



Women's Education and Marriage Outcomes: Evidence from China's Higher Education Expansion

Qiteng Wang

Nanjing University

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Introduction

- **Two important phenomena in education**
 - A substantial increase in the average educational attainment
 - A quicker increase among women than men in the average educational attainment
- Human capital theory suggests that investment in education yields returns in both the **labor market** and the **marriage market** (Lefgren and McIntyre 2006)
 - Women tend to favor partners with higher educational levels, leading to **assortative mating**
 - Increasing in the competitive pressures faced by women in the marital market
 - The traditional societal notion of women “marrying up” (hypergamy) in China
- **Core questions**



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 - Increasing in the competitive pressures faced by women in the marital market
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- **Core questions**
 - How does rising female education reshapes marital strategies, stability, and spousal characteristics **in China**?



China's Higher Education Expansion (HEE)

- **National College Entrance Examinations (*gaokao*)**

- Higher education controlled by the Ministry of Education (MoE), which sets provincial, university and subject quotas annually

- **Pressure**

- 1997 Asian financial crisis
- Unemployment by the reforms of the state-owned enterprises (SOEs)

- **Random shock**

- MoE suddenly announced a 47% increase in university places in June 1999
- HE institutions around the country were only given a few months to prepare for the surge in intake

China's Higher Education Expansion (HEE)

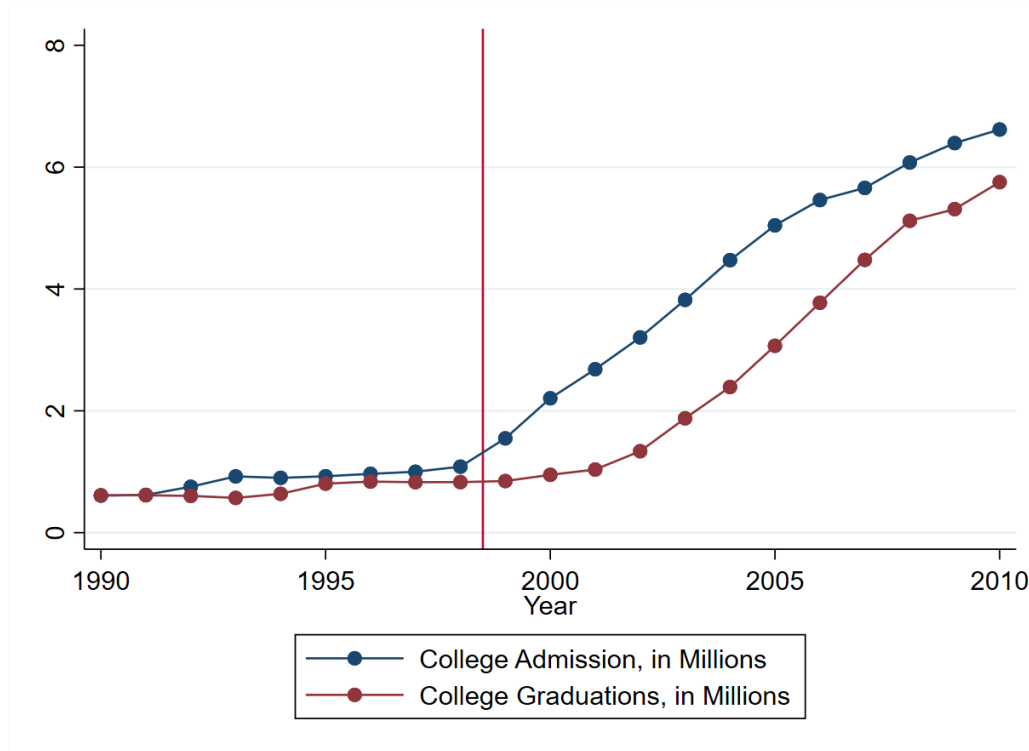


Figure 1: College Admission and College Graduates

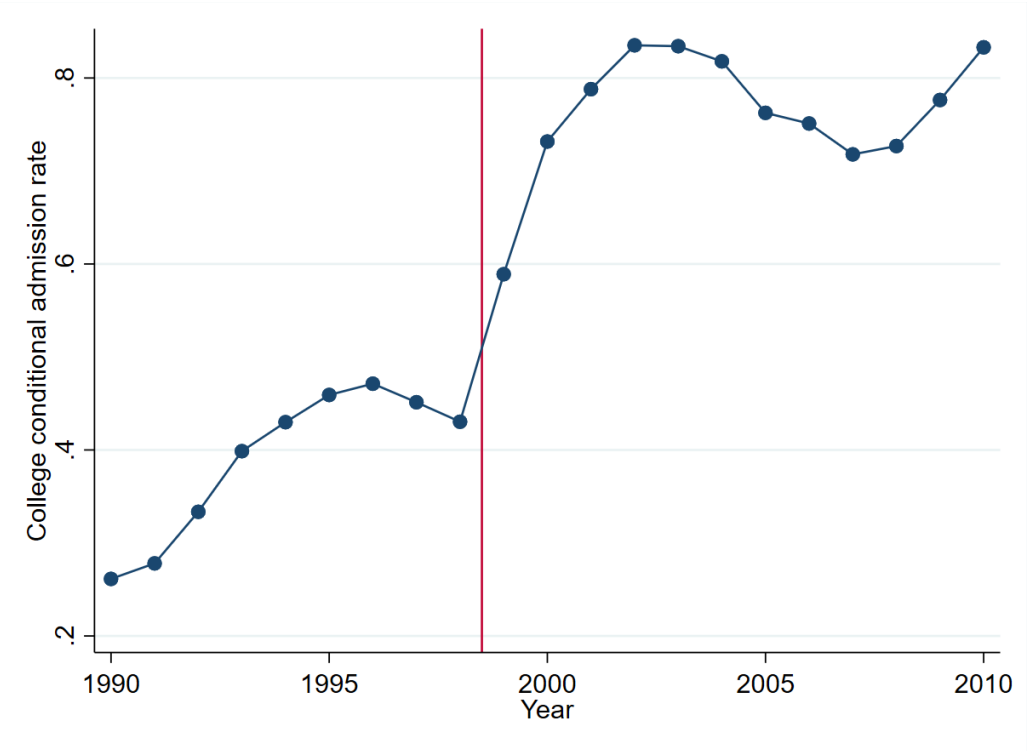


Figure 2: College Conditional Admission Rate



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Education

- **Labor market returns** ([Dickson and Harmon 2011](#); [Churchill and Mishra 2018](#))
 - The institutional changes brought by compulsory education laws are often utilized to evaluate the impact of education on income ([Angrist and Krueger 1991](#); [Oreopoulos 2006](#); [Devereux and Hart 2010](#))
- **Non-market returns**



Education

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- **Non-market returns**
 - Improve health (Kippersluis, O'Donnell, and Doorslaer 2011; Heckman, Humphries, and Veramendi 2018)
 - Influence health behaviors (Sander 1995)
 - Reduce the incidence of criminal activities (Lochner and Moretti 2004; Buonanno and Leonida 2009)
 - Marriage outcomes (Lafortune 2013; Lefgren and McIntyre 2006)
 - Women's probability and age of first marriage (Brien and Lillard 1994; Goldin 2006)
 - Fertility (Clark and Del Bono 2016; Fort, Schneeweis, and Winter-Ebmer 2016; Osili and Long 2008)
 - Health status of children (Currie and Moretti 2003; McCrary and Royer 2011)



Assortative mating

- **Assortative mating** (i.e. the nonrandom matching of individuals to marry or form partnerships with others who share similar characteristics)
 - Exhibited an increasing prevalence in contemporary society ([Greenwood et al. 2014](#))
 - Affects individuals' access to resources and the distribution of those resources among families ([Schwartz 2013](#))
- Individuals tend to choose partners **who align with themselves** in:



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 - Affects individuals' access to resources and the distribution of those resources among families ([Schwartz 2013](#))
- Individuals tend to choose partners **who align with themselves** in:
 - Socioeconomic status ([Breen and Salazar 2011](#); [Kalmijn 1994](#); [Sweeney and Cancian 2004](#))
 - Race or ethnicity ([Chiswick and Houseworth 2011](#))
 - Religion ([McClendon 2016](#))



China's Higher Education Expansion

- A significant policy change in recent decades, with the **number of students** enrolled in higher education institutions **increasing dramatically**
- **Driven by various factors**
 - To stimulate domestic consumption and to ease the immediate pressure on the labor market (Wan 2006)
- **Various outcomes**



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- **Various outcomes**
 - Labor market performance (Li, Whalley, and Xing 2014; Che and Zhang 2018)
 - Social stratification (Yeung 2013)
 - Social mobility (Liu, Yue, and Zhu 2025)
 - Gender norms (Si 2022)
 - Regional innovation (Rong and Wu 2020)



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Data

- **CFPS** (China Family Panel Studies) is a longitudinal survey conducted by the Institute of Social Science Survey at Peking University. The survey launched its formal interviews in 2010 with a baseline sample encompasses 25 provinces, municipalities, and autonomous regions, representing 95% of China's population. To date, CFPS has released follow-up data from the years 2012, 2014, 2016, 2018, 2020, and 2022. This comprehensive dataset provides invaluable insights into various aspects of family and societal change over time.
- This study utilizes all seven rounds of the CFPS 2010-2022 dataset, as well as the cross-year individual core variable database. The sample in this paper consists of **individuals born between 1971 and 1989**, with a primary focus on variables related to their educational status and marital outcomes.



Identification Strategy

- **Endogeneity**
 - **Omitted variables:** factors affecting the cost of education may have an independent effect on marriage outcomes ([Lefgren and McIntyre 2006](#)); some girls pursue more education as a conscious strategy to avoid early marriage ([Chen 2022](#))
 - **Reverse causality:** increased education could be a result of delayed entry into marriage or parenthood



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- **IV-DID**

- **First stage:** using HEE as an exogenous source of educational attainment and interacting it with birth cohorts as an IV (technically, a cohort-DID estimator)
- **Second stage:** estimating the impact of exogenous educational attainment on marriage outcomes



Identification Strategy

- **Cohort treatment group assignment**
 - **Post-HHE cohort:** born between 1981 and 1989 (less than 18 years old in 1999)
 - **Partial-Post-HHE cohort:** born between 1976 and 1980 (18-22 years old in 1999)
 - **Pre-HHE cohort:** born between 1971 and 1975 (23-27 years old in 1999)
- **HEE intensity**
 - **Low intensity:** provinces with an expansion rate of higher education below the median
 - **High intensity:** provinces with an expansion rate of higher education above the median



Model Specification

First Stage

$$Edu_{ipc} = \alpha_1 + \sum_{c=2}^3 \alpha_c (Cohort_{ic} \times Exp_rate_p) + \mathbf{X}'_{ipc} \alpha_4 + \gamma_c + \lambda_p + \lambda_p \times Cohort_c + \delta_t + \varepsilon_{ipc}$$

- Edu_{ipc} : the educational attainment of individual i in province p and cohort c
- $Cohort_{ic}$: a dummy variable that indicates whether individual i belongs to the treatment cohort
- Exp_rate_p : the expansion rate of higher education in province p
- $\mathbf{X}'_{ipc}$: individual-level covariates
- γ_c , λ_p and δ_t : cohort, province and wave fixed effects, respectively
- $\lambda_p \times Cohort_c$: province-specific birth cohort time trend
- ε_{ipc} : the error term



Model Specification

Second Stage

$$Y_{ipc} = \beta_1 + \beta_2 \widehat{Edu}_{ipc} + \mathbf{X}'_{ipc} \beta_3 + \gamma_c + \lambda_p + \lambda_p \times Cohort_c + \delta_t + u_{ipc}$$

- Y_{ipc} : marriage outcomes of individual i in province p and cohort c
- $\widehat{Edu}_{ipc}$: the predicted educational attainment from the first stage
- u_{ipc} : the error term
- The other variables are defined as above



Measures (Pending)

- Independent Variables: **Educational attainment**
 - Schooling years
- Dependent Variables: **Marriage outcomes**
 - Probability of marriage
 - Age at first marriage
 - Marriage stability
 - Spouses' income
 - Spouses' education level
- Covariates
 - Male
 - Age²
 - Ethnicity *Han*
 - Urban
 - *Hukou*



Summary Statistics (Preliminary)

Table 1: Summary Statistics

Variables	Pre-HEE Cohort	Post-HEE Cohort	Difference
<i>Panel A: predetermined characteristics</i>			
Male	0.50	0.50	0.00
Age	39.54	29.64	9.90***
Ethnicity <i>Han</i>	0.90	0.91	-0.01***
Urban	0.50	0.51	-0.01***
<i>Hukou</i>	0.27	0.27	0.00
<i>Panel B: outcomes</i>			
Eduy	8.21	10.52	-2.31***
Eduy_spouse	6.41	7.56	-1.150***
Income_spouse	16778.17	20205.20	-3427.04***

Notes: (1) HEE refers to the Higher Education Expansion. (2) The table reports the mean values of the variables for the core sample. (3) T-tests are employed to compare the differences in outcomes across groups: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. (4) The Pre-HEE cohort refers to those born before the cutoff while the Post-HEE cohort refers to those born after it



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Thanks!