Firm A is fined; related firm B responds
 - How “similar” does firm B have to be to firm A to adjust its behavior?
- Could we speak to some of these effects by looking at responses to specific interventions?
 - $cyber_share_{ij,t+1} = \beta enforcement_{jt} + FE$
 - OR $cyber_share_{ij,t+1} = \beta enforcement_{-j,t} + FE$

Brexit and labor market definitions

- Brexit: are there any structural changes we should worry about?
 - Broad contraction of the labor market is controlled for by the share outcome variable
- Do these structural changes differentially impact industries or labor market segments?
 - Different mix of regulatory requirements as governance shifts from EU to UK?
 - Replacement of non-domestic workers?
- Understanding the relevant firms and labor market definitions
 - Do firms operate in multiple markets?
 - If yes, are postings for multi-market firms market-specific?

Minor: Exposure index construction and robustness

- Several degrees of freedom
 - Frequency or share of regulatory activity
 - Weighting of different types of intervention
 - Cut-off for “high” versus “low” is 75th percentile
 - Time period – currently includes regulatory action before and after the first policy change, but not after the second
- Are parallel trends sensitive to the definition?
- Should this index change over time? Period-specific or cumulative?
 - Should we think of treatment as staggered based on timing of regulatory interventions?

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