Productivity Breakthrough or Not:

Internet Industry and College Premium in China

UCL Explore Econ 2024
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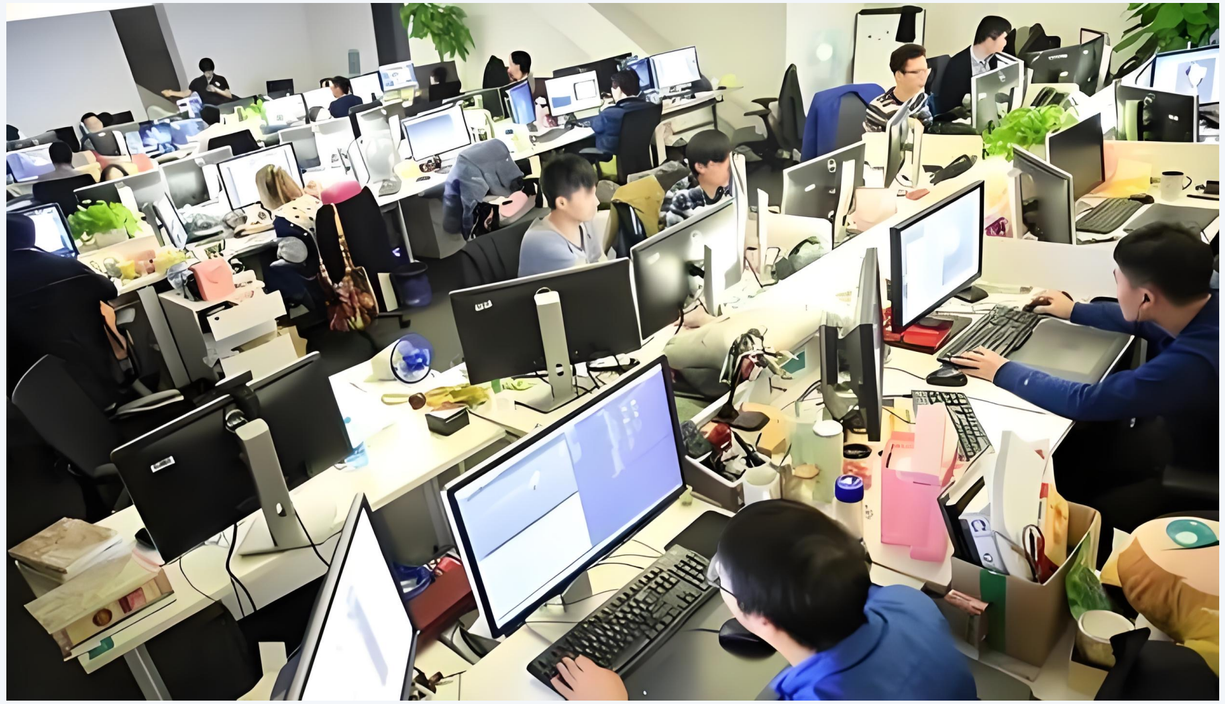
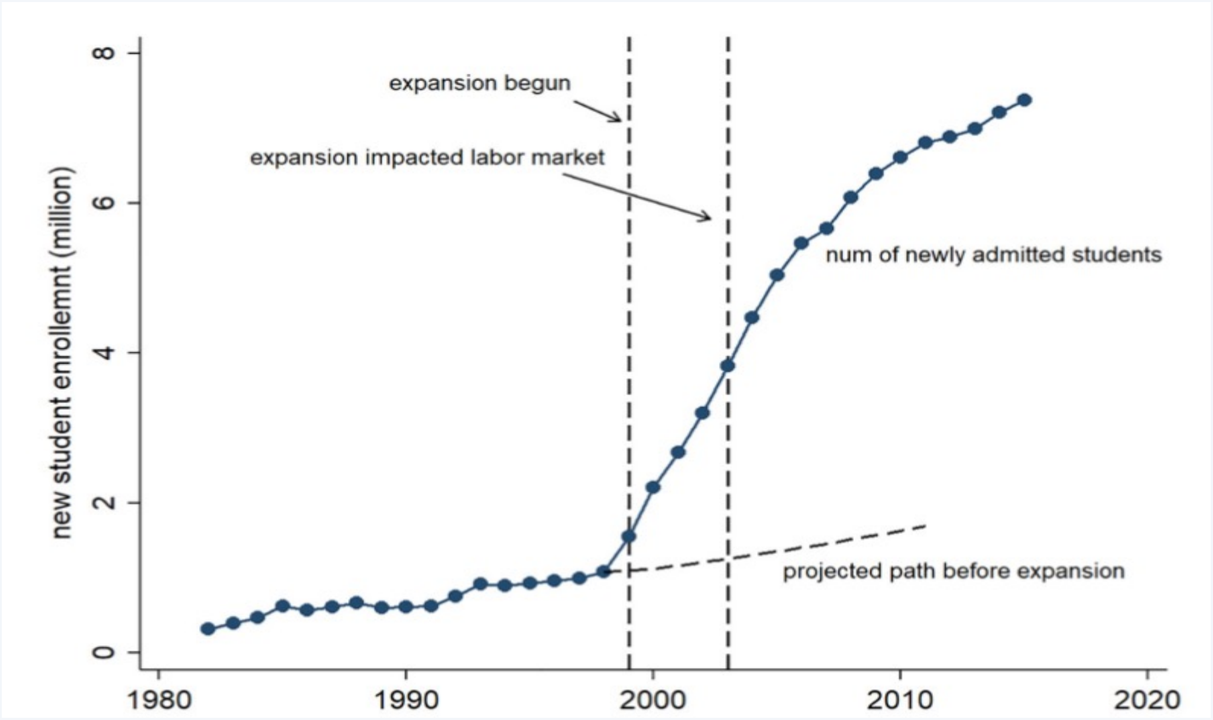
How Has Internet Industry Impacted College Premium in China?

The 2010s in China:

- Unusual simultaneous increase of both college premium and graduate supply
- Boom of Internet industry





Any Connections?

- Goldin and Katz: “The Race Between Education and Technology”
- A productivity breakthrough in Internet Industry?

- Graph on left from Internet
- Figure on the right from Huang, B., Tani, M., Wei, Y., & Zhu, Y. (2022). Returns to education in China: Evidence from the great higher education expansion. China Economic Review, 74, 101804.

Hypothesis

The effect of Internet industry on college premium is due to…

H1: Computer Application

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H2: Industry-Specific Productivity Breakthrough

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H1: Computer Application

H2: Industry-Specific Productivity Breakthrough

H3: Efficiency Wage

H4: Regional Difference

Methodology and Data

Hypothesis Verification:

- Regress log income on targeted intersection terms:

  comp for H1, indu and other_indu for H2 and H3, prov for H4
- Control for: experience, gender, marriage, language, and employer type

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$$income = \beta_0 + \beta_1 edu + \beta_2 comp + \beta_3 edu\_comp + \beta_4 prov + X^T\sigma + \epsilon \quad \textit{(Equation 2)}$$

$$income = \beta_0 + \beta_1 edu + \beta_2 indu + \beta_3 other\_indu + \beta_4 edu\_indu + \beta_5 edu\_other\_indu + \beta_6\, prov + X^T\sigma + \epsilon \quad \textit{(Equation 3)}$$

$$income = \beta_0 + \beta_1 edu + \beta_2 prov + \beta_3 edu\_prov + X^T\sigma + \epsilon \quad \textit{(Equation 4)}$$

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Data Source

- Chinese Family Panel Study (CFPS) 2014, 2016, 2018, and 2020
- A PKU-led household survey programme, conducted every two years

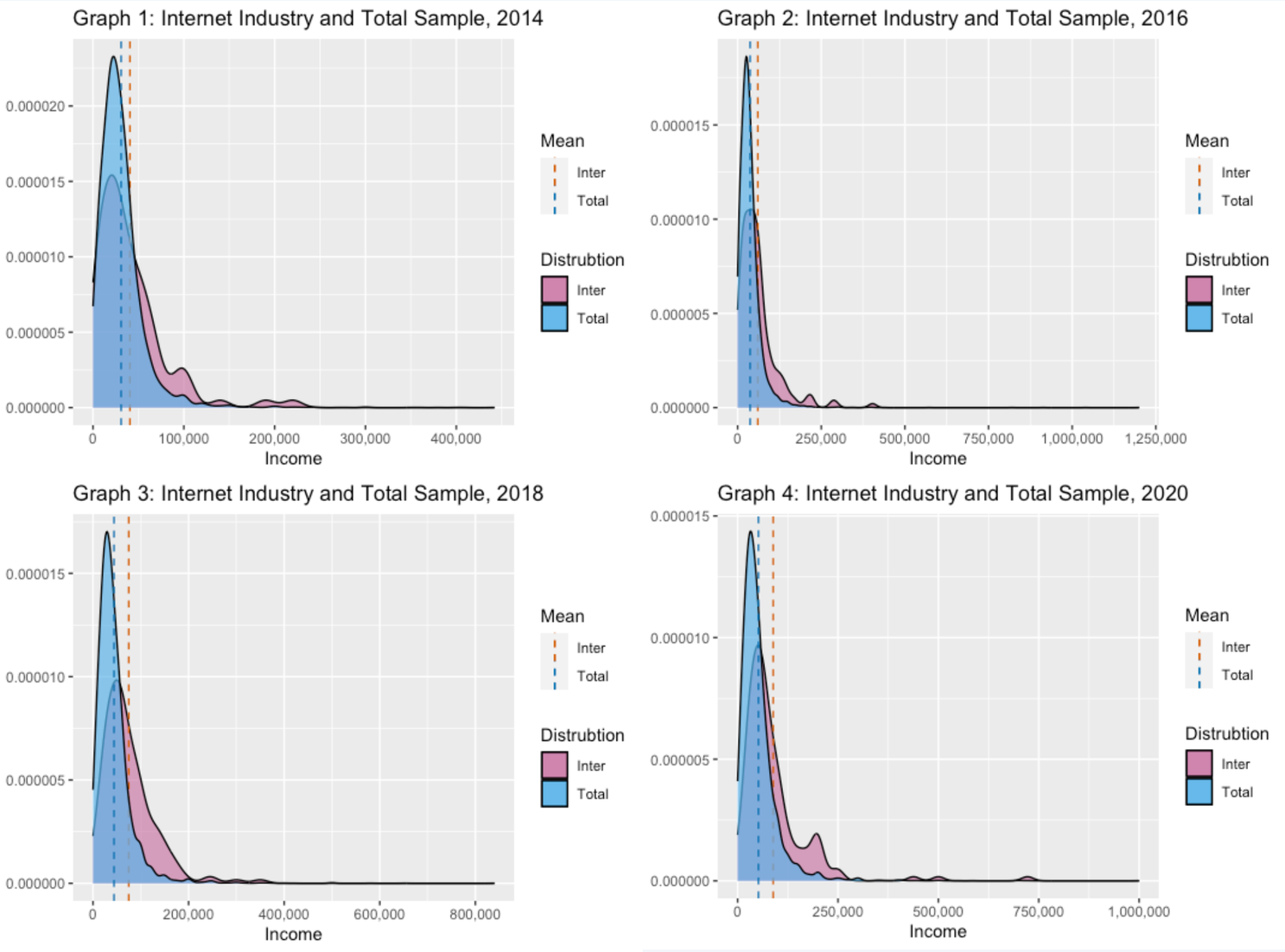
Result: Existence of College Premium and Profile for Internet Industry Worker

Table 4: General Regression Results

	2014	2016	2018	2020
edu	0.365***	0.357***	0.394***	0.419***
	(.091)	(.041)	(.023)	(.025)
comp	0.223***	0.098**	0.295***	0.321***
	(.021)	(.032)	(.020)	(.021)
indu	−1.382	0.045	0.128*	0.083
	(.091)	(.114)	(.064)	(.062)
other_indu	0.116	0.164**	0.117***	0.203***
	(.037)	(.058)	(.030)	(.032)
prov	0.382***	0.510***	0.364***	0.375***
	(.020)	(.032)	(.018)	(.019)
N	7394	8949	9024	8118

Table 3: Profile for workers in Internet industry

	income		edu		comp		prov		*N*	
	Total	Inter	Total	Inter	Total	Inter	Total	Inter	Total	Inter
2014	30971	40932	0.223	0.646	0.390	1.000	0.316	0.402	7394	81
2016	37387	59697	0.255	0.695	0.452	1.000	0.317	0.461	8949	164
2018	43988	74651	0.293	0.755	0.465	1.000	0.300	0.445	9024	154
2020	51832	88354	0.342	0.774	0.505	1.000	0.283	0.439	8118	163



- All tables and graphs are from author's paper .

Result: Productivity Based Effect

Table 5: Regression Results for Equation 2

	2014	2016	2018	2020
edu	0.315^{***}	0.297^{***}	0.288^{***}	0.376^{***}
	(.051)	(.059)	(.044)	(.045)
comp	0.211^{***}	0.075^{*}	0.271^{***}	0.316^{***}
	(.025)	(.036)	(.022)	(.024)
edu_comp	0.07	0.114	0.147^{**}	0.064
	(.051)	(.059)	(.048)	(.050)
N	7394	8949	9024	8118

Note: Standard errors are presented in parenthesis.

$^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$

Table 6: Regression Results for Equation 3

	2014	2016	2018	2020
edu	0.354^{***}	0.363^{***}	0.395^{***}	0.410^{***}
	(.029)	(.043)	(.024)	(.025)
indu	-0.474^{**}	0.282	0.103	-0.007
	(.153)	(.206)	(.127)	(.130)
edu_indu	0.516^{**}	-0.338	0.033	0.120
	(.189)	(.245)	(.146)	(.147)
other_indu	0.115^{*}	0.154^{*}	0.127^{**}	0.176^{***}
	(.045)	(.073)	(.040)	(.043)
edu_other_indu	0.002	0.025	-0.022	0.058
	(.081)	(.121)	(.062)	(.063)
N	7394	8949	9024	8118

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Effect from computer application (H1) in 2018

Effect from industry breakthrough (H2) in 2014

- Both tables are from author's paper .

Result: Non-Productivity Based Effect

Table 7: Regression Results for Equation 4

	2014	2016	2018	2020
edu	0.305^{***}	0.304^{***}	0.376^{***}	0.359^{***}
	(.031)	(.047)	(.026)	(.027)
prov	0.335^{***}	0.460^{***}	0.340^{***}	0.297^{***}
	(.023)	(.037)	(.021)	(.024)
edu_prov	0.194^{***}	0.178^{*}	0.077^{*}	0.217^{***}
	(.048)	(.073)	(.038)	(.040)
N	7394	8949	9024	8118

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- **Regional difference (H4) always matters**
- **Indirect evidence for Internet industry effect in 2020**
- **No evidence for efficiency wage (H3)**

- Both tables are from author's paper .

Takeaway

Conclusions

- Productivity based effect in 2014 and 2018
  - Industry-specific productivity growth in 2014
  - Computer-led productivity growth in 2018
- Indirect evidence for effect in 2020
- Internet industry has significant impact on college premium
- This impact mostly comes from productivity breakthrough

Contributions

- Update understanding of college premium in China
- New prospective of impact from an emerging industry

Thanks!