Is Marriage a White Institution? Understanding the Racial Marriage Divide

Elizabeth Caucutt, Nezih Guner and Christopher Rauh

University of Western Ontario

CEMFI

University of Cambridge (UK)

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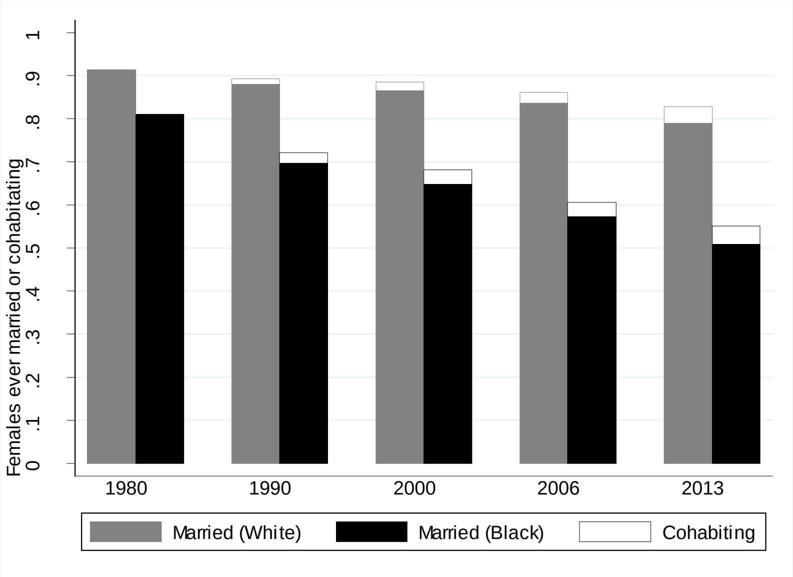
Motivation

- Marriage gap between blacks and whites
  - 77% of white women between ages 25 and 54 were ever-married in 2013.
  - 55% of black women of the same age were ever-married.
- Differences mainly reflect entry into marriage
  - 74% of white women marry by age 30, while only 47% of black women do.
  - 22% of white marriages end in divorce in 5 years, while 27% of black marriages do.
- The marriage gap between whites and blacks was smaller in 1970.
  - 92% of white women between ages 25 and 54 were ever-married versus 87% of black women.

Fraction of Ever-Married Females (25-54)



Why do we care?

- Parental resources and family structure have important effects on children.
  - 70.7% of births among blacks are to unmarried women versus 26.6% among whites.
  - 40% of black children live with two parent versus 76.8% of white children.
  - 34% of black children live in poverty versus 14.4% of white children were.
- Importance of initial conditions – Neal and Johnson (1996),

  Cunha, Heckman, Lochner and Masterov (2006)
- Importance of family structure for differences in investment on children between black and whites families – Gayle, Golan and Soytas (2015)

Wilson Hypothesis

- Wilson (1987) argued that the decline of marriage among blacks was a result of the lack of marriageable black men due to unemployment and incarceration.
- We take a new look at the Wilson hypothesis.
- Incarceration and labor market prospects makes black men *riskier* spouses than white men.
- As a result, marriage is a risky decision for black women – Oppenheimer (1988).

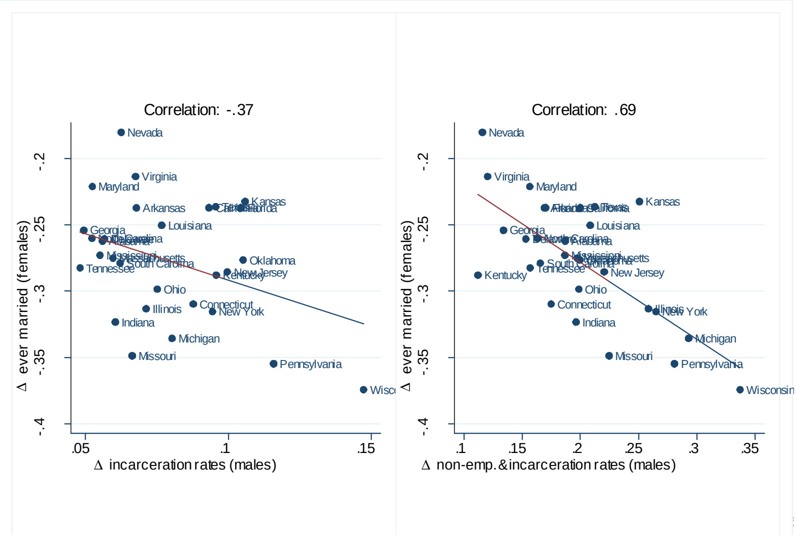
- In 1982 Reagan officially declared War on Drugs
  - 1984 Comprehensive Crime and Control Act
  - 1986 Anti Drug Abuse Act
  - Clinton's endorsement of "three strikes and you're out" in 1994.
- Prison population grew by more than 5 times from 1970 to 2000.
- 8% of black males vs 1% of white males in prison in 2000 (Western 2006).
  - 17% of non-college black men between ages 20-40 are in prison, versus 6.0% of whites.
  - 32.4 % of high-school dropout black men between ages 20-40 are in prison, versus 10.7% of whites.
  - Cumulative risk of incarceration by age 30-34: 20.5% for black men versus 2.9% for whites.

- Black men, in particular less educated black men, are much more likely to go to prison in a given year.

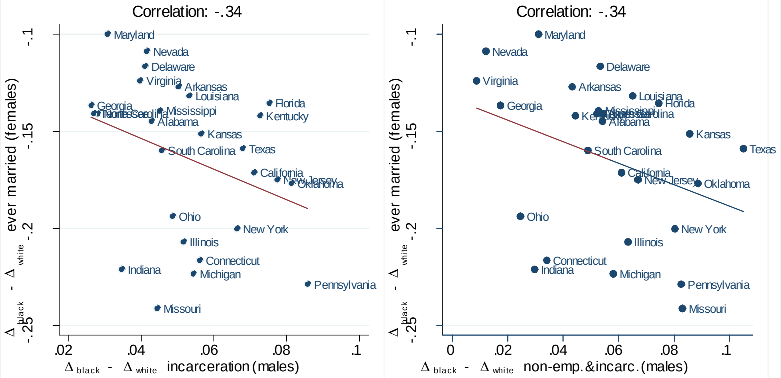
Probability of Going to Prison, Men (25-54)

Education	Black	White
$<$ HS	.085	.015
HS	.030	.007
SC	.010	.002
C	.005	.001

- Relation between black-white differences in incarceration rates and marriage rates across US states in 2006.



- Relation between black-white differences in changes in incarceration rates and marriage rates between 1980 and 2006 across US states.



- Develop an equilibrium model of marriage, divorce and labor supply.
- Incorporate transitions between employment, unemployment and prison for individuals by race, gender, and education level.
- Calibrate this model to key marriage and labor market statistics in 2006 by gender, race and education level.
- Asses the effects of employment transitions, prison transitions, wage transitions and education distributions on the black-white marriage gap.
- Simulate effects of changing incarceration policies for drug crimes on marriage rates.

Related Literature

- Equilibrium Models of Marriage:
  - Regalia and Rios-Rull (2001), Caucutt, Guner, and Knowles (2002), Fernandez and Wong (2014), Greenwood et al (2016), ...
- Black and White Marriage Differences
  - Cross state variations: Charles and Luoh (2010), Mechoulan (2011)
  - Structural: Seitz (2010), Keane and Wolpin (2010)
- Economic effects of incarceration: Neal and Rick (2014)
- Three-state (employment, unemployment and prison) labor market transitions: Burdett, Lagos and Wright (2003, 2004).

What we find

- Imposing the educational distribution of whites on blacks reduces the marriage gap by 20%.
- Imposing the wages of whites on blacks reduces the gap by 6%.
- Imposing the employment transitions of white men on black men reduced the gap by 29%.
- Imposing the prison transitions of white men on black men reduces the gap by 39%.
- Imposing the *employment and prison transitions* of white men on black men reduces the gap by 76%.

Model – Heterogeneity

- Economy of males (m) and females (f) of different races, $r = b, w$ (black, white).
- Individuals live forever, but each period face a constant probability of death, ρ.
  - Let $\beta = \rho\widetilde{\beta}$, where $\widetilde{\beta}$ is the discount factor.
- Individuals differ by permanent types (education) denoted by x (females) and z (females).
- These types map into wages $w_f(x)$ and $w_m(z)$.
- Individuals also face persistence shocks to their wages, ε_f and ε_m, each period.

Model - Labor Markets, Males

- Each period, men can be in one of three possible labor market states: employed, unemployed, or they can be in prison.
  - $\lambda \in \{e, u, p\}$
- They move between these states following an exogenous process.
- All men with an employment opportunity work, $\overline{n}_m^s$ and $\overline{n}_m^m$.
- Employed men also receive idiosyncratic wage shocks ε_m each period, which also follows an exogenous process.

- Employment transitions:

$$\Lambda(\lambda'|\lambda) = \begin{array}{c} \\ p \\ u \\ e \end{array} \begin{array}{c} \begin{array}{ccc} p & u & e \end{array} \\ \begin{bmatrix} \pi_{pp} & \pi_{pu} & \pi_{pe} \\ \pi_{up} & \pi_{uu} & \pi_{ue} \\ \pi_{ep} & \pi_{eu} & \pi_{ee} \end{bmatrix} \end{array}$$

- Wage transitions:

$$\Upsilon(\varepsilon'|\varepsilon) = \begin{array}{c} \\ \varepsilon_1 \\ \varepsilon_2 \\ \vdots \\ \varepsilon_N \end{array} \begin{array}{c} \begin{array}{cccc} \varepsilon_1 & \varepsilon_2 & \dots & \varepsilon_N \end{array} \\ \begin{bmatrix} \pi_{11} & \pi_{12} & \dots & \pi_{1N} \\ \pi_{21} & \pi_{22} & \dots & \pi_{2N} \\ \vdots & \vdots & \vdots & \vdots \\ \pi_{n1} & \pi_{N2} & \dots & \pi_{NN} \end{bmatrix} \end{array}$$

- Putting shocks to employment and wages together for males gives us:

$$
\begin{array}{c} \\ p \\ u \\ \varepsilon_1 \\ \varepsilon_2 \\ \vdots \\ \varepsilon_N \end{array}
\begin{array}{c} \begin{array}{cccccc} p & u & \varepsilon_1 & \varepsilon_2 & \dots & \varepsilon_N \end{array} \\
\left[\begin{array}{cccccc}
\pi_{pp} & \pi_{pu} & \widetilde{\mathrm{Y}}(\varepsilon_1) & \widetilde{\mathrm{Y}}(\varepsilon_2) & \dots & \widetilde{\mathrm{Y}}(\varepsilon_N) \\
\pi_{up} & \pi_{uu} & \widetilde{\mathrm{Y}}(\varepsilon_1) & \widetilde{\mathrm{Y}}(\varepsilon_2) & \dots & \widetilde{\mathrm{Y}}(\varepsilon_N) \\
\pi_{ep} & \pi_{eu} & \pi_{11} & \pi_{12} & \dots & \pi_{1N} \\
\pi_{ep} & \pi_{eu} & \pi_{21} & \pi_{22} & \dots & \pi_{2N} \\
\vdots & \vdots & \vdots & \vdots & \vdots & \vdots \\
\pi_{ep} & \pi_{eu} & \pi_{n1} & \pi_{N2} & \dots & \pi_{NN}
\end{array} \right] \end{array} .
$$

where $\widetilde{\mathrm{Y}}(\varepsilon_i)$ is draws of wage shocks when a male moves from p or u to e.

Model - Labor Markets, Females

- Each period, unemployed women face an opportunity to work, denoted by $\theta^r(x)$.
- Given this opportunity, women decide whether to work or not, $\overline{n}_f^s$ and $\overline{n}_f^m$.
- Working has a utility cost.
  - Women differ in a permanent utility benefit that they drive from staying home, $q \sim Q(q) \equiv Gamma(\alpha_q^1, \alpha_q^2)$.
- Each period, employed women face an exogenous probability of loosing their jobs, denoted by $\delta^r(x)$.
- Like males, $\lambda \in \{e, u\}$ denotes the labor market status: opportunity to work (e), unemployed (u).

Model - Prison

- Men enter into and exit from prison according to an exogenous process.
- If a man has ever been in prison, he suffers an earnings penalty.
  - Denote prison history with indicator function, P.
  - Wage penalty $\psi^r(P)$
- If a woman's husband is in prison, then she bears a utility cost, ζ.
- Single men who are in the prison do not participate in the marriage market.

- Labor earnings are taxed by τ which finances transfers to households.
- Transfers depend on household income, I.

$$T(I) = \begin{cases} \omega_0, \text{ if } I = 0 \\ \max\{0, \alpha_0 - \alpha_1 I\}, \text{ if } I > 0 \end{cases}.$$

- Transfers also depend on type of household, single (male and female) or married, via differences in ω_0 and α's.

Model - Marriages

- Marriage markets are segmented by race r.
- A man meets a woman of the same education level with probability, φ_r, and with probability, $1 - \varphi_r$, he meets a woman randomly.
- Couples draw a permanent match quality shock upon meeting, $\gamma \sim \Gamma(\gamma) \equiv N(\mu_\gamma, \sigma_\gamma)$.
- Each period, they also draw an *iid* match quality, $\phi \sim \Theta(\phi) \equiv N(\mu_\phi, \sigma_\phi)$.

- When two people match, each party sees last period's employment/prison status λ and labor market shocks ε, man's prison history P, constant female home benefit q, and today's match quality shocks (γ, ϕ).
- Given this information, they decide whether or not to get married or stay single.
- After marriage decisions, employment/prison status λ and labor market shocks ε are updated, and couple decides whether the wife should work or not.
- Similarly a married couple observes λ, ε, P, q and (γ, ϕ), and decides whether to stay married or not.
- If a couple divorces, each party pays a one-time utility cost, η, and remains single for a period.
- Married couples have to finance a fixed consumption commitment $\underline{c}$ each period.

Model - Marriages

- Married couples have to finance a fixed consumption commitment $\underline{c}$ each period – Santos and Weiss (2015).
- Captures commitments, such as larger housing, children etc., that comes with a marriage.
- Interacts with prison and employment risk.

$$V_f^s(\underbrace{x, \varepsilon, \lambda, q}_{\text{state}}) = \max_{n_f^s}\{\frac{c^{1-\sigma}}{1-\sigma} + q\chi(n_f^s = 0) + \beta \underbrace{\widetilde{V}_f^s(x, \varepsilon, \lambda, q)}_{\text{start of next period}}\},$$

subject to

$$c = \begin{cases} \omega_f(x) n_f^s \varepsilon(1-\tau) \\ + T_f^s(\omega_f(x) n_f^s \varepsilon), \text{ if } \lambda = e \\ \\ T_f^s(0), \text{ if } \lambda = u \end{cases} \text{ and } n_f^s = \begin{cases} \in \{0, \overline{n}_f^s\} \text{ if } \lambda = e \\ \\ 0 \text{ if } \lambda = u \end{cases},$$

- Individuals are not allowed to save.

$$V_m^s(\underbrace{z, \varepsilon, \lambda, P}_{\text{state}}) = \frac{c^{1-\sigma}}{1-\sigma} + \beta \underbrace{\widetilde{V}_m^s(z, \varepsilon, \lambda, P')}_{\text{start of next period}},$$

subject to

$$c = \begin{cases} \omega_m(z)\overline{n}_m^s \psi(P)\varepsilon(1-\tau) + T_m^s(\omega_m(z)\overline{n}_m^s \psi(P)) \text{ if } \lambda = e \\ T_m^s(0) \text{ if } \lambda = u \\ c_p \text{ if } \lambda = p \end{cases},$$

$$n_m^s = \begin{cases} \overline{n}_m^s \text{if } \lambda = e \\ 0 \text{ if } \lambda = u \end{cases}, \qquad P' = \begin{cases} 1 \text{ if } \lambda = p \\ P \text{ otherwise.} \end{cases}$$

- State: $(x, z, \varepsilon_f, \varepsilon_m, \lambda_f, \lambda_m, P, \gamma, \phi, q)$,
- The value of being married is determined by

$$\max_{n_f^m}[\mu(\frac{c_f^{1-\sigma}}{1-\sigma} + \chi(n_f^m = 0)q) + (1-\mu)\frac{c_m^{1-\sigma}}{1-\sigma} + \gamma + \phi]$$

$$+\mu\beta E_{\phi'}\widetilde{V}_f^m(x, z, \varepsilon_f, \varepsilon_m, \lambda_f, \lambda_m, P', \gamma, \phi', q)$$

$$+(1-\mu)\beta E_{\phi'}\widetilde{V}_m^m(x, z, \varepsilon_f, \varepsilon_m, \lambda_f, \lambda_m, P', \gamma, \phi', q),$$

- $\widetilde{V}_f^m(x, z, \varepsilon_f, \varepsilon_m, \lambda_f, \lambda_m, P, \gamma, \phi)$ be the value of being married, with an option to divorce, at the start of next period.

$$
c_f = \begin{cases}
\frac{1}{1+\kappa}\big[(\omega_f(x) n_f^m \varepsilon_f + \omega_m(z)\psi(P)\overline{n}_m \varepsilon_m)(1-\tau) + \\
T^m(\omega_f(x) n_f^m \varepsilon_f + \omega_m(z)\psi(P)\overline{n}_m \varepsilon_m) - \underline{c} \,\big] \text{ if } \lambda_f = \lambda_m = e \\
\\
\frac{1}{1+\kappa}\big[\omega_f(x) n_f^m \varepsilon_f (1-\tau) \\
+ T^m(\omega_f(x) n_f^m \varepsilon_f (1-\tau)) - \underline{c} \,\big] \text{if } \lambda_f = e, \lambda_m = u \\
\\
\frac{1}{1+\kappa}\big[w(z)\psi(P)\overline{n}_m \varepsilon_m \\
+ T^m(\omega_m(z)\psi(P)\overline{n}_m \varepsilon_m \ ) - \underline{c}\big] \text{ if } \lambda_f = u, \lambda_m = e \\
\\
\frac{1}{1+\kappa}\left[T^m(0) \ - \underline{c}\right] \text{ if } \lambda_f = \lambda_m = u \\
\\
\omega_f(x) n_f^m \varepsilon_f (1-\tau) \\
+ T^m(\omega_f(x) n_f^m \varepsilon_f (1-\tau)) - \underline{c} \text{ if } \lambda_f = e, \lambda_m = p \\
\\
T^m(0) - \underline{c} \text{ if } \lambda_f = u, \lambda_m = p
\end{cases},
$$

Continuation Values – Single Females

- $\widetilde{V}_f^s(x, \varepsilon_f, \lambda_f, q)$ – a single female entering into marriage market
- With probability φ, meets someone from the same education

$$\varphi \sum_{P,\varepsilon_m,\lambda_m,\gamma,\phi} \max\{EV_f^m(x, z, \varepsilon_f, \varepsilon_m, \lambda_f, \lambda_m, P, \gamma, \phi, q)$$

$$I_m(.),\ EV_f^s(x, \varepsilon_f, \lambda_f, q)\}\Gamma(\gamma)\Theta(\phi)\Omega(z, \varepsilon_m, \lambda_m = e, u, P|z = x)$$

$$+(1-\varphi) \sum_{P,\varepsilon_m,\lambda_m,\gamma,\phi} \max\{EV_f^m(x, z, \varepsilon_f, \varepsilon_m, \lambda_f, \lambda_m, P, \gamma, q)$$

$$I_m(.),\ EV_f^s(x, \varepsilon_f, \lambda_f, q)\}\Gamma(\gamma)\Theta(\phi)\Omega(z, \varepsilon_m, \lambda_m = e, u, P).$$

Continuation Values – Single Female

- Marriage decision are made based on expected values of being single and married
- Expected value of being single

$$EV_f^s(x, \varepsilon_f, e, q) = \delta(x) \sum_{\varepsilon_f'} \Pi_f^x(\varepsilon_f' | \varepsilon_f) V_f^s(x, \varepsilon_f', u, q)$$
$$+(1 - \delta(x)) \sum_{\varepsilon_f'} \Pi_f^x(\varepsilon_f' | \varepsilon_f) V_f^s(x, \varepsilon_f', e, q),$$

and

$$EV_f^s(x, \varepsilon_f, u, q) = \theta(x) \sum_{\varepsilon_f'} \Pi_f^x(\varepsilon_f' | \varepsilon_f) V_f^s(x, \varepsilon_f', e, q)$$
$$+(1 - \theta(x)) \sum_{\varepsilon_f'} \Pi_f^x(\varepsilon_f' | \varepsilon_f) V_f^s(x, \varepsilon_f', u, q)$$

- The value functions depend on the distribution of singles.
- The distributions of singles depend on value functions.
- Fixed point between the distribution of singles and the value functions.
- Plus the government budget constraint.

- We fit the model developed to the US data for 2006.
- We assume that the length of a period is one year and set $\widetilde{\beta} = 0.96$.
- We set $\sigma = 2$ (curvature of the utility function)
- All the targets for the estimation are calculated for individuals between ages 25 and 54, which corresponds to an operational lifespan of 30 years. We set $(1-\rho) = 1/30 = 0.033$.
- We set $\kappa = 0.7$ (economies of scale)
- We assume that there are four types (education groups): less than high school (<HS), high school (HS), some college (SC), and college and above (C).

Distribution of Population
(fractions for each race sum to 1)

Black			White		
	Female	Male		Female	Male
<HS	5.64	6.57	<HS	2.53	3.38
HS	22.67	22.84	HS	17.76	19.72
SC	14.95	10.54	SC	12.96	11.35
C	10.26	6.52	C	16.82	15.48

Wages
(normalized by mean wages)

	Blacks		Whites	
	Female	Male	Female	Male
<HS	0.496	0.561	0.510	0.682
HS	0.624	0.757	0.654	0.900
SC	0.710	0.846	0.796	0.993
C	1.062	1.183	1.200	1.679

- Based on Western (2006), the earnings penalty after prison is set to $\psi^w(P) = .642$ for whites and $\psi^b(P) = .631$ for blacks.

- The Survey of Inmates in State and Federal Correctional Facilities (SISCF) – inmates admitted in last 12 months.
- Bureau of Justice Services (BJS) - total number of admission

Probability of Going to Prison, Men (25-54)

Education	Black	White
$<$ HS	.085	.015
HS	.030	.007
SC	.010	.002
C	.005	.001

- Allows us to set $\pi_{up} = \pi_{ep}$
- From the SISCF, we calculate the average effective sentence length: about 3 years for both blacks and whites.
  - Set $\frac{1}{1-\pi_{pp}} = 3$.

- From the CPS, we compute transitions between employment and non-employment

Employment Transitions
(males)

		Black		White	
		e	u	e	u
$<$ HS	e	.850	.150	.911	.089
	u	.157	.843	.195	.805
HS	e	.897	.103	.947	.053
	u	.244	.756	.309	.691
SC	e	.918	.082	.954	.046
	u	.328	.672	.368	.632
C	e	.950	.050	.975	.025
	u	.354	.646	.478	.522

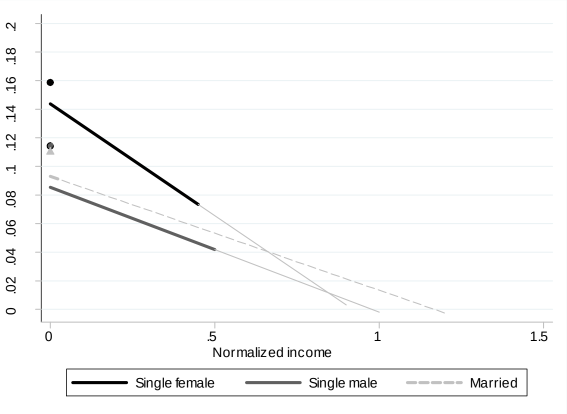
- Putting pieces together

$$\Lambda_m^{b,<HS}(\lambda'|\lambda) = \begin{array}{c} \\ p \\ u \\ e \end{array} \begin{array}{c} \begin{array}{ccc} p & u & e \end{array} \\ \left[\begin{array}{ccc} .67 & .21 & .12 \\ .18 & .69 & .13 \\ .18 & .12 & .70 \end{array}\right] \end{array}.$$

- We assume $\varepsilon \in \{0.75, 0.9, 1, 1.10, 1.25\}$
- Compute transitions from the CPS

$$\Upsilon_m^{b,<HS}(\varepsilon'|\varepsilon) = \begin{bmatrix} .365 & .282 & .200 & .094 & .059 \\ .104 & .377 & .251 & .126 & .142 \\ .042 & .170 & .420 & .231 & .137 \\ .052 & .117 & .240 & .403 & .188 \\ .043 & .148 & .174 & .113 & .522 \end{bmatrix}.$$

- Estimate using the Survey of Income and Program Participation (SIPP)
- Transfer income as fraction of household income (both normalized by the mean household income).



The remaining parameters

$$\underbrace{\eta, \underline{c}, \zeta, \varphi^{w}, \varphi^{b}}_{\text{marriage}}, \underbrace{\theta^{w}(x), \delta^{w}(x), \theta^{b}(x), \delta^{b}(x)}_{\text{labor markets}}, \underbrace{\alpha_q^1, \alpha_q^2, \mu_\gamma, \sigma_\gamma, \mu_\phi, \sigma_\phi}_{\text{heterogeneity-shocks}}, \tau$$

are chosen to match:

1. Marital status of population by race, gender, and education level.
2. Fraction of women married by ages 20, 25, 30, 35, and 40, by race.
3. Fraction of marriages that last 1, 3, 5, and 10 years by race.
4. The degree of marital sorting among whites and blacks.
5. Labor market and prison status of population by race, gender, education level and marital status.

Fraction of Agents Not-Married
model (data)

	Education	Black	White
Females	<HS	.86 (.79)	.61 (.47)
	HS	.66 (.69)	.44 (.35)
	SC	.56 (.65)	.36 (.35)
	C	.42 (.58)	.30 (.32)
Males	<HS	.97 (.75)	.63 (.52)
	HS	.66 (.62)	.46 (.42)
	SC	.49 (.53)	.36 (.38)
	C	.35 (.47)	.30 (.31)

Fraction Married by a Given Age and
Fraction Divorced by Duration of Marriage

By age	20	25	30	35	40
Black	.06 (.05)	.32 (.24)	.50 (.47)	.63 (.58)	.72 (.64)
White	.09 (.14)	.42 (.48)	.63 (.74)	.76 (.84)	.84 (.89)

Duration	1 year	3 years	5 years	10 years
Black	.89 (.92)	.73 (.81)	.63 (.73)	.47 (.51)
White	.95 (.95)	.86 (.86)	.81 (.78)	.72 (.64)

- Data: National Survey of Family Growth, 2006-2010.

	Spearman Rank Correlation
Black	.40 (.48)
White	.49 (.54)

Fraction of Population by Marriage and Employment Status, Blacks
model (data)

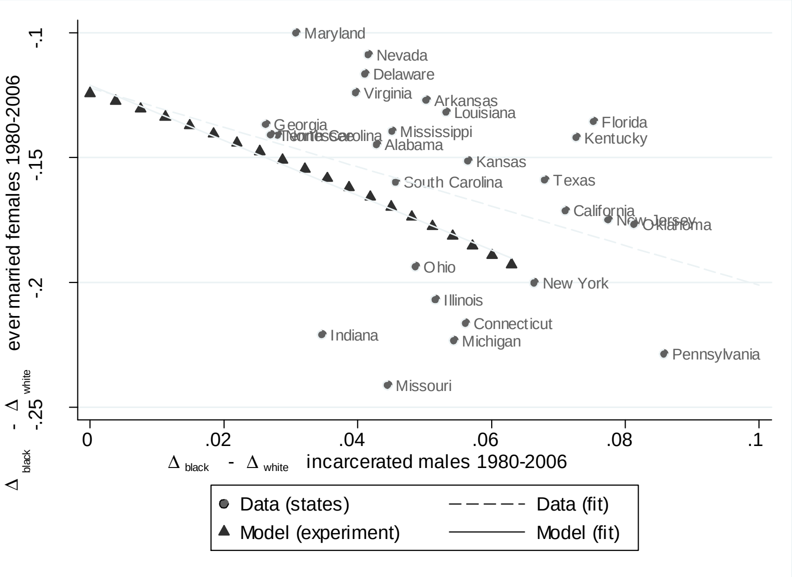
Educ	Marital St.	Females	Males		
		E	E	U	P
< HS	Single	.43 (.39)	.37 (.29)	.42 (.43)	.21 (.28)
	Married	.51 (.47)	.66 (.57)	.25 (.29)	.09 (.14)
HS	Single	.64 (.63)	.56 (.56)	.33 (.32)	.11 (.12)
	Married	.72 (.69)	.74 (.78)	.23 (.18)	.03 (.04)
SC	Single	.74 (.77)	.72 (.71)	.24 (.22)	.04 (.07)
	Married	.79 (.78)	.82 (.85)	.17 (.13)	.01 (.02)
C	Single	.92 (.86)	.83 (.82)	.15 (.16)	.02 (.02)
	Married	.89 (.86)	.87 (.92)	.12 (.07)	.01 (0.1)

Fraction of Population by Marriage and Employment Status, Whites
model (data)

Educ	Marital St.	Females	Males		
		E	E	U	P
$<$ HS	Single	.47 (.45)	.58 (.54)	.36 (.38)	.06 (.08)
	Married	.52 (.43)	.75 (.75)	.23 (.23)	.02 (.02)
HS	Single	.71 (.72)	.78 (.74)	.18 (.22)	.04 (.04)
	Married	.74 (.69)	.87 (.90)	.12 (.10)	.01 (0)
SC	Single	.79 (.81)	.87 (.82)	.12 (.17)	.01 (.01)
	Married	.77 (.74)	.89 (.92)	.11 (.07)	0 (.01)
C	Single	.91 (.89)	.94 (.89)	.06 (.11)	0 (0)
	Married	.56 (.77)	.95 (.96)	.05 (.04)	0 (0)

- Does the elasticity of marriages w.r.t. incarceration makes sense?
- Use cross-state variation in the data as a check.
- Decrease the probabilities of going to prison for blacks and whites, $\pi^r_{ep} = \pi^r_{up}$, by small percentage increments.
- For each new value of $\pi^r_{ep} = \pi^r_{up}$, we recalculate $\Lambda^r(\lambda'|\lambda)$ and solve our model economy (keeping all other parameters fixed).

Model in Historical Perspective



- Impose white population's characteristics (education, wages, employment and prison transitions) on blacks

Fraction Not-Married

		Black	Educ.	Wage	Emp.	Prison	White
Females	<HS	.86	.76	.85	.77	.78	.61
	HS	.66	.62	.65	.58	.58	.44
	SC	.56	.50	.53	.49	.46	.36
	C	.42	.35	.42	.41	.33	.30
Males	<HS	.97	.98	.96	.91	.80	.63
	HS	.66	.67	.65	.59	.57	.46
	SC	.49	.50	.46	.41	.43	.36
	C	.35	.38	.35	.31	.34	.30
$\Delta_{b,w}$ accounted for (%)		20	6	29	39		

Fraction Not-Married

		Black	Prison&Wage	Prison&Emp.	White
Females	<HS	.86	.76	.63	.61
	HS	.66	.57	.47	.44
	SC	.56	.43	.39	.36
	C	.42	.34	.32	.30
Males	<HS	.97	.77	.66	.63
	HS	.66	.56	.48	.46
	SC	.49	.40	.36	.36
	C	.35	.34	.30	.30
$\Delta_{b,w}$ accounted for (%)			45	76	

- Interaction effects.

- Reduce the average prison term
- Eliminate transition to prison due to drug offences - the SISCF

Fraction Not-Married

	Educ.	Black	Average term		War on drugs		White
			2 years	1 year	(low)	(high)	
Females	<HS	.86	.85	.81	.84	.82	.61
	HS	.66	.64	.57	.63	.62	.44
	SC	.56	.52	.46	.52	.50	.36
	C	.42	.37	.32	.39	.37	.30
Males	<HS	.97	.96	.87	.93	.90	.63
	HS	.66	.62	.54	.63	.61	.46
	SC	.49	.45	.42	.46	.45	.36
	C	.35	.34	.34	.35	.34	.30
$\Delta_{b,w}$ accounted for (%)			13	41	13	20	

- Eliminate the wage penalty
- Eliminate the utility cost of having a husband in prison

Fraction Not-Married

	Educ.	Black	Wage penalty	Utility cost	White
Females	<HS	.86	.85	.79	.61
	HS	.66	.65	.58	.44
	SC	.56	.53	.46	.36
	C	.42	.42	.31	.30
Males	<HS	.97	.95	.74	.63
	HS	.66	.65	.56	.46
	SC	.49	.45	.45	.36
	C	.35	.34	.35	.30
$\Delta_{b,w}$ accounted for (%)			7	42	

- Develop an equilibrium model of marriage, divorce and female labor supply.
- Incorporate transitions between employment, unemployment and prison for individuals by race, gender, and education to understand role of incarceration on the black-white marriage gap.
- Calibrate this model to key marriage and labor market statistics by gender, race, and education.
- Use the model to disentangle the effects of employment transitions, prison transitions, wages and education distributions on marriage rate differences between blacks and whites.
- Imposing the employment and prison transitions of white men on black men reduces the marriage gap by 76%.

Parameter	Description	Value
τ	tax rate	0.0377
η	divorce cost	27.019
$\underline{c}$	cost of a married household	0.025
α_1	scale parameter of home stay gamma distrib	1
α_2	shape parameter of home stay gamma distrib	5.737
μ_γ	mean of γ draw	-9.452
σ_γ	s.d. of γ draw	18.32
μ_ϕ	mean of ϕ draw	0
σ_ϕ	s.d. of ϕ draw	17.11
ζ	utility cost when husband is in prison	121.78
ϕ^b	Probability of meeting own type (black)	0.353
ϕ^w	Probability of meeting own type (white)	0.504

Distortions versus Productivity Differences

	Job arrival θ		Job destruction δ	
	Black	White	Black	White
<HS	.16	.15	.20	.15
HS	.24	.24	.12	.08
SC	.32	.30	.10	.07
C	.51	.48	.04	.04