Online Appendix
Wealth, Marriage, and Sex Selection

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A. TABLES AND FIGURES

Table A1—**Comparison of Demographic and Socioeconomic Characteristics**

	Men			Women		
Region	South India	Tamil Nadu	Study Area	South India	Tamil Nadu	Study Area
Panel A						
Age distribution						
married (%) <10Yrs	0.0	0.0	0.0	0.0	0.0	0.0
10-14	0.0	0.0	0.0	0.0	0.0	0.0
15-19	0.2	1.5	0.0	0.5	0.0	0.8
20-24	2.2	6.9	1.0	5.2	1.0	5.7
25-29	5.4	8.0	4.4	7.9	4.7	7.8
30-34	6.7	7.2	6.8	7.3	6.4	6.4
35-39	6.8	6.7	6.6	6.6	6.9	7.5
40-44	6.2	5.7	6.3	5.9	6.2	5.5
45-49	5.5	5.0	5.9	5.2	6.6	5.6
50-54	4.6	3.4	5.0	3.6	4.7	3.4
55-59	3.6	3.4	4.1	3.8	4.0	3.2
60-64	2.9	2.1	3.4	2.0	3.7	1.9
65-69	2.2	1.3	2.5	1.2	2.3	1.1
70-74	1.4	0.7	1.5	0.5	1.5	0.3
75-79	0.8	0.3	0.9	0.2	0.7	0.1
80-84	0.4	0.1	0.4	0.1	0.4	0.0
85>	0.2	0.1	0.2	0.1	0.2	0.0
Kolmogorov-Smirnov test of equality (p-value)	1.00	1.00	-	1.00	1.00	-
Literacy rate (%)	78.5	82.0	86.8	61.2	65.0	69.7
Labor force participation rate (%, 15-59 years)	79.8	81.1	81.0	44.9	42.6	40.0
Panel B						
Hindu(%)	91.0	92.9	93.7			
Muslim(%)	5.3	2.6	1.8			
Christian(%)	1.3	4.2	4.5			
Other(%)	2.4	0.2	0.0			
Sex Ratio	102	101	100			
Child Sex Ratio	107	107	108			
Population	97,390,696	18,679,065	474,384	95,226,008	18,550,525	475,022

Notes: South India includes rural Maharashtra, Karnataka, Andra Pradesh, and Tamil Nadu. Tamil Nadu refers to rural Tamil Nadu. % married measures the number of married individuals in each age category as a fraction of the total population, seperately for men and women. Literacy rate is defined by the Goverment of India as the percentage of those aged 7+ who can, with understanding, read and write a short, simple statement on their everyday life; SICHS Census definition is those aged 7+ with ≥ 1 year of education (figures for ≥ 3 years of education are similar, 73.8% for men and 59.5% for women). Labor force participation is defined as the proportion of 15-59 year old persons of the total 15-59 years population who are either employed or seeking or available for employment. Sex Ratio refers to the number of males per 100 females in the population. Child sex ratio is the number of males per 100 females for those aged between 0-6 years.
Sources: For Tamil Nadu and South India, the data on age distribution, literacy rate, religious composition and sex ratios are from the 2011 Census of India. The data on labor force participation is from the Ministry of Labor and Employment, Government of India, 2009-10. For Study Area, all statistics based on SICHS Census.

Table A2—**Sex Ratios**

Population	Rural South India		Rural Vellore		
Data Source	DHS 2005-06	DHS 2015-16	SICHS census 2012-14	t-test p-value	
	(1)	(2)	(3)	(4)	(5)
First-born children	105	107	106	0.344	0.765
Later-born children	111	112	110	0.805	0.880
All children	109	110	108	0.780	0.764
t-test p-value	0.146	0.188	0.045		
Observations	5,750	27,072	79,027		

Notes: Sex ratios are computed for children aged 0-6 as the number of boys per 100 girls. The t-test in Columns 1-3 reports the p-value of a two sample unpaired t-test for equality of the sex ratio for first-born and later-born children. Column 4 reports the p-value for equality of the sex ratios in DHS 2005-06 and the SICHS data and Column 5 reports the p-value for equality of the sex ratios in DHS 2015-16 and the SICHS data.

Table A3—**School Enrollment and Sex Selection**

Dependent variable	Boys higher secondary enrollment	Girls higher secondary enrollment	Girl dummy
Age range	14-17	14-17	0-6
	(1)	(2)	(3)
Mother's educations	0.0106	0.0126	-0.000422
	(0.000608)	(0.000612)	(0.000509)
Father's education	0.0112	0.0109	0.000167
	(0.000595)	(0.000600)	(0.000510)
Mean of dependent variable	0.838	0.842	0.479
Observations	27,103	25,300	91,403
Caste FE	Yes	Yes	Yes

Notes: Higher secondary enrollment indicates whether the child is enrolled in school. The lower bound for the age range is set at 14 because most children in rural Tamil Nadu study till the 8th grade (age 13). The upper bound is set at 17 because girls start to marry (and leave their parental homes) by the age of 18. Sex selection is measured by the probability that the child (aged 0-6) is a girl.
Source: SICHS census

Table A4—**Mean Forecast Sum of Square Errors**

	Linear (1)	Quadratic (2)	Cubic (3)	Quartic (4)
No interaction	0.025148	0.025163	0.025154	0.025163
Linear interaction	0.025230	0.025241	0.025239	0.025252
Linear + quadratic interaction		0.025197	0.025163	0.025180
Linear + quadratic + cubic interaction			0.025661	0.025641
All interactions				0.025384

Notes. Mean forecast error is based on k-fold cross validation, with k=10. We consider 14 specifications of the control function: linear, quadratic, cubic and quartic functions of wealth, with varying degrees of interaction between the wealth terms and the family size dummies. All specifications include caste and village fixed effects.

Table A5—**Linear Regressions Corresponding to Each Specification in Figure 3**

Dependent variable		Girl dummy	
Specification	Figure 3a (blue)	Figure 3a (red)	Figure 3b (red)
	(1)	(2)	(3)
Relative wealth	-0.108	-0.0553	-0.0574
	(0.00732)	(0.00710)	(0.00732)
Mean of dependent variable	0.499	0.479	0.497
Observations	79027	79068	79027
Caste FE	Yes	Yes	Yes
Village FE	Yes	Yes	Yes
Absolute wealth	No	No	Yes
Family size FE	No	No	Yes

Notes: This table reports the linear regression corresponding to each specification in Figure 3. Caste and village fixed effects are first partialled out, using the Robinson procedure, in all columns. The optimal control function is also partialled out in Column 3. Standard errors (in parentheses) are clustered at the caste-panchayat level. Source: SICHS census.

Table A6—**Structural Parameter Estimates**

	Mean [95% Confidence Interval]
Boys' bargaining position: β	0.730 [0.722,0.739]
Son Preference: u_0	0.515 [0.446,0.584]
Boys' cost of being single: m_b	0.362 [0.324,0.401]
Cost of sex selection: a	23.470 [22.921,24.019]

Notes: Sample restricted to children aged 0-6 in 12 largest castes. Each caste is partitioned into 10 equal sized wealth classes and the sex ratio is computed within each class. Bootstrapped confidence intervals in brackets. Source: SICHS census

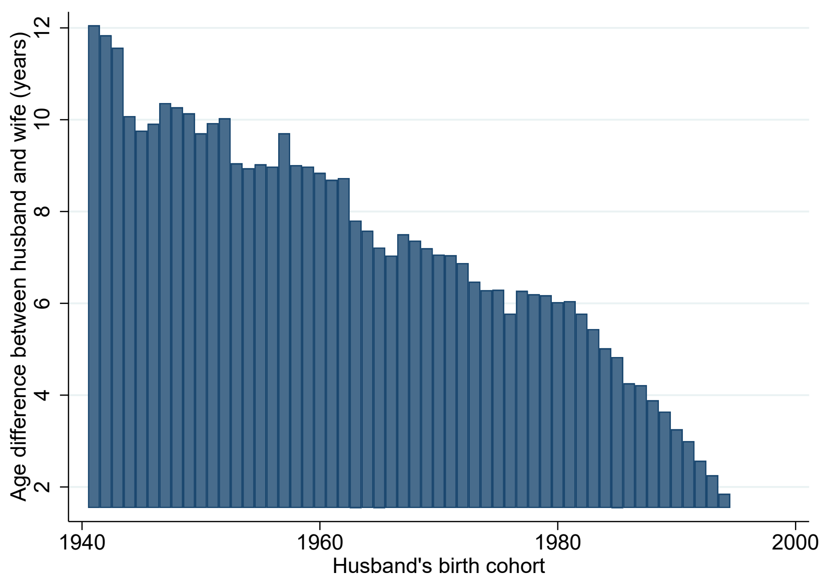


Figure A1. **Age Difference Between Husband and Wife by Birth Cohorts**

Note: This figure shows the age-gap (in years) between spouses with respect to the husband's birth cohort.

Source: SICHS census.

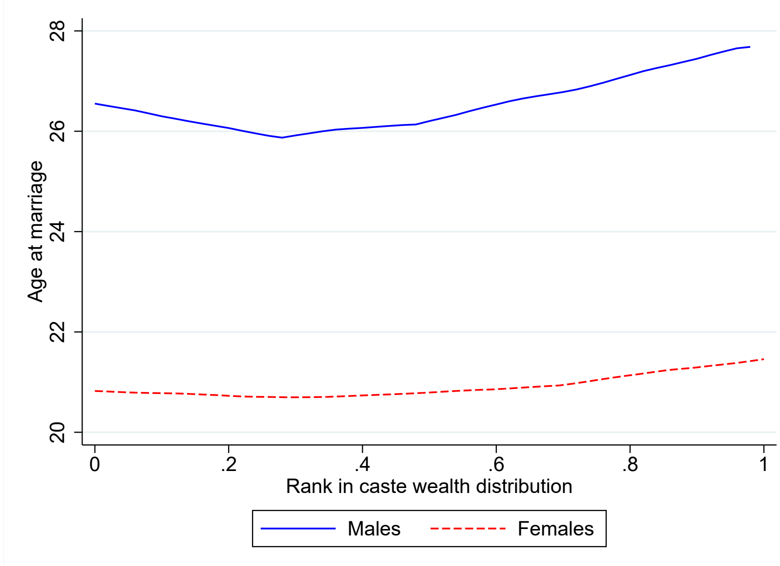


Figure A2. **Variation in Age at Marriage by Relative Wealth**

Note: This figure shows the age at marriage for men and women with respect to relative wealth.

Source: SICHS survey

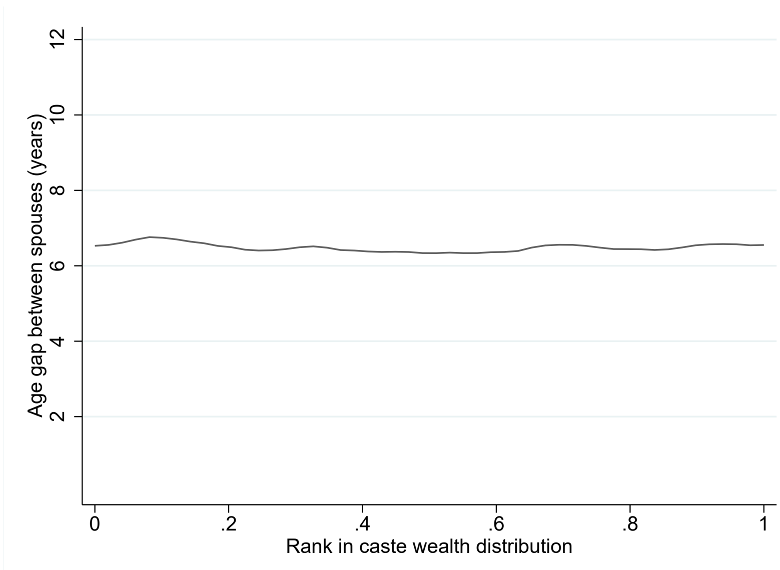


Figure A3. **Variation in Spousal Age Gap by Relative Wealth**

Note: This figure shows the age gap (in years) between spouses with respect to relative wealth.

Source: SICHS census

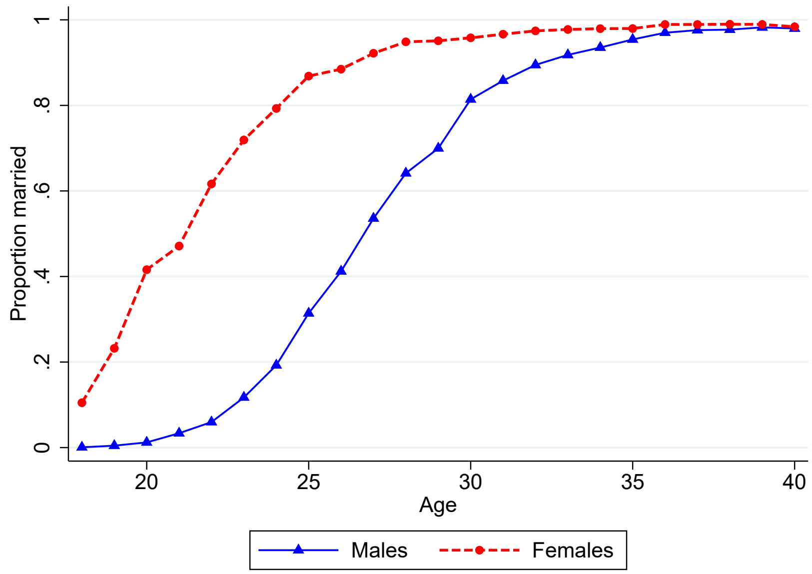
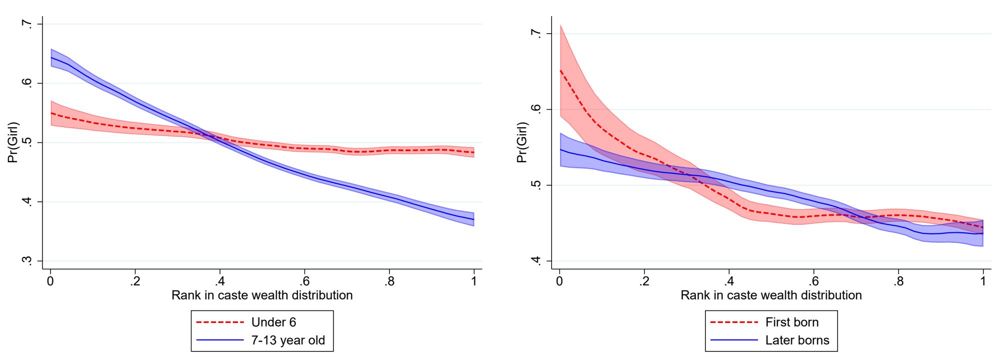


Figure A4. **Proportion Married by Age**

Note: This figure shows the proportion of men and women who are married at each age (18-40 years).

Source: SICHS census.



(a) Across age groups

(b) Across birth order

Figure A5. **Sex Selection across Groups**

Note: This figure shows the nonparametric relationship between probability that a child is a girl and relative wealth, after partialling out caste and village fixed effects. In Panel (a), children aged 0-6 years are shown in red and children aged 7-13 years are shown in blue, with the accompanying 95% confidence interval. In Panel (b), the first-born are shown in red and later born children are shown in blue.

Source: SICHS census

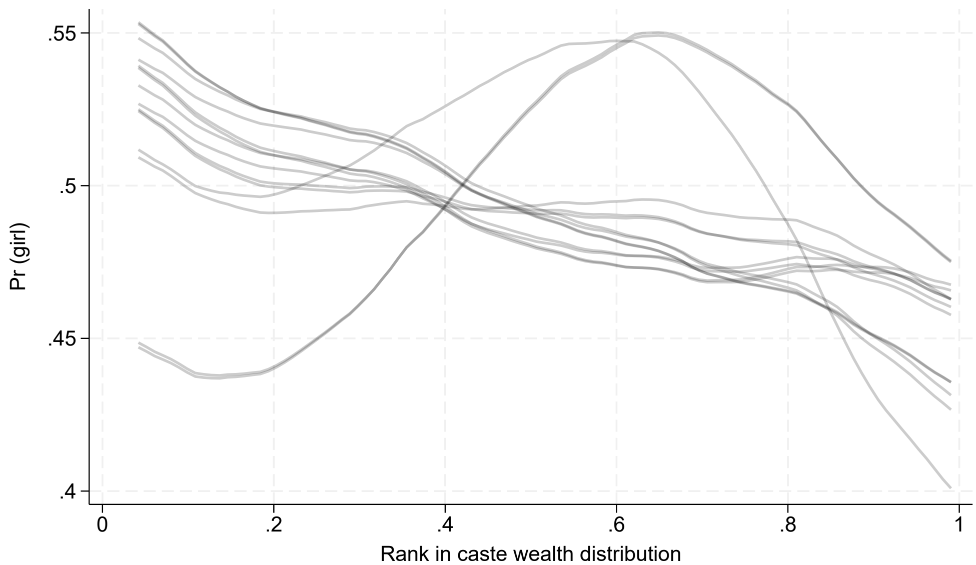
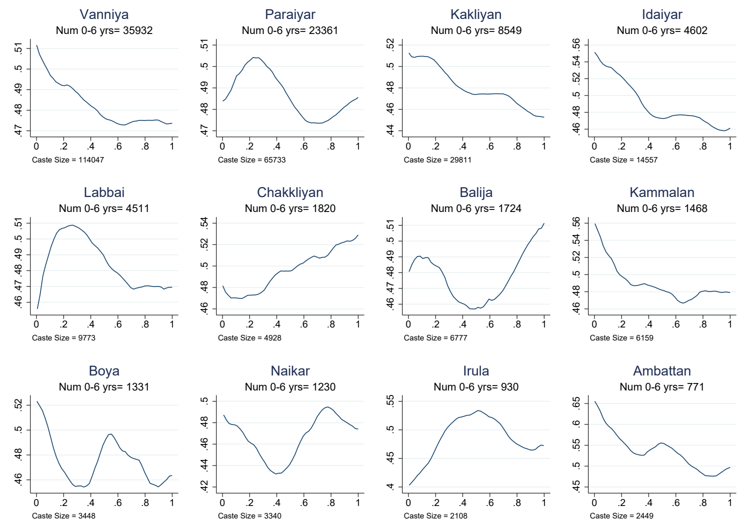
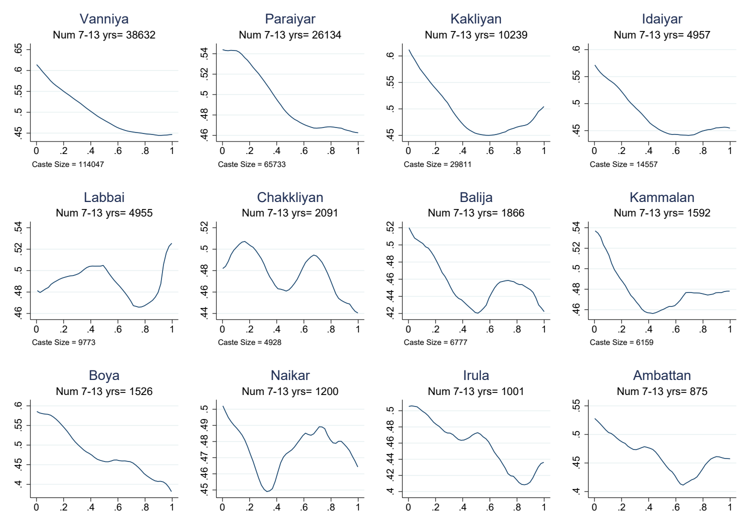


Figure A6. **Sex Selection and Relative Wealth - Control Function**

Note: This figure shows the nonparametric relationship between probability that a child is a girl and relative wealth, after partialling out caste and village fixed effects and different specifications of the control function. Each line depicts one of the 14 specifications of the control function, as explained in Table A4. The three control function specifications that include cubic interactions of predicted income with family size dummies exhibit an inverted-U relationship between the probability that a child is a girl and relative wealth. This relationship is monotonically declining for all other specifications.
Source: SICHS census



(a) Ages 0-6



(b) Ages 7-13

Figure A7. **Sex Selection and Relative Wealth (12 largest castes)**

Note: This figure shows the nonparametric relationship between the probability that the child is a girl and the household's relative wealth, by caste for children aged 0-6 years in Panel (a) and 7-13 years in Panel (b). The 12 largest castes are shown. Number of 0-6 year old and 7-13 year old children within a caste is mentioned in each individual chart. The caste size refers to the households within the caste.
Source: SICHS census

B. Omitted Proofs

B1. Proof of Proposition 1

PROOF:

Equation (6) describes the first order condition associated with the girl's family's utility maximization problem:

$$v_x + v_u u' = 0 \;\;\Rightarrow\;\; u' = -\frac{v_x}{v_u}. \tag{B1}$$

Then the surplus is supermodular and the allocation will be PAM (see Legros and Newman (2007) and Chade, Eeckhout and Smith (2017)) provided:

$$\frac{\partial^2 v(x,y,u)}{\partial x \partial y} = v_{xy} + v_{uy}u' > 0. \tag{B2}$$

From equation (5), we can write the equilibrium utility of the girl's family as:

$$v = \log\left(x + y - \frac{2e^{\frac{u-u_b}{2}}}{\beta}\right) + \frac{u-u_b}{2} + \log\left(\frac{2(1-\beta)}{\beta}\right). \tag{B3}$$

Next, to derive the condition for PAM in inequality (B2), we derive the following terms:

$$v_x = \frac{1}{x + y - \frac{2e^{\frac{u-u_b}{2}}}{\beta}} \tag{B4}$$

$$v_{xy} = -\left(x + y - \frac{2e^{\frac{u-u_b}{2}}}{\beta}\right)^{-2} \tag{B5}$$

$$v_u = \frac{-\frac{e^{\frac{u-u_b}{2}}}{\beta}}{x + y - \frac{2e^{\frac{u-u_b}{2}}}{\beta}} + \frac{1}{2} \tag{B6}$$

$$v_{uy} = -\left(x + y - \frac{2e^{\frac{u-u_b}{2}}}{\beta}\right)^{-2}\left(-\frac{e^{\frac{u-u_b}{2}}}{\beta}\right). \tag{B7}$$

Inequality (B2) is equivalent to:

$$v_{xy} > \frac{v_x}{v_u} v_{uy} \tag{B8}$$

$$-\left(x+y-\frac{2e^{\frac{u-u_b}{2}}}{\beta}\right)^{-2} > \frac{\frac{1}{x+y-\frac{2e^{\frac{u-u_b}{2}}}{\beta}}}{\frac{-\frac{e^{\frac{u-u_b}{2}}}{\beta}}{x+y-\frac{2e^{\frac{u-u_b}{2}}}{\beta}}+\frac{1}{2}}\left[-\left(x+y-\frac{2e^{\frac{u-u_b}{2}}}{\beta}\right)^{-2}\left(-\frac{e^{\frac{u-u_b}{2}}}{\beta}\right)\right] \tag{B9}$$

$$-1 > \frac{1}{\frac{-e^{\frac{u-u_b}{2}}}{\beta}+\frac{1}{2}\left(x+y-\frac{2e^{\frac{u-u_b}{2}}}{\beta}\right)}\left(\frac{e^{\frac{u-u_b}{2}}}{\beta}\right) \tag{B10}$$

$$-1 > \frac{\frac{e^{\frac{u-u_b}{2}}}{\beta}}{\frac{1}{2}\left(x+y-\frac{4e^{\frac{u-u_b}{2}}}{\beta}\right)}. \tag{B11}$$

If $x+y-\frac{4e^{\frac{u-u_b}{2}}}{\beta} < 0$ then condition (B11) implies that:

$$x+y-\frac{2e^{\frac{u-u_b}{2}}}{\beta} > 0, \tag{B12}$$

which is always satisfied since the LHS is equal to $y-d$, the consumption of the girl's parent, which is constrained to be positive.

$$x+y-\frac{4e^{\frac{u-u_b}{2}}}{\beta} < 0 \iff \frac{u-u_b}{2} > \log\frac{\beta}{4}(x+y). \tag{B13}$$

The utility from marriage must exceed the outside option of remaining single:

$$u \geq u_b + 2\log\frac{x}{2} - m_b \iff \frac{u-u_b}{2} \geq \log\frac{x}{2} - \frac{m_b}{2}. \tag{B14}$$

When $y = x$, given (B14) holds, equation (B13) is satisfied provided $\log\left(\frac{\beta}{4}(2x)\right) < \log\frac{x}{2} - \frac{m_b}{2}$ or equivalently, $2\log\beta < -m_b$. Whenever $y < x$, this sufficient condition is satisfied as well. This establishes the proof.

B2. Proof of Proposition 2

PROOF:

1. At the top of the wealth distribution, $\overline{y} = \overline{x}$. When the dowry $d = 0$,

$$u(\overline{y}) - v(\overline{y}) = u_b + 2\log\left(\frac{\beta}{2}\overline{y}\right) - \log\left((1-\beta)\overline{y}\right) - \log(\overline{y}) \tag{B15}$$

$$= u_b + 2\log\left(\frac{\beta}{2}\right) - \log(1-\beta). \tag{B16}$$

It follows that:

$$u(\overline{y}) - v(\overline{y}) > 0 \iff u_b > \log(1-\beta) - 2\log\left(\frac{\beta}{2}\right). \tag{B17}$$

The right hand side of the second inequality is decreasing in β. Thus, there exists $\underline{u_b}(\beta)$, $\underline{u_b}'(\beta) < 0$, such that $u(\overline{y}) - v(\overline{y}) > 0$ if $u_b > \underline{u}_b(\beta)$. $u_b > 0$, $\beta \in (2/3, 1)$. For $\beta = 2/3$, $\underline{u}_b = -\log(1/3)$. For $\beta \to 1$, $\underline{u}_b \to 0$.

Next, we show that $u(\overline{y}) - v(\overline{y})$ is increasing in the dowry d:

$$u(\overline{y}) - v(\overline{y}) = u_b + 2\log\left(\frac{\beta}{2}(\overline{y}+d)\right) - \log\left((1-\beta)(\overline{y}+d)\right) - \log(\overline{y}-d) \tag{B18}$$

$$\frac{\partial}{\partial d}\Big(u(\overline{y}) - v(\overline{y})\Big) = \frac{2}{\overline{y}+d} - \frac{1}{\overline{y}+d} + \frac{1}{\overline{y}-d} = \frac{1}{\overline{y}+d} + \frac{1}{\overline{y}-d} > 0. \tag{B19}$$

Assuming that the condition in Lemma 1 is satisfied, $d > 0$ and, hence, $u(\overline{y}) - v(\overline{y}) > 0$ for any value of the equilibrium dowry. There is sex selection at the top of the wealth distribution.

2. At the bottom of the wealth distribution, girls' families with wealth $\underline{y}$ match with boys' families with wealth x^*. The last boy to match is indifferent between marrying and staying single:

$$u_b + 2\log\left(\frac{\beta}{2}(x^*+d)\right) = u_b + 2\log\left(\frac{x^*}{2}\right) - m_b. \tag{B20}$$

Denote $M_b \equiv \exp(m_b/2) > 1$.

Then we can solve for the equilibrium dowry $d(x^*)$ received by the last boy to marry:

$$d(x^*) = \left(\frac{1 - M_b\beta}{M_b\beta}\right)x^* \tag{B21}$$

$M_b\beta < 1$ from Lemma 1 and, hence, $d(x^*)$ is increasing in x^*.
Next, we show that $u(\underline{y}) - v(\underline{y}) > 0$ for $x^* = \underline{x} = \underline{y}$. If the family with wealth $y = \underline{y}$ chooses to have a boy instead of a girl, he will either be unmatched or the last boy to

match. Either way, its utility will be $u(\underline{y}) = u_b + 2\log\frac{\underline{y}}{2} - m_b$.

$$u(\underline{y}) - v(\underline{y}) = u_b + 2\log\frac{\underline{y}}{2} - m_b - \log\left((1-\beta)(\underline{x}+d(\underline{x}))\right) - \log\left(\underline{y}-d(\underline{x})\right) \tag{B22}$$

$$= u_b + 2\log\left(\frac{\underline{y}}{2}\right) - m_b - \log\left(\frac{(1-\beta)\underline{y}}{M_b\beta}\right) - \log\left(\frac{(2M_b\beta-1)\underline{y}}{M_b\beta}\right) \tag{B23}$$

$$= u_b - 2\log 2 - \log\left(\frac{(1-\beta)(2M_b\beta-1)}{\beta^2}\right) \tag{B24}$$

It follows that:

$$u(\underline{y}) - v(\underline{y}) > 0 \quad \Longleftrightarrow \quad u_b > \log(1-\beta) - 2\log\left(\frac{\beta}{2}\right) + \log(2M_b\beta - 1). \tag{B25}$$

This is the same condition as at the top of the wealth distribution, except for the $\log(2M_b\beta - 1)$ term. From Lemma 1, $M_b\beta < 1$ and, hence, this term is negative. If $u(\bar{y}) - v(\bar{y}) > 0$, then $u(\underline{y}) - v(\underline{y}) > 0$ for $x^* = \underline{x}$.
Next, we show that $u(\underline{y}) - v(\underline{y})$ is decreasing in $x^\star$ for $x^* \leq \underline{x}^*$, such that $d(\underline{x}^*) = \underline{y}/2$, and increasing in $x^\star$ for $x^* > \underline{x}^*$

$$u(\underline{y}) - v(\underline{y}) = u_b + 2\log\left(\frac{\underline{y}}{2}\right) - m_b - \log\left((1-\beta)\left(x^* + d(x^*)\right)\right) - \log\left(\underline{y} - d(x^*)\right) \tag{B26}$$

Substituting the expression for $d(x^*)$ from equation (B21),

$$u(\underline{y}) - v(\underline{y}) = u_b + 2\log\left(\frac{\underline{y}}{2}\right) - m_b - \log\left(\frac{(1-\beta)x^*}{M_b\beta}\right) - \log\left(\underline{y} - \left(\frac{1-M_b\beta}{M_b\beta}\right)x^*\right). \tag{B27}$$

Therefore:

$$\frac{\partial\left(u(\underline{y}) - v(\underline{y})\right)}{\partial x^\star} = \frac{-1}{x^*} + \frac{1}{\underline{y} - \left(\frac{1-M_b\beta}{M_b\beta}\right)x^*}\left(\frac{1-M_b\beta}{M_b\beta}\right) \tag{B28}$$

$$= \frac{-\underline{y} + 2\left(\frac{1-M_b\beta}{M_b\beta}\right)x^*}{x^*\left(\underline{y} - \left(\frac{1-M_b\beta}{M_b\beta}\right)x^*\right)} \tag{B29}$$

$$= \frac{2d(x^*) - \underline{y}}{x^*\left(\underline{y} - d(x^*)\right)}. \tag{B30}$$

The term in the denominator is positive because $\underline{y} - d(x^*)$, the consumption of the girl's parent, is constrained to be positive. The term in the numerator is negative if $d(x^*) \leq \underline{y}/2$

and positive if $d(x^*) > \underline{y}/2$. To complete the proof, we thus need to establish that $u(\underline{y}) - v(\underline{y}) > 0$ at x^* such that $d(x^*) = \underline{y}/2$. From the expression for $d(x^*)$, the corresponding value of x^* is $\frac{\underline{y}}{2}\frac{M_b\beta}{1-M_b\beta}$.

(B31)
$$u(\underline{y}) - v(\underline{y}) = u_b + 2\log\left(\frac{\underline{y}}{2}\right) - m_b - \log\left((1-\beta)\left(\frac{\underline{y}}{2}\frac{M_b\beta}{1-M_b\beta} + \frac{\underline{y}}{2}\right)\right) - \log\left(\underline{y} - \frac{\underline{y}}{2}\right)$$

$$\text{(B32)} \qquad = u_b + 2\log\left(\frac{\underline{y}}{2}\right) - m_b - \log\left(\frac{1-\beta}{1-M_b\beta}\right) - 2\log\left(\frac{\underline{y}}{2}\right)$$

$$\text{(B33)} \qquad = u_b - 2\log M_b - \log\left(\frac{1-\beta}{1-M_b\beta}\right).$$

$$\text{(B34)} \qquad u(\underline{y}) - v(\underline{y}) > 0 \iff u_b > \log(1-\beta) - \log(1-M_b\beta) + 2\log M_b.$$

This condition will be satisfied for $M_b \to 1$ since $u_b > 0$ and, hence, for some $\overline{m}_b$ such that $m_b < \overline{m}_b$.

B3. Proof of Proposition 3

PROOF:

The extent of sex selection is given by $k^\star(y)$:

$$\text{(B35)} \qquad k^\star(y) = u(y) - v(\mu(y), y, u(\mu(y))).$$

We need to show that $k^\star(y)$ is increasing in y or

$$\text{(B36)} \qquad k^{\star'}(y) = u'(y) - \left(v_x\mu' + v_y + v_u u'\mu'\right) > 0.$$

From the first order condition (6), along the equilibrium matching $\mu(y)$, it must be that $v_x + v_u u' = 0$, so the derivative can be written as:

$$\text{(B37)} \qquad k^{\star'}(y) = u'(y) - \left((v_x + v_u u')\mu' + v_y\right)$$

$$\text{(B38)} \qquad = u'(y) - v_y(\mu, y, u(\mu)).$$

This is increasing provided:

$$\text{(B39)} \qquad \frac{-2}{y + \mu(y) - \frac{4e^{\frac{u(\mu(y))-u_b}{2}}}{\beta}} - \frac{1}{y + \mu(y) - \frac{2e^{\frac{u(\mu(y))-u_b}{2}}}{\beta}} > 0.$$

To derive the preceding inequality, we note that $u' = -\frac{v_x}{v_u}$ from the First-Order Condition

(B1) and that expressions for v_x and v_u can be obtained from equations (B4) and (B6). The expression for v_y is obtained by partially differentiating expression (5).

1. At the top of the wealth distribution. At $y = \overline{y}$, under positive sorting we have $\overline{y} = \mu(\overline{y}) = \overline{x}$. Then condition (B39) can be written as:

$$\text{(B40)} \qquad \frac{-2}{2\overline{y} - \frac{4e^{\frac{u(\overline{y})-u_b}{2}}}{\beta}} - \frac{1}{2\overline{y} - \frac{2e^{\frac{u(\overline{y})-u_b}{2}}}{\beta}} > 0$$

$u(\overline{y}) = u_b + 2\log\left(\frac{\beta}{2}(\overline{y}+d)\right)$. Substituting the expression for $u(\overline{y})$ in equation (B40) and rearranging, we obtain:

$$\text{(B41)} \qquad \frac{1}{d} - \frac{1}{\overline{y}-d} > 0.$$

$\overline{y} - d > 0$ to satisfy the constraint that the girl's parent's consumption must be positive and, hence, the preceding condition will be satisfied if $d < \overline{y}/2$.

2. At the bottom of the wealth distribution. At $y = \underline{y}$, $\mu(\underline{y}) = x^{\star}$. As noted above, if the family chooses to have a boy instead of a girl, he will either remain unmatched or be the last boy to match and, hence, its utility will be $u(\underline{y}) = u_b + 2\log\frac{\underline{y}}{2} - m_b$. Therefore $u'(\underline{y}) = \frac{2}{\underline{y}}$. At an income level $\underline{y}$, we can then write condition (B39), noting that the first term is $u'(y)$ from (B38) as:

$$\text{(B42)} \qquad \frac{2}{\underline{y}} - \frac{1}{x^{\star} + \underline{y} - \frac{2e^{\frac{u(x^{*})-u_b}{2}}}{\beta}} > 0.$$

Substituting the expression for $u(x^{*})$ in equation (B42) and rearranging, we obtain:

$$\text{(B43)} \qquad \frac{2}{\underline{y}} - \frac{1}{\underline{y} - d(x^{*})} > 0.$$

$\underline{y} - d(x^{*}) > 0$ to satisfy the constraint that the girl's parent's consumption must be positive and, hence, it is straightforward to verify that the preceding condition will be satisfied if $d(x^{*}) < \underline{y}/2$.

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