

Paying for the Selected Son: Sex Imbalance and Marriage Payments in China

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Two Puzzles in China

- 1 In the US and Europe, marriage payments disappear with industrialization and modernization.
→ But China witnessed a rise in marriage payments since 1980s, after the market-oriented reforms and economic growth.
- 2 In other developing world, the society is characterized by one direction of marriage payment.
 - ▶ Sub-Saharan Africa - brideprice payment only;
 - ▶ South Asia - dowry only.→ China is the unique case where brideprice and dowry co-exist.

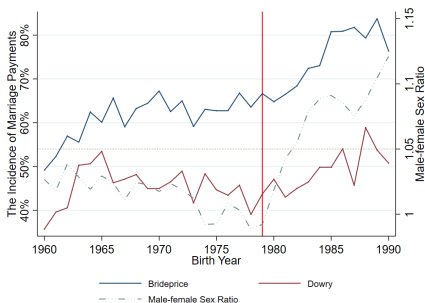
Marriage Payments

- Two directions: brideprice and dowry.
- Theoretical interpretation:
 - ① brideprice = dowry, marriage market clearance price (Becker, 1991),
 - ② dowry as pre-mortem inheritance (Zhang and Chan, 1999; Botticini and Siow, 2003).
→ dowry might carry stronger intergenerational meanings.
- Chinese background of marriage formation:
 - ① brideprice is compulsory and dowry is voluntary,
 - ② dowry is usually financed as a return proportion of brideprice (Engel, 1984).
→ brideprice has a stronger function of marriage market status goods.

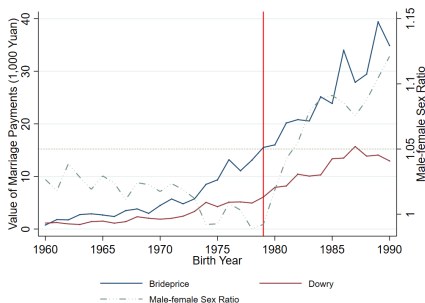
“Missing Women” in China

- Emerged since 1980s.
- Policy considerations - one child policy (1979-2016) (Ebenstein, 2010; Bulte et al., 2011; Li et al., 2011), rural land reform (1978-1986) (Almond et al., 2019), and ultra-sound technology (1974-1985) (Chen et al., 2013).
- Huge concerns on marriage distortions:
 - ▶ higher unmarried rate of males, esp. those with lower socio-economic status (Huang and Zhou, 2015),
 - ▶ marriage squeeze among males (Ebenstein and Sharygin, 2009) - increased crime rate (Edlund et al., 2013), entrepreneurship (Wei and Zhang, 2011a), and savings rate (Wei and Zhang, 2011b).
- Perspectives on marriage payments are neglected.
- High brideprices have caused huge financial burden in Chinese households with sons, especially in rural area.

Figure 1: Sex Imbalance and Marriage Payments: Cohort Born 1960-1990



(a) Incidence



(b) Value (CPI adjusted)

Data Source: CHARLS (2013) and census data (2000). Own calculation.

- Average value of 40,000 CNY - equivalently 6-7 folds annual individual income in rural area, and twice in urban area.

This Paper

- ① Why there is a rise in marriage payments in China? Does the surging sex imbalance contribute to that?
→ Result Preview - sex imbalance causes a rise in the incidence of brideprice payments, but has no effect on dowry.
- ② Why we observe both brideprice and dowry rising? Do they have different functions in the society?
→ Result Preview - brideprices improves male attractiveness in the marriage market; dowry has stronger intergenerational function than brideprices; dowry is positively associated with female bargaining power.

Data Sources

① CHARLS 2013

- ▶ rich information on health status, elderly care, financial well-being of the 40+ population, nationally representative;
- ▶ child-parent pairwise information, socio-economic background, marriage payment info (incidence, value, year), birth history of parent, family structure, potential indicators for preference compared to siblings;

② Census data 1990, 2000

- ▶ local (prefectural city level) male-female sex ratio in each birth year;

③ Statistic Yearbook

- ▶ province-level confounders, e.g. disposable income, economic growth, CPI;

④ Policy data from previous research

- ▶ One Child Policy (fine rates), Household Responsibility System, ultra-sound technology.

Research Question 1:

Does the surging sex imbalance contribute to the rise in marriage payments in China?

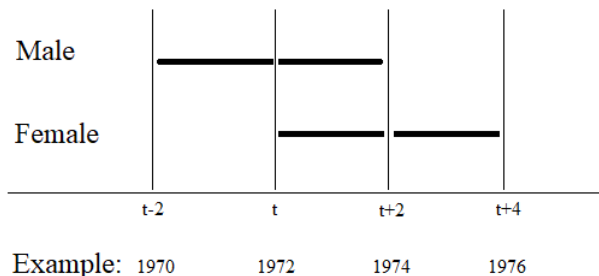
Econometric Model

$$Payment_{ihct} = \alpha + \beta Sex Ratio_{ct} + \lambda \mathbf{X}_i + \mu_h + \zeta_t + \epsilon_{ihct} \quad (1)$$

- $Sex Ratio_{ct}$: sex ratios in city c (# 126) among those born in year t (# 31);
- \mathbf{X}_i : child controls: sex, education level, birth order, birth order within the same sex (CF1), birth interval, age difference from parent, biological child dummy;
- μ_h : parent (natal family) fixed effects;
- ζ_t : birth year fixed effects;
- ϵ_{ihct} : robust standard errors clustered within cities.

Sex Ratios

I assume a 2-year age gap, and a 5-year age window. CF3



- Two candidates from 2000 census:
 - 1 Residential sex ratios - among residents in one city (current demographic structure);
 - 2 Birth sex ratios - among new-borns in one province.
... and residential sex ratios from 1990 census.

Table 1: Sex Imbalance and the Incidence of Marriage Payments

	All		Brideprice		Dowry	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A: Without Survey Weights</i>						
Residential Sex Ratio	0.098*	0.142***	0.261***	0.258***	0.010	0.009
	(0.055)	(0.051)	(0.093)	(0.091)	(0.083)	(0.081)
Observations	13927	13927	5053	5053	4798	4798
R ²	0.647	0.677	0.803	0.806	0.814	0.816
<i>Panel B: With Survey Weights</i>						
Residential Sex Ratio	0.099*	0.138***	0.262***	0.267***	0.034	0.026
	(0.058)	(0.052)	(0.091)	(0.088)	(0.087)	(0.086)
Observations	13660	13660	4947	4947	4717	4717
R ²	0.655	0.682	0.802	0.806	0.817	0.819
Child Controls		✓		✓		✓
Parent FE	✓	✓	✓	✓	✓	✓
Birth Year FE	✓	✓	✓	✓	✓	✓

Figure 1 Effect size: $0.13 \times 0.26 = 3.4$ pp, but the incidence of brideprices increased by about 10 pp.

Table 2: Sex Imbalance and the Value of Marriage Payments

	Absolute Monetary Amounts					
	All	Brideprice	Dowry	All	Brideprice	Dowry
	(1)	(2)	(3)	(4)	(5)	(6)
Residential Sex Ratio	6082.269** (2806.918)	-4438.697 (5562.292)	-343.596 (2102.235)	5336.309** (2645.614)	-7259.203 (5418.002)	-530.454 (2070.570)
In GDP Per Capita				3846.445*** (613.573)	4741.393*** (731.060)	657.484* (387.205)
Observations	6194	2580	1737	6194	2580	1737
R^2	0.744	0.818	0.813	0.749	0.825	0.813
Child Controls	✓	✓	✓	✓	✓	✓
Parent FE	✓	✓	✓	✓	✓	✓
Birth Year FE	✓	✓	✓	✓	✓	✓

BT1

Robustness Checks

- 1 Alternative measurements of sex imbalance **AT1**;
- 2 Economic development as confounders **AT2**;
- 3 Non-migrant children **AT3**;
- 4 Policies as confounders **AT4**;
- 5 Marriage year fixed effects **AT5**;
- 6 Falsification tests **AT6**.
- 7 Additionally controlling for province time trends.

→ Brideprice has a function in marriage market, but dowry not.

Heterogeneity

- 1 Socio-economic status - role of brideprice as status good in marriage market;
- 2 Family structure - family size, and sex composition of children.

Table 3: Sex Imbalance and the Incidence of Marriage Payments - The Role of Socio-economic Status

	Parent Education				Child Education			
	Brideprice		Dowry		Brideprice		Dowry	
	Low (1)	High (2)	Low (3)	High (4)	Low (5)	High (6)	Low (7)	High (8)
Residential Sex Ratio	0.352*** (0.119)	-0.044 (0.171)	0.055 (0.096)	-0.150 (0.153)	0.338*** (0.118)	0.174 (0.195)	0.030 (0.084)	-0.055 (0.193)
ln GDP p.c.	-0.031* (0.016)	-0.031 (0.022)	-0.027 (0.018)	-0.054** (0.026)	-0.021 (0.016)	-0.060* (0.036)	-0.046** (0.019)	-0.044 (0.040)
Observations	3128	1652	2981	1615	3001	976	3336	688
R^2	0.818	0.804	0.824	0.822	0.829	0.822	0.826	0.836
Child Controls	✓	✓	✓	✓	✓	✓	✓	✓
Parent FE	✓	✓	✓	✓	✓	✓	✓	✓
Birth Year FE	✓	✓	✓	✓	✓	✓	✓	✓

→ Brideprice - complementary to males ability / position in marriage market.

Table 4: Sex Imbalance and the Incidence of Marriage Payments - Family Structure

	Brideprice				Dowry			
	Family Size		Majority Daughters		Family Size		Majority Daughters	
	Small (1)	Big (2)	Yes (3)	No (4)	Small (5)	Big (6)	Yes (7)	No (8)
Residential Sex Ratio	0.259** (0.126)	0.235 (0.148)	0.542*** (0.160)	0.138 (0.112)	0.017 (0.136)	0.030 (0.089)	-0.001 (0.079)	0.392 (0.533)
ln GDP p.c.	-0.027* (0.016)	-0.022 (0.024)	-0.025 (0.025)	-0.025 (0.015)	-0.059*** (0.016)	-0.003 (0.021)	-0.040*** (0.015)	0.080 (0.064)
Observations	3507	1539	1468	3581	2974	1824	4585	204
R^2	0.816	0.790	0.834	0.798	0.816	0.822	0.816	0.859
Child Controls	✓	✓	✓	✓	✓	✓	✓	✓
Parent FE	✓	✓	✓	✓	✓	✓	✓	✓
Birth Year FE	✓	✓	✓	✓	✓	✓	✓	✓

→ Small families - financially less constraint; a majority of daughters - son more scarce and less homogeneous.

→ But sex of first-borns and last-borns seems not to matter. AT7

Research Question 2:

Why there is no decrease in dowry when brideprice increases? Do they have different functions in the Chinese society?

The Role of Marriage Payments in China

- ① Inter-generational role - future transfers, help, and care;

$$Outcome_{iht} = \alpha + \beta Payment_i + \theta Payment_i \times Son_i + \lambda \mathbf{X}_i + \mu_h + \zeta_t + \epsilon_{iht} \quad (2)$$

- ② Intra-household role - female bargaining power.

$$Outcome_{ijhp} = \alpha + \beta Dowry_i + \lambda \mathbf{X}_i + \delta \mathbf{Y}_j + \theta \mathbf{Z}_h + \mu_p + \epsilon_{ijhp} \quad (3)$$

Table 5: Marriage Payments and Inter-generational Monetary Transfers

Dependent Variable:	In Monetary Amounts + 1				Monetary Amounts	
	Received From Children		Given To Children		Net From Children	
	Last Year (1)	Regularly (2)	Last Year (3)	Regularly (4)	Last Year (5)	Regularly (6)
Paid Marriage Payment	-0.235** (0.110)	-0.131* (0.077)	0.127* (0.073)	0.026 (0.036)	340.427 (504.267)	445.960 (446.917)
Paid Marriage Payment × Son	-0.086 (0.124)	-0.029 (0.087)	0.007 (0.096)	-0.009 (0.047)	-1587.389** (755.294)	-1123.136* (605.052)
Son	-0.400*** (0.100)	-0.032 (0.066)	0.309*** (0.070)	0.081** (0.033)	61.098 (402.319)	221.443 (225.222)
Observations	10934	10917	11099	11082	10901	10880
R ²	0.681	0.776	0.649	0.608	0.401	0.219
Child Controls	✓	✓	✓	✓	✓	✓
Parent FE	✓	✓	✓	✓	✓	✓
Birth Year FE	✓	✓	✓	✓	✓	✓

Table 6: Marriage Payments and Inter-generational Help and Contact

Dependent Variable: The Incidence of Inter-generational Help and Contact						
	Essential Help	Household Chores	Manage Money	Future Help	See Monthly	Contact Monthly
	(1)	(2)	(3)	(4)	(5)	(6)
Paid Marriage Payment	0.006** (0.003)	-0.001 (0.006)	0.003 (0.003)	-0.020 (0.013)	0.006 (0.017)	0.007 (0.016)
Paid Marriage Payment \times Son	-0.009** (0.004)	-0.014 (0.009)	-0.011** (0.005)	0.017 (0.017)	-0.023 (0.023)	-0.031 (0.024)
Son	0.006* (0.003)	0.031*** (0.007)	0.011*** (0.004)	0.089*** (0.014)	0.014 (0.016)	-0.001 (0.021)
Observations	13589	13616	13616	13616	10731	6207
R^2	0.602	0.560	0.404	0.823	0.654	0.711
Child Controls	✓	✓	✓	✓	✓	✓
Parent FE	✓	✓	✓	✓	✓	✓
Birth Year FE	✓	✓	✓	✓	✓	✓

Table 7: Dowry and Female Bargaining Power - Evidence from CFPS 2014

	Time Use			Marriage Satisfaction (=1)		
	Housework Weekdays (1)	Housework Weekend (2)	Work (3)	Overall (4)	Economic Contribution (5)	Housework Contribution (6)
<i>Panel A</i>						
Incidence of Dowry	0.042 (0.045)	0.042 (0.045)	-0.028 (0.097)	-0.014 (0.012)	-0.013 (0.012)	-0.035*** (0.012)
Observations	9481	9481	6170	9464	9461	9464
R ²	0.082	0.082	0.085	0.028	0.030	0.038
<i>Panel B</i>						
Log Dowry Value	-0.035** (0.018)	-0.035** (0.018)	0.075** (0.038)	-0.002 (0.005)	0.002 (0.005)	-0.014*** (0.005)
Observations	6596	6596	4519	6580	6579	6582
R ²	0.099	0.099	0.087	0.024	0.026	0.036
Female Controls	✓	✓	✓	✓	✓	✓
Partner Controls	✓	✓	✓	✓	✓	✓
Household Controls	✓	✓	✓	✓	✓	✓
Province FE	✓	✓	✓	✓	✓	✓

Conclusion

- Male surplus in the marriage market leads to higher incidence of bride prices, but has no influence on dowry.
- The increase in value seems to be an income effect.
- Brideprices serve as a status good in the marriage market, but dowry not. Dowry has stronger intergenerational functions for old-age care and help than brideprice.
- Marriage payments have limited intergenerational incentives. Higher dowry is associated with higher female intra-household bargaining power.

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Appendix

Table A.1: Sex Imbalance and the Incidence of Marriage Payments - Alternative Measurements

	All	Brideprice	Dowry	All	Brideprice	Dowry
	(1)	(2)	(3)	(4)	(5)	(6)
Residential Sex Ratio (1990)	0.125*** (0.036)	0.208*** (0.070)	0.054 (0.063)			
Birth Sex Ratio				0.145*** (0.047)	0.247*** (0.086)	0.016 (0.074)
Observations	13927	5053	4798	13927	5053	4798
R^2	0.678	0.807	0.816	0.678	0.806	0.816
Child Controls	✓	✓	✓	✓	✓	✓
Parent FE	✓	✓	✓	✓	✓	✓
Birth Year FE	✓	✓	✓	✓	✓	✓

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Table A.2: Sex Imbalance and the Incidence of Marriage Payments - Additional Controls

	All	Brideprice	Dowry	All	Brideprice	Dowry
	(1)	(2)	(3)	(4)	(5)	(6)
Residential Sex Ratio	0.147*** (0.051)	0.272*** (0.092)	0.020 (0.080)	0.142*** (0.052)	0.261*** (0.091)	0.020 (0.081)
In GDP p.c.	-0.025** (0.009)	-0.027* (0.014)	-0.038** (0.015)			
In Disposable Income p.c.				-0.033*** (0.012)	-0.028* (0.017)	-0.049** (0.020)
Observations	13921	5049	4798	13856	5014	4773
R^2	0.678	0.807	0.816	0.678	0.807	0.816
Child Controls	✓	✓	✓	✓	✓	✓
Parent FE	✓	✓	✓	✓	✓	✓
Birth Year FE	✓	✓	✓	✓	✓	✓

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Table A.3: Sex Imbalance and the Incidence of Marriage Payments - Non-migrant Children Sample

	All	Brideprice	Dowry
	(1)	(2)	(3)
Residential Sex Ratio	0.180*** (0.055)	0.237*** (0.079)	0.074 (0.095)
Child Controls	✓	✓	✓
Parent FE	✓	✓	✓
Birth Year FE	✓	✓	✓
Observations	9318	3354	3050
R^2	0.710	0.840	0.849

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Table A.5: Sex Imbalance and the Incidence of Marriage Payments - Additional Marriage Year Fixed Effects

	All	Brideprice	Dowry	All	Brideprice	Dowry
	(1)	(2)	(3)	(4)	(5)	(6)
Residential Sex Ratio	0.145** (0.066)	0.318*** (0.112)	-0.033 (0.108)	0.131** (0.065)	0.312*** (0.110)	-0.048 (0.109)
In GDP p.c.				0.076** (0.035)	0.032 (0.056)	0.064 (0.058)
Fine in years of income				-0.001 (0.026)	0.025 (0.063)	0.021 (0.051)
Observations	10059	3602	3133	10057	3600	3133
R^2	0.682	0.812	0.812	0.682	0.812	0.812
Child Controls	✓	✓	✓	✓	✓	✓
Parent FE	✓	✓	✓	✓	✓	✓
Birth Year FE	✓	✓	✓	✓	✓	✓
Marriage Year FE	✓	✓	✓	✓	✓	✓

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Table A.6: Falsification Test

	<i>Without Survey Weights</i>			<i>With Survey Weights</i>		
	All	Bride Price	Dowry	All	Bride Price	Dowry
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A: Linked with sex ratios with a 10-year lead</i>						
Residential Sex Ratio (1970-2000)	-0.002 (0.091)	0.080 (0.104)	0.102 (0.129)	0.030 (0.091)	0.150 (0.114)	0.090 (0.134)
Observations	6681	2112	2061	6570	2062	2039
R^2	0.715	0.845	0.825	0.728	0.853	0.838
<i>Panel B: Linked with sex ratios with a 5-year lead</i>						
Residential Sex Ratio (1965-1995)	-0.112 (0.073)	-0.151 (0.097)	0.052 (0.119)	-0.119 (0.080)	-0.152 (0.126)	0.105 (0.122)
Observations	10491	3574	3518	10303	3494	3472
R^2	0.698	0.816	0.818	0.706	0.815	0.822
Child Controls	✓	✓	✓	✓	✓	✓
Parent FE	✓	✓	✓	✓	✓	✓
Birth Year FE	✓	✓	✓	✓	✓	✓

Table A.7: Sex Imbalance and the Incidence of Marriage Payments - Other Family Characteristics

	Brideprice				Dowry			
	First Birth		Last Birth		First Birth		Last Birth	
	Son (1)	Daughter (2)	Son (3)	Daughter (4)	Son (5)	Daughter (6)	Son (7)	Daughter (8)
Residential Sex Ratio	0.243** (0.110)	0.387** (0.174)	0.264** (0.101)	0.317* (0.178)	0.152 (0.208)	-0.015 (0.089)	0.205* (0.123)	-0.059 (0.105)
ln GDP p.c.	-0.022 (0.015)	-0.047* (0.026)	-0.031* (0.016)	-0.016 (0.031)	-0.064* (0.037)	-0.033** (0.016)	-0.046 (0.032)	-0.039** (0.017)
Observations	3732	1317	3867	1182	1069	3729	1596	3202
R^2	0.799	0.835	0.801	0.839	0.850	0.809	0.822	0.819
Child Controls	✓	✓	✓	✓	✓	✓	✓	✓
Parent FE	✓	✓	✓	✓	✓	✓	✓	✓
Birth Year FE	✓	✓	✓	✓	✓	✓	✓	✓

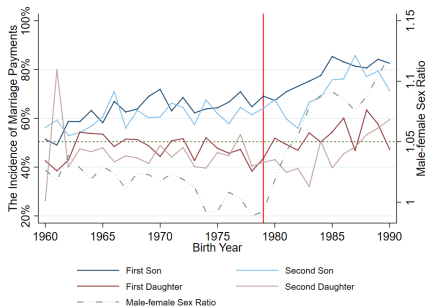
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Table B.1: Sex Imbalance and the Value of Marriage Payments

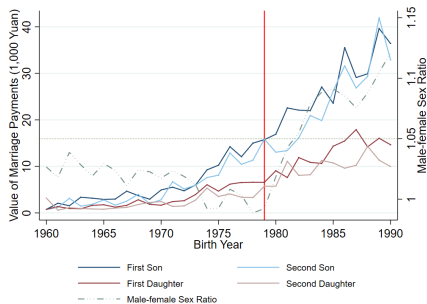
	Log Monetary Amounts			Share of Disposable Income		
	All	Brideprice	Dowry	All	Brideprice	Dowry
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A: Without Survey Weights</i>						
Residential Sex Ratio	0.056 (0.217)	0.326 (0.413)	-0.198 (0.368)	0.239 (0.630)	-2.772** (1.329)	0.568 (0.897)
Observations	6194	2580	1737	6160	2563	1724
R^2	0.785	0.857	0.868	0.601	0.684	0.704
<i>Panel B: With Survey Weights</i>						
Residential Sex Ratio	0.115 (0.214)	0.243 (0.417)	0.116 (0.409)	0.514 (0.759)	-3.514** (1.515)	1.804 (1.478)
Observations	6075	2526	1707	6041	2509	1694
R^2	0.788	0.857	0.874	0.603	0.677	0.703
Child Controls	✓	✓	✓	✓	✓	✓
Parent FE	✓	✓	✓	✓	✓	✓
Birth Year FE	✓	✓	✓	✓	✓	✓

The Role of Birth Order

Figure C.1: Sex Imbalance and Marriage Payments By Birth Order: Cohort Born 1960-1990



(a) Incidence

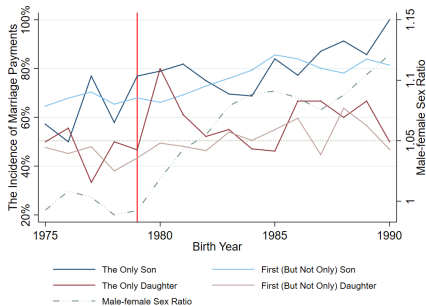


(b) Value (CPI adjusted)

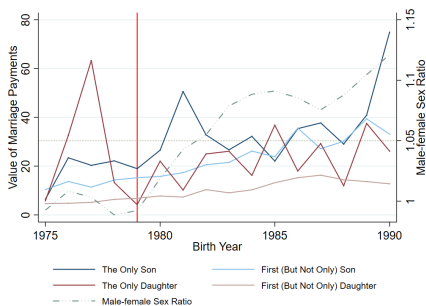
Data Source: CHARLS (2013) and census data (2000). Authors' own calculation.

The Role of Family Structure

Figure C.2: Sex Imbalance and Marriage Payments Among First Sons and Daughters: Cohort Born 1975-1990



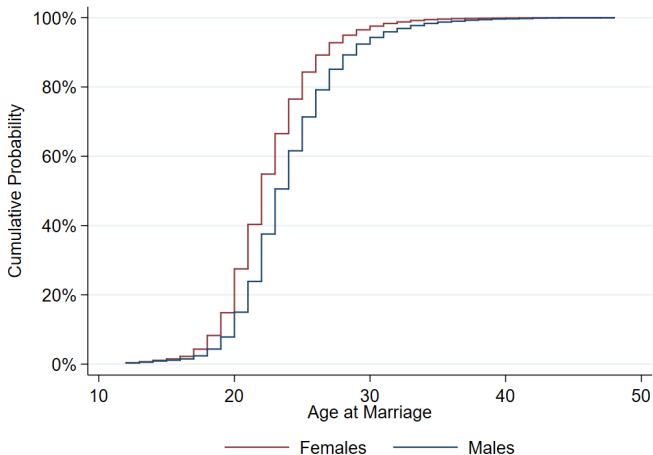
(a) Incidence



(b) Value (CPI adjusted)

Notes: Data Source: CHARLS (2013) and census data (2000). Authors' own calculation.

Figure C.3: Cumulative Probability of Age at Marriage among Males and Females



Related Literature

- ① Determinants and interpretation of marriage payments:
 - ▶ direction and magnitude of marriage payments depend on certain social and family characteristics (Anderson, 2007a),
 - ▶ brideprice and dowry are assumed to be the same in nature and vary with productivity, social heterogeneity, and socio-economic status (Becker, 1991),
 - ▶ dowry as pre-mortem inheritance, rather than a price for grooms (Zhang and Chan, 1999; Botticini and Siow, 2003).
- ② Socio-economic consequences of sex imbalance and the one child policy in China:
 - ▶ higher crime rate (Edlund et al., 2013), unmarried rate of males (Huang and Zhou, 2015), entrepreneurship and economic growth (Wei and Zhang, 2011a), savings (Wei and Zhang, 2011b);
 - ▶ child abandonment and abduction (Bao et al., 2019), man-made twins (Huang et al., 2016) and birth mis-reporting (Merli and Raftery, 2000).

Related Literature

- ③ Marriage formation and marriage market adjustments:
 - ▶ adjustments to shocks of demographic imbalance: marriage payments (Rao, 1993; Botticini and Siow, 2003), marrying up the socio-economic status (Abramitzky, Delavande and Vasconcelos, 2011), and timing of marriage entry (Anderson, 2007b; Corno, Hildebrandt and Voena, 2016);
 - ▶ higher dowry in India: girl mortality (Bhalotra, Chakravarty and Gulesci, 2020), higher female bargaining power in the new household (Menon, 2020).