Labor Market Consequences of Public Sector Salary Surge

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Increase in Public Sector Salaries

- Higher salaries play a key role in attracting high-quality employees and delivering services effectively (Finan et al., 2017).
- Countries sometimes implement large increases in public-sector salaries (e.g., Govt. of India 2008, 2015).
- Might result in some unintended consequences.
  - Job security, power, and prestige associated with government jobs create fierce competition for government jobs.
    - Acceptance rate in some countries: $<$0.1% in India (2020), 0.45% in Bangladesh (2019), 1.6% in China (2020), 2.4% in South Korea (2017), 3% in Pakistan (2015), 5.3% in Indonesia (2016).
  - Job seekers often take full-time preparation and sit multiple times for these exams.

NYTIMES.COM

Tens of Thousands of Students Protest Job Quotas in Bangladesh's Streets

Research Questions

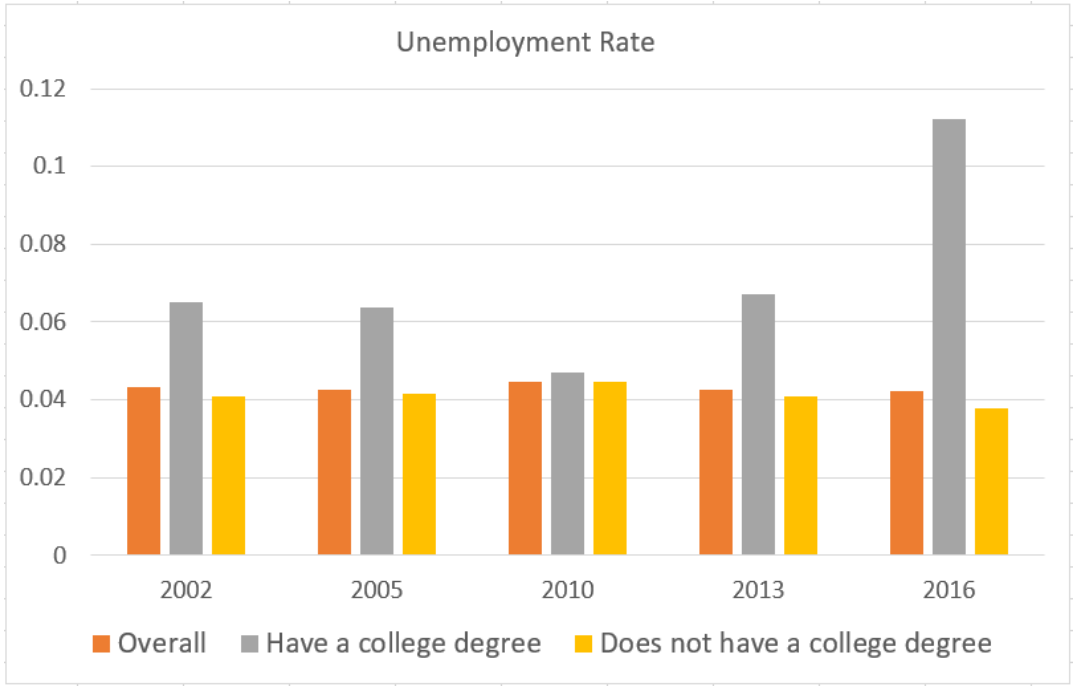
- How does an increase in public sector salaries affect the labor market outcomes in the short-run?
- Does the effect persist in the long run?
- What are the other socio-economic consequences?

Contributions

- Contributes to the literature on the impact of salary increase
  - Earlier works focused on exploring whether higher salaries attract a higher quality candidate pool (Dal Bo, 2013; Ashraf, 2015) or how it affects worker performance or productivity (De Ree et al., 2018; Khan, Khwaja, and Olken, 2014; Baicker and Jacobson, 2007; Muralidharan and Sundararaman, 2011).
  - Our paper explores the effect of public sector salary increases on unemployment.
- Contributes to the literature exploring reasons behind the high unemployment rates among college graduates in developing countries.

Context

- In December 2015, the Bangladesh government introduced the 8th National pay scale that nearly doubled public sector salaries. table
- Media reports suggest that unemployment among college graduates rose sharply immediately.
  - Labor force surveys weigh in favor of this.



Public Sector Jobs in Bangladesh

- Four tiers: 1st Class, 2nd class, 3rd class and 4th class.
- Top-tier and middle-tier (Class 1 and 2, and some Class 3) jobs are allocated through merit-based exams.
  - These are the jobs that require at least a college degree
- The bottom-tier jobs are mostly allocated on an *ad-hoc* basis or through viva and a short MCQ exam testing knowledge in the relevant field.
  - Does not require a college degree
  - Corruption is rampant; Connection with political leaders/higher-up officials help
  - If anything, some job experience helps
- The age cutoff of applying to government jobs is 30 years.

Merit-based Exams

- The Recruitment Process follow three steps.
  1. Preliminary exam: Involves Multiple Choice exams.
  2. Written Exam: Knowledge test on English and Bengali literature, Maths and Science, and Bangladesh and International Affairs
  3. Viva/Oral interview
- Exams are extremely competitive.
  - In the latest (43rd) BCS Exam, out of 321,650 candidates, 15,229 (4.8%) cleared the preliminary exam, 9,841 (3%) cleared the written exam, and only 2,163 (0.67%) applicants were recommended for appointment after Viva.
- Requires long-term preparation, and candidates often try multiple times.
  - Mangal (2022) provides a theoretical explanation of why candidates sit for the public exam multiple times in India.

Data

- Eight rounds of Labor Force Surveys:
  - Four yearly rounds of LFS surveys before the policy change (2002, 2005, 2010, and 2013).
  - Four quarterly rounds of LFS surveys after the policy change (2016Q3, 2016Q4, 2017Q1, 2017Q2).
- LFS contains detailed information on (un)employment, other labor market outcomes, and demographic characteristics.
- 2020 round of Sample Vital Registration Survey (SVRS) to shed light on long-term outcomes.
  - collect information on key demographic indicators, including occupation.

Empirical Approach

- The age limit to apply for upper-level government jobs is 30.
- We use a difference-in-differences (DiD) estimation strategy.

$$y_{ihdt} = \alpha_d + \beta_t + \gamma_1 Treated_{ihdt} + \gamma_2 Post_t + \gamma_3 Treated_{ihdt} \times Post_t + \delta X_{ihdt} + u_{ihdt} \quad (1)$$

  - $Treated_{ihdt}$ takes a value of 1 if the individual is aged between 24-30, and 0 if aged 31-36
  - $Post_t$ takes a value of 1 for the survey rounds after the salary increase (December 2015), and 0 otherwise.
- Sample: College graduates.

Main Results

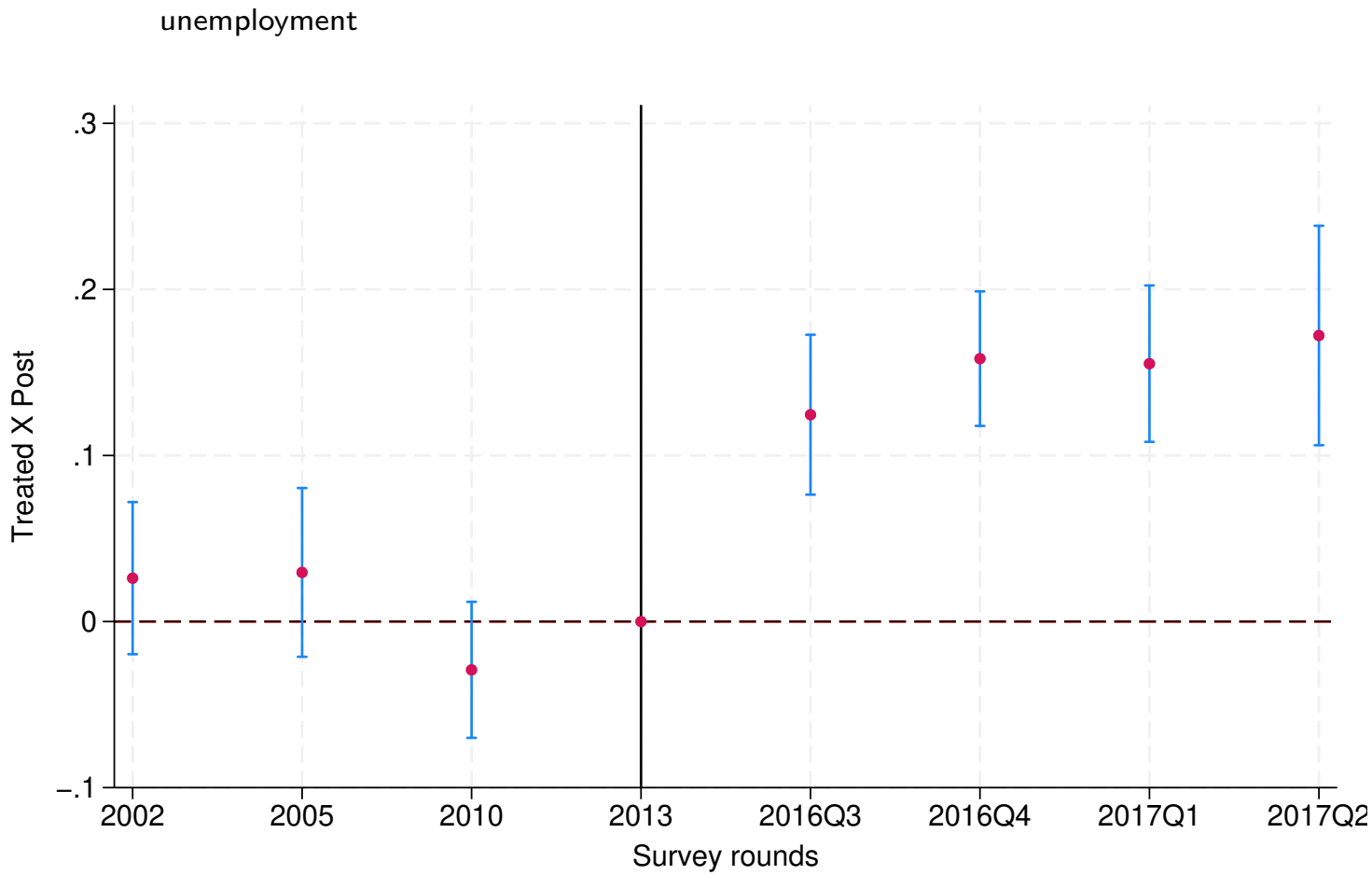


Figure: Effect of Salary Increase on Unemployment Among College Graduates

DiD Point estimate: 13.5 to 14.5 percentage points. table

Effect on Job Market Participation

	College graduates		Not college graduates	
VARIABLES	Public sector (1)	Private Sector (2)	Public sector (3)	Private Sector (4)
Treated (=1 if age is between 24 & 30)	-0.172***	-0.105***	-0.00334	0.0147
	(0.0221)	(0.0337)	(0.00378)	(0.0110)
Post	-0.00994	-0.0396	-0.00110	-0.0412
	(0.0194)	(0.0519)	(0.00287)	(0.0268)
Treated x Post	**-0.00493**	**-0.0992*** **	**-0.00126**	**0.0475*** **
	(0.0174)	(0.0237)	(0.00219)	(0.0137)
Observations	14,311	14,311	155,715	155,715
R-squared	0.036	0.063	0.001	0.226
Endline control mean	0.25	0.46	0.14	0.32

Heterogeneity Analysis

- The treatment effect on unemployment is higher for fresh graduates. figure
- The treatment effect on employment is higher for female college students. table
    - Women often have a stronger preference for public sector jobs than men (Gomes and Kuehn, 2020; Suhi et al., 2021).

Mechanisms

- We rule out the demand shock channel as a possible explanation.
  - GDP growth, as well as private investment, remained robust and consistent.
  - The policy increased average wages for those who continue to participate in the private sector. table
    - Consistent with a simple demand and supply model of the labor market with finite demand and supply elasticity.
- Due to postponing (private) labor market participation to prepare for competitive exams.
  - For the 24-30 age cohort with no college degree, we do not observe any increase in unemployment. table

Long-term Outcomes

- Unemployment persists in the long run, even after the age limit for applying for public jobs expires.
  - Four years after the policy, college graduates between 31 and 34 are:
    - three percentage points more likely to be unemployed. table
    - 6.8 percentage points less likely to participate in labor market. table
  - These have high welfare costs:
    - These 31-34-year college graduates are less likely to be married and more likely to live in financial distress. table
    - Exam preparation generates no human capital (Mangal, 2021).

Summary

- An increase in the public sector salaries increases the unemployment rate significantly among college graduates
  - The effect is higher for female graduates and new graduates.
- The effect on unemployment persists in the long run as well.
- Restricting the number of attempts for the public service exams can be a good policy lever.

Thank you!!

For any questions, please contact:

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Appendix

Table: Job Classification and Minimum Academic Qualification

	7th National Payscale (2009-2015)	**8th National Payscale (2015-Present)**	**Type of job**	**Minimum academic qualification**
Grade-9	11000	22000	1st class	Undergraduate
Grade-10	8000	16000	2nd class	Undergraduate
Grade-11	6400	12000	2nd class	Undergraduate
Grade-12	5900	11300	2nd class	Undergraduate
Grade-13	5500	11000	3rd class	Undergraduate
Grade-14	5200	10200	3rd class	Undergraduate
Grade-15	4900	9700	3rd class	Undergraduate/ Secondary
Grade-16	4700	9300	3rd class	Undergraduate/ Secondary
Grade-17	4500	9000	4th class	Secondary
Grade-18	4400	8800	4th class	Secondary
Grade-19	4250	8500	4th class	Secondary/ Class VII
Grade-20	4100	8250	4th class	Secondary/ Class VII

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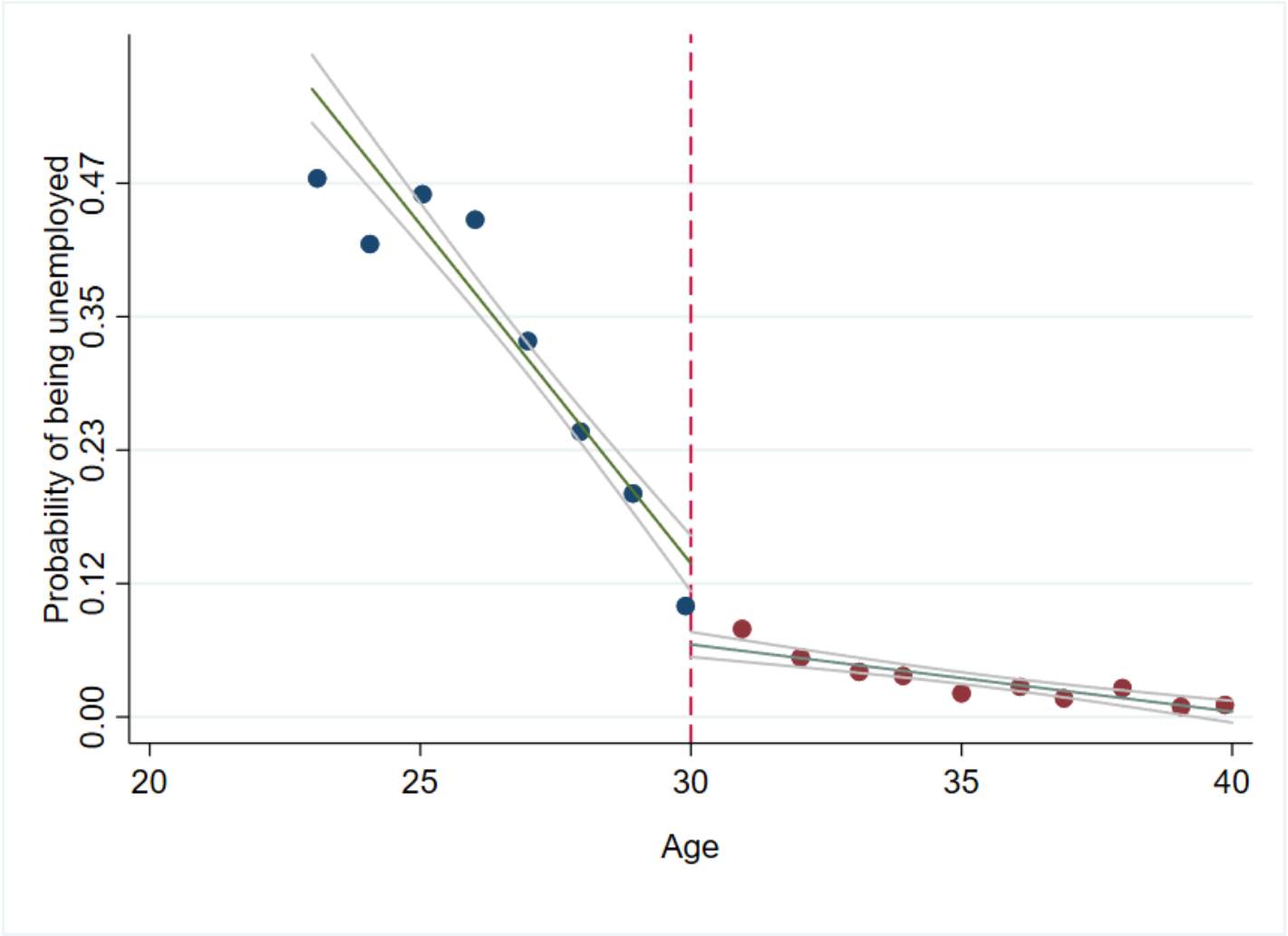

Figure: Effect of the Salary Increase on the Either Sides of the Age Cut-off

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Testing Parallel Trend

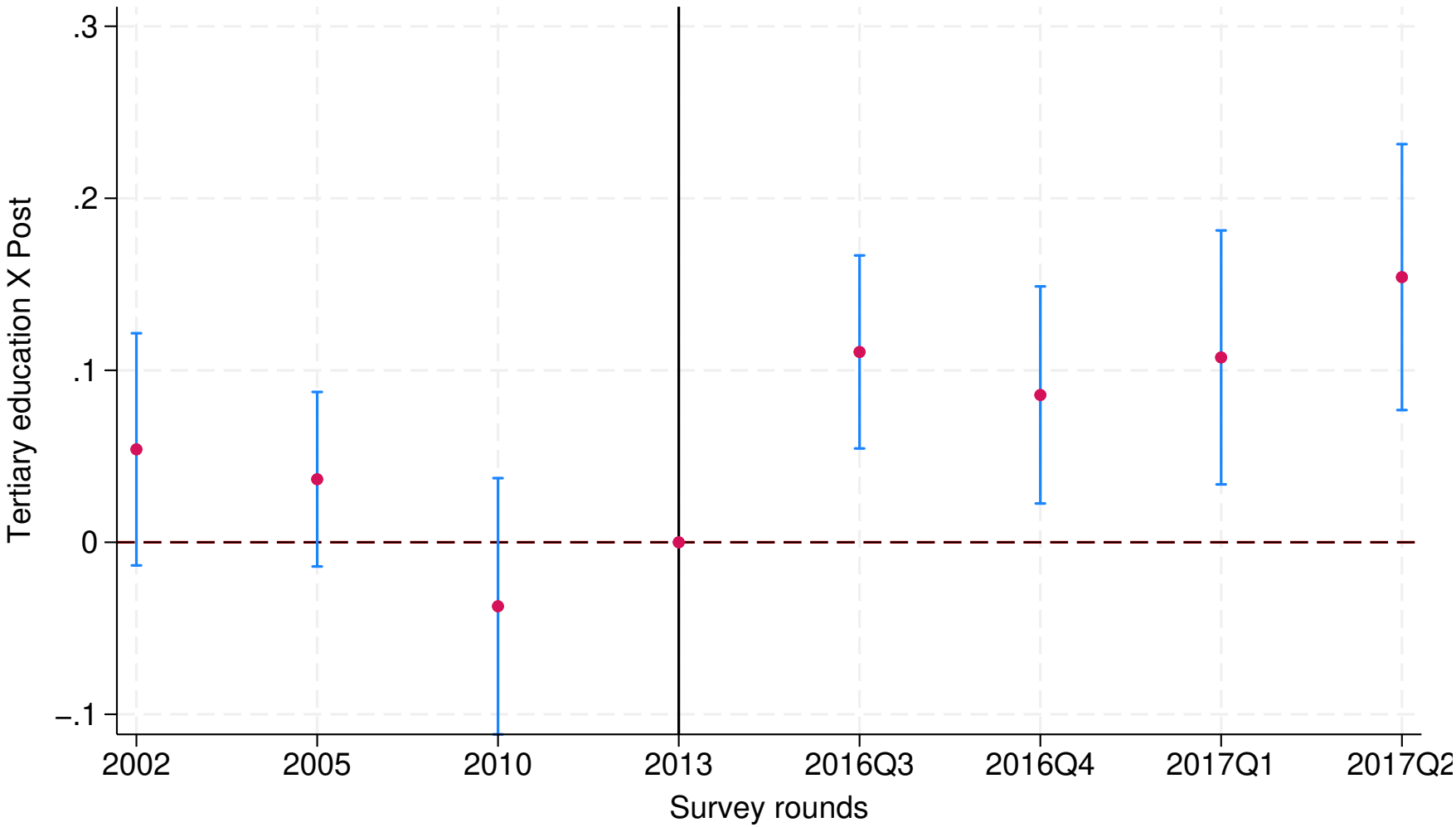
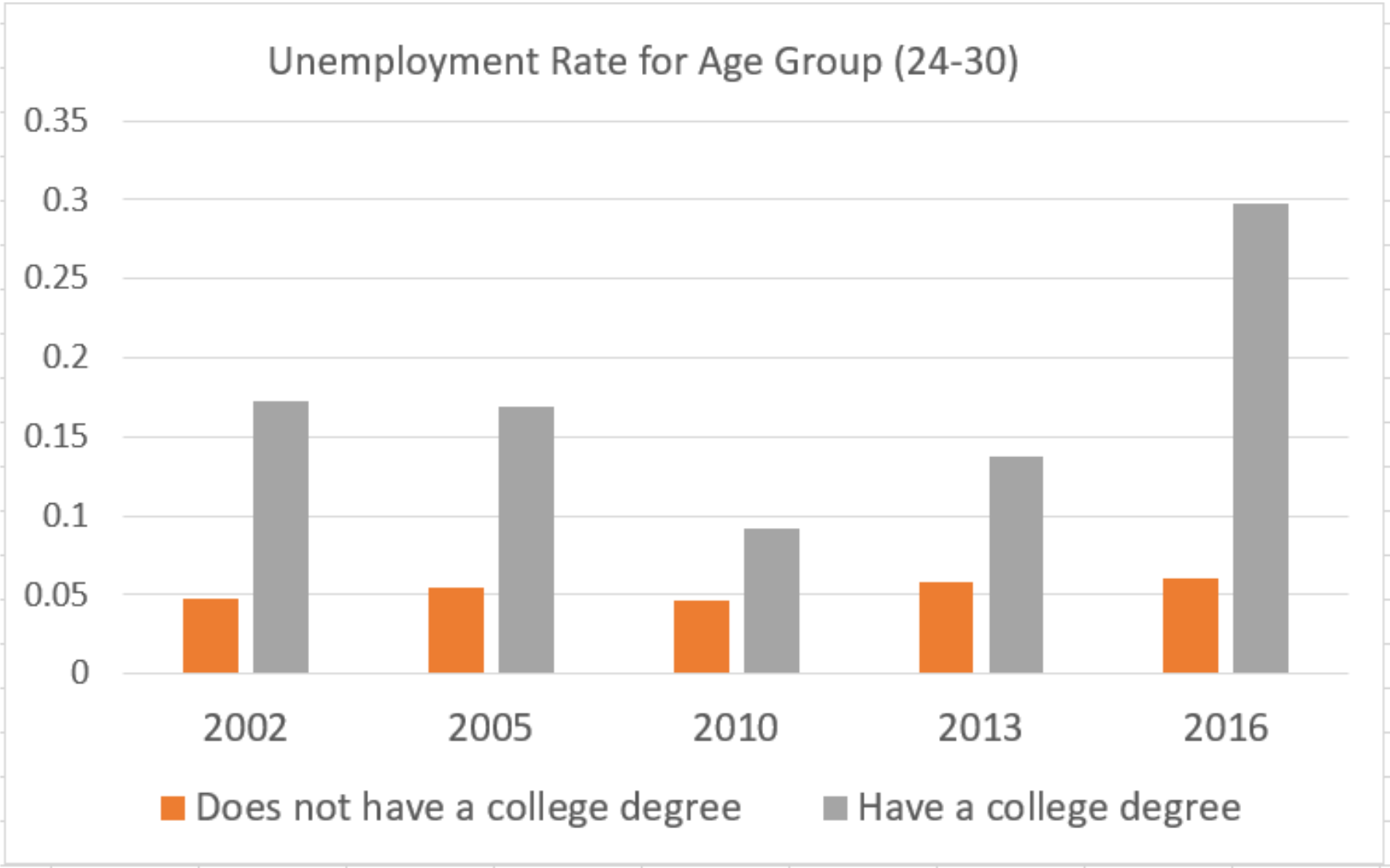
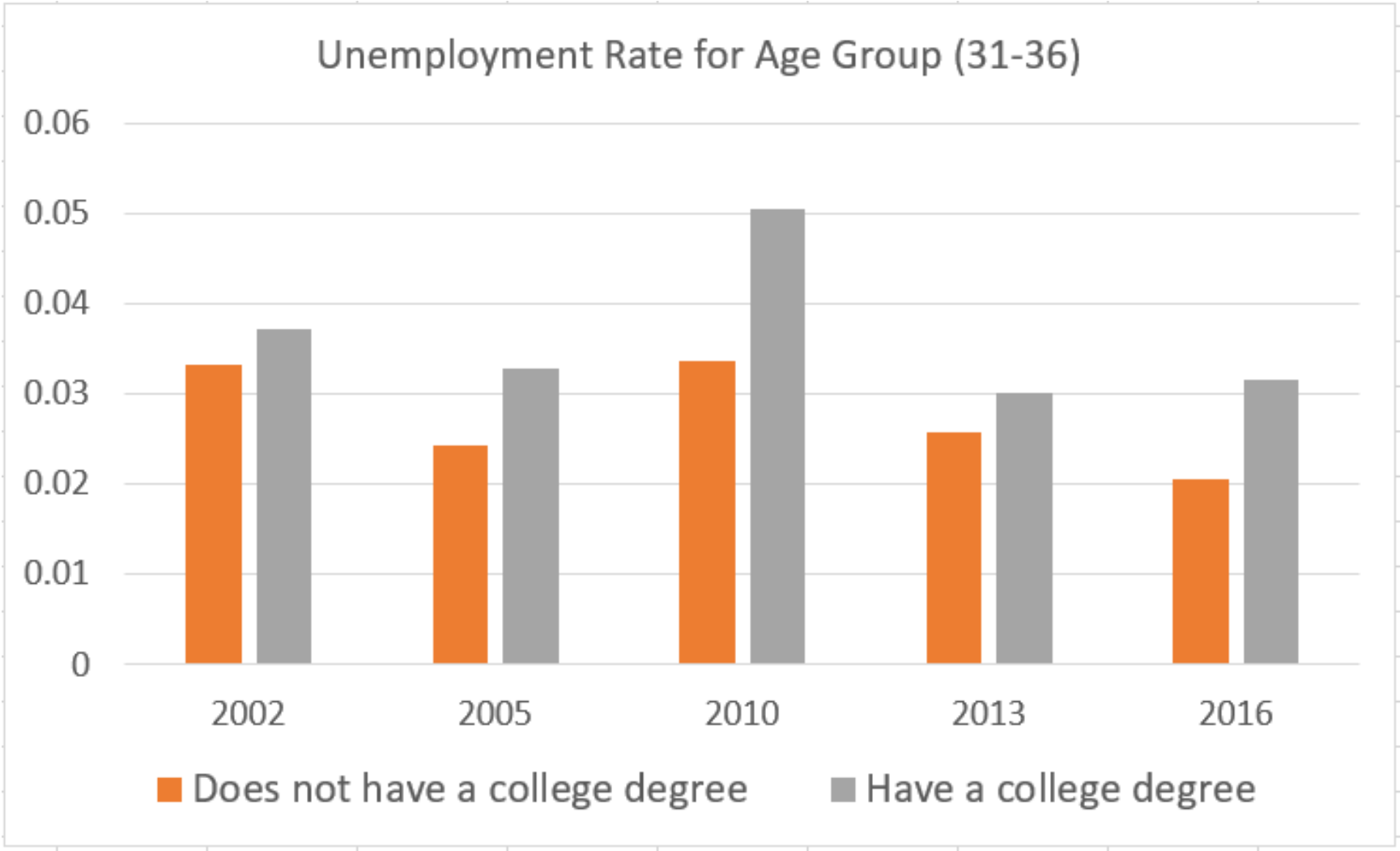


Figure: Effect of Salary Increase on Unemployment for 24-30 Aged Population


Unemployment Rate for Age Group (24-30)
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
2002
2005
2010
2013
2016
Does not have a college degree
Have a college degree


Unemployment Rate for Age Group (31-36)
0.06
0.05
0.04
0.03
0.02
0.01
0
2002
2005
2010
2013
2016
Does not have a college degree
Have a college degree

Placebo test: Effect of Salary Increase on Individuals w/o a College Degree

VARIABLES	(1) Unemployed	(2) unemployed	(3) unemployed
Treated	0.0351***	0.0346***	0.0337***
	(0.00565)	(0.00543)	(0.00547)
Post	-0.00557	-0.00675	-0.00841*
	(0.00438)	(0.00407)	(0.00439)
Treated x Post	0.00539	0.00488	0.00289
	(0.00540)	(0.00518)	(0.00518)
District Fixed Effects	No	Yes	Yes
Survey Round Fixed Effects	Yes	Yes	Yes
Socioeconomic Controls	No	No	Yes
Observations	128,024	128,024	123,234
R-squared	0.005	0.021	0.024
Endline control mean	0.02	0.02	0.02

Notes: Treated is a dummy variable taking a value of 1 if the individual is aged between 24 to 30 years, and 0 if aged between 31 to 36 years.

main

Effect of Salary Increase on 24-30 Aged Population

VARIABLES	(1) Unemployed	(2) unemployed	(3) unemployed
Tertiary education	0.0950***	0.0961***	0.0502***
	(0.0107)	(0.0106)	(0.00968)
Post	0.00994	0.00842	-0.00415
	(0.0104)	(0.00948)	(0.00887)
Tertiary education x Post	0.142***	0.136***	0.144***
	(0.0179)	(0.0161)	(0.0172)
District Fixed Effects	No	Yes	Yes
Survey Round Fixed Effects	Yes	Yes	Yes
Socioeconomic controls	No	No	Yes
Observations	95,890	95,890	92,433
R-squared	0.051	0.070	0.081
Endline control mean	0.06	0.06	0.06

How Credible is the Effect Size?

- Number of population aged 24-30: 19,709,361
- Proportion of college graduates among 24-30 age people: 8.6 percent
- Number of college graduates aged 24-30: 1,695,005
- Number of unemployed college graduates due to the salary increase: (1,695,005 X 0.14)= 237,300
- For comparison, the number of applicants in 2017 and 2018 BCS alone was 288,899 and 412,000, respectively.

Effect of Salary Increase on College Graduates

VARIABLES	(1) Unemployed	(2) Unemployed	(3) Unemployed
Treated	0.238***	0.242***	0.231***
	(0.0273)	(0.0276)	(0.0283)
Post	-0.00433	-0.00562	-0.0199**
	(0.0114)	(0.0105)	(0.00944)
Treated x Post	0.145***	0.134***	0.135***
	(0.0176)	(0.0168)	(0.0165)
District Fixed Effects	No	Yes	Yes
Survey Round Fixed Effects	Yes	Yes	Yes
Socioeconomic Controls	No	No	Yes
Observations	14,311	14,311	14,179
R-squared	0.145	0.177	0.187
Endline control mean	0.03	0.03	0.03

Notes: Treated is a dummy variable taking a value of 1 if the individual is aged between 24 to 30 years, and 0 if aged between 31 to 36 years.

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Placebo test: Effect of Salary Increase on Individuals Aged 31-36

VARIABLES	(1) Unemployed	(2) unemployed	(3) unemployed
Tertiary education	0.00718*	0.00802*	-0.00227
	(0.00403)	(0.00417)	(0.00483)
Post	-0.00837*	-0.00896**	-0.0116**
	(0.00466)	(0.00446)	(0.00473)
Tertiary education x Post	0.00342	0.00367	0.00196
	(0.00917)	(0.00894)	(0.00855)
District Fixed Effects	No	Yes	Yes
Survey Round Fixed Effects	Yes	Yes	Yes
Socioeconomic controls	No	No	Yes
Observations	74,136	74,136	72,184
R-squared	0.002	0.013	0.017
Endline control mean	0.02	0.02	0.02

- I can't reject the null of parallel pre-trend for this specification. here

Heterogeneity in the Treatment Effect by Age

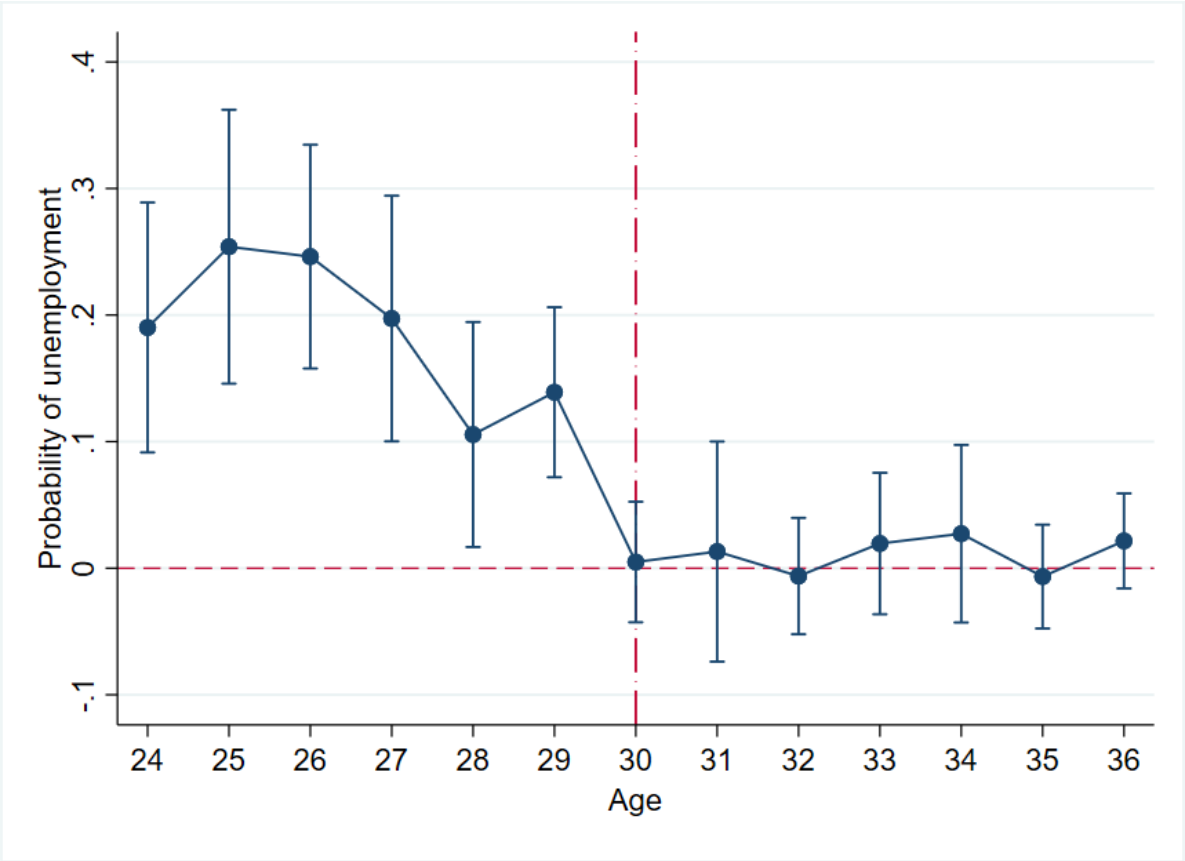

Figure: Average Marginal Effects of the Policy Change with 95% Confidence Intervals

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Heterogeneity in the Treatment Effect by Gender

	Unemployed		Unmarried	
	Male	Female	Male	Female
VARIABLES	(1)	(2)	(3)	(4)
Treated (=1 if age is between 24 & 30)	0.0842***	0.109***	0.231***	0.172***
	(0.00987)	(0.0296)	(0.0298)	(0.0150)
Post	-0.0234***	-0.0165	-0.153***	-0.156***
	(0.00587)	(0.0292)	(0.0172)	(0.0221)
Treated x Post	0.134***	0.204***	0.247***	0.00729
	(0.0219)	(0.0287)	(0.0289)	(0.0219)
Observations	10,344	3,835	11,274	6,670
R-squared	0.114	0.127	0.208	0.126

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Longer-term Effects of the Salary Increase

VARIABLES	(1) unemployed	(2) unemployed	(3) unemployed
Post	0.0235***	0.0234***	-0.00252*
	(0.00209)	(0.00209)	(0.00148)
Tertiary	0.00160	0.00268**	0.00166
	(0.00113)	(0.00135)	(0.00114)
Post x Tertiary	0.0520***	0.0517***	0.0517***
	(0.00310)	(0.00309)	(0.00308)
Age control	Yes	Yes	Yes
Other controls	No	Socio-economic controls	District fixed effect
Observations	129,433	129,433	129,433
R-squared	0.022	0.023	0.025

Notes: Post takes a value of 1 if aged between 24-30 in 2016, and 0 otherwise. Tertiary takes a value of 1 if the individual has a college degree, and 0 otherwise.

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Longer-term Effects of the Salary Increase

VARIABLES	Unemployed	
	27-30 aged group during 2016 (1)	24-26 age group during 2016 (2)
Post	0.0126***	0.0184***
	(0.00164)	(0.00199)
Tertiary	0.00160	0.00160
	(0.00113)	(0.00113)
Post x Tertiary	0.0307***	0.0780***
	(0.00295)	(0.00507)
Age control	Yes	Yes
Observations	99,462	89,275
R-squared	0.008	0.031

Notes: Post takes a value of 1 if aged between 24-30 in 2016, and 0 otherwise. Tertiary takes a value of 1 if the individual has a college degree, and 0 otherwise.

Effect on Unemployment by Educational Attainment

	Unemployment	
	24-30 Years	31-36 years
VARIABLES	(1)	(2)
Post	0.00724	-0.00823
	(0.0153)	(0.00751)
Primary x Post	-0.0103	-0.00653
	(0.00627)	(0.00498)
Some secondary x Post	-0.0150	-0.00713
	(0.0105)	(0.00500)
Secondary x Post	0.0348**	-0.0295***
	(0.0150)	(0.00862)
College x Post	0.142***	-0.00571
	(0.0186)	(0.0103)
Observations	94,690	73,616
R-squared	0.067	0.006

Notes: Each regression control for individual's age, education category in level form, district and survey round fixed effects.

Summary Statistics: Change in Salaries

	Before the policy change	After the policy change	% change
Panel A: College Graduates			
Private Sector	3147	6321	101%
Public sector	2646	6429	143%
Panel B: Not college graduates			
Private Sector	1993	2889	45%
Public sector	1927	3988	107%

Effect on Salaries

VARIABLES	Monthly salary 24-30 age group (1)	 31-36 age group (2)
Tertiary	476.2***	666.6***
	(95.63)	(191.2)
Post	3,019***	3,078***
	(106.4)	(136.7)
Tertiary x Post	1,715***	1,863***
	(210.5)	(318.9)
Private	-341.1***	-439.3***
	(48.11)	(71.54)
Tertiary x Private	457.3***	859.6***
	(130.2)	(249.7)
Post x Private	-752.3***	-766.0***
	(119.0)	(131.1)
Tertiary x Post x Private	**458.6****	**247.6**
	(216.2)	**(302.5)**
Observations	18,158	13,423
R-squared	0.444	0.347

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Longer-term Effects of the Salary Increase

VARIABLES	(1) Participates in Labor market	(2) Married	(3) Lives in financial distress
Post	-0.0437***	0.0592***	-0.0102**
	(0.00573)	(0.00230)	(0.00506)
Tertiary	0.280***	0.0319***	-0.195***
	(0.00527)	(0.00218)	(0.00526)
Post x Tertiary	-0.0685***	0.0952***	0.0216***
	(0.00691)	(0.00482)	(0.00366)
Observations	195,823	195,823	195,823
R-squared	0.026	0.037	0.021

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