

# MAKE YOUR OWN LUCK: THE WAGE GAINS FROM STARTING COLLEGE IN A BAD ECONOMY

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## Context

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# THE LONG-LASTING IMPACT OF BUSINESS CYCLES

- Earnings losses due to job displacement (Davis and von Wachter, 2011)
- “Scarring effects” (Aslund and Rooth, 2007; Kahn, 2010; Oreopoulos et al, 2012; Altonji et al, 2016; Schwandt and von Wachter, 2019)
- Risk aversion, inflation expectations, preferences (Malmendier and Nagel, 2011, 2016; Giuliano and Spilimbergo, 2014; Cotofan et al, 2021)
- Human capital investment (Betts and McFarland, 1995; Dellas and Sakellaris, 2003; Barr and Turner, 2015; Sievertsen, 2016; Atkin, 2016; Charles et al, 2018; Blom et al, 2020)

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How?

- Use individual-level data for graduates from 39 enrolment cohorts;
- Exploit within-cohort state variation in economic conditions at the time of enrolment.

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- Graduates who enrolled during periods of higher unemployment have higher annual labour earnings;
- Increase in hourly wages for both men and women;
- Women also increase labor market attachment (prob working and hours)
- Changes in field of study composition (Blom et al., 2020) account only for about 10% of the earnings gains;
- Consistent with behavioural adjustment (increased effort/preference for work) for individuals enrolling during downturns.

## Data and Empirical Strategy

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## American Community Survey (IPUMS):

- Annual data, 2009–2019
- Restrict to college graduates born in the U.S.

## Economic conditions:

- State-level unemployment rates from the Bureau of Labor Statistics
- Available for 1976 onwards

⇒ Restrict to cohorts enrolling 1976–2014

# WHICH ECONOMIC CONDITIONS?

## Match based on:

- Year in which they turned 18 (Schwandt and von Wachter, 2019; Blom et al, 2020)
- State of birth (Schwandt and von Wachter, 2019)

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- Solution: exploit only within-cohort variation in economic conditions across geographical regions (states) (similar to Oreopoulos et al., 2012).



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$$w_{it} = \alpha + \beta U_{sc} + \chi_{ct} + \theta_s + \gamma x_{it} + \epsilon_{it}$$

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- $\chi_{ct}$ : fully interacted cohort-year fixed effects
- $\theta_s$ : state of birth fixed effects
- $x_{it}$ : additional controls (race/ethnicity; indicator for individuals with MA/PhD)



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- Given that  $time = cohort + age$ , replacing cohort-time FE with cohort-age FE generates numerically identical results
- Note that data on  $w_{it}$  is for 2009–2019, but identification uses variation in enrollment conditions (at state level) between 1976–2014

## Main Results

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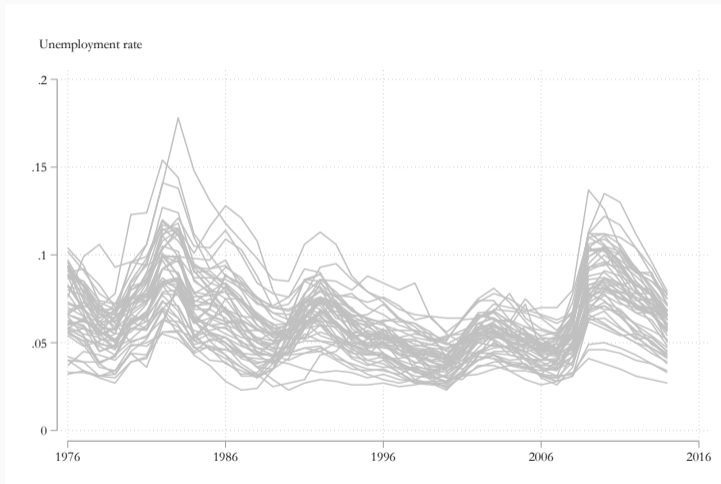
# WAGES INCREASE WITH UNEMPLOYMENT AT CHOICE

	<i>Women</i>				
	(1)	(2)	(3)	(4)	(5)
U at enrol, nat'l	0.679** (0.292)	-0.029 (0.210)			
U at enrol, state			0.384*** (0.107)	0.385*** (0.109)	0.385*** (0.109)
Obs.	1,924,219	1,924,219	1,924,219	1,924,219	1,924,219
$R^2$	0.098	0.119	0.098	0.120	0.120
Nr. of Clusters	39	39	1,989	1,989	1,989
State FE	✓	✓	✓	✓	✓
Year FE	✓		✓		
Age FE		✓		✓	
Cohort Trend	✓	✓			
Cohort FE			✓	✓	
Cohort-Year FE					✓

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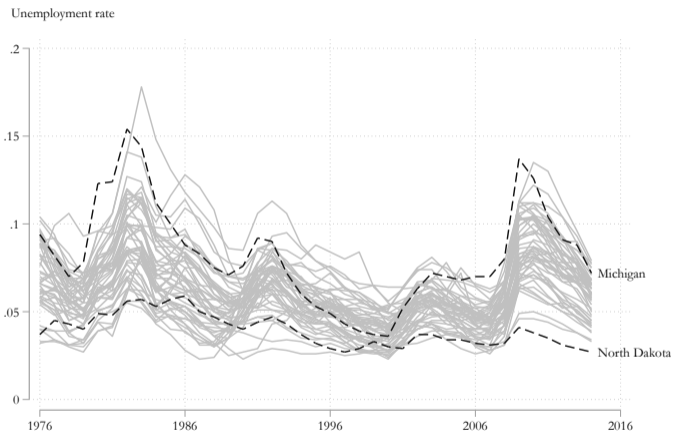
	<i>Men</i>				
	(1)	(2)	(3)	(4)	(5)
U at enrol, nat'l	0.729** (0.282)	0.178 (0.111)			
U at enrol, state			0.189* (0.110)	0.214** (0.107)	0.218** (0.107)
Obs.	1,670,797	1,670,797	1,670,797	1,670,797	1,670,797
R <sup>2</sup>	0.191	0.219	0.191	0.219	0.219
Nr. of Clusters	39	39	1,989	1,989	1,989
State FE	✓	✓	✓	✓	✓
Year FE	✓		✓		
Age FE		✓		✓	
Cohort Trend	✓	✓			
Cohort FE			✓	✓	
Cohort-Year FE					✓

# IMPLIED WAGE GAINS $\sim$ 3,000\$ PER YEAR

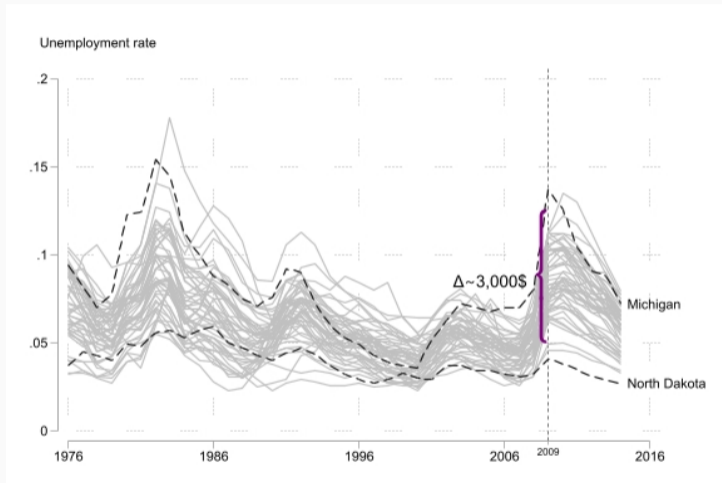




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# MEN AND WOMEN INCREASE W/PH WOMEN ALSO INCREASE WORKING TIME

	Prob. Any Income (1)	<i>Men</i> <i>Conditional on Working</i>			
		Annual Income (2)	Weeks (3)	Hours (4)	Hourly Wage (5)
U at enrol, state	0.045 (0.029)	0.218** (0.107)	0.017 (0.032)	0.026 (0.033)	0.175** (0.081)
Obs.	1,835,246	1,670,797	1,670,797	1,670,797	1,670,797
R <sup>2</sup>	0.015	0.219	0.066	0.054	0.186
Nr. of Clusters	1,989	1,989	1,989	1,989	1,989
State & Cohort-Year FE	✓	✓	✓	✓	✓

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	Prob. Any Income (1)	<i>Women</i> <i>Conditional on Working</i>			
		Annual Income (2)	Weeks (3)	Hours (4)	Hourly Wage (5)
U at enrol, state	0.131*** (0.034)	0.385*** (0.109)	0.121*** (0.038)	0.101** (0.050)	0.163** (0.075)
Obs.	2,269,728	1,924,219	1,924,219	1,924,219	1,924,219
R <sup>2</sup>	0.026	0.120	0.030	0.022	0.138
Nr. of Clusters	1,989	1,989	1,989	1,989	1,989
State & Cohort-Year FE	✓	✓	✓	✓	✓

How can this be?

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## POSSIBLE CHANNELS

1. Selection on pre-enrolment ability
2. Business cycle conditions at time of graduation
3. Changes in field of study

# 1. SELECTION ON PRE-ENROLLMENT ABILITY?

- Enrollment in post-secondary education tends to expand during downturns
  - In our data: the proportion of college graduates in a cohort-state cell is increasing in the unemployment rate when the cohort turned 18 (after controlling for cohort and state fixed effects)
  - Standard notions of selection would suggest that this would be associated with enrollment of lower ability marginal students
    - In Bickakova et al.,(2021): evidence that graduates who enrolled during downturns in the UK have slightly worse pre-university academic achievements
- ⇒ Unlikely that the pool of graduates is more positively selected at entry

## 2. ECONOMIC CONDITIONS AT GRADUATION? 3. MAJOR CHOICE?

	<i>Women</i>			
	(1)	(2)	(3)	(4)
U at enrol, state	0.385*** (0.109)		0.318*** (0.113)	0.350*** (0.113)
U at grad, state		-0.289*** (0.103)	-0.285*** (0.099)	
Obs.	1,924,219	1,924,219	1,924,219	1,924,219
R <sup>2</sup>	0.120	0.128	0.129	0.144
Nr. of Clusters	1,989	1,989	1,989	1,989
Birth State FE	✓		✓	✓
State of Resid FE		✓	✓	
Cohort-Year FE	✓	✓	✓	✓
Major FE				✓



## 2. ECONOMIC CONDITIONS AT GRADUATION? 3. MAJOR CHOICE?

	<i>Men</i>			
	(1)	(2)	(3)	(4)
U at enrol, state	0.218** (0.107)		0.173 (0.113)	0.199* (0.102)
U at grad, state		-0.507*** (0.112)	-0.488*** (0.105)	
Obs.	1,670,797	1,670,797	1,670,797	1,670,797
$R^2$	0.219	0.227	0.228	0.253
Nr. of Clusters	1,989	1,989	1,989	1,989

## Behavioural changes

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## DISCUSSION: BEHAVIORAL CHANGE?

- Cohorts that enrol in bad times have higher average earnings, even though:
  - **more students enrol** (including potentially lower ability marginal students),
  - and **resources per student decline** (Kane et al, 2005; Barr and Turner, 2013)
- Consistent with behavioural changes that lead to increased effort
  - Students choose more challenging fields
  - Higher earnings conditional on field of study choice (more human capital accumulation during/after university)
  - More labour market attachment for women

# BEHAVIOURAL CHANGES: POTENTIAL REASONS

- **Changing attitudes/preferences**
  - Impressionable years hypothesis (Krosnick and Alwan, 1987)
  - Cotofan et al (2021): “Recessions create cohorts of workers who give higher priority to income, whereas booms make cohorts care more about job meaning, for the rest of their lives.”
- **Increased competition**
  - Higher enrolment may incentivize students to work harder (Morin, 2015; Roth, 2017)
- **Time reallocation**
  - Lower employment probabilities during bad times

# CONCLUSIONS

- Individuals who enrol in university during periods of higher unemployment have higher wages ex-post
- This is due to higher hourly wages for both men and women, as well as higher labor market attachment for women
- Not explained by economic conditions at graduation
  - ⇒ Conditions at enrolment and at graduation both matter
- Only about 10% accounted for by changes in major choice
- Consistent with behavioural adjustment (increased effort/preference for work) for individuals experiencing downturns during early adulthood