ONLINE APPENDIX:
Lowering Standards to Wed? Spouse Quality, Marriage, and Labor Market Responses to the Gender Wage Gap

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A.1 Illustrative Model

This section provides a model to support the Beckerian intuition provided in Section 2. I adapt the static marriage and household decision making framework in Bertrand et al. (2018), which studies the trade-off between women's work and home production in the presence of gender norms.[32] Whereas Bertrand et al. (2018) use this model to examine how societal gender norms influence the skilled-unskilled marriage gap and women's education decisions, I derive four new theoretical predictions of the effect of the gender wage gap on spouse quality, marriage, and the labor market participation of women. The model is kept intentionally simple to advance the intuition of these predictions.

I assume that an individual i meets a potential match j and makes two decisions (i) whether to marry j; and (ii) if she marries, how much time, t_i, to allocate to home production of children, n, and time to allocate to market production, $1 - t_i$. She perceives j to have spouse quality q_{ij}, which is drawn from a differentiable distribution F with continuous and positive density over the support $[\underline{q}, \overline{q}]$.[33,34] Spouse quality perceived by i and j are allowed to be independent, i.e. $q_{ij} \perp q_{ji}$.

I allow for the presence of societal norms, α_i, that inform the utility obtained from a spouse's career, following Bertrand et al. (2018). When $\alpha_i < 1$, i has some displeasure with spousal work, such as a male perception that a woman's career challenges traditional gender roles. The utility from marriage is given by:

$$\max_{0 \leq t_i \leq 1} (1 - t_i)\, w_i + \alpha_i\, (1 - t_j) w_j + \beta\, n \left(\gamma\, t_i - \frac{t_i^2}{2} + \gamma\, t_j - \frac{t_j^2}{2} \right) + q_{ij} \tag{2}$$

where $\beta > 0, \gamma \geq 1, \alpha_f = 1, 0 \leq \alpha_m < 1$, and t_j is taken as given.

From here, I apply this model to a single marriage market with homogeneous wages for men and women in the market, which reflects the empirical focus on within-market behavior. The results are unchanged when I allow for wage variation in the market. Corresponding to the data, and as in Bertrand et al. (2018), I presume that men have an advantage in market production such that $w_m > \beta\, n\, \gamma > w_f$[35]. This makes it optimal for married men to work full time. Married women, then, either (1) completely specialize in home work if w_f is too low, $w_f < \beta\, n\, (\gamma - 1)$; or (2) work in the market part time, $t_f = \gamma - \frac{w_i}{\beta n}$, if $w_f > \beta\, n\, (\gamma - 1)$. Single men and women work full time

[32]The model in Bertrand et al. (2018) is closely related to the dynamic household model in Fernandez et al. (2002), both of which I follow closely. One deviation is that I model utility as quadratic in household production rather than the log of household production because it produces a slightly more straightforward prediction regarding spouse quality.

[33]Spouse quality is an inherently relative concept, as it represents the additional non-pecuniary benefits of marriage relative to remaining single. An alternative interpretation of spouse quality is as a transfer required to enter into marriage.

[34]This formulation is slightly different than in Bertrand et al. (2018), where quality is inherent to the match rather the individual, and allows for the realistic possibility that each partner in a married couple may experience different non-pecuniary gains from one's spouse.

[35]Consistent with this, husbands earn more than wives in nearly three-quarters of couples (BKP). Moreover, the potential wages that I utilize in the empirical strategy also conform to this pattern - the relative wage in the marriage market is never predicted to be above 1.

and obtain utility w_i.

Individual i marries j if her utility in marriage is greater than the outside option. Gains from marriage then derive from two sources: pecuniary gains, given by the difference between the total household earnings in marriage and her own wage; and non-pecuniary gains, which reflect the utility experienced from the public good and spouse quality. This condition produces a reservation spouse quality, q_i^*, for men and women, q_m^* and q_f^*, which is necessary and sufficient for an individual to agree to marry.

If the wife does not work ($w_f < \beta\, n\, (\gamma - 1)$), the reservation spouse qualities for men and women, q_m^* and q_f^*, respectively, are:

$$q_m^* = -\beta\, n\, (\gamma - \frac{1}{2}) \tag{3a}$$

$$q_f^* = w_f - w_m - \beta\, n\, (\gamma - \frac{1}{2}) \tag{3b}$$

whereas, if the wife works part time ($w_f > \beta\, n\, (\gamma - 1)$) they are given by:

$$q_m^* = -\alpha\, w_f\, (1 - \gamma + \frac{w_f}{\beta n}) - \beta\, n \left[\gamma\, (\gamma - \frac{w_f}{\beta n}) - \frac{1}{2}\, (\gamma - \frac{w_f}{\beta n})^2\right] \tag{4a}$$

$$q_f^* = w_f(\gamma - \frac{w_f}{\beta n}) - w_m - \beta\, n \left[\gamma(\gamma - \frac{w_f}{\beta\, n}) - \frac{1}{2}\, (\gamma - \frac{w_f}{\beta\, n})^2\right] \tag{4b}$$

Predictions

With this set up, I develop predictions about the effect of an increase in the female to male wage gap, $\Gamma(w_f, w_m) = w_f - w_m$ on women's spouse quality, marriage and labor market decisions. I provide intuition for the predictions here and proofs below. As in the empirical specification, I consider the effect of a rise in Γ that leaves the average wage constant, i.e. raises w_f and reduces w_m.[36] Unless otherwise noted, I maintain that $\underline{q} < q_i^* < \overline{q}$ for men and women, such that some, but not all matches agree to marry.

Prediction 1 *An increase in Γ raises average husband quality, $E\left[q_f | q_f > q_f^*, q_m > q_m^*\right]$.*

The first-order effect of a higher Γ is to reduce the pecuniary gains to marriage for women by raising the opportunity cost of marriage, single women's earnings relative to married household's earnings. A second-order effect is that it reduces the time married women spend in household production, which further lowers the value of marriage relative to being single. Together, these lead women to require greater non-pecuniary gains to offset the fewer gains of marriage, which raises the spouse quality threshold. As a result, women no longer marry men at the lower end of the spouse quality distribution, and average husband quality rises.

Prediction 2 *An increase in Γ unambiguously causes individuals to marry less if the gender*

[36] This "compensated" wage increase corresponds nicely to the thought experiment used as a proof for the theoretical predictions in Becker (1973), in which the combined output of the single households is kept constant.

norm is sufficiently strong ($\alpha < \frac{1}{2}$).

Marriage declines with certainty if both men and women deem a lower share of potential spouses to be unmarriageable. This occurs when the reservation spouse quality of men and women increases. As discussed above, a higher Γ raises women's reservation spouse quality. For men, a higher Γ generates two opposing effects on married utility and, in turn, on reservation quality; women's earnings increase, but household production declines. The net effect depends on the strength of the gender norm, which scales men's utility from women's earnings. When men have a strong gender norm ($\alpha < \frac{1}{2}$), an increase in Γ reduces married utility from household production more than it increases women's earnings, which raises the reservation spouse quality. The prediction is ambiguous for weaker gender norms, however.

Similar forces predict that couples will choose to divorce, though this is not possible to illustrate in a static model. One way to incorporate this would be to assume that an individual chooses to marry based on a noisy measure of spouse quality, $\widetilde{q_{ij}}$, and divorces if she learns that her true spouse quality falls below the threshold quality. As a result, when Γ increases and threshold spouse quality rises, more individuals choose to divorce.

Prediction 3 *For women, marginal marriages involve a potential husband with undesirable spouse quality: $q_f < 0$.*

Utility gains from pecuniary sources and household production create a positive incentive to enter into marriage. Women are thus willing to accept a negative spouse quality to obtain the other benefits of marriage.

Prediction 4 *An increase in Γ increases women's hours of work conditional on employment, even holding women's wage constant.*

In the model, married women work less than full time due to substitution from market work to household production. A higher Γ attenuates this substitution effect through two channels. First, a higher share of women remain single (Proposition 2), even holding women's wage constant, and spend no time in home production. Second, the opportunity cost of household production increases, and married women choose to work more hours.

Prediction 4′ *An increase in Γ has a zero or positive effect on women's labor force participation, depending on $\underline{q}$. The effect will be positive, unless $\underline{q}$ is high enough such that women who are on the margin of employment are inframarginal to marriage, i.e. $\underline{q} > q_f^*$ for all non-working wives.*

Extensive employment effects are determined entirely by the behavior of non-working married women, whose low wages cause them to work only when single. The reduction in marriage in Prediction 2, then, implies that employment will increase under a higher Γ. Importantly, however, the poor outside option for this group generates sizable pecuniary gains to marriage and drives down the reservation spouse quality. It is feasible, then, that the reservation spouse quality may fall below the lower bound of spouse quality in the market, counter to the maintained assumption of Prediction 2. In that case, these women become *inframarginal* to marriage and to employment, and labor force participation will not increase under a higher Γ.

A.1.1 Proofs of Predictions

Proof of Prediction 1

The relationship between q_f^* and Γ depends on the net effects of w_f and w_m on q_f^*, which are obtained by taking partial derivatives of Equations 3b and 4b with respect to w_f and w_m. For all women,

$$\frac{\partial q_f^*}{\partial w_m} = -1.$$

For working women,

$$\frac{\partial q_f^*}{\partial w_f} = \gamma - \frac{w_f}{\beta\, n}.$$

This is positive by the assumption that $w_f < \beta\, n\, \gamma$.
For non-working women,

$$\frac{\partial q_f^*}{\partial w_f} = 1$$

Hence, q_f^* is increasing with Γ.
Now suppose that Γ increases from Γ_0 to Γ_1 such that q_f^* rises to $q_f^*(\Gamma_1)$ from $q_f^*(\Gamma_0)$. As the quality threshold increases, women no longer marry men at the low end of marriageable spouse quality (i.e with $q_f > q_f^*(\Gamma_0)$, but $q_f < q_f^*(\Gamma_1)$), and husband quality rises.[37]

Proof of Prediction 2

Marriage declines unambiguously if q_f^* and q_m^* both increase with Γ, such that both men and women simultaneously become pickier, and there are fewer mutually-acceptable matches. The proof of Prediction 1 affirms that q_f^* is positively related to Γ. For q_m^*, I take partial derivatives of Equations 3a and 4a. For all men,

$$\frac{\partial q_m^*}{\partial w_m} = 0.$$

If women work when married ($w_f > \beta\, n\, (\gamma - 1)$),

$$\frac{\partial q_m^*}{\partial w_f} = \frac{w_f}{\beta\, n}\,(-2\,\alpha + 1) + \alpha(\gamma - 1).$$

This term is always positive when $\alpha < \frac{1}{2}$, since $\gamma > 1$. If $\alpha \geq \frac{1}{2}$, q_m^* may decrease, increase, or be unchanged with w_f, depending on the values of β, n, and γ.

[37] Note that a change in men's reservation wife quality does not affect the mean husband quality because q_f is orthogonal to q_m.

If women do not work when married ($w_f < \beta\, n\, (\gamma - 1)$)

$$\frac{\partial q_m^*}{\partial w_f} = 0.$$

Thus, q_m^* and q_f^* are non-decreasing with Γ when $\alpha < \frac{1}{2}$.

Proof of Prediction 3

For women that do not work if married, it is simple to show that q_f^* in Equation 3b is negative under the assumptions of the model.

For women that work if married, q_f^* is given by Equation 4b. Analyzing the first two terms in this expression, $w_f(\gamma - \frac{w_f}{\beta n}) - w_m$,

$$\begin{aligned}
&= w_f\left(\frac{\beta n\gamma - w_f}{\beta n}\right) - w_m \\
&< w_f\left(\frac{\beta\, n\gamma - \beta\, n(\gamma-1)}{\beta n}\right) - w_m, \text{ by } w_f > \beta\, n\,(\gamma - 1) \\
&< w_f\left(\frac{1}{\beta n}\right) - w_m \\
&< 0, \text{ by } w_f < w_m
\end{aligned}$$

Then, the last two terms, $-\beta\, n \left[\gamma(\gamma - \frac{w_f}{\beta\, n}) - \frac{1}{2}\,(\gamma - \frac{w_f}{\beta\, n})^2\right]$. This will be less than 0 if the bracketed term is positive, when:

$$\begin{aligned}
&\gamma > \left(\frac{\beta n\gamma - w_f}{\beta n}\right)\frac{1}{2} \\
&2\,\beta\, n\,\gamma > \beta n\gamma - w_f \\
&w_f > -\beta\, n\gamma, \text{which is true by the assumption that } w_f > 0.
\end{aligned}$$

Since both these terms are negative, I have shown that $q_f^* < 0$ for women that would work when married, and more broadly for all women.

Proof of Prediction 4

The proof of Prediction 3 documents that a higher Γ reduces marriage and increases the share of single women with certainty when $\alpha < \frac{1}{2}$. This mechanically increases hours of work because single women work full time, while married women (at most) work part-time. For women that work when married, increases in w_f also cause married women to increase hours of work through the substitution effect: $\frac{\partial(1-t_f)}{\partial w_f} = \frac{1}{\beta\, n}$.[38]

Proof of Prediction 5

[38] If women's bargaining power also increases in the household, hours of work may increase less (Knowles, 2012).

Under the maintained assumptions, the marriage decline in Prediction 2 is expected to increase employment of non-working married women. However, for this subgroup, the assumption that women are marginal to marriage, i.e. $q_f < q_f^*$, may be overly restrictive. In particular, among married women $w_f^{*,\text{non-working}} < w_f^{*,\text{working}}$, which implies that

$$q_f^{*,\text{non-working}} < q_f^{*,\text{working}}$$

since $\frac{\partial q_{f^*}}{\partial w_f} > 0$ (see proof of Prediction 1). Non-working married women have a lower threshold spouse quality than working women. It may be the case, then, that in some markets, the reservation quality of non-working married women is below the lower bound of spouse quality, i.e $q_f^{*,\text{non-working}} < \underline{q}$. In that case, non-working married women are *inframarginal* to marriage, and also inframarginal to working.

A.1.2 Additional Theoretical Predictions

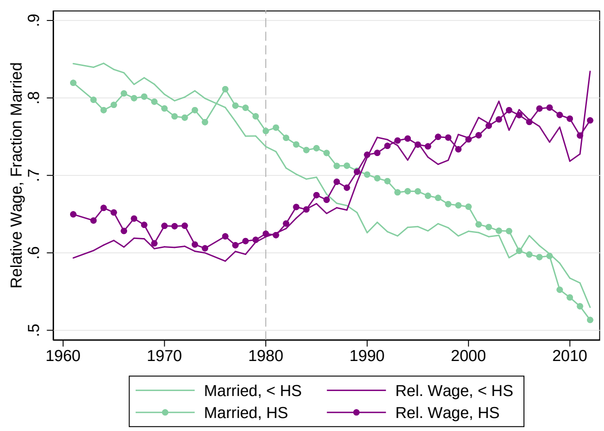
Prediction $1'$ *An increase in* $\Gamma(.)$ *has an ambiguous effect on average wife quality,* $E\left[q_m | q_f > q_f^*, q_m > q_m^*\right]$.

The relationship between q_m^* and $\Gamma(.)$ is ambiguous, since q_m^* is invariant to w_m, increasing with w_f if $\alpha < \frac{1}{2}$ and is indeterminant with w_f if $\alpha > \frac{1}{2}$ (see proof of Prediction 2.) Hence, wife quality increases if $\alpha < \frac{1}{2}$ and is indeterminant when $\alpha > \frac{1}{2}$.

A.2 Further Tables and Figures

Figure A.1: Women's Hourly Wage as a Fraction of Men's Wage, and Marriage Rates, Separating Education Categories

(a) Less than High School or High School



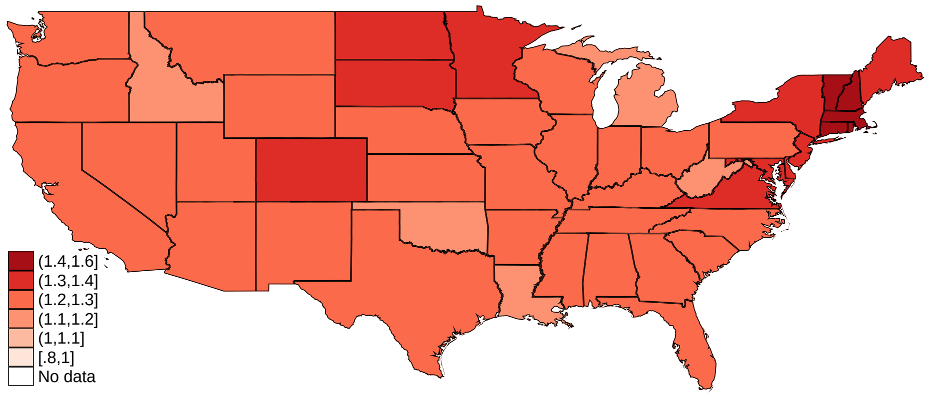
(b) Some College or College

Notes: This figure depicts the relative wage, defined as the ratio of average female hourly wage to average male hourly wage, together with marriage rates. Average hourly wages are calculated from the March Annual Demographic files (1962-2012) as annual earnings divided by total hours worked. Sample for wage calculation includes individuals age 18 to 64 with positive hours worked and positive earned income; for marriage includes women 22-44 years old.

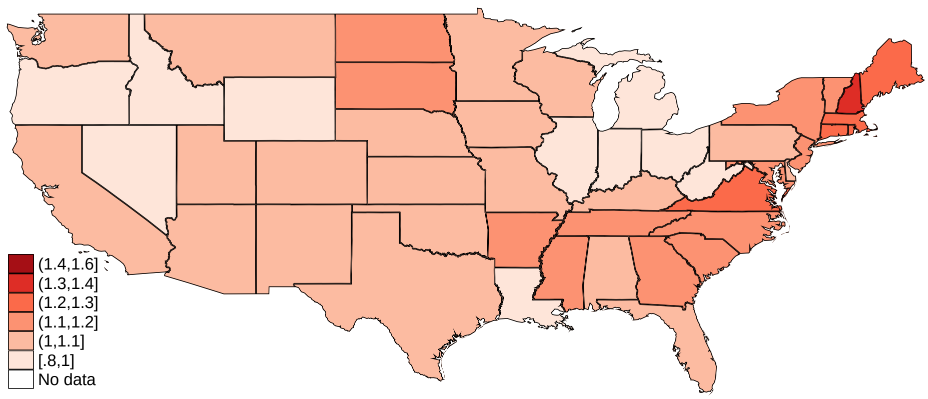
Figure A.2: Variation Across States in Change in -

log Female and log Male Wages, 1980-2010

A. Log female wage ($2012)

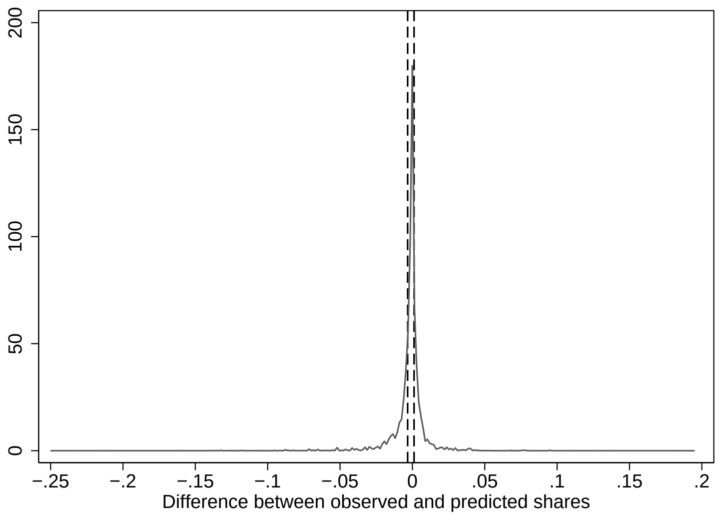


B. Log male wages ($2012)



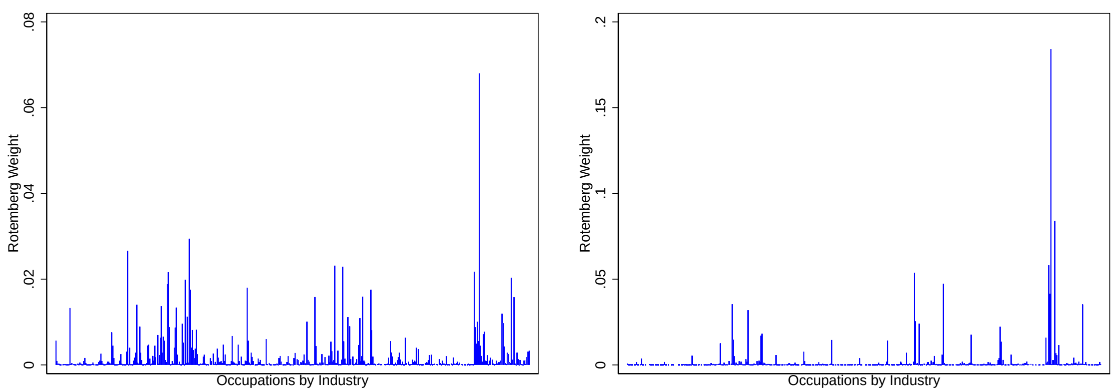
Source: 1970-2000 decennial censuses, 2010 ACS; author's calculation.

Figure A.3: Difference between Actual $\frac{E_{oj\mu g,1970}}{E_{\mu g,1970}}$ and Prediction



Notes: This figure presents the difference between the actual shares in each occupation and industry, $\frac{E_{oj\mu g,1970}}{E_{\mu g,1970}}$ and the prediction $\frac{E_{jersg,1970}}{E_{ersg,1970}} \times \frac{E_{ojerg,1970}}{E_{jerg,1970}}$. See text for details. Source: 1970 Census

Figure A.4: Rotemberg Weights for Each Industry and Occupation

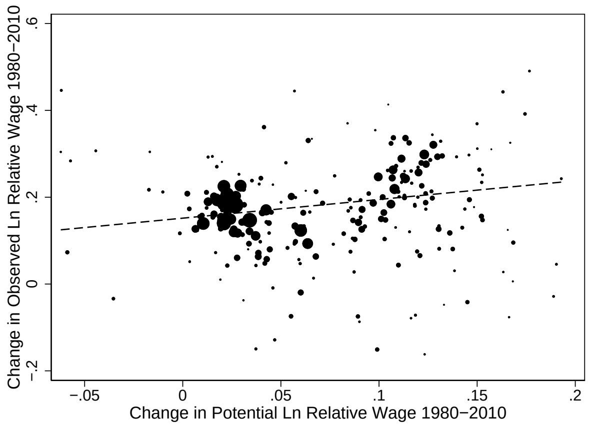


(a) Men

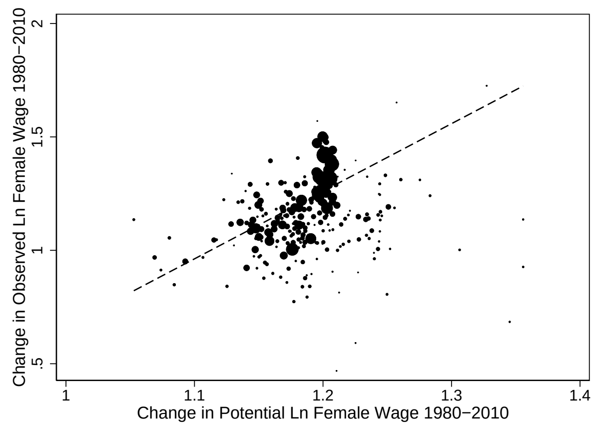
(b) Women

Notes: This figure shows the Rotemberg weights for each occupation and industry for men (panel a) and women (panel b), which quantifies the contribution of each of each occupation-industry to the identification. These are constructed using the Stata "bartik_weight" command available from the supplemental material to Goldsmith-Pinkham et al. (2018), where the endogenous variable is the observed log wage in the marriage market for men or women and the outcome in the structural equation is the share of women married in the market. By construction, the weights sum to 1 for each sex. The top 5 occupation-industries for men include: school teachers (6.8%), machine operators in basic manufacturing (2.9%), construction trades (2.6%), retail managers (2.3%, and retail salesmen (2.3%). For women these include: school teachers (18.4%) administrative support for professional service (8.4%), doctors and nurses (5.8%), retail sales (5.3%), and administrative support in finance (4.7%).

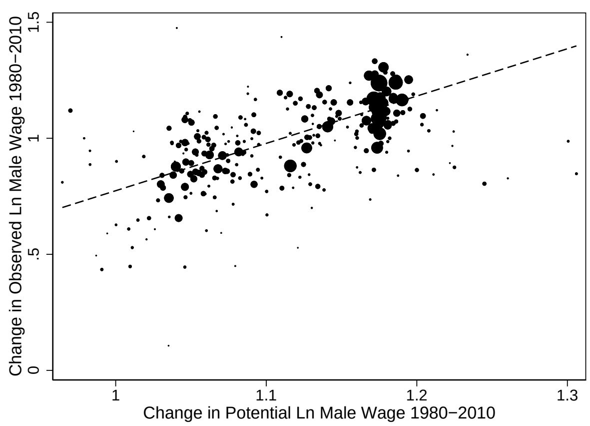
Figure A.5: Correlation between Growth in Potential Wage and Observed Wages, 1980-2010



(a) Relative



(b) Female



(c) Male

Note: This figure shows the correlation between the change in the observed wage between 1980 and 2010 in a marriage market and the corresponding change in the potential wage proxy. Size of the marker is proportional to the population in the marriage market. Extremes omitted for ease of illustration. Sources: Potential wage: 1970 decennial census, 1980 - 2011 March CPS, Observed wages: 1980-2000 decennial censuses, 2010 ACS.

Table A.1: Sample Composition, by Year

	All		1980		2010	
	Mean	SD	Mean	SD	Mean	SD
Age	32.86	6.53	31.67	6.44	33.17	6.64
Year of Birth	1962.67	12.55	1947.58	6.45	1976.83	6.64
Years of Education	13.21	2.72	12.62	2.62	13.62	2.83
White (%)	76.10	42.65	83.47	37.14	67.07	47.00
Black (%)	11.83	32.29	10.36	30.47	13.26	33.92
Hispanic (%)	12.07	32.58	6.17	24.06	19.67	39.75
Married (%)	64.86	47.74	73.83	43.95	55.98	49.64
Never Married (%)	24.09	42.76	15.69	36.37	33.88	47.33
Divorced (%)	10.26	30.34	9.44	29.23	9.57	29.42
Cohabitation (official)(%)	13.38	34.05	–	–	15.75	36.42
Spouse More Ed. (%)	33.35	47.15	39.22	48.82	27.54	44.67
Spouse Less Ed. (%)	31.06	46.27	26.89	44.34	38.17	48.58
Spouse Older (%)	70.08	45.79	73.54	44.11	68.04	46.63
Spouse Younger (%)	17.18	37.72	13.72	34.41	18.86	39.12
Single Mom (%)	17.99	38.41	12.30	32.84	24.66	43.10
Employed (%)	66.89	47.06	59.80	49.03	67.51	46.84
Weekly Hours	36.94	11.02	35.71	10.75	36.77	11.19
Weekly Earnings ($2012)	699.31	1062.57	599.15	522.97	713.84	874.77
Annual Earnings ($2012)	22997.44	29507.63	17173.24	19850.84	24653.49	36491.92
Female Breadwinner (%)	23.28	42.26	21.45	41.05	23.74	42.55
Male Breadwinner (%)	10.67	30.87	15.23	35.93	9.45	29.26
Multiple Earner (%)	61.43	48.68	58.09	49.34	62.76	48.34
Sex Ratio	1.12	0.40	1.13	0.26	1.16	0.65
Log Rel. Wage (Potential)	-0.22	0.06	-0.26	0.05	-0.18	0.06
Log Avg. Wage (Potential, $2012)	2.85	0.13	2.81	0.10	2.90	0.14
Log Rel. Wage (Actual)	-0.30	0.11	-0.43	0.09	-0.22	0.07
Log Avg. Wage (Actual, $2012)	2.87	0.24	2.82	0.17	2.88	0.29
Observations	4915368		1401324		320493	

Notes: This table shows summary statistics for white non-Hispanic, black non-Hispanic, and Hispanic women ages 22-44. Female (male) breadwinner is defined as a household with a single female (male) contributor to household income. Reported cohabitation is unavailable in 1980. Statistics are weighted by census-provided weights. Source: 1980-2000 decennial censuses and 2010 ACS.

Table A.2: Occupations with the Highest Share of Men and Women

	Share of Men	Share of Women	Top 10 Men	Top 10 Women
Management	11.9	3.4	1	0
Admin. Support	8.2	35.5	1	1
Sales	7.3	9.5	1	1
Mechanical/Electronic Repair	7.2	0.2	1	0
Misc. Operator	7.1	4.7	1	1
Construction, Mover	7.0	1.0	1	0
Vehicle Operator	6.4	0.4	1	0
Construction Trades	6.2	0.1	1	0
Metal/Wood Work	6.0	0.7	1	0
Engineers and scientists	4.1	0.3	1	0
Teacher/Social Wkr.	3.9	9.1	0	1
Assemblers	3.7	3.5	0	1
Cleaning Services	2.6	4.7	0	1
Food Service	2.2	6.7	0	1
Textile Machine Operator	1.2	5.5	0	1
Physicians/Nurses	0.7	3.7	0	1
Health Asst.	0.5	4.6	0	1

Share of men/women is calculated the number of men/women in the occupation relative to the total number of employed men/women in 1970. Weighted by census person weights. These occupations account for the majority of workers, 71.4% of male workers in 1970 and 87.4% of female workers. Source: Census 1970 - 2000, ACS 2010.

Table A.3: Ex. of Variation in Potential Wage: Growth Rate of Management across Industries

	Share (%)	Within Growth	Natl. Occ. Growth
Agriculture	29.9	1.4	1.2
Mining	4.9	2.0	1.2
Construction	8.0	1.5	1.2
Low Tech Manuf.	4.7	1.9	1.2
Basic Tech Manuf.	5.2	2.3	1.2
High Tech. Manuf.	6.4	2.2	1.2
Transportation	6.3	1.2	1.2
Communication	7.7	1.7	1.2
Utilities	5.3	2.1	1.2
Wholesale Trade	13.2	0.6	1.2
Retail Trade	12.8	0.5	1.2
Finance	17.5	1.2	1.2
Business and Repair	9.4	1.4	1.2
Personal Services	6.9	1.4	1.2
Entertainment	19.1	0.7	1.2
Professional Services	6.3	1.3	1.2
Public Administration	9.5	0.9	1.2
Total	10.2	1.4	1.2

Management was the occupation with the most males in 1970. Column 1 displays the share of the occupation in each industry in 1970. Columns 2-3 present $\pi^{W}_{oj,2010}$ and $\pi_{o,2010}$. I define the unexpected shock to occupation growth as the ratio of Columns 2 and 3. Source: Census 1970 - 2000, ACS 2010.

Table A.4: Correlation of Potential Wage with Observed Wages: Sensitivity to Controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
A: Relative							
ln Rel. Wage (Potential)	0.916***	0.477***	0.432***	0.544***	0.630***	0.612***	0.833***
	(0.075)	(0.098)	(0.050)	(0.100)	(0.204)	(0.194)	(0.225)
Partial R-Squared	0.258	0.076	0.103	0.182	0.043	0.040	0.067
Obs	1064	1064	1064	1064	1064	1064	1064
B: Female							
ln Female Wage (Potential)	1.022***	1.791***	2.375***	2.260***	0.786***	0.574***	0.426**
	(0.009)	(0.349)	(0.411)	(0.310)	(0.172)	(0.155)	(0.202)
Partial R-Squared	0.920	0.117	0.257	0.308	0.091	0.059	0.039
Obs	1064	1064	1064	1064	1064	1064	1064
C: Male							
ln Male Wage (Potential)	0.917***	1.995***	1.983***	1.962***	0.928***	0.569***	0.481***
	(0.012)	(0.120)	(0.116)	(0.111)	(0.219)	(0.188)	(0.156)
Partial R-Squared	0.920	0.494	0.732	0.803	0.124	0.054	0.041
Obs	1064	1064	1064	1064	1064	1064	1064
StandYr FE	No	Yes	Yes	Yes	Yes	Yes	Yes
StEdRace FE	No	Yes	Yes	Yes	Yes	Yes	Yes
YrState FE	No	No	Yes	Yes	Yes	Yes	Yes
YrRace FE	No	No	No	Yes	Yes	Yes	Yes
YrEd FE	No	No	No	No	Yes	Yes	Yes
Controls	No	No	No	No	No	Yes	Yes
RaceStTrend	No	No	No	No	No	No	Yes

This table shows the sensitivity of the correlation between the potential wage and observed wage to the addition of controls, shown at the bottom of the table. Each panel shows a set of regressions where the dependent variable is the observed wage indicated in the panel title. The unit of observation is a cell defined by an education x race x state x year. Sources: Proxy: 1970 decennial census, 1980 - 2011 March CPS, Wages: 1980-2000 decennial censuses, 2010 ACS. Standard errors clustered at the state level. * p<0.10, ** p<0.05, *** p<0.01

Table A.5: Effects of the Relative Wage on Marriage Market Education Composition

	(1) Male/Fem Ed	(2) Male-Fem Ed
Effect of 10% Increase in Rel. Wage	-0.011	-0.095
	(0.009)	(0.087)
Mean Y	0.998	-0.020
Obs	23255	23267

Notes: This table shows the coefficients from estimating Equation 1 rescaled to represent the effect of a 10% increase in the relative (potential) wage. The dependent variables are the ratio of the average male education to the average female education in a cell (column 1) and the difference between the average male education and the average female education in a cell (column 2). Standard errors are clustered at the state level, and cells are weighted by the female population in cell. * p<0.10, ** p<0.05, *** p<0.01. Source: Census 1980, 1990, 2000, and ACS 2010.

Table A.6: Impact of Relative Wage on Spousal Age

	Spouse Age, Relative to Own			Spouse Older by		Spouse Younger by		Age Gap
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Younger	Same	Older	Up to 3 Yrs	4+ Yrs	Up to 3 Yrs	4+ Yrs	Absolute
Effect of 10% Increase in Rel. Wage	0.007	0.014	-0.021*	-0.031**	0.010	0.010	0.001	0.069
	(0.010)	(0.009)	(0.012)	(0.012)	(0.013)	(0.010)	(0.004)	(0.092)
Mean Y	0.165	0.127	0.707	0.366	0.315	0.186	0.042	3.347
Obs	22673	22673	22673	22673	22673	22673	22673	22673
Average Wage	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table shows the coefficients from estimating Equation 1 rescaled to represent the effect of a 10% increase in the relative (potential) wage. The dependent variable is shown in the column heading. Standard errors are clustered at the state level, and cells are weighted by the female population in cell. * p<0.10, ** p<0.05, *** p<0.01. Source: Census 1980, 1990, 2000, and ACS 2010.

Table A.7: Impact of Relative Wage on Women's Contribution to Household Income

	Own Share of Earnings in	Income Contributor(s) in Household:		
	(1)	(2)	(3)	(4)
	Household	Fem. Breadwinner	Male Breadwinner	Multiple
Effect of 10% Increase in Rel. Wage	0.034***	0.038**	-0.024***	-0.001
	(0.009)	(0.015)	(0.006)	(0.012)
Mean Y	0.462	0.233	0.106	0.614
Obs	23423	23573	23573	23573
Average Wage	Yes	Yes	Yes	Yes

Notes: This table shows the coefficients from estimating Equation 1 rescaled to represent the effect of a 10% increase in the relative (potential) wage. The dependent variable is shown in the column heading. Standard errors are clustered at the state level, and cells are weighted by the female population in cell. * p<0.10, ** p<0.05, *** p<0.01. Source: Census 1980, 1990, 2000, and ACS 2010.

Table A.8: Heterogeneous Responses to the Relative Wage Across Subgroups

	(1) Marr.	(2) Nev. Marr.	(3) Divorced	(4) Cohab	(5) Sp. More Ed.	(6) Fem. Earner	(7) Hrs. Work
A: Interaction with Education							
Effect of 10% Increase in Rel. Wage x Low Skill	-0.043***	0.035***	0.011	0.058***	-0.005	0.026*	0.970***
	(0.009)	(0.009)	(0.007)	(0.015)	(0.020)	(0.015)	(0.238)
Effect of 10% Increase in Rel. Wage x High Skill	-0.059***	0.021	0.033***	0.032	-0.004	0.064***	1.153**
	(0.014)	(0.013)	(0.011)	(0.024)	(0.021)	(0.020)	(0.433)
Equality P-value	.283	.364	.082	.323	.952	.036	.691
B: Interaction with Race							
Effect of 10% Increase in Rel. Wage x Black	-0.005	0.023**	-0.010	0.039**	-0.001	-0.006	1.088***
	(0.010)	(0.011)	(0.007)	(0.019)	(0.020)	(0.015)	(0.361)
Effect of 10% Increase in Rel. Wage x Hispanic	-0.008	0.008	0.001	0.000	0.006	-0.001	0.278
	(0.011)	(0.011)	(0.009)	(0.017)	(0.024)	(0.013)	(0.384)
Effect of 10% Increase in Rel. Wage x White	-0.075***	0.044***	0.028***	0.042***	0.024	0.054***	1.226***
	(0.011)	(0.010)	(0.006)	(0.014)	(0.018)	(0.012)	(0.277)
Obs	23573	23573	23573	22663	16925	23573	23222
Equality P-value	0.000	0.018	0.000	0.102	0.582	0.001	0.052

Notes: This table shows the coefficients from estimating Equation 1 interacted with indicators for education (Panel A) or race (Panel B) rescaled to represent the effect of a 10% increase in the relative (potential) wage. Interactions of the average potential wage with education (Panel A) or race (Panel B) are also included. The dependent variable is shown in the column heading. Standard errors are clustered at the state level, and cells are weighted by the female population in cell. * $p<0.10$, ** $p<0.05$, *** $p<0.01$. Source: Census 1980, 1990, 2000, and ACS 2010.

Table A.9: Effects of the Relative Wage on Marriage by Decade

	(1) Marr.	(2) Nev. Marr.	(3) Divorced
S.S. Rel Wage x 1980	-0.053***	0.037***	0.017***
	(0.010)	(0.009)	(0.006)
S.S. Rel Wage x 1990	-0.057***	0.033***	0.022***
	(0.011)	(0.010)	(0.006)
S.S. Rel Wage x 2000	-0.056***	0.032***	0.022***
	(0.011)	(0.009)	(0.006)
S.S. Rel Wage x 2010	-0.063***	0.038***	0.023***
	(0.013)	(0.011)	(0.006)
Obs	23573	23573	23573

Notes: This table shows the coefficients from estimating Equation 1 including interactions between the relative wage and a dummy for each decade, and rescaling to represent the effect of a 10% increase in the relative (potential) wage. Standard errors are clustered at the state level, and cells are weighted by the female population in cell. * p<0.10, ** p<0.05, *** p<0.01. Source: Census 1980, 1990, 2000, and ACS 2010.

Table A.10: Does the Change in the Future Relative Wages Predict the Change in Past (1960-1970) Outcomes?

	Dep. Var: 60-70 Change in:							
	Marr.	Nev. Marr	Divorced	Sp. Less Ed	Sp. More Ed	Single Mom	Hours Work	Poverty
A: 1980-1990 Relative Wage								
Effect of 10% Increase in Rel. Wage	-0.022	0.058	-0.014	0.124	-0.127	-0.019	0.652	0.075
	(0.099)	(0.089)	(0.039)	(0.103)	(0.104)	(0.051)	(4.369)	(0.138)
Obs	231	231	231	224	224	230	202	230
B: 1990-2000 Relative Wage								
Effect of 10% Increase in Rel. Wage	0.060	-0.084	0.042	0.026	-0.118	0.021	2.005	0.178
	(0.093)	(0.098)	(0.047)	(0.164)	(0.152)	(0.064)	(6.743)	(0.149)
Obs	231	231	231	224	224	230	202	230
C: 2000-2010 Relative Wage								
Effect of 10% Increase in Rel. Wage	-0.102	0.133	-0.030	0.059	-0.056	0.028	1.149	-0.010
	(0.097)	(0.109)	(0.049)	(0.146)	(0.153)	(0.051)	(5.393)	(0.127)
Obs	231	231	231	224	224	230	202	230

Notes: This table shows the coefficients from estimating a first-differences specification described in the text rescaled to represent the effect of a 10% increase in the relative (potential) wage. The unit of observation is a marriage market, as defined in the text. The dependent variable is the difference between 1960 and 1970 in the outcome shown in the column heading. The independent variable of interest is the change in the future potential relative wage (1980 to 1990, 1990 to 2000, or 2000 to 2010) shown in the panel heading. Standard errors are clustered at the state level, and cells are weighted by the female population in cell. * p<0.10, ** p<0.05, *** p<0.01. Pre-exposure outcomes observed in the 1960 & 1970 Censuses.

Table A.11: Insensitivity of Results to Inclusion of Lagged Wages

	(1) Marr.	(2) Nev. Marr.	(3) Divorced	(4) Cohab	(5) Sp. More Ed.	(6) Fem. Earner	(7) Hrs. Work
ln Rel. Wage Option	-0.035***	0.021**	0.012*	0.057***	0.017	0.024	0.729**
	(0.010)	(0.010)	(0.007)	(0.018)	(0.013)	(0.015)	(0.294)
Avg. ln Wage Option	0.043**	-0.001	-0.043***	-0.023	0.004	-0.017	-0.376
	(0.020)	(0.016)	(0.016)	(0.029)	(0.031)	(0.022)	(0.668)
L. ln Rel. Wage Option	-0.017**	0.013*	0.007	-0.008	-0.033*	0.018	0.382*
	(0.008)	(0.007)	(0.006)	(0.016)	(0.017)	(0.012)	(0.217)
L. Avg. ln Wage Option	0.037*	-0.026	-0.000	-0.014	-0.003	-0.031	0.525
	(0.020)	(0.016)	(0.019)	(0.035)	(0.033)	(0.021)	(0.687)
Obs	0.645	0.245	0.102	0.324	0.159	0.233	36.823
N	23573	23573	23573	22663	16925	23573	23222

Notes: This table shows the coefficients from estimating a modified version Equation 1 which includes the one-year lag of the relative and average potential wage, rescaled to represent the effect of a 10% increase in the potential wage. The dependent variable is shown in the column heading. Weighted by female population in cell. Standard errors are clustered at the state level, and cells are weighted by the female population in cell. * p<0.10, ** p<0.05, *** p<0.01. Source: Census 1980, 1990, 2000, and ACS 2010.

Table A.12: Impact of Relative Wage on Moving States

	(1) Married	(2) Nev. Marr.	(3) Divorced	(4) Sp. More Ed	(5) Fem. Earn	(6) Moved States
A: Total						
Effect of 10% Increase in Rel. Wage	-0.050***	0.027***	0.022***	0.058***	0.042***	0.023**
	(0.009)	(0.008)	(0.005)	(0.013)	(0.010)	(0.010)
B: Moved States and...						
Effect of 10% Increase in Rel. Wage	0.005	0.014***	0.004*	0.016***	0.016***	
	(0.008)	(0.004)	(0.002)	(0.005)	(0.003)	
C: Did not Move and...						
Effect of 10% Increase in Rel. Wage	-0.055***	0.013	0.018***	0.042***	0.026***	
	(0.008)	(0.008)	(0.005)	(0.011)	(0.009)	
Pct. Effect among Stayers	109.497	47.646	82.355	72.076	62.244	

Notes: This table shows the coefficients from estimating Equation 1 rescaled to represent the effect of a 10% increase in the relative (potential) wage. The dependent variable is shown in the column heading. "Moving states" is defined as having moved states in the last five years. Percent effect among stayers is calculated as Panel B divided by Panel A times 100. Weighted by female population in cell. Standard errors are clustered at the state level, and cells are weighted by the female population in cell. * p<0.10, ** p<0.05, *** p<0.01. Source: Census 1980, 1990, 2000, and ACS 2010.

Table A.13: Impacts of Male, Female Wage Potential Wage on Main Outcomes

	(1) Marr.	(2) Nev. Marr.	(3) Divorced	(4) Sp. More Ed.	(5) Cohab	(6) Fem. Earner	(7) Hrs. Work
Effect of 10% Increase in Male Wage	0.087***	-0.045***	-0.039***	-0.069***	0.010	-0.062***	-0.980***
	(0.009)	(0.009)	(0.007)	(0.015)	(0.021)	(0.018)	(0.300)
Effect of 10% Increase in Female Wage	-0.008	0.017*	-0.004	0.033**	0.002	0.014	1.062***
	(0.011)	(0.009)	(0.006)	(0.015)	(0.017)	(0.015)	(0.252)
Test Equal,Oppos:							
P-value	0.000	0.006	0.000	0.019	0.335	0.000	0.804
F-statistic	56.508	8.233	33.694	5.897	0.947	15.926	0.062

Notes: This table shows the coefficients from estimating Equation 1, substituting the potential wages for male and female wages for the relative wage, rescaled to represent the effect of a 10% increase in the male/female wage. The bottom two rows of the table show the p-value and F-statistics associated with the test that the male and female potential wages are equal in magnitude and opposite in sign. Weighted by female population in cell. Standard errors are clustered at the state level, and cells are weighted by the female population in cell. * p<0.10, ** p<0.05, *** p<0.01. Source: Census 1980, 1990, 2000, and ACS 2010.

Table A.14: Impacts of Relative Wage

Interacted with Quartile of Growth in Male Wage Potential Wage

	(1) Marr.	(2) Nev. Marr.	(3) Divorced	(4) Cohab	(5) Sp. More Ed.	(6) Fem. Earner	(7) Hrs. Work
10% Increase in Rel. Wage x Q1 of D. Male Wage	-0.042**	0.036**	0.007	0.055***	-0.024	0.034**	0.101
	(0.016)	(0.015)	(0.007)	(0.014)	(0.022)	(0.015)	(0.359)
10% Increase in Rel. Wage x Q2 of D. Male Wage	-0.021	0.019	0.003	0.043**	0.016	0.013	-0.002
	(0.015)	(0.013)	(0.008)	(0.017)	(0.020)	(0.013)	(0.326)
10% Increase in Rel. Wage x Q3 of D. Male Wage	-0.007	0.019	-0.004	-0.021	0.022	0.030*	0.429
	(0.021)	(0.019)	(0.010)	(0.022)	(0.022)	(0.017)	(0.540)
10% Increase in Rel. Wage x Q4 of D. Male Wage	-0.031*	0.031**	0.002	-0.013	-0.012	0.030*	-0.304
	(0.016)	(0.015)	(0.007)	(0.025)	(0.024)	(0.016)	(0.424)
Mean Y	0.645	0.245	0.102	0.324	0.159	0.233	36.823
Obs	795	795	795	795	525	795	795

Notes: This table shows the coefficients from a first-differenced equation, described in the text, which includes interactions between the change in the relative wage with indicators for the quartile of the distribution of growth in the male wage potential wage, rescaled to represent the effect of a 10% increase in the relative (potential) wage. The dependent variable is shown in the column heading. Quartile of growth is defined separately for each year. The first quartile generally ranges from 0 to 0.02 log points; second from 0.02 to 0.08; third from 0.08 to 0.085; and fourth from 0.085 to 0.09. Standard errors are clustered at the state level, and cells are weighted by the female population in cell. * p<0.10, ** p<0.05, *** p<0.01. Source: Census 1980, 1990, 2000, and ACS 2010.

Table A.15: Benchmarking the Effect of PrWomanEarnsMore

	PrWomanEarnsMore	
Effect of 10% Increase in Rel. Wage	0.029**	
	(0.014)	
(mean) lncpsaveshiftwage	0.005	
	(0.015)	
Effect of 10% Increase in Male Wage		-0.026
		(0.019)
Effect of 10% Increase in Female Wage		0.031***
		(0.011)
Obs	1064	1064
Mean Y	0.259	0.259

Notes: This table shows the coefficients from estimating Equation 1, omitting unnecessary cohort controls, when the outcome is the probability that a woman earns more than a man in the market. Construction of this variable is described in the text. The dependent variable is shown in the column heading. Standard errors are clustered at the state level, and cells are weighted by the female population in cell. * p<0.10, ** p<0.05, *** p<0.01. Source: Census 1980, 1990, 2000, and ACS 2010.

Table A.16: Distinguishing the Effect of the Relative Wage from PrWomanEarnsMore

	(1) Marr.	(2) Nev. Marr.	(3) Divorced	(4) Cohab	(5) Sp. More Ed.	(6) Fem. Earner	(7) Hrs. Work
Effect of 10% Increase in Rel. Wage	-0.044***	0.027***	0.017***	0.052***	-0.006	0.042**	0.822***
	(0.009)	(0.008)	(0.006)	(0.013)	(0.019)	(0.016)	(0.206)
Effect of 10 p.p. Increase in PrWomanEarnsMore	-0.009*	0.009*	0.001	-0.003	0.003	-0.009	0.518***
	(0.005)	(0.005)	(0.003)	(0.007)	(0.006)	(0.006)	(0.146)
Mean	0.645	0.245	0.102	0.324	0.159	0.233	36.823
Obs	23573	23573	23573	22663	16925	23573	23222

Notes: This table shows the coefficients from estimating Equation 1 when the probability that a woman earns more is included as a control. Construction of this variable is described in the text. The dependent variable is shown in the column heading. Standard errors are clustered at the state level, and cells are weighted by the female population in cell. * $p<0.10$, ** $p<0.05$, *** $p<0.01$. Source: Census 1980, 1990, 2000, and ACS 2010.

Table A.17: Effects of the Relative Wage, Controlling for Alternative Mechanisms

	Marr.	Nev. Marr.	Divorced	Cohab	Sp. More Ed.	Fem. Earner	ln Rel. Wage
A: + ln(Pop.), Share Incarc.							
Effect of 10% Increase in Rel. Wage	-0.039***	0.035***	0.005	-0.006	0.024**	0.021*	0.059***
	(0.008)	(0.008)	(0.005)	(0.014)	(0.010)	(0.012)	(0.018)
B: + Male Wage Variance							
Effect of 10% Increase in Rel. Wage	-0.040***	0.030***	0.010**	-0.006	0.021**	0.026**	0.059***
	(0.007)	(0.007)	(0.004)	(0.014)	(0.010)	(0.013)	(0.018)
*C: + 1970 Manuf.*Yr. FE*							
Effect of 10% Increase in Rel. Wage	-0.037***	0.026***	0.011**	-0.008	0.017	0.028**	0.055***
	(0.009)	(0.008)	(0.005)	(0.016)	(0.014)	(0.013)	(0.020)
Obs	23278	23278	23278	16805	22465	23278	1057

Notes: This table shows the coefficients from estimating Equation 1 rescaled to represent the effect of a 10% increase in the relative (potential) wage. The dependent variable is shown in the column heading. Panel A adds controls for the log population and shares of men and women incarcerated in the marriage market. Panel B adds a control for the 50-10, 90-50, and 90-10 gap in men's log wages for all outcomes except the observed relative wage. Panel C adds a control for the share of individuals in the marriage market employed in manufacturing in 1970 interacted with year fixed effects. Standard errors are clustered at the state level, and cells are weighted by the female population in cell. * p<0.10, ** p<0.05, *** p<0.01. Source: Census 1980, 1990, 2000, and ACS 2010.

Table A.18: Marriage Effects by Whether Have Children in Household

	Any Kids	Married w/		Nev. Married w/		Divorced w/	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Kids	No Kids	Kids	No Kids	Kids	No Kids
Effect of 10% Increase in Rel. Wage	-0.030***	-0.056***	0.008	0.022***	0.009	0.006	0.012***
	(0.008)	(0.009)	(0.005)	(0.007)	(0.006)	(0.005)	(0.003)
Mean Y	0.634	0.511	0.135	0.054	0.191	0.063	0.039
Obs	23573	23573	23573	23573	23573	23573	23573
Average Wage	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table shows the coefficients from estimating Equation 1 rescaled to represent the effect of a 10% increase in the relative (potential) wage. The dependent variable is shown in the column heading. "Any children" is defined as having at least one child (biological, adopted, or stepchild) of any age in the household. The outcomes in columns 2-7 are the share of women that have a particular marital status and children/no children in the household. Standard errors are clustered at the state level, and cells are weighted by the female population in cell. * p<0.10, ** p<0.05, *** p<0.01. Source: Census 1980, 1990, 2000, and ACS 2010.

A.3 Data Appendix

Tables A.19 and A.20 show the 17 industries and 28 occupation groupings used in the analysis. I define occupations using the broad groupings by type of work in IPUMS. Industries are classified similarly to Katz and Murphy (1992), with manufacturing disaggregated into three industries.

I follow Autor et al. (2008) closely to construct wage variables in the Census and CPS. I drop all imputed wage observations, and multiply top coded earnings are multiplied by 1.5 and hourly earnings are set not to exceed top coded earnings multiplied by 1.5 divided by 1400 hours. The hourly wage is then set as annual earnings divided by weeks worked times usual hours worked. Wages are averaged using CPS sample weights multiplied by hours worked.

Table A.19: Industry Groupings

1. Agriculture, forestry, and fishing
2. Mining
3. Construction
4. Low Tech Manufacturing
5. Basic Tech Manufacturing
6. High Tech Manufacturing
7. Transportation
8. Communication
9. Utilities
10. Wholesale Trade
11. Retail Trade
12. Finance
13. Protective services
14. Personal Services
15. Entertainment and Recreation
16. Professional Services
17. Public Administration

Table A.20: Occupation Groupings

1. Management
2. Engineers and scientists
3. Other technicians
4. Physicians/Nurses
5. Health assistants
6. Teachers and social workers
7. Lawyers and judges
8. Entertainment
9. Sales
10. Administrative support
11. Cleaning services
12. Other personal service
13. Protective services
14. Food service
15. Farm and forestry workers
16. Mechanical and electronic repair
17. Construction trades
18. Mining extraction
19. Metal or wood work or calibrators
20. Plant operator
21. Metal work operator
22. Textile work
23. Misc machine operator
24. Assemblers/fabricators
25. Vehicle operators
26. Construction, movers
27. Financial specialists
28. Management support

A.4 Alternative Constructions of Potential Wage

A.4.1 Comparison of Potential Wage with Previous Methods

In this section, I create two additional, alternative, proxies for potential wages which use variation slightly different from that used in the paper, which I will refer to as the dynamic occupation-industry proxy, in order to understand the importance of each source of variation.

In particular, the first alternative proxy, which I will refer to as the demographic-industry proxy, eliminates any variation in occupation in the fixed share of workers, but adds demographic by industry variation in wages. This approach is akin to that taken in Bertrand et al. (2015) to generate a wage proxy at the mean, with four important differences; (1) the marriage market is defined as education-race-state cells, instead of education-race-state-age cells; (2) national wages are defined in the CPS instead of the Census; (3) national wages are hourly rather than annual (4) the base year is 1970 instead of 1980.

$$\widehat{w_{\mu gt}} = \sum_j \frac{E_{j\mu g,1970}}{E_{\mu g,1970}} \times w_{j,\mu g,t,-s}$$

The second proxy, the "static occupation-industry proxy", simply removes the dynamic updating of the shares, π_t^W from the instrument used in this paper:

$$w_{\mu gt} = \sum_o \sum_j \frac{E_{oj\mu g,1970}}{E_{\mu g,1970}} \times w_{ojt,-s}$$

In Table A.21, I show the results of estimating Equation 1, removing cohort-varying controls, for relative wages using the demographic-industry proxy (Panel A), or the static occupation-industry proxy (Panel B), together with the dynamic occupation-industry proxy (Panel C).[39] To test the sensitivity of the correlations, I increasingly add more controls, and show the full specification in Column 6.

Comparing estimates across panels, it is clear that conditional on national time varying race and education controls, the proxy which takes advantage of occupation variation is more highly correlated (four-fold) with the observed relative wage than that which relies on industry and demographic variation in wages. In particular, when year by race fixed effects are added in Column 4, the coefficient on the proxy in Panel A drops substantially in magnitude and the standard error doubles. The estimate does not recover when year by education group fixed effects or controls are added. This suggests that there may not be enough variation within race and education groups in wage growth by industry to be able to generate a significant correlation with the observed relative wage net of the time-varying fixed effects. Another thing to note is that the coefficients are not very different between the dynamic occupation-industry proxy and the static occupation-industry. Nonetheless, the standard errors are lower (by 10%) and the coefficients are higher (by 12%) for

[39] I focus on the sensitivity of the proxy for the relative wage because it is the key regressor in the analysis. I have previously looked at the sensitivity of the gender-specific wage proxies when created in these three manners, and found that there is a much smaller difference in their predictive power across specifications.

the dynamic occupation-industry proxy, suggesting that adding the dynamic updating of shares is helping increase the correlation between the proxy and observed wages.

Table A.21: Correlation with Observed Wages: Bridge with Other Variation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
A: Variation by demographic-industry							
ln Rel. Wage (Potential)	0.861***	0.397***	0.286***	0.142	0.166	0.180*	0.174*
	(0.039)	(0.068)	(0.040)	(0.094)	(0.100)	(0.093)	(0.095)
Partial R-Squared	0.642	0.089	0.075	0.009	0.014	0.017	0.018
Obs	1064	1064	1064	1064	1064	1064	1064
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
B: Variation by occupation-industry							
ln Rel. Wage (Potential)	0.993***	0.521***	0.438***	0.566***	0.591**	0.579**	0.745***
	(0.088)	(0.104)	(0.055)	(0.109)	(0.238)	(0.218)	(0.249)
Partial R-Squared	0.305	0.077	0.090	0.166	0.027	0.027	0.039
Obs	1064	1064	1064	1064	1064	1064	1064
C: Add dynamic shares							
ln Rel. Wage (Potential)	0.916***	0.477***	0.432***	0.544***	0.630***	0.612***	0.833***
	(0.075)	(0.098)	(0.050)	(0.100)	(0.204)	(0.194)	(0.225)
Partial R-Squared	0.258	0.076	0.103	0.182	0.043	0.040	0.067
Obs	1064	1064	1064	1064	1064	1064	1064
StandYr FE	No	Yes	Yes	Yes	Yes	Yes	Yes
StEdRace FE	No	Yes	Yes	Yes	Yes	Yes	Yes
YrEd FE	No	No	No	No	Yes	Yes	Yes
YrRace FE	No	No	No	Yes	Yes	Yes	Yes
YrState FE	No	No	Yes	Yes	Yes	Yes	Yes
Controls	No	No	No	No	No	Yes	Yes
RaceStTrend	No	No	No	No	No	Yes	Yes

The unit of observation is a cell defined by an education x race x state x year. Sources: Proxy: 1970 decennial census, 1980 - 2011 March CPS, Wages: 1980-2000 decennial censuses, 2010 ACS. Standard errors clustered at the state level. * p<0.10, ** p<0.05, *** p<0.01

Finally, Table A.22 shows the main results of the paper re-estimated using the static occupation-industry proxy described above. Although I show that including dynamics in the construction of the potential wage increases precision above, this variation may be undesirable if it is correlated with local marriage market decisions. If this form of endogeneity was influential for the results, we might expect the findings to be significantly different when the dynamics are removed. In contrast to this, the results in Table A.22 are quite similar to the estimates with my preferred proxy. The only important departure is that the effects on divorce are attenuated, which then also reduces the effects on marriage rates by construction. Nonetheless, the effects are are within the 95 percent confidence interval of the main estimates.

Table A.22: Effects of the Relative Wage, Removing Dynamic Updating from Potential Wage Constuction

	(1) Marr.	(2) Nev. Marr.	(3) Divorced	(4) Cohab	(5) Sp. More Ed.	(6) Fem. Earner	(7) Hrs. Work
ln Rel. Wage (Potential)	-0.036**	0.031***	0.006	0.047***	0.002	0.027**	1.108***
	(0.015)	(0.010)	(0.007)	(0.016)	(0.016)	(0.013)	(0.296)
Mean Y	0.645	0.245	0.102	0.324	0.159	0.233	36.823
Obs	23573	23573	23573	22663	16925	23573	23222
Average Wage	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table shows the coefficients from estimating Equation 1 rescaled to represent the effect of a 10% increase in the relative (potential) wage using the static occupation-industry proxy described in Section A.4.1. The dependent variable is shown in the column heading. Standard errors are clustered at the state level, and cells are weighted by the female population in cell. * $p<0.10$, ** $p<0.05$, *** $p<0.01$. Source: Census 1980, 1990, 2000, and ACS 2010.

A.4.2 Sensitivity of Potential Wage to Census Wages and Alternative Education Groupings

The baseline results use a potential wage which relies on variation from 28 occupations; wages from the March CPS supplement; and varies across two education groups that are separated by any college participation. Nonetheless, the results are robust to defining education categories by non-college attainment/college-attainment, fewer occupations, and the use of the Census-reported income. Table A.23 shows the power of three alternative wage proxies where all three rely on variation from 21 occupations[40], the second and third utilize Census wage information, and the third utilizes the alternative categorization of education groups.

Table A.23: Sensitivity to Fewer Occupations, Census Wages, College-Education Groupings

	(1) 21 Occs	(2) + Census	(3) + Col. Groups
ln Rel. Wage Option	0.712***	0.608***	0.650***
	(0.220)	(0.223)	(0.176)
Partial R-Squared	0.481	0.054	0.030
Obs	1064	1064	23091

This table estimates Equation 1, removing cohort-varying controls, where the outcome is wages from the Census and the wage proxy is constructed as described in Section 4 with the above modifications. Standard errors clustered at the state level. * p<0.10, ** p<0.05, *** p<0.01. Sources: 1970-2000 Censuses, 2010 ACS.

I use the last potential wage to investigate whether the effects of the relative wage differ for individuals with a college education. This speaks to the assertion that differential responses to changes in the incentive to specialize might explain the gap in marriage across college- and non-college-educated individuals (Lundberg et al., 2016). Table A.24 provides some support for this claim: an increase in the relative wage has a smaller impact on the likelihood that a college-educated woman remains unmarried compared with less-educated women. For other outcomes, the effects are of similar magnitude or larger, in the case of hours worked, for college-educated women.

[40] The occupations combine technicians and engineers/scientists; construction and protective services and mining extraction; personal services and food services; metal work operator and plant operator; textile operator with assemblers; motor vehicle operation and moving

Table A.24: Do Effects of Relative Wage Differ For College-Educated?

	(1) Marr.	(2) Nev. Marr.	(3) Divorced	(4) Cohab	(5) Sp. More Ed.	(6) Fem. Earner	(7) Hrs. Work
ln Rel. Wage x Col+	-0.023**	0.017*	0.007	-0.010	0.007	0.024**	0.280
	(0.009)	(0.009)	(0.009)	(0.012)	(0.015)	(0.010)	(0.457)
ln Rel. Wage x HS-	-0.057***	0.059***	-0.001	0.051***	-0.001	0.036***	-0.334
	(0.009)	(0.010)	(0.008)	(0.014)	(0.016)	(0.010)	(0.464)
Obs	0.645	0.245	0.102	0.325	0.159	0.233	36.785
N	45371	45371	45371	42279	31551	45371	43963

Notes: This table shows the coefficients from estimating Equation 1 on a sample of women ages 22-44. "HS-" indicates having up to some college education, "Col+" indicates having at least a college degree. The dependent variable is shown in the column heading. Standard errors are clustered at the state level, and cells are weighted by the female population in cell. * p<0.10, ** p<0.05, *** p<0.01. Source: Census 1980, 1990, 2000, and ACS 2010.

A.5 Descriptive Evidence with NSFH

This section uses Wave 1 (collected 1987-1988) of the NSFH to provide descriptive estimates of the relationship between relative wife to husband income in the household and reported marital satisfaction. Under the assumption that happiness in marriage rises with spouse quality, this provides corroborating evidence that husband quality improves with the relative wage. Although the survey contains rich data over preferences and happiness among married couples, the relatively few households in the survey provide insufficient power to perform estimation with the exogeneous proxy for the relative wage. Therefore, I provide cross-sectional estimates of this relationship, which I believe are informative, although susceptible to biases.

The NSFH is a national survey of 13,000 households that collects comprehensive information regarding the marital history and cohabitation of a primary respondent and his or her spouse, if applicable. For the most part, I treat the data similarly to Bertrand et al. (2015), who use this data to study the change in marital satisfaction when women earn more than men.[41] Their sample includes 4,000 married couples where at least one person earns positive income. I further hone in on households where the wife is between the ages of 22 and 44 (to match my Census sample) and where she earns less than her husband (to fit the set-up of the theoretical model). This conveniently also allows me to abstract from the aversion mechanism that forms the focus in Bertrand et al. (2015). There are 3,000 married households with relevant ages, and I remain with 80% of these (2,400) after the income restriction.

I analyze responses to three survey questions that capture marital happiness to varying degrees. The first two, which were also used in Bertrand et al. (2015), measure whether a respondent describes her marriage as very happy (7 on a scale of 1 to 7) and whether during the past year the respondent ever thought that marriage might be in trouble. To supplement these and address the prior literature on domestic violence (Aizer, 2010), I also examine the responses to whether an argument with her partner became physical in the past year.

I estimate

$$Y_i = \beta_1 lnRelativeIncome_i + \beta_2 lnTotalIncome_i + \beta_3 X_i + \epsilon_i \tag{5}$$

where Y_i is a binary variable based on the survey response by either the wife or husband, $lnRelativeIncome$ is the difference between $lnWifeIncome$ and $lnHusbandIncome$[42] and X_i is a vector that includes an indicators for region of residence, whether the wife is working, whether the husband is working, race and ethnicity of the wife and husband, education category; quadratics in the wife's and husband's ages; and a linear term in years of education.

Table A.25 reports that when the relative income is more equal (higher) a woman is more likely to describe her marriage as very happy and less likely to have thought her marriage was in trouble

[41] In results not reported, I replicated the NSFH results in Bertrand et al. (2015).

[42] Following Bertrand et al. (2015), I set lnWifeIncome equal to 0 if wife's income is 0, and similarly for husband's income. Results are robust to replacing $lnRelativeIncome$ with $WifeShareIncome = \frac{\text{WifeIncome}}{TotalIncome}$.

in the last year. The effect on physical violence is statistically insignificant; however, the baseline incidence of violence is quite low (7.5%), which could make it difficult to detect an impact, in addition to the fact that misreporting could be more prevalent for this question. Interestingly, a higher relative wage is also associated with less marital strife for husbands. Since men do not report being happier, this could be a reflection of less distress among women. Taken together with the estimates of improvements in spousal characteristics in Section 5.1, this helps to provide a unified picture of that a higher relative wage leads to greater husband quality, as predicted in the model.

Table A.25: Correlation Between Relative Wife to Husband Income and Marital Satisfaction

	V. Happy	Marr. Trouble	Physical Last Year
A: Wife's Response			
Ln(Wife Income/Husband Income)	0.027**	-0.018*	0.002
	(0.011)	(0.010)	(0.005)
Mean Y	0.477	0.298	0.075
Obs	2433	2391	2369
B: Husband's Response			
Ln(Wife Income/Husband Income)	0.011	-0.026***	-0.003
	(0.010)	(0.010)	(0.006)
Mean Y	0.437	0.254	0.074
Obs	2435	2407	2388

Responses of married men and women in households where the wife is between the ages of 22 and 44 and earns less than her husband. Survey questions are described in the test. Regressions weighted by married couple case weight ("spweight") and robust standard errors are shown. Source: Wave 1 of NSFH.