

Male Income Inequality & Female Marital Outcomes

Evidence from India

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APPAM International Conference, Segovia

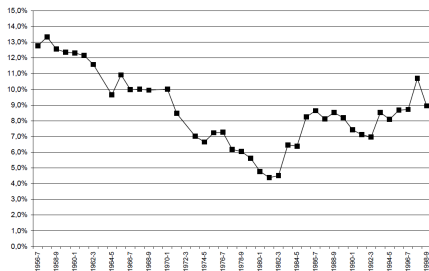
September 29-30, 2014

Motivation

Increasing income inequality in India

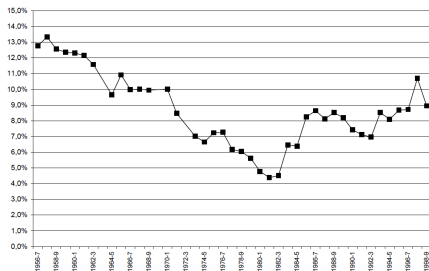
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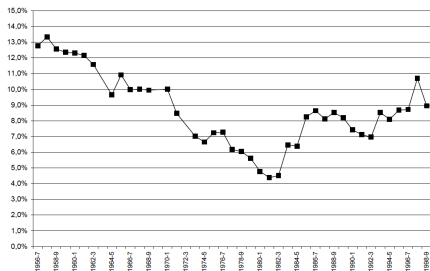
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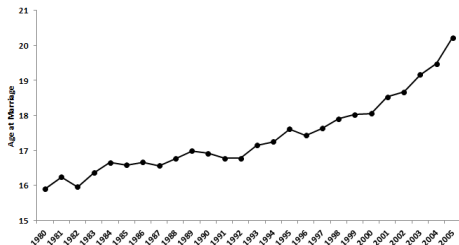
And women's age at marriage rising

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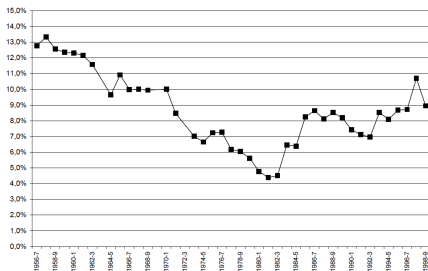


And women's age at marriage rising

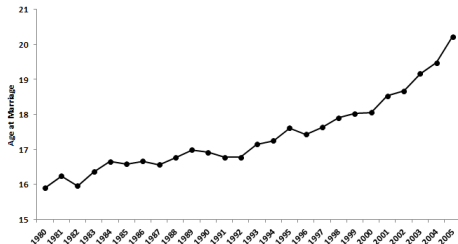


Motivation

Increasing income inequality in India



And women's age at marriage rising



How are two trends related?

Does male income affect female marital outcomes?

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Increased (upper tail) earnings inequality: Women delay marriage

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- Women get additional 0.6 years of education

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- Complete high school; Matriculate into college

Overview

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Model: Marital Search

Data: Indian Human Development Survey (2005)

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Empirical Strategy

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Empirical Strategy

Results: Impact of male income inequality on female marital outcomes

- Educational attainment

Overview

Motivation

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Data: Indian Human Development Survey (2005)

Empirical Strategy

Results: Impact of male income inequality on female marital outcomes

- Educational attainment

Summary & Conclusion

Model

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Woman faces male earnings distribution

Model

Woman faces male earnings distribution: accepts or rejects offer of x

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- Reservation earnings level R
- Probability of marriage q
- Search time (age at marriage) $\frac{1}{q}$

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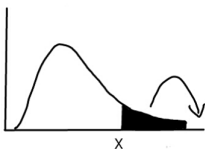
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Rising inequality often asymmetric

- Upper-tail inequality increases R and search time for most women

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- Inequality in lower-tail will not affect most women

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- Ever-married sample: Impact on age at marriage

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Measures

- Male earnings: Outside earnings + farm/business income
- Earnings distribution: Eligible men in each marriage market

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 - Earnings distribution: Eligible men in each marriage market
- ↔ Unmarried; ages 18-35; not enrolled in school

Marriage markets: Community (caste) and state

- Exploits regional and occupational earnings differences

Descriptives

Empirical Strategy

Full sample: Regress marital status on male earnings inequality (LPM)

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$$y_{ics} = \beta_1(e^{90} - e^{50})_{cs} + \beta_2(e^{50} - e^{10})_{cs} + \beta_3e_{cs}^{50} + \gamma Age_{ics} + \eta_c + \eta_s + u_{ics}$$

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$y_{ics} = 1$ if woman i in community c and state s is married

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$(e^{90} - e^{50})_{cs}, (e^{50} - e^{10})_{cs}$: male earnings inequality measures

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Age_{ics} : individual's age

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e_{cs}^{50} : male earnings distribution location

Age_{ics} : individual's age

η_c : community fixed effects; η_s : state fixed effects

u_{ics} : error

Empirical Strategy

Ever-married sample: Regress age at marriage on male earnings inequality

$$AgeMarriage_{ics} = \beta_1(e^{90} - e^{50})_{cs} + \beta_2(e^{50} - e^{10})_{cs} + \beta_3 e_{cs}^{50} + \eta_c + \eta_s + u_{ics}$$

$AgeMarriage_{ics}$: age at marriage for woman i in caste c and state s

$(e^{90} - e^{50})_{cs}, (e^{50} - e^{10})_{cs}$: male earnings inequality measures

e_{cs}^{50} : male earnings distribution location

Age_{ics} : individual's age

η_c : community fixed effects; η_s : state fixed effects

u_{ics} : error

↑ Male income inequality: ↓ Female marriage rates

Driven by upper-half inequality

	Probability of marriage
Male earnings: 90th-50th percentile	-0.016*** (0.006)
Male earnings: 50 th -10 th percentile	-0.007 (0.009)
Male earnings: 50 th percentile	0.014 (0.013)
Age of woman (years)	0.068*** (0.001)
Community fixed effects?	Yes
State fixed effects?	Yes
N (women)	25,550
R-squared	0.451

↑Male income inequality: ↓Female marriage rates; ↑Age at marriage
 Driven by upper-half inequality

	Probability of marriage	Age at marriage
Male earnings: 90th-50th percentile	-0.016*** (0.006)	0.343*** (0.109)
Male earnings: 50 th -10 th percentile	-0.007 (0.009)	0.055 (0.287)
Male earnings: 50 th percentile	0.014 (0.013)	-0.476** (0.233)
Age of woman (years)	0.068*** (0.001)	
Community fixed effects?	Yes	Yes
State fixed effects?	Yes	Yes
N (women)	25,550	646
R-squared	0.451	0.174

Testing alternative hypotheses

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AH1: Are men searching longer for women?

No

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AH2: Are women different across high- and low-inequality markets?

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AH4: Are male earnings proxying for (expected) female earnings?

No

Testing alternative hypotheses

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AH2: Are women different across high- and low-inequality markets?

No

AH3: Are men absent from marriage market?

No

AH4: Are male earnings proxying for (expected) female earnings?

No

AH5: Are marriages delayed due to wedding expenditures (dowry)?

No

Human capital implications of delayed marriage (ever-married sample)

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Impact on completed years of education

$$EduYears_{ics} = \beta_1(e^{90} - e^{50}) + \beta_2(e^{50} - e^{10}) + \beta_3 e^{50} + \eta_c + \eta_s + u_{ics}$$

Human capital implications of delayed marriage (ever-married sample)

Impact on completed years of education

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Identify level where additional education accrues

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Women attain more education, at high school/college

- Women accrue 0.6 additional years of education

	Years of education
Male earnings: 90 th -50 th percentile	0.607* (0.313)
Male earnings: 50 th -10 th percentile	0.270 (0.590)
Male earnings: 50 th percentile	-0.656 (0.541)
Caste fixed effects?	Yes
State fixed effects?	Yes
N (women)	627
R-squared	0.201

Human capital implications of delayed marriage (ever-married sample)

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- Complete high school; Matriculate into college

	Years of education	Any education	5+ years	8+ years	10+ years	12+ years	15+ years
Male earnings: 90 th -50 th percentile	0.607* (0.313)	0.013 (0.026)	0.016 (0.027)	0.052 (0.035)	0.042 (0.029)	0.076*** (0.027)	0.057*** (0.021)
Male earnings: 50 th -10 th percentile	0.270 (0.590)	0.052 (0.047)	0.035 (0.049)	-0.042 (0.066)	0.009 (0.060)	0.057 (0.058)	-0.010 (0.053)
Male earnings: 50 th percentile	-0.656 (0.541)	-0.124** (0.051)	-0.104** (0.048)	-0.068 (0.047)	-0.065 (0.045)	-0.041 (0.057)	0.099* (0.056)
Caste fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (women)	627	627	627	627	627	627	627
R-squared	0.201	0.139	0.130	0.164	0.176	0.167	0.232

Human capital implications of delayed marriage (ever-married sample)

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Conclusion

Earnings inequality impacts female marital outcomes in India

- Increases in upper-half inequality delay marriage; no effect from lower-half
- Results robust to alternative hypotheses, measures, regression samples

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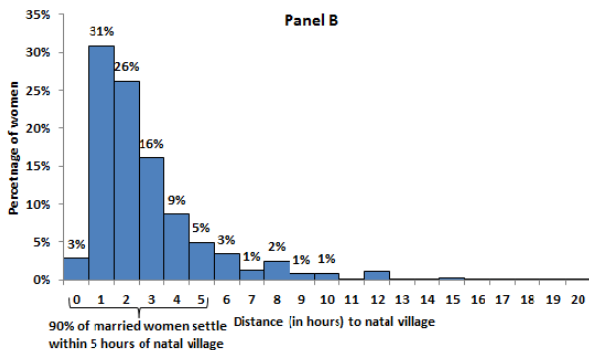
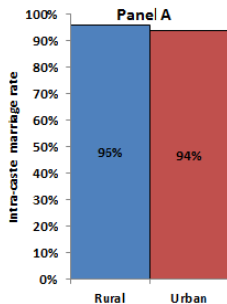
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Corresponding effect on educational attainment, at higher levels

Thank you!

Women marry within their community and settle nearby



AH1: Male marriage uncorrelated with female earnings dispersion

	Probability of marriage
Female earnings: 90 th -50 th percentile	-0.001 (0.004)
Female earnings: 50 th -10 th percentile	-0.004 (0.008)
Female earnings: 50 th percentile	0.020 (0.012)
Age of man (years)	0.047*** (0.000)
Community fixed effects?	Yes
State fixed effects?	Yes
N (men)	37,841
R-squared	0.546

AH2: Women in high-inequality markets are not observably different

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	Age at menarche	Height (cm)
Male earnings: 90th-50th percentile	0.035 (0.080)	1.106 (1.310)
Male earnings: 50 th -10 th percentile	0.153 (0.179)	-0.831 (3.878)
Male earnings: 50 th percentile	0.091 (0.237)	1.590 (3.706)
<hr/>		
Community fixed effects?	Yes	Yes
State fixed effects?	Yes	Yes
N (women)	646	646
R-squared	0.235	0.086

AH2: Women in high-inequality markets are not observably different

	Age at menarche	Height (cm)	Age at marriage
Male earnings: 90th-50th percentile	0.035 (0.080)	1.106 (1.310)	0.335*** (0.106)
Male earnings: 50 th -10 th percentile	0.153 (0.179)	-0.831 (3.878)	0.054 (0.289)
Male earnings: 50 th percentile	0.091 (0.237)	1.590 (3.706)	-0.489** (0.240)
Age at menarche			0.041 (0.060)
Height (cm)			0.006** (0.002)
Community fixed effects?	Yes	Yes	Yes
State fixed effects?	Yes	Yes	Yes
N (women)	646	646	646
R-squared	0.235	0.086	0.180

AH3: Men are not absent from marriage market

	Probability of marriage	Age at marriage
Male earnings: 90th-50th percentile	-0.014** (0.005)	0.339*** (0.109)
Male earnings: 50 th -10 th percentile	0.002 (0.008)	0.048 (0.296)
Male earnings: 50 th percentile	0.002 (0.011)	-0.460 (0.245)
Age of woman (years)	0.068*** (0.001)	
Male:Female ratio	0.044*** (0.011)	-0.239 (0.332)
Community fixed effects?	Yes	Yes
State fixed effects?	Yes	Yes
N (women)	25,530	644
R-squared	0.451	0.174

AH4: Male earnings not proxying for female earnings

	Probability of marriage	Age at marriage
Male earnings: 90th-50th percentile	-0.021*** (0.007)	0.467*** (0.139)
Male earnings: 50 th -10 th percentile	-0.012 (0.009)	0.191 (0.312)
Male earnings: 50 th percentile	0.010 (0.013)	-0.328 (0.274)
Age of woman (years)	0.068*** (0.001)	
Female earnings: 90 th -50 th percentile	0.012** (0.006)	-0.283 (0.182)
Female earnings: 50 th -10 th percentile	-0.006 (0.010)	0.199 (0.321)
Female earnings: 50 th percentile	0.017 (0.014)	-0.581 (0.527)
Community fixed effects?	Yes	Yes
State fixed effects?	Yes	Yes
N (women)	25,550	646
R-squared	0.451	0.179

AH5: Wedding expenditures are not prohibitive

	Probability of marriage	Age at marriage
Male earnings: 90th-50th percentile	-0.013** (0.006)	0.386*** (0.129)
Male earnings: 50 th -10 th percentile	-0.005 (0.009)	0.066 (0.281)
Male earnings: 50 th percentile	0.011 (0.013)	-0.506** (0.230)
Age of woman (years)	0.068*** (0.001)	
Wedding expenditure	-0.003 (0.002)	-0.041 (0.076)
Community fixed effects?	Yes	Yes
State fixed effects?	Yes	Yes
N (women)	25,550	646
R-squared	0.451	0.175

Women with no education still delay marriage

Channel: Income inequality → education

	Age at marriage	
	(1)	(2)
Male earnings: 90th-50th percentile	0.311*** (0.117)	0.311** (0.119)
Male earnings: 50 th -10 th percentile	-0.017 (0.283)	-0.076 (0.291)
Male earnings: 50 th percentile	-0.377 (0.231)	-0.348 (0.236)
Female no education indicator	-0.868*** (0.224)	
Female less than primary indicator		-0.934*** (0.205)
Male 90th-50th * No education	0.282 (0.239)	
Male 50 th -10 th * No education	0.097 (0.179)	
Male 90th-50th * Less than primary		0.183 (0.217)
Male 50 th -10 th * Less than primary		0.287 (0.169)
Net effect	0.593** (0.236)	0.494** (0.209)
Community fixed effects?	Yes	Yes
State fixed effects?	Yes	Yes
N (women)	627	627
R-squared	0.202	0.208

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Education outcomes unchanged for young girls

	Currently enrolled in school	Completed years of education
Male earnings: 90 th -50 th percentile	0.011 (0.012)	0.023 (0.017)
Male earnings: 50 th -10 th percentile	0.023 (0.018)	0.001 (0.039)
Male earnings: 50 th percentile	-0.045 (0.024)	-0.022 (0.054)
Age of woman (years)	0.219*** (0.003)	0.389*** (0.014)
Community fixed effects?	Yes	Yes
State fixed effects?	Yes	Yes
N (girls)	19,446	19,446
R-squared	0.552	0.571