Social Media and Income

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Introduction

- More than 5.34 Billion people use social media by early 2025 (Meltwater and Social 2025)
- Average daily time spent on social media is around 2.5 hours (Meltwater and Social 2025)
- The effect of introducing Facebook at a college on mental health is around 22% of the effect of job loss (Braghieri, Levy, and Makarin 2022)

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- (quick) **Literature Review:**
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- **Contribution:** Comprehensive **causal effect** of **social media usage** on future **income** of students

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- **Contribution:** Comprehensive **causal effect** of **social media usage** on future **income** of students
- **Preview of Results:**
  - 4% $\downarrow$ wages 1 year after graduation for students that had access to Facebook
  - The negative effect tends to disappear after 10 years
  - Student majoring humanities most affected

Facebook Backstory & Stylized Facts

- Created in 2004 in Harvard.
- Expanded to different universities in a staggered fashion until September 2006.
- After September 2006 became publicly available
- As per September 2005, 85% of students had Facebook.
- As per early 2006, Facebook was 9th most visited website.

Data

Facebook Rollout Dates

- Replication files from Braghieri, Levy, and Makarin 2022 via Wayback Machine.

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Earnings (PSEO)

- Census Bureau PSEO dataset (2001–present).
- Earnings at 25th, 50th, 75th percentiles 1, 5, 10 years post-graduation.
- Data aggregated in 3-year cohort blocks.
- 111 merged universities from across U.S.

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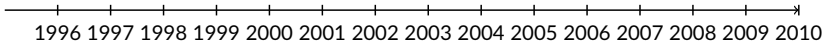
Exposure Measure

- Average exposure to Facebook during college in 3-year cohort block .

Timeline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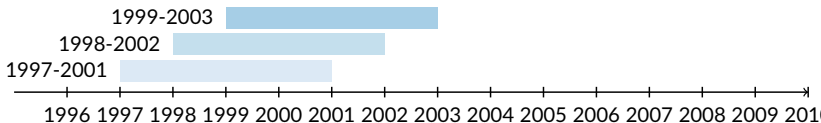
Timeline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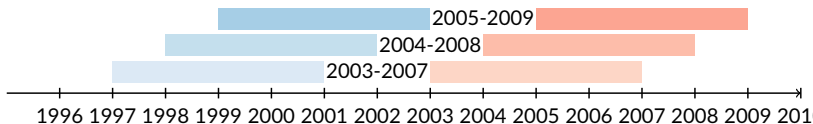
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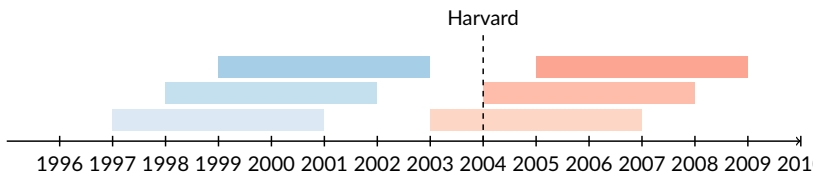
Harvard
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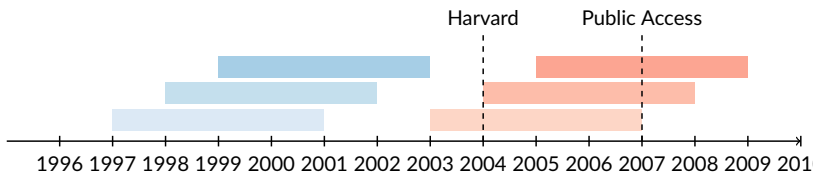
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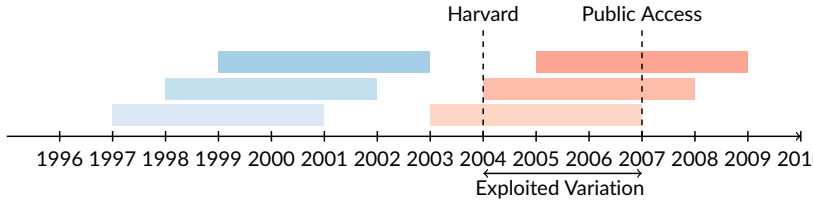
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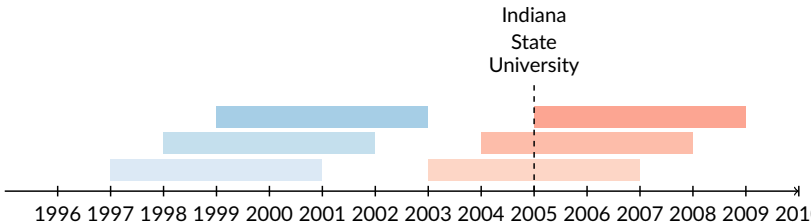
Exploited Variation

Timeline


Indiana
State
University
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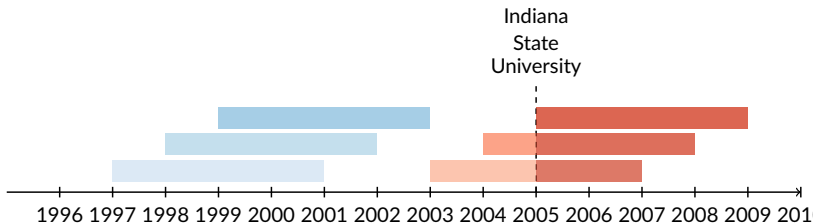
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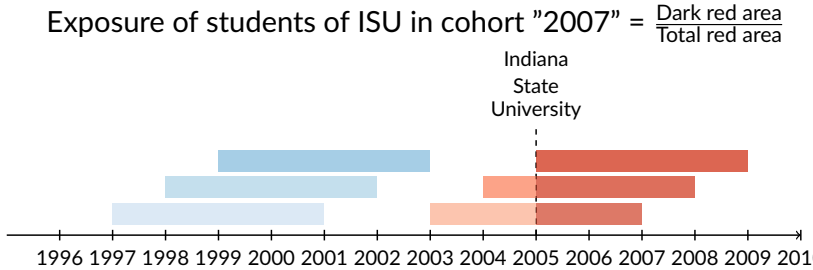
Exposure of students of ISU in cohort ”2007” = Dark red area / Total red area
Indiana State University
1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010

DiD Structure & Assumptions

	Pre-treatment	**”Post”-treatment**
Most exposed university	$Y_{\text{2001-03},1,m}$	$Y_{\text{2007-09},1,m}$
Second most exposed	$Y_{\text{2001-03},2,m}$	$Y_{\text{2007-09},2,m}$
	$\vdots$	$\vdots$
Least exposed university	$Y_{\text{2001-03},111,m}$	$Y_{\text{2007-09},111,m}$

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	⋮	⋮
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Constant Selectivity
Into Major-Uni

DiD Structure & Assumptions

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Least exposed university	$Y_{\text{2001-03},111,m}$	$Y_{\text{2007-09},111,m}$	$Y_{\text{2007-09},111,m}(0) - Y_{\text{2001-03},111,m}$

PTA

Baseline Model

$$\log(\text{earnings})_{c,i,m} = \beta\, \text{exposure}_{c,i} + \delta_c + \xi_i \times \gamma_m + \epsilon_{c,i,m}.$$

- Cohorts 2001–03 (*pre*) vs. 2007–09 (*"post"*).
- Clustering at (major × institution) level.

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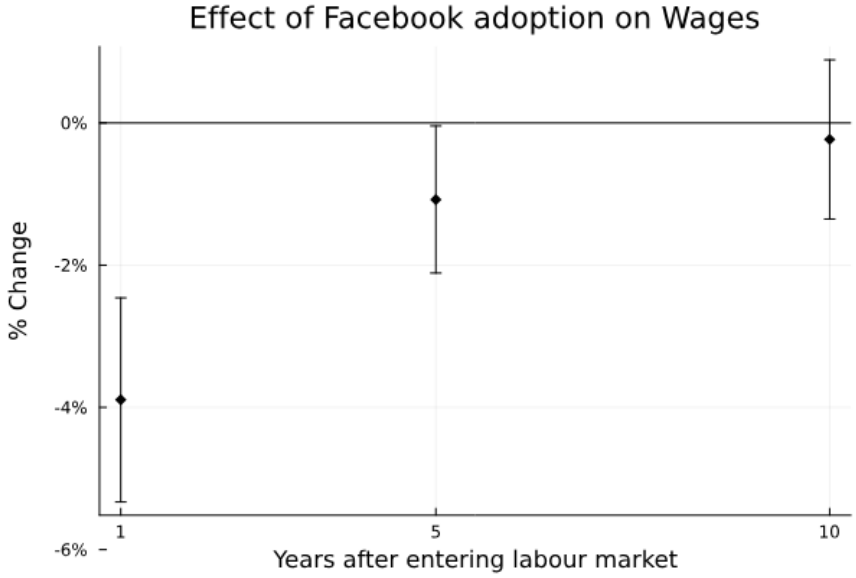
Identification Assumptions:

- Constant Selectivity into institutions and majors
- Parallel trends: stable relative wage gaps absent treatment among same major in different institutions.

Results



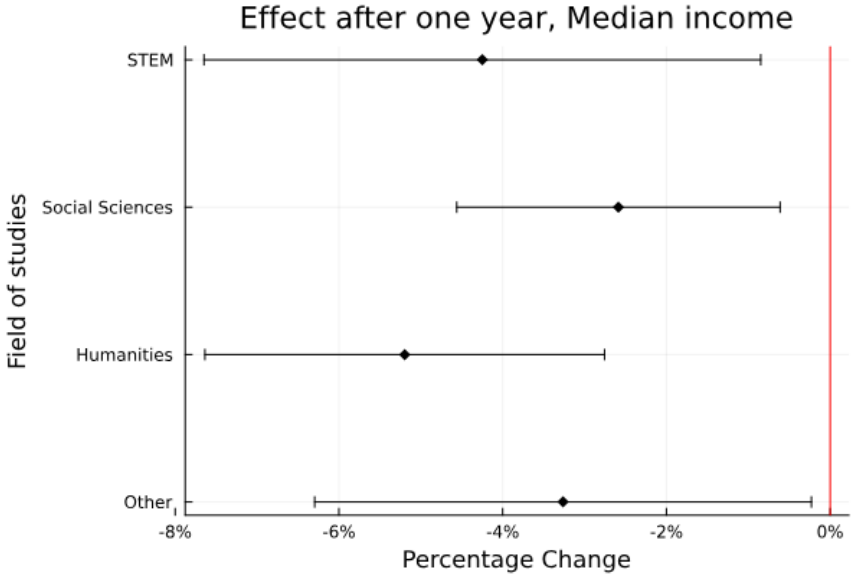
With 2004-2006

Heterogeneity

$$log(earnings)_{c,i,m} = \beta_1(exposure_{c,i} \times Field_{c,i,m}) + \beta_2 exposure_{c,i} + \beta_3(Field_{c,i,m} \times \delta_c)$$

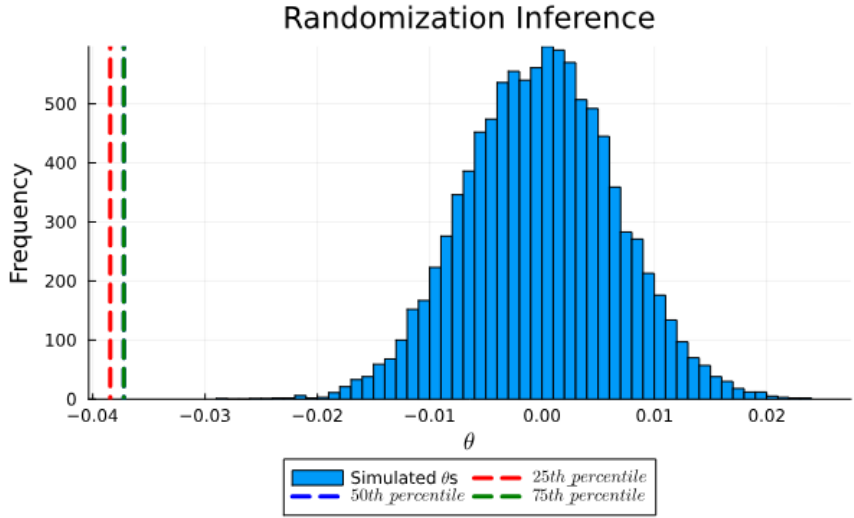
$$+\delta_c + \xi_i \times \gamma_m + \epsilon_{c,i,m}$$

Heterogeneity



Placebo Tests

- Falsely assign treatment to 2004–06, 2013–15, etc. cohorts.
- Randomization inference:



Caveats & Avenue for Future Work

Limitations

- relatively small number of matched institutions (111)
- three-cohorts aggregation, prevents us from:
  - Control for the 2008 crisis properly
  - Measure exposure precisely (graduants in 2009 are treated as if they started studies in 2004)

Caveats & Avenue for Future Work

Avenue for Future Work

- Find better data/ask for data at the cohort level (not aggregated) to solve the above two issues
- Expand the analysis to Unemployment (PSEOE dataset)
- Add “clean” 2004-2006 controls
- Make PTA more credible:
  - Perform IPW (regressors = ranking, number of students)
  - Drop treated universities from 2004-2006 sample and check trends with 2001-2003 graduates
  - Exploit information state of residence and occupation (PSEOF dataset)

Conclusion

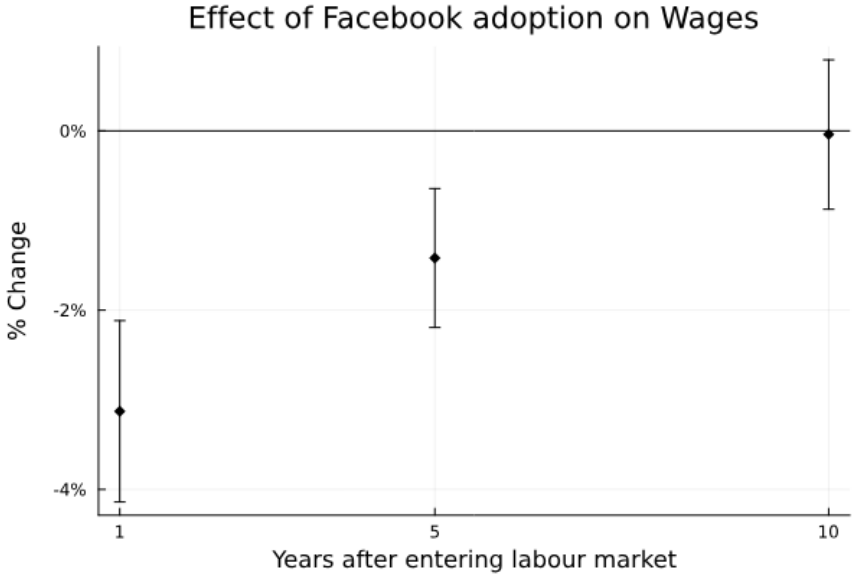
- **RQ:** Does usage of Facebook during college affect later earnings?
- **Identification Strategy**: Staggered rollout of Facebook across U.S. colleges to estimate its causal impact on wages.
- **Negative wage Effects**: The introduction of Facebook implies negative effect on wages.
- **Dynamics**: The effect tend to disappear after 10 years.
- **Heterogeneity**: Most affected group is the one studying Humanities.

Thank You!

- Armona, Luis (2023). “Online Social Network Effects in Labor Markets: Evidence from Facebook’s Entry to College Campuses”. In: *Review of Economics and Statistics*, pp. 1–47.
- Braghieri, Luca, Ro’ee Levy, and Alexey Makarin (2022). “Social media and mental health”. In: *American Economic Review* 112.11, pp. 3660–3693.
- Meltwater and We Are Social (2025). *Digital 2025: AI accelerates, YouTube tops user charts, social ad spend soars and more*. Accessed: 2025-04-29. URL: https://www.meltwater.com/en/about/press-releases/digital-2025-ai-accelerates-youtube-tops-user-charts-social-ad-spend-soars-and-more.

Appendix!

Results including 2004-2006 cohorts as controls



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