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# AGE OF MARRIAGE, WEATHER SHOCKS, AND THE DIRECTION OF MARRIAGE PAYMENTS

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We study how aggregate economic conditions affect the timing of marriage, and particularly child marriage, in Sub-Saharan Africa and in India. In both regions, substantial monetary or in-kind transfers occur with marriage: bride price across Sub-Saharan Africa and dowry in India. In a simple equilibrium model of the marriage market in which parents choose when their children marry, income shocks affect the age of marriage because marriage payments are a source of consumption smoothing, particularly for a woman's family. As predicted by our model, we show that droughts, which reduce annual crop yields by 10 to 15% and aggregate income by 4 to 5%, have opposite effects on the marriage behavior of a sample of 400,000 women in the two regions: in Sub-Saharan Africa they increase the annual hazard into child marriage by 3%, while in India droughts reduce such a hazard by 4%. Changes in the age of marriage due to droughts are associated with changes in fertility, especially in Sub-Saharan Africa, and with declines in observed marriage payments. Our results indicate that the age of marriage responds to short-term changes in aggregate economic conditions and that marriage payments determine the sign of this response. This suggests that, in order to design successful policies to combat child marriage and improve investments in daughters' human capital, it is crucial to understand the economic role of marriage market institutions.

KEYWORDS: Marriage market, income shocks, informal insurance, Africa, India, dowry, bride price, external validity.

**Research Interest**

How do aggregate economic conditions affect the timing of marriage, and particularly child marriage, across sub-Saharan Africa and in India?

**Keywords**

Marriage market, Income shocks, Informal insurance, Africa, India, Dowry, Bride price, External validity.

# Child Marriage

- Child marriage: defined as marriage before the age of 18
- It is a widespread and dramatic phenomenon among women in the developing world that has been linked to poor educational, socioeconomic, and health outcomes for both women and their children.
- Corno et al. (2020) study two regions of the world, Sub-Saharan Africa and India, where, despite improvements in female educational and economic opportunities, a large number of women continue to marry at an early age and where child marriage is strongly associated with poverty.

# Persistent Tradition of Marriage Payments

**Bride Price**

- The groom's family pays the bride's family.
- Practiced in many African countries

**Dowry**

- The bride's family pays the groom's family.
- Practiced in South Asia

# Main Results

**Droughts** (Exogenous (as-if Random) Economic Shocks)

- Annual crop: 10-15% ↓
- Aggregate incomes: 4-5% ↓

**Sub-Saharan Africa** (Bride Price Countries)

- 3% increase in child marriages
  - Bride side: income transfer
  - Groom side: additional labor

**India** (Dowry Country)

- Child marriage is reduced by 4%
  - Because the bride's side needs to pay.

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# Model

# Marriage Payments

- Here we study how aggregate income fluctuations affect child marriage, developing a simple equilibrium model.
- Under what assumptions do marriage payments play a crucial role?
- Whether more or fewer women marry early when aggregate income is low?

# Setup

- Consider a unit mass of HHs with a daughter and a unit mass of HHs with a son.
- $2$ periods (life stages for a woman)
  - $t = 1$ : childhood
  - $t = 2$ : adulthood
  - $\delta$ : the discount factor
- Incomplete markets
- No borrowing nor saving
- Each HH decides whether or not to have their child marry.

# Setup: Preferences

- HHs have Constant Relative Risk Aversion utility

$$u(c) = \frac{c^{1-\gamma}}{1-\gamma}$$

over consumption in each period, with $\gamma \geq 1$.

# Setup: Income

- In each period, HH income is equal to

$$y_t + \epsilon_t.$$

- Aggregate income can be high or low ($y_t \in \left\{y^H, y^L\right\}$) with equal probability in each year, depending on the weather realization
- Idiosyncratic income $\epsilon_t$ is IID according to pdf $f()$ and cdf $F()$.
- $y_t$ and $\epsilon_t$ are independent and serially uncorrelated.

# Setup: Children's Contribution to HH Consumption

- Children contribute to the HH budget constraint.
- Net contribution to HH: $w_t^s$, where $s \in \{f, m\}$.
  - A son is always productive: $w_t^m > 0$.
  - A daughter contributes more or less than she consumes: $w_t^f > 0$ or $w_t^f < 0$, respectively.
  - We require that $w_t^m > w_t^f$ (sons are more productive than daughters).
- The *historical* $w_t^f$: $\tilde{w}_t^f$
  - $\tilde{w}_2^f > 0$ in most of sub-Saharan Africa
  - $\tilde{w}_2^f < 0$ in India
- Assume that these contributions are not directly affected by aggregate shocks:

$$\frac{dw_t^s}{dy_t} = 0.$$

# Setup: Marriage

- Families obtain utility from the marriage of their son or daughter, denoted by

$$\xi^s \geq 0 \text{ for } s \in \{f, m\}.$$

- The society is virilocal (upon marriage, women move to groom's family and contribute to their budget).

# Setup: Marriage Payments

- Bride price (groom's family $\Rightarrow$ bride's family)

$$\tau_t > 0$$

- Dowry (bride's family $\Rightarrow$ groom's family)

$$\tau_t < 0$$

- These marriage payments occur in period $t$, at the same time as the marriage.

## Setup: Payoffs

- The utility in period $t = 1, 2$ of the family with child $s = f, m$:

$$U_t^s(b_t|M_{t-1})$$

- This utility depends on whether their child marries in period 1 ($b_1 = 1$) or marries in period 2 ($b_2 = 1$).
- $M_{t-1}$ is a state variable that takes value 1 if the person is married at the beginning of period $t$.
- Note
  - $M_0 = 0$, because no one is married at the beginning.
  - If $M_1 = 1$, then $b_2 = 0$, because people can only marry once.

# Adulthood (Period 2)

- In adulthood, HHs are price takers.
- Given the marriage choice $b_2$, payoffs for families of children who are unmarried at the beginning of period 2 are

$$U_2^f(b_2 \mid M_1 = 0, y_2, \epsilon_{2i}, \tau_2) = u(y_2 + \epsilon_{2i} + w_2^f + b_2 \cdot (\tau_2 - w_2^f)) + b_2 \cdot \xi^f,$$
$$U_2^m(b_2 \mid M_1 = 0, y_2, \epsilon_{2i}, \tau_2) = u(y_2 + \epsilon_{2i} + w_2^m - b_2 \cdot (\tau_2 - w_2^f)) + b_2 \cdot \xi^m,$$

  while payoffs for families of children who are already married are

$$U_2^f(b_2 \mid M_1 = 1, y_2, \epsilon_{2i}) = u(y_2 + \epsilon_{2i}) + \xi^f,$$
$$U_2^m(b_2 \mid M_1 = 1, y_2, \epsilon_{2i}) = u(y_2 + \epsilon_{2i} + w_2^m + w_2^f) + \xi^m.$$

- When total income is sufficiently low, a payment $\tau_2$ may be required for a HH to consent to marriage.
- The direction of the marriage payment may be due to the historical sign of a woman's contribution $\tilde{w}^f$ (Boserup et al., 2013).
- $\tilde{w}_2^f > 0$ (historically productive)
  $\Rightarrow$ A bride price payment $\tau_2 > 0$ would be needed to persuade a woman's parents to let their daughter marry.
- $\tilde{w}_2^f > 0$ (historically costly)
  $\Rightarrow$ A dowry payment $\tau_2 < 0$ would be required to persuade a man's family to accept a bride into their HH.

- Recall that HHs are price-takers.
- For a given transfer $\tau_2$, HHs will allow their child to marry if

$$U_2^s(b_2 = 1 \mid M_1 = 0, y_2, \epsilon_2, \tau_2) \geq U_2^s(b_2 = 0 \mid M_1 = 0, y_2, \epsilon_2), \ s \in \{f, m\}.$$

- Any transfer that satisfies this condition for both sides of the marriage market $s = \{f, m\}$ can be an equilibrium marriage payment $\tau_2^*$.

**Proposition 1**

*There exists a non-empty interval $[\underline{\tau}_2, \bar{\tau}_2]$ such that, with marriage transfer $\tau_2^*$, everyone who is single at the beginning of the second period marries. When the gains from marriage $\xi^s$ are sufficiently large, such an interval includes values of $\tau_2^*$ such that sign$(\tau_2^*)$ = sign$(\tilde{w}_2^f)$ irrespective of present-day $w_f$, as long as consumption is strictly positive.*

- Proposition 1 shows that whether in adulthood bride price ($\tau_2^* > 0$) or dowry ($\tau_2^* < 0$) prevails can be due to culture, which is intended as a way of selecting among multiple equilibria (Greif, 1994).
- In particular, the historical role of women in production, captured by $\tilde{w}_2^f$, determines the direction of marriage payments within $[\underline{\tau}_2, \bar{\tau}_2]$ and plays no further role in this model given women's contemporary net productivity $w_2^f$.

- In each state of nature, we denote each party's payoff as

$$V_2^s\left(M_1, y_2, \epsilon_2, \tau_2^*\right).$$

- The expected value of being unmarried at the start of period $2$, given income uncertainty and for a fixed transfer $\tau_2^*$, is defined as

$$\mathbb{E}[V_2^s(M_1 = 0)].$$

- The expected value of being married at the start of period $2$, given income uncertainty, is defined as

$$\mathbb{E}[V_2^s(M_1 = 1)].$$

# Childhood (Period 1)

- For given transfer $\tau_1$ paid in marriages that occur in the first period, payoffs are

$$U_1^f(b_1 \mid M_0 = 0, y_1, \epsilon_{1i}, \tau_1) = u(y_1 + \epsilon_{1i} + w_1^f + b_1(\tau_1 - w_1^f)) + \delta\mathbb{E}[V_2^f(M_1)],$$
$$U_1^m(b_1 \mid M_0 = 0, y_1, \epsilon_{1i}, \tau_1) = u(y_1 + \epsilon_{1i} + w_1^m - b_1(\tau_1 - w_1^f)) + \delta\mathbb{E}[V_2^m(M_1)].$$

- A woman or a man will want to get married in the first period if and only if

$$U_1^s(b_1 = 1 \mid M_0 = 0, y_1, \epsilon_1, \tau_1) > U_1^s(b_1 = 0 \mid M_0 = 0, y_1, \epsilon_1),\ s \in \{f, m\}.$$

- Implication 1: For any marriage to occur in childhood, the bride price payment needs to be larger than the woman's contribution to her parents' budget ($\tau_1 \geq w_1^f$).
- Implication 2: For any marriage to occur in childhood, a dowry needs to be larger than a woman's cost to her in-laws' budget ($\tau_1 \leq w_1^f$).

- Given these constraints, a threshold rule on each HH's idiosyncratic temporary income will determine the fraction of people willing to marry given aggregate income $y_1$ and marriage payment $\tau_1$.

**Proposition 2**

*There exist two thresholds of idiosyncratic temporary income, $\epsilon_f^*(\tau_1, y_1)$ and $\epsilon_m^*(\tau_1, y_1)$, which determine the marriage decision in the first period. With bride price, all women with $\epsilon_{1i} \leq \epsilon_f^*(\tau_1, y_1)$ and all men with $\epsilon_{1i} \geq \epsilon_m^*(\tau_1, y_1)$ will want to marry in the first period. With a dowry, all women with $\epsilon_{1i} \geq \epsilon_f^*(\tau_1, y_1)$ and all men with $\epsilon_{1i} \leq \epsilon_m^*(\tau_1, y_1)$ will want to marry in the first period.*

- Intuitively, under concavity, it is the poorer HHs that want to receive the marriage market transfer and the richest ones that want to pay it.

# Demand and Supply Functions

- The cumulative density associated with the thresholds determines the supply and demand functions for brides.
- Consider cases in which the support of $F()$ includes the thresholds $\epsilon_s^*,\ s \in \{f, m\}$ given the relevant values of $\tau_1$ in equilibrium and $y_1$, in which the rate of child marriage is between $0$ and $1$.

**Proposition 3**

*When bride price prevails, the supply of brides $S(\tau_1, y_1)$ is decreasing in aggregate income $y_1$ and the demand for brides $D(\tau_1, y_1)$ is increasing in aggregate income $y_1$. When dowry prevails, the supply of brides $S(\tau_1, y_1)$ is increasing in aggregate income $y_1$ and the demand for brides $D(\tau_1, y_1)$ is decreasing in aggregate income $y_1$.*

# Equilibrium in the Marriage Market

- The equilibrium marriage payment is the one that solves $D(\tau_1^*, y_1) = S(\tau_1^*, y_1)$, whose price determines the equilibrium quantity of child marriage $Q_1^*(y_1)$.

**Proposition 4**

*When bride price prevails and $w^m$ is sufficiently large, lower aggregate income $y_1$ increases child marriage in equilibrium:*

$$\frac{dQ_1^*(y_1)}{dy_1} < 0.$$

*When dowry prevails and $w^m$ is sufficiently large, lower aggregate income $y_1$ decreases child marriage in equilibrium:*

$$\frac{dQ_1^*(y_1)}{dy_1} > 0.$$

- A sufficient condition for Proposition 4 is that

$$w_1^m + \epsilon_m^* > w_1^f + \epsilon_f^* \text{ under bride price, and that}$$
$$w_1^m + \epsilon_m^* > w_1^f + \epsilon_f^* - 2(\gamma - 1)(\tau_1 - w_1^f) \text{ under dowry.}$$

  In both cases, $\epsilon_m^*$ is strictly increasing in $w_2^m$.
- Under bride price, the above sufficiency is satisfied when

$$w_2^m + w_2^f > 2\tau_2^*,$$

  which is easily accommodated by the bounds on $\tau_2^*$ defined under Proposition 1.
- Under dowry, a necessary condition for the above sufficiency to be satisfied is that

$$w_2^m + w_2^f \text{ is strictly positive,}$$

  that is, that a man's income contribution is sufficient to cover the consumption cost of his wife. Moreover, under dowry, the proof requres that

$$y_1 + \epsilon_m^* + w_1^m > -(\gamma - 1)(\tau_1 - w_1^f).$$

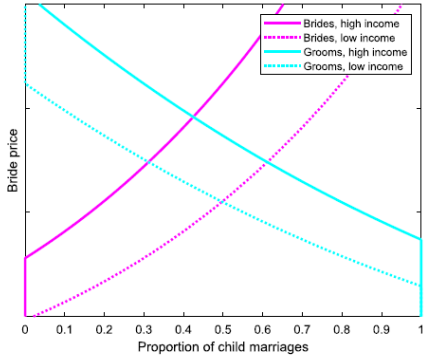
# Marriage Payments and Aggregate Income

- The model also generates a predicton on how marriage payments should vary with aggregate income.
- When both demand and supply depend on aggregate income, prices drop when aggregate income is lower.

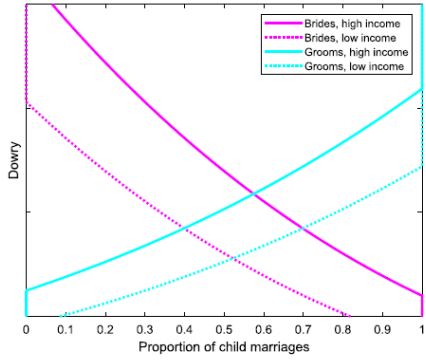
**Proposition 5**

*Marriage payments in the first period $\tau_1^*$ are lower when aggregate income $y_1$ is lower.*

# Equilibrium Outcomes




(a) Sub-Saharan Africa




(b) India

FIGURE 1.—Equilibrium outcomes. *Note*: Part (a) plots the coefficients of rainfall vingtiles in regressions with log of annual crop yield (tons per hectare) from 1961 to 2010 as the dependent variable in SSA. Part (b) plots the coefficients of rainfall vingtiles in regressions with log of annual crop yield (tons per hectare) for Indian districts from 1957 to 1987 as the dependent variable. All regression specifications include year and country or district fixed effects. The capped vertical bars show 95% confidence intervals calculated using robust standard errors clustered at the country level.

- Suppose that supply and demand for brides are equally income-elastic and equally price-elastic.
  - Aggregate income shocks reduce prices.
  - Aggregate income shocks have no effect on the quantity of child marriage.
- Suppose that supply is more income-elastic and/or less price-elastic than demand:

$$|S_y| > |D_y| \text{ or } |S_\tau| < |D_\tau|.$$

  - Under bride price, lower aggregate income $\Rightarrow$ a larger quantity of child marriage
  - Under dowry, lower aggregate income $\Rightarrow$ a lower quantity of child marriage

# Empirical Strategy

# Discrete Approximation of Duration Model (Currie and Neidell, 2005)

- Interested in:
  - The impact of weather shocks on the timing of marriage
  - The impact of weather shocks on the hazard into child marriage
- The duration of interest is the time between $t_0$ and $t_m$.
- $t_0$ is the age when a woman is first at risk of getting married.
- Set $t_0$ as 12, which is the minimum age at which non-negligible number of women in their sample report getting married for the first time.
- $t_m$ is the age when she enters her first marriage.

# Descriptive Statistics

**Table B4:** Summary statistics of the regression samples for Sub-Saharan Africa and India

| | SSA | | | India | | |
|---|---|---|---|---|---|---|
| | Obs | Mean | Std. Dev. | Obs | Mean | Std. Dev. |
| **Panel A: Unique individuals** | | | | | | |
| Age of first marriage | 306,265 | 18.59 | 4.37 | 66,466 | 17.67 | 3.62 |
| Percent married between ages 12 and 17 | 326,645 | 44.69 | 49.72 | 66,466 | 54.08 | 49.83 |
| Percent married between ages 12 and 24 | 326,645 | 84.64 | 36.06 | 66,466 | 94.72 | 22.36 |
| Age of first child | 308,445 | 19.56 | 3.91 | 63,799 | 19.56 | 3.71 |
| Percent with first child between ages 12 and 17 | 326,645 | 30.56 | 46.07 | 66,466 | 30.22 | 45.92 |
| Percent with first child between ages 12 and 24 | 326,645 | 84.27 | 36.41 | 66,466 | 86.43 | 34.24 |
| Number of children | 326,645 | 4.40 | 2.70 | 66,466 | 3.54 | 2.04 |
| Number of droughts between ages 12 and 17 | 326,645 | 1.05 | 0.99 | 66,466 | 0.92 | 0.84 |
| Number of droughts between ages 12 and 24 | 326,645 | 2.26 | 1.41 | 66,466 | 1.93 | 1.12 |
| Percent Hindu | . | . | . | 66,409 | 77.43 | 41.80 |
| **Panel B: Survival data** | | | | | | |
| Age | 2,461,176 | 16.13 | 3.28 | 433,187 | 15.55 | 2.95 |
| Percent married between ages 12 and 17 | 1,799,037 | 8.76 | 28.27 | 329,586 | 10.91 | 31.17 |
| Percent married between ages 12 and 24 | 2,461,176 | 11.34 | 31.71 | 433,187 | 14.53 | 35.24 |
| Percent with first child between ages 12 and 17 | 1,931,808 | 5.56 | 22.92 | 374,059 | 5.37 | 22.54 |
| Percent with first child between ages 12 and 24 | 2,754,577 | 9.75 | 29.67 | 560,616 | 10.25 | 30.33 |
| Percent drought | 2,461,176 | 16.12 | 36.77 | 433,187 | 15.26 | 35.96 |
| Percent Hindu | . | . | . | 432,801 | 75.03 | 43.29 |

**Note:** Table shows summary statistics for the main Sub-Saharan Africa and India regression samples, consisting of women aged 25 or older at the time of interview. Summary statistics for Sub-Saharan Africa are weighted by the population-adjusted survey sampling weights.

# Baseline Specification

$$M_{i,g,k,t} = X_{g,k,t}\beta + \alpha_t + \omega_g + \gamma_k + \epsilon_{i,g,k,t}. \quad (1)$$

- $M_{i,g,k,t}$ : a binary variable coded as 1 in the year the woman gets married
- $X_{g,k,t}$ : a time-varying measure of weather conditions in location $g$ during the year in which the woman born in year $k$ is age $t$. A dummy indicator for a drought occuring in a given year is included in $X_{g,k,t}$.
- $\beta$ : the main coefficient of interest, which measures the effect of rainfall shocks on the probability of marriage
- $\alpha_t$ : a vector of age fixed effects
- $\omega_g$ : location-specific fixed effects
- $\gamma_k$ : year-of-birth fixed effects
- $\epsilon_{i,g,k,t}$ : clustered at the grid-cell (for Sub-Saharan Africa) or district (for India) level $g$

# Additional Specifications

- The key identification assumption in the above specification is that, within a given location and year-of-birth, the weather shocks included in $X_{g,k,t}$ are orthogonal to potential confounders.
- The exogeneity of rainfall shocks is particularly important in their setting because there are many unobservables for which they cannot control.
- Most importantly, they lack data on parental wealth or poverty status around the time of a woman's marriage, on the educational background of her parents, and on the numbers and ages of her siblings, all of which will affect the marital timing decisions (Vogl, 2013).
- To control for cohort-specific changes in marriage behavior at the country (Sub-Saharan Africa) or state (India) level, such as a change in the legal age at marriage, they include additional specification that controls for country or state fixed effects interacted with ten-year birth cohort fixed effects.

# Main Results

# Marriage Timing

## Sub-Saharan Africa (Bride Price Countries)

- Women who experience a drought between ages 12 and 24 are 0.37pp more likely to get married in the same year.
- The average annual marriage hazard for this age group is equal to 0.113. Thus, the effect corresponds approximately to a $3.3\%$ increase.

## India (Dowry Country)

- Women who experience a drought between ages 12 and 24 are 0.41pp less likely to get married in the same year.
- The average annual marriage hazard for this age group is equal to 0.145. Thus, the effect corresponds approximately to a $2.8\%$ decline.

TABLE I

EFFECT OF DROUGHTS ON THE TIMING OF MARRIAGE[a]

| | SSA | | | India | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Drought | 0.0037 | 0.0037 | 0.0032 | −0.0041 | −0.0044 |
| | (0.0012) | (0.0012) | (0.0011) | (0.0016) | (0.0017) |
| Birth Year FE | Yes | Yes | Yes | Yes | Yes |
| Age FE | Yes | Yes | Yes | Yes | Yes |
| Country FE | No | Yes | Yes | No | No |
| Country FE × Cohort FE | No | No | Yes | No | No |
| State FE × Cohort FE | No | No | No | No | Yes |
| $N$ | 2,461,176 | 2,461,176 | 2,461,176 | 433,187 | 433,187 |
| Adjusted $R^2$ | 0.062 | 0.062 | 0.062 | 0.091 | 0.091 |

[a]Table shows OLS regressions for the Sub-Saharan Africa (SSA) and India full regression samples: women aged 25 or older at the time of interview. Observations are at the level of person × age (from 12 to 24 or age of first marriage). The dependent variable is a binary variable for marriage, coded to 1 if the woman married at the age corresponding to the observation. Standard errors (in parentheses) are clustered at the grid cell level (SSA) or district level (India). A drought is defined as an annual rainfall realization below the 15th percentile of the local rainfall distribution. All regression specifications include grid cell (SSA) or district (India) fixed effects. Regressions for SSA are weighted using country population-adjusted survey sampling weights.

# Child Marriage

## Sub-Saharan Africa (Bride Price Countries)

- Droughts increase the probability of child marriage.
- Girls who experience a drought between ages 12 and 17 are 0.26pp more likely to get married in the same year.
- The average annual marriage hazard for this age group is equal to 0.088. Thus, the effect corresponds to a $3\%$ increase.

## India (Dowry Country)

- Droughts decrease the probability of child marriage.
- Girls who experience a drought between ages 12 and 17 are 0.46pp less likely to get married in the same year.
- The average annual marriage hazard for this age group is equal to 0.109. Thus, the effect corresponds to a $4.2\%$ decline.

TABLE II

EFFECT OF DROUGHTS ON CHILD MARRIAGE[a]

| | SSA | | | India | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Drought | 0.0026 | 0.0026 | 0.0020 | −0.0046 | −0.0047 |
| | (0.0012) | (0.0012) | (0.0012) | (0.0016) | (0.0017) |
| Birth Year FE | Yes | Yes | Yes | Yes | Yes |
| Age FE | Yes | Yes | Yes | Yes | Yes |
| Country FE | No | Yes | Yes | No | No |
| Country FE × Cohort FE | No | No | Yes | No | No |
| State FE × Cohort FE | No | No | No | No | Yes |
| $N$ | 1,799,037 | 1,799,037 | 1,799,037 | 329,586 | 329,586 |
| Adjusted $R^2$ | 0.071 | 0.072 | 0.072 | 0.082 | 0.082 |

[a]Table shows OLS regressions for the Sub-Saharan Africa (SSA) and India full regression samples: women aged 25 or older at the time of interview. Observations are at the level of person × age (from 12 to 17 or age of first marriage, whichever is earlier). The dependent variable is a binary variable for marriage, coded to 1 if the woman married at the age corresponding to the observation. Standard errors (in parentheses) are clustered at the grid cell level (SSA) or district level (India). A drought is defined as an annual rainfall realization below the 15th percentile of the local rainfall distribution. All regression specifications include grid cell (SSA) or district (India) fixed effects. Regressions for SSA are weighted using country population-adjusted survey sampling weights.

# Proposition 4 (re)

**Proposition 4**

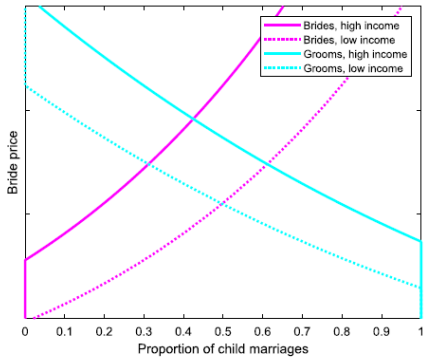
*When bride price prevails and $w^m$ is sufficiently large, lower aggregate income $y_1$ increases child marriage in equilibrium:*

$$\frac{dQ_1^*(y_1)}{dy_1} < 0.$$

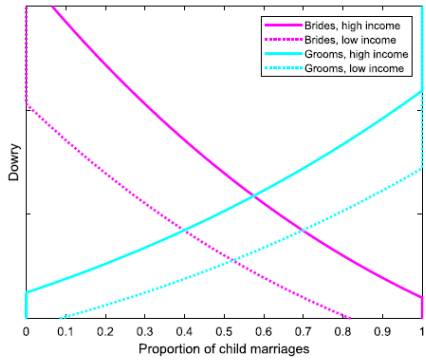
*When dowry prevails and $w^m$ is sufficiently large, lower aggregate income $y_1$ decreases child marriage in equilibrium:*

$$\frac{dQ_1^*(y_1)}{dy_1} > 0.$$

# Equilibrium Outcomes (re)




(a) Sub-Saharan Africa




(b) India

FIGURE 1.—Equilibrium outcomes. *Note*: Part (a) plots the coefficients of rainfall vingtiles in regressions with log of annual crop yield (tons per hectare) from 1961 to 2010 as the dependent variable in SSA. Part (b) plots the coefficients of rainfall vingtiles in regressions with log of annual crop yield (tons per hectare) for Indian districts from 1957 to 1987 as the dependent variable. All regression specifications include year and country or district fixed effects. The capped vertical bars show 95% confidence intervals calculated using robust standard errors clustered at the country level.

# Conclusions

# Conclusions

- In developing countries where marriage payments are customary, the age of marriage responds to short-term changes in aggregate economic conditions in a way that is consistent with simple economic theory.
- This suggests that there is a potential for economic policy to influence marriage markets, however, in complex ways that interact with culture.

# Cash Transfer and Child Marriage

- Consider policy evaluations testing the role of cash or in-kind transfers to reduce child marriage.
- Transfers targeting adolescent girls and their families could have a different effect on marriage and teenage pregnancy depending on the traditional mode of marriage payments in place in different countries and ethnic groups.
  - Transfer programs in sub-Saharan Africa may decrease child marriages.
  - They may have an opposite effect in countries where dowry payments are customary.
- Baird, McIntosh, and Ozler (2011)
  - Unconditional cash transfers reduce child marriage and teenage childbearing in Malawi.
  - However, there is no rigorous evidence of how unconditional cash transfers can affect early marriage in India.

# Dowry and Conditional Cash Transfer

- In contexts where dowry is prevalent, conditional cash transfers may be more effective.
  - Sinha and Yoong (2009): the Apni Beti Apni Dhan program (in Haryana, India)
  - Buchmann, Field, Glennerster, Nazneen, Pimkina, and Sen (2017, unpublished): incentive programs conditional on remaining unmarried until the age of 18 (in Bangladesh)

# On Policy Making

- Designing successful policies to reduce child marriage is a goal that has received increasing attention because of its potentially large impact on human capital accumulation and economic development (Wodon et al., 2017), which requires understanding the economic role of culture and institutions.
- Corno et al. (2020) point to the importance of culture and institutions in influencing the external validity of natural experiments and to the value of replicating empirical and experimental analyses in different contexts, to improve our understanding of the economic mechanisms behind empirical results.