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

Na'ama Shenhav*

February 5, 2018

Abstract

This paper examines the influence of the female to male wage ratio, "relative wage," on the spouse quality of women, marriage, and women's labor market activity. Theoretically, I show that a higher relative wage (i) increases the minimum non-pecuniary benefits ("quality") women require from a spouse, (ii) reduces marriage among low-quality husbands, and (iii) increases women's hours of work. To evaluate these predictions, I exploit task-based demand shifts as a shock to relative pay. Consistent with the model, I find that an increase in the relative wage increases the quality of women's mates, delays a woman's first marriage, and raises divorce rates. Women also work more hours, conditional on being employed. The estimates suggest that increases in the female to male wage ratio explain 20% of the marriage decline from 1980 to 2010.

*Department of Economics, Dartmouth College. E-mail: naama.shenhav@dartmouth.edu. I am grateful to Doug Miller, Marianne Page, Giovanni Peri, and Hilary Hoynes for their insights, guidance and support. I thank Kristin Butcher, Scott Carrell, Elizabeth Cascio, Chloe Gibbs, Nora Gordon, Judith Hellerstein, Melissa Kearney, Ethan Lewis, Erzo Luttmer, Richard Murnane, Claudia Olivetti, Maureen Pirog, Dave Rapson, Kim Shauman, Shu Shen, Dmitry Taubinsky, and Catherine Weinberger for useful discussions. I am also appreciative of the feedback that I received from numerous seminar participants at the Bureau of Labor Statistics, the Census Bureau, Cornell, Dartmouth College, Georgia State University, UC Davis, University of Colorado Denver, University of Houston, University of Maryland, and UC Santa Barbara, in addition to conference participants at SOLE. This work was supported by a National Academy of Education/Spencer Dissertation Fellowship. Previous versions of this work were circulated under the title "What Women Want: Family Formation and Labor Market Responses to Marriage Incentives."

1 Introduction

Over the last three decades, the share of women never married before age 44 rose to 34% from 16% and likewise the share of births to unmarried women increased to 40% from 20%.[1] This decline in marriage has attracted significant attention; yet, to date, work in this area has not addressed *which* marriages did not form. Nor has it evaluated the labor supply implications of the coinciding reduction in the gender wage gap. Both of these are critical for evaluating the social consequences of the marriage decline.

A central concern is that the increasing share of single mother households caused the academic performance and behavior of children to suffer (Autor et al., 2015; Bertrand and Pan, 2013). However, the ramifications for children depend immensely on the characteristics of the spouses that mothers would have married and the net effect on parental investments. As one example, while a positive male role model can improve child behavior, a caustic or abusive household environment can also inflict substantial harm (e.g. Carrell and Hoekstra, 2010).

In the backdrop of these changes in marriage, labor market opportunities for women relative to men showed a marked improvement from 1980 to 2010. Foremost, women's wages relative to men's appreciated by an unprecedented 20%, depicted in Figure 1. Paralleling the rise in wages, women's relative hours worked and share of family income also increased.[2] This increase in women's wages relative to men's may have lifted the labor market participation of women by reducing the incentive to marry and attenuating the extent of specialization within households. Put in this way, the decline in marriage would simply be a byproduct of the greater labor productivity of women, which could have improved the living standards of households.[3]

In this paper, I study the effect of the closing of the gender wage gap on spouse quality, marriage, and women's labor market outcomes. I begin with a novel analysis of a standard model of marriage with specialization as in Becker (1973), and demonstrate that it predicts that a more equal female to male wage ratio reduces a woman's propensity to marry a "low quality" husband, as defined below, raises the average husband quality among married women, and raises women's hours of work.

[1] Lundberg et al. (2016), Lundberg and Pollak (2013), Autor and Wasserman (2013) and Bailey et al. (2014), as well as others, provide nice summaries of recent patterns in marriage, cohabitation, and fertility.

[2] See, e.g. Glynn (2010, 2014); Knowles (2012); Bertrand et al. (2015).

[3] In particular, households where women control a larger share of income have been shown to invest more in child education and health and hold less-risky financial assets (Duflo, 2003, 2012; Qian, 2008; Thornqvist and Vardardottir, 2013).

In the model, women experience fewer pecuniary gains to marriage under a more equal female to male wage ratio, and hence increase the minimum non-pecuniary benefits that they require from a husband. As a result, fewer women marry men that are perceived to have undesirable spouse quality, those for whom pecuniary gains serve to offset unattractive personal traits. In aggregate, then, when the gender wage gap decreases, the marriage rate declines, and average spouse quality improves. Women's hours of work conditional on working increase, although extensive margin labor supply effects are shown to depend on the distribution of spouse quality.

To identify the impact of the ratio of female to male wages, or, simply, the relative wage, I take advantage of the fact that shifts in demand over this period relatively benefited "female" occupations, which tend to be high in cognitive and social tasks (Beaudry and Lewis, 2014; Weinberg, 2000; Bacolod and Blum, 2010). Specifically, I generate variation in the *potential wages* across marriage markets using a novel variant of the Bartik-type approach, relying on differential exposure to these demand shifts across sexes and geographic areas which arise from the historical geographic dispersion of industries and, distinct from prior work, differential specialization in occupations across sexes (Bartik, 1991). The empirical analysis then yields reduced form effects of the *potential* relative wage, which I hereafter refer to as the relative wage for brevity. To assuage concerns regarding unobserved confounds in the marriage market, I show that growth in the potential wage is not correlated with pre-existing trends in marriage, single motherhood, or women's employment, and is also not correlated with shocks to the opposite-sex wages or with the potential average wage in the market.

I provide four sets of empirical findings that support the theoretical predictions.

First, I show that a higher relative female to male wage improves husband quality among married couples along observable characteristics. A 10% increase in the relative wage - roughly the variation that I leverage over this period - leads to a 16 percent increase in the share of women married to a higher-educated spouse. Women are also less likely to be married to an older spouse, which recent surveys find is correlated with lower marital satisfaction, although there is not a consensus over the age preferences of women (Lee and McKinnish, 2017). Moreover, descriptive evidence from the National Survey of Families and Households (NSFH) indicates that a higher relative wife to husband income ratio correlates with greater marital happiness for households that

have a dominant male earner, as in the model.[4]

Second, I demonstrate that a higher relative wage reduces marriage through a meaningful delay in first marriages and increased divorce. A 10% increase in the relative wage leads to a 3.1 percentage point (p.p.) increase in the share of never-married women and a 1.7 p.p. increase in the share of divorced women. The first-marriage decisions of low-educated and younger women are particularly responsive to the relative wage, consistent with evolving marriage norms among these groups (Lundberg et al., 2016; Edin and Kefalas, 2005). The estimates can explain 20% of the decline in marriage between 1980 and 2010.

Third, I provide evidence of the undesirability of the marginal potential spouse by examining whether a higher relative wage affects whether women live with a romantic partner. If a higher relative wage lessens the demand for marital commitment equally across all couples, then for some women, cohabitation would be an optimal alternative. Women facing a spouse with unpleasant traits would be unlikely to substitute, however, since cohabitation does not provide greater offsetting pecuniary benefits than marriage (Lundberg et al., 2016). Consistent with the latter prediction, I find that 65% of women who do not marry under a higher relative wage (and would have lived with their spouse) instead opt to live with a female roommate or live alone. Further, though 23% of these women live with a single man, I do not find a material increase in reported cohabitation, suggesting these may be largely non-romantic living arrangements. This shift towards a platonic living arrangement in place of marriage is consistent with the marginal spouse being undesirable.

Fourth, I find that a higher relative wage increases women's labor supply, even once I condition on the female wage. A 10% increase in the relative wage induces an additional 1 hour of work per week conditional on working. Decomposing this result, I document that a woman's hours respond symmetrically to her own wage and to men's wage, indicating that the wages of potential mates exert substantial influence over women's labor market decisions. However, I find no effect on employment or labor force participation. In total, the appreciation of the relative wage causes a 5% increase in women's annual earnings and a 7% rise in women's share of household income.

This paper relates to several literatures.

First, it adds to a small group of studies that consider the determinants of spouse quality, and

[4]Unfortunately, these data have too few observations, just 13,000 households, to perform estimation using demand-based shocks.

has thus far focused on the role of the balance of sexes in the market and individual skills. Utilizing varying shocks to the relative supply of men in the marriage market, Charles and Luoh (2010), Angrist (2002), and Abramitzky et al. (2011) show that a reduction in the male to female sex ratio tends to increase the male marriage rate, "upgrade" spouse quality - measured by relative education and lower age gap - and increase women's labor force participation. McCrary and Royer (2011) show that improvements in women's education also serve to improve mate quality along these dimensions. My findings suggest that labor market opportunities also influence spousal characteristics, and argue that selection out of marriage is a significant contributor to the average spouse quality, not only "marrying up."

Second, it connects to a growing body of work that quantifies the impact of men and women's employment opportunities on marriage and fertility, but has not yet addressed spouse quality (Schaller, 2015; Blau et al., 2000; Autor et al., 2017; Kearney and Wilson, 2017). In general, these studies show that increasing demand in industries in which women (men) are concentrated lead to reductions (increases) in marriage and fertility.[5] However, it is difficult to translate the effects of employment changes to closing the wage gap. If, for example, labor supply is relatively elastic, then demand-induced employment increases may not necessarily correspond to a higher wage. The identifying variation for effects on marriage is also different than this paper and sometimes at risk of labor supply influences; leveraging transitory employment shocks (Schaller, 2015), recent shifts in natural resource and manufacturing employment (Autor et al., 2017; Kearney and Wilson, 2017), and contemporaneous local worker occupation and industry choices (Blau et al., 2000).

Closer to the current work, Bertrand et al. (2015) document that increases in the probability of women earning more than men reduces marriage and, for married women, reduces labor force participation and marital satisfaction. However, their work abstracts from the spouse quality of marriages that do not form, which I show is important for considering the total implications of a higher relative wage. Moreover, this paper estimates the broader impact of the relative wage - utilizing the entire distribution of the relative wage - and shows average effects that differ from the response to women earning more than men. Unlike Bertrand et al. (2015), I find a *positive* effect of the relative wage on hours worked, indicating that the labor market withdrawal is specific to

[5] An exception to this is Kearney and Wilson (2017), who find that increases in men's wages during the fracking boom did not lead to greater marriage.

women earning *more* than men. Additionally, I find suggestive evidence of a *positive* relationship between relative income with marital satisfaction when, as in my model, women earn less than men.

Third, this work complements recent studies that show that improving women's wages relative to men leads to a reduction in the incidence of emotional and physical abuse against women (Aizer, 2010; Munyo and Rossi, 2015). The records of violence utilized in those studies prevent the authors from analyzing mechanisms for the effects. My findings provide evidence for two additional channels for the previously documented effects; a decline in relationships with low-quality spouses and greater financial independence of women, which can be a source of power against potential spouses (Edin and Kefalas, 2005).[6]

Last, I improve upon prior methods used to construct potential wages, both in power as well as in the evidence of the validity of the identifying assumption. The method here is most similar to Aizer (2010), and Bertrand et al. (2015), each of whom utilize cross-industry variation in wages in a Bartik aproach. But by allowing exposure to additionally vary by occupation, I am able to better capture heterogeneity in task-work across markets and therefore increase power relative to earlier wage proxies.[7] To my knowledge, this is also the first paper to provide evidence for the assumption that the relative potential wage is uncorrelated with pre-existing trends in family formation.

The paper proceeds as follows. I introduce the expected effects of the relative wage in Section 2 and the data in Section 3. Section 4 provides background on the gender wage gap and sample summary statistics. Section 5 introduces the empirical strategy followed by evidence on the validity of the empirical strategy in Section 6. The results are presented in Section 7. Section 8 addresses alternative specifications and the robustness of the results, and 9 concludes.

2 Expected Effects of the Relative Wage

To analyze the effect of the gender pay gap on spouse quality and women's employment, I adapt the static marriage and household decision making framework in Bertrand et al. (2016), which studies the trade-off between women's work and home production in the presence of gender

[6] Edin and Kefalas (2005) write that "[l]ow income women are waging a war of the sexes in the domestic sphere, and they believe their own earnings and assets are what buys them power."

[7] Less recent papers such as Katz and Murphy (1992) and Blau et al. (2000) also take advantage of occupational variation (in those cases, to instrument for employment growth).

norms. I adjust the model to allow for a bounded support for spouse quality, but maintain the other main features of the model.[8] Whereas Bertrand et al. (2016) use this model to examine how societal gender norms influence the skilled-unskilled marriage gap and women's education decisions, I derive five 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 $[\underline{q}, \overline{q}]$.[9] Spouse quality perceived by i and j are 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. (2016). 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:

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

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

I apply this model to a single marriage market with homogeneous wages for men and women in the market. This corresponds to the focus on within-market behavior in the empirical design. Results hold when I allow for wage variation in the market. Matching observed wage patterns, and as in Bertrand et al. (2016), I presume that men have an advantage in market production such that $w_m > \beta\, n\, \gamma > w_f$[10]. 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

[8] The model in Bertrand et al. (2016) 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.

[9] 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.

[10] Consistent with this, husbands earn more than wives in nearly three-quarters of couples (Bertrand et al., 2015). 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.

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 and obtain utility w_i.

Individual i marries j if her utility in marriage is greater than the outside option. Gains from marriage 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, 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:

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

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

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

$$q_m^* = -\alpha\, w_f\, (1 - \gamma + \frac{w_f}{\beta n}) - \beta\, n \left[\gamma\, (\gamma - \frac{w_f}{\beta n}) - \frac{1}{2}\, (\gamma - \frac{w_f}{\beta n})^2\right] \tag{3a}$$

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

Predictions

With this set up, I develop clear 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 formal proofs in Appendix A.1.1. For predictions over men's spouse quality, see Appendix A.1.2.[11] To match the empirical work, I consider the effect of a rise in Γ that leaves the average wage constant, i.e. raises w_f and reduces w_m.[12] Unless otherwise noted, I maintain throughout that $\underline{q} < q_i^* < \overline{q}$ for men and women, such that some, but not all matches agree to marry.

[11] Because the relationship between the relative wage and men's spouse quality is theoretically ambiguous, and I have fewer measures of observable spouse quality for men, I focus less on this prediction.

[12] 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.

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 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. Now, greater non-pecuniary gains are now required 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 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.

Prediction $2'$ *Suppose that women experience an additive marriage utility* ϕ *associated with increasing age, e.g. from a greater taste for marriage or greater negative social pressure associated with being single. Then, the marriage decisions of older women will be less responsive to* Γ.

Incorporating ϕ into the marriage utility of women generates additional gains to marriage with age, such that women's reservation spouse quality decreases with age. If ϕ is sufficiently large, such that $q_f^* < \underline{q}$, women become inframarginal to Γ.

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 5 *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 sizeable 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.

3 Data

I use data from the IPUMS 1970 (1%) Census and the 1980 to 2011 March Current Population Survey (King et al., 2010; Ruggles et al., 2010) to create my proxy for potential wages. I restrict the sample to working age individuals between 18 and 64 years old who have positive reported earnings

for the previous year and are not self-employed. The roughly one million working age individuals in the 1970 census allow me to establish detailed employment shares in each marriage market prior to my period of analysis. I observe approximately 60,000 households in the March CPS that I use to obtain annual information on average hourly wages for each industry and occupation.[13] Hence, I am able to show responses to contemporaneous as well as once-lagged wages, in case there is a delay in behavioral responses to wages (results in Appendix A.2.5). Further detail on the occupation and industry groupings as well as the construction of wage variables is available in Appendix A.2.1. I include sensitivity analyses to using decennial Census wages and to alternative industry-occupation groupings in Section A.2.3.

I obtain data on family structure and family income from the 1980, 1990, and 2000 Censuses and the 2010 American Community Survey (ACS). I observe current marital status, cohabitation (reported from 1990 on by the head of household), employment, and wages for individuals in the sample as well as spousal age and education, and total income in the household.[14] I focus on a sample of almost 5 million women ages 22 to 44, who are likely to be on the margin of marriage.[15] This ensures that I can reliably classify whether an individual completed some college or not - since the hazard for completing some college is significantly lower after age 22 - and that women are all of child-bearing age (Bailey, 2006). I include individuals that identify as one of three race-ethnicity groups: white non-Hispanic, black non-Hispanic, and Hispanic; and two education levels: less than or equal to high school and at least some college.

4 Background: The Gender Wage Gap and Families, 1980-2010

4.1 The Role of Tasks in Wage Convergence Across Sexes

Although many factors contributed to wage growth during this period, a number of recent studies document that technology-induced demand shifts account for the majority of the closing gender wage gap.[16] In particular, the wave of computerization beginning in 1980 reoriented demand

[13] The May CPS/Outgoing Rotation Group (MORG) also provides annual information, but had a notable redesign in 1994, which makes its measures less comparable over time (Autor et al., 2008).

[14] Unfortunately, age at first marriage, another relevant outcome, ceased being collected after the 1980 Census.

[15] The average effects are not different when I analyze 22 to 30 and 31 to 44 year old women separately. Section 7.4 discusses heterogeneity by age and education.

[16] Other factors include: the rise in women's educational attainment and workplace experience (O'Neill and Polachek, 1993; Blau and Kahn, 1997; Goldin et al., 2006), the introduction of birth control (Bailey et al., 2012), the

for occupations based on their complementarity with technology; increasing the need for workers in cognitive- and people-oriented occupations while incrementally eliminating physically-intensive occupations (Autor et al., 2003; Bacolod and Blum, 2010; Autor and Price, 2013; Deming, 2015). These shifts favored women due to their historical specialization and innate advantage in the former category of work (Baker and Cornelson, 2016; Beaudry and Lewis, 2014; Weinberg, 2000).[17] The sharp break from previous trends comes across in a simple plot of wage growth by skill group and gender, as in Figure 2. It also highlights the particular significance of 1980 for the acceleration of wages of high-skilled women and the depreciation of the wages of low-skilled men (Autor et al., 2008; Katz and Murphy, 1992; Blau and Kahn, 1997).

Given the role of mechanization in this convergence, it is interesting to observe how the growth in the relative wage varies across states with distinct industrial concentrations. Figure 3 visually depicts the geographic variation in the change in the log relative wage from 1980-2010. The convergence of male and female wages ranges from 5% to 30%.[18] The majority of states experienced convergence above 18%, with higher rate of convergence seen in the Rust Belt (Pennsylvania, West Virginia, Ohio, Indiana, Michigan, Illinois and Wisconsin) - the center of American manufacturing - and lower convergence primarily in the South and New England. Employment of women in the health sector - which had rapidly growing wages over this period - may have also influenced this pattern. This could have contributed to the high rates of convergence in Minnesota, for example, where 15% of low-skilled women were employed as doctors, nurses, or health assistants in the 1970 Census. My empirical strategy returns to these occupational differences across sexes and geographic areas as an important source of variation that explains the ensuing wage convergence.

4.2 Family Formation and Labor Market Participation

Table 1 presents descriptive statistics for the family formation and labor market outcomes in the sample from 1980 to 2010. In the first two columns I present the mean and standard deviation

rise in females in professional and managerial occupations, reductions in discrimination (Black and Juhn, 2000; Black and Strahan, 2001; Black and Brainerd, 2004), increasingly positive selection into the workforce (Mulligan and Rubinstein, 2008), and changes in demand (Katz and Murphy, 1992). See Blau and Kahn (2000) and Blau and Kahn (2016) for discussions of the relative importance of these factors.

[17] An alternative explanation for women's complementarity to technology adoption is women's greater specialization in more easily automated (routine) tasks (Black and Spitz-Oener, 2010). The results in this paper are robust to this interpretation.

[18] Appendix Figure A.1 shows the variation in male and female wages across states.

for the whole period, while in the following columns, I include the corresponding statistics for 1980 and 2010, respectively, to highlight the changes over time. The statistics are weighted by census-provided weights to make the sample representative of the population.

Over this period, the percent married declines by 18 p.p., from 74% in 1980 to 56% in 2010. This pattern corresponds to the rise in never-married females, which climbed from 16% to 34%.The share of divorcees, on the other hand, is steady at 9.5 percent throughout. The percent of unmarried mothers living with their children nearly doubles from 9% to 15%.

The attributes of women's spouses have also evolved. For instance, women are 50 percent more likely to marry a younger spouse in 2010 than 1980, although over 70 percent still marry older men. Additionally, the share of women with spouses more educated than themselves declined from 39% to 28%, mirroring the rise in education levels of women.

Concurrently, women's participation in the labor market expanded. On the extensive margin, the share of women employed grew from 59.8% to 67.5%. Prior work has highlighted the significant rise in the labor force participation of married women as an important source of increases in women's participation rates (Goldin, 2006). Weekly hours of work (conditional on working) also increased, from 35.7 to 36.8 hours. The percent of households with a sole female breadwinner, or contributor to household total income - hereafter, simply, female breadwinner - grew from 20.8% to 23.3%, while the percent of households with a (sole) male breadwinner fell from 15.2% to 9.5%.

5 Empirical Approach

5.1 Identification of Impacts on Family Outcomes

I estimate the relationship between the relative potential wage and family outcomes, Y, observed for a local marriage market μ, and birth cohort c, in a given year t as follows:

$$\begin{aligned} Y_{\mu ct} =& \beta ln RelativePotentialWage_{\mu t} + \alpha_\mu + \delta_{rt} \\ &+ \chi_{et} + \gamma_{st} + \xi_{ct} + \rho_{rs} * t + X_{\mu t}\phi + \upsilon_{\mu ct} \end{aligned} \tag{4}$$

I define the marriage market as composed of men and women who share similar background characteristics and are located within the same geographic area. This conforms with evidence that

men and women tend to marry assortatively. In the spirit of prior literature, μ is defined by a common education level e (up to high school or at least some college), race r (white non-Hispanic, black non-Hispanic, Hispanic), and state s.

Using these parameters to determine the marriage market has several benefits. First, I maintain continuity with recent work, which enables comparison of estimates (Bertrand et al., 2015; Charles and Luoh, 2010). Second, defining education in two coarse bins allows me to dependably categorize younger individuals into an education category, and also permits matching between individuals across finer education categories. For example, in 1980, among married women, 20 percent of the college-educated were married to a man with some college (but not a degree), and 31 percent of women that only had some college married a man with a college degree.[19,20] Third, related to this point, limiting the marriage market to one's state of residence, rather than a more granular geographic level, allows for matching to occur outside of one's locality. If these parameters are misspecified, such that the relative wage I assign to individuals is not reflective of own wages or potential partners' wages, I expect that my results will be attenuated by measurement error.

To estimate a causal effect of the relative wage, I require a plausibly exogenous source of variation in potential wages across sexes (conditional on other covariates - I return to these at the end of this section). I focus on the impact of potential wages, not actual wages, because they have been argued to be the relevant measure for marriage decisions (Pollak, 2005). Lacking experimental variation in wages, a common quasi-experimental approach is to set the potential wage as the weighted average of national industry-specific log wages w, where the weights reflect the share of the sex and market μg in industry j prior to the period of analysis (i.e. 1970) (Aizer, 2010; Bertrand et al., 2015; Diamond, 2016).

$$w_{\mu g t} = \sum_{j} \frac{E_{j\mu g,1970}}{E_{\mu g,1970}} \times w_{jt,-s}$$

To gain intuition for this approach, one can consider the simple case of two industries, j_1 and j_2, and that wages vary from low to high only for j_1. In that case, the the logic of identification simplifies to a difference-in-difference design, comparing the effect of the wage change across markets

[19] These statistics were fairly stable over time; 22 percent were in each of these categories in 2010.

[20] The results are not sensitive to an alternative education grouping that separates college-educated from lower-educated, as shown in Appendix Section A.2.3.

that have a greater presence of j_1 to those with a lesser presence of j_1.

I introduce two adjustments to this setup. First, I incorporate variation in shares and wages across occupations o within an industry (i.e $\frac{E_{oj\mu g,1970}}{E_{\mu g,1970}}$), drawing on recent work which highlights the importance of occupation-specific tasks in the closing of the gender gap.[21] The use of sub-industry wages has become a standard way to gain additional precision in this prediction, but typically relies on demographic-level wages (Bertrand et al., 2015).[22] I discuss the additional power gained from this approach in Section 6.

Second, I allow systematic updating of marriage-market weights following national trends in occupation growth to account for the large changes in the distribution of employment over this period. However, rather than rely on overall growth in occupations, which was influenced by changes in women's labor supply behavior (Black and Juhn, 2000), I take advantage of the differential growth in the importance of occupations *across industries*. This is reflected in deviations in the growth of the within-industry employment share of the occupation, $\frac{E_{ojt,-s}}{E_{jt,-s}}$, from the growth in the national employment share of the occupation, $\frac{E_{ot,-s}}{E_{t,-s}}$.[23] This source of growth is more likely to reflect industry-productivity or industry-technology than labor supply decisions, and contributes additional power to the potential wage, which I quantify in the next section.

Letting the growth in the within-industry share relative to 1970 be $\pi^W_{ojt,-s}$, and the growth in the national occupation share relative to 1970 be $\pi_{ot,-s}$, this updating term is written as:

$$\pi^{W*}_{ojt,-s} = (\pi^W_{ojt,-s})(\frac{1}{\pi_{ot,-s}}).$$

The updating term is then normalized such that the weights sum to one. Updating the weights in this manner allows the weights for each marriage market to more realistically reflect the contemporaneous local employment conditions without compromising the validity of the potential wage.

[21] Unfortunately, the industry-occupation-state cells in the 1970 census are quite small, so I use national industry-occupation shares in order to minimize the amount of noise in the shares. In particular $\frac{E_{oj\mu g,1970}}{E_{\mu g,1970}} = \frac{E_{ojersg,1970}}{E_{ersg,1970}}$ is approximated as $\frac{E_{jersg,1970}}{E_{ersg,1970}} \times \frac{E_{ojerg,1970}}{E_{jerg,1970}}$. Appendix Figure A.2 shows a high correspondence between observed shares and this prediction.

[22] My incorporation of occupation wages reduces the source of variation to cross-sectional differences in occupations, and limits the introduction of variation from unobservable characteristics of demographic groups.

[23] To fix ideas, in Table A.8 I present $\pi^W_{oj,2010}$ and $\pi_{o,2010}$ for management (columns 2 and 3, respectively.) Looking within column (2), it is apparent that management was increasing its share in most industries, which is reflected in the national average growth of 21% in column (3). I update the weights using the ratio of columns (2) and (3).

The resulting potential wage is:

$$\widehat{w_{\mu g t}} = \sum_j \underbrace{\frac{E_{j\mu g,1970}}{E_{\mu g,1970}}}_{\substack{\text{Between-industry} \\ \text{exposure, 1970}}} \times \sum_o \underbrace{\frac{E_{oj\mu g,1970}}{E_{j\mu g,1970}}(\pi^{W*}_{ojt,-s})}_{\substack{\text{Within-industry} \\ \text{exposure, t*}}} \times w_{ojt,-s}$$

Intuitively, the key variation in the log relative potential wage ($\widehat{w_{\mu female t}} - \widehat{w_{\mu male t}}$) derives from the segregation of men and women in occupations and industries within a marriage market interacted with the change in returns to occupation over time. All else equal, marriage markets experience more growth in the relative wage when men and women in the market have less overlap in their occupations (and industries) and when the occupations (and industries) that women are in experience relatively more growth in wages. As illustration of this specialization, Appendix Table A.7 shows that there is little overlap in the 10 most common occupations for men and women. The extent of this segregation varies across marriage markets due to the idiosyncratic location of industries across states and sex-specialization patterns across demographic groups.

This approach circumvents the concerns of using local wages, but remains vulnerable to potential biases. The most severe of these concerns stems from sorting into occupations and industries. Returning to the simple example above, if markets with a greater presence ("weight") of j_1 are unobservably different, this approach would misattribute those differences to the potential wage. To address this, I include a vector of marriage market fixed effects, α_μ, which fully absorbs the cross-market variation in initial occupation and industry choices as well as preferences for and expectations regarding family and labor market work.

This solution would not be sufficient, however, if occupation choices are correlated with trends in behavior, rather than fixed differences. This could happen, for instance, if states with a larger hospital sector - and hence, a larger share of nurses - also tended to have a strong downward trajectory in marriage. Therefore, I add a rich set of fixed effects to control for the differential patterns across states and and demographic groups; δ_{rt}, χ_{et}, γ_{st}. I also allow for varying trends by state and race $\rho_{rs} * t$. This creates a fairly restrictive specification, to a large extent relying on differences in 1970 employment across education groups within a state.[24]

To address remaining confounds in the marriage market, I include $X_{\mu t}$, a vector of mean educational attainment for men and women and the sex ratio. In most specifications, I also control for

[24]There is insufficient variation to further absorb fixed effects for each year-education-race cell or each year-state-education cell.

the market-level average potential wage to account for changes in the level of wages that affect the combined earning power of households. The inclusion of the average wage does not alter the results, as I discuss in Section 7.1. Cohort by year fixed effects, ξ_{ct}, are included to increase precision of the estimation by accounting for differences in marriage and labor market participation across cohorts and ages. All regressions are weighted by population and I cluster standard errors at the state level.

6 Validity of Identification

The validity of the potential wage relies on two key identifying assumptions. First, it should be correlated with the observed wage. This speaks to the plausibility of the constructed potential wage as a proxy for unobserved potential wages. Figure 4 presents descriptive evidence of this correlation using observed wages in the Census/ACS. It shows a positive correlation between the long change (1980–2010) in log relative, log female, and log male wages and the equivalent change in the potential wage.

The first three columns of Table 2 show the estimated correlations from regressing observed wages on potential wages using a modified version of Equation 4 (i.e. omitting cohort controls). The estimates show sizable correspondences between potential wages and observed wages which are precisely estimated. The coefficients are: 0.426 ($p<.05$) for women, 0.481 (male, $p<.01$) for men, and 0.833 ($p<.01$) for the relative wage. In Appendix A.2.2 I show that the addition of variation by occupation increases the magnitude of this correlation by four times and that updating reduces the estimated standard errors by 10%.[25] As mentioned previously, these results are robust to using a more succinct list of occupations and to using alternative definitions of the marriage market.

Second, potential wages must be plausibly exogenous to marriage decisions in the marriage market, which, in practice, requires that they are uncorrelated with unobserved changes in local labor supply. I examine and address potential violations of this assumption in a few ways. The rich set of fixed effects, described earlier, absorb a large number of potentially worrisome sources of variation, including across-marriage-market comparisons. Appendix Table A.9 indicates that the

[25] In results not reported, I find that a potential wage using only occupation variation suffers from lack of power similar to the industry-only potential wage, which is sensible given the variance in occupation-specific wages across industries.

variation in the potential wage is largely orthogonal to these fixed effects.

Additionally, I check whether the residual variation, conditional on these controls, in the potential wage is predictive of marriage market wage shocks to the *opposite* sex. I show the results for the regressions in columns (4) and (5) of Table 2. Reassuringly, only the coefficient on the same-sex potential wage is significant, indicating that the potential wage is not simply picking up shocks to the marriage market over time.

Finally, I show that the potential wage is not picking up an unobserved long-run factor in wage and family outcomes in Section 8 (Autor et al., 2013; Peri et al., 2014). In particular, I present evidence that future growth in the potential wage is not predictive of past growth in family outcomes, as might be the case if the proxy was correlated with a long-term trend in outcomes. This is reassuring evidence in favor of the empirical strategy.

7 Results

7.1 Marriage

Panel A of Table 3 presents the estimated effect of the relative wage on marriage decisions. At baseline I do not control for the average potential wage. For ease of interpretation, I have rescaled the coefficients to represent the effect of a 10% increase in the relative wage. Column (1) shows that a 10% increase in the relative wage, roughly the variation that I leverage between 1980 and 2010, leads to a 5.1 p.p. (8%) decline in the probability that a woman is married.[26] This effect size is of similar magnitude to the increase in the fraction of never-married women following the introduction of the birth control pill and twice as large as the increase attributed to the rise in incarceration (Goldin and Katz, 2002; Charles and Luoh, 2010).[27] My estimate implies that approximately 20 percent of the reduction in marriage during the last three decades is attributable to the increase in the relative wage.[28]

I separate this estimated effect into its components in the subsequent columns.[29] The results

[26] If not otherwise specified, all effect sizes are measured relative to the mean.

[27] The availability of the pill led to a 6 p.p. increase in the likelihood of being never married, which was mirrored in a similar-sized decline in divorce rates (Goldin and Katz, 2002). The rise in imprisonment from 1980 to 2000 increased the share of never-married women by 2.3 p.p., and reduced divorce rates by 0.9 p.p (Charles and Luoh (2010) - calculations based on their Tables 2 and 3).

[28] Calculated as $\frac{5.1*.8}{73.83-55.98}$ =22.9%. See Table 1 for source numbers.

[29] The effect of the relative wage on being a widow, another potential but unlikely channel, is statistically insignif-

indicate that the reduction in marriage is caused by changes in behavior along multiple margins. In column (2), a 10% increase in the relative wage leads to a 1.9 percentage point increase in the likelihood of divorce, accounting for one-third of the change in marriage rates. The estimated impact on the likelihood of being never married explains the remaining decline. Specifically, a 10% increase in the relative wage leads to a 3.2 p.p. decline in the likelihood of being never married, an 18% increase. These results indicate that the margin of entry into marriage is more sensitive to changes in outside options than exit from marriage.

In Panel B of Table 3, I examine the sensitivity of my results to the inclusion of a measure of the mean potential earnings in the market in 2012 dollars, $\frac{\widehat{w^f_{erst}}+\widehat{w^m_{erst}}}{2}$. This allows me to separate the effect of the relative wage from absolute wages, which appear to be slightly correlated in Figure 2. The estimated effects of the relative wage are only marginally reduced by the introduction of this control variable. A 10% increase in the relative wage leads to a 4.8 p.p. decline in marriage, a 1.7 p.p increase in the likelihood of divorce, and a 3.1 p.p. increase in the likelihood of being never married.[30] The insensitivity of the point estimates to this control indicates that there is substantial variation in the relative wage measure independent of the average wage measure; nevertheless, I include this control going forward to allow for the cleanest interpretation of the results, and the results are not affected when I do not include this control.

7.2 Spousal Matching, Cohabitation, and Other Living Arrangements

Having shown that higher relative wages leads to a decline in marriage, a relevant question is *which* couples respond to the change in this incentive? In the model, marginal matches are those in which a women obtains disutility from the match. Selection out of these matches is then expected to improve women's perceived spouse quality among married couples. I test each of these predictions in turn.

As a first signal of preference for a partner, I examine whether women continue to live with a romantic partner under a higher relative wage, despite reducing marital commitments. This analysis is motivated by the empirical finding that cohabitation is characterized by less production specialization, which implies fewer pecuniary gains relative to marriage (Lundberg et al., 2016). It

icant.

[30] The positive coefficient of on the average wage is also consistent with prior evidence that income has a "stabilizing" effect on marriage (Bitler et al., 2004).

follows, then, that the threshold spouse quality would be at least as high, if not higher than for marriage. Hence, I predict that women should not choose to cohabit with spouses that are deemed too undesirable to marry.

Ideally, I would like to test this prediction using reported cohabitation for all individuals; however, since the data on cohabitation is incomplete, I use three complementary measures to gain evidence on whether women are living with a romantic partner. First, I use the official report of cohabitation, which as mentioned previously, is only available for the head of household from 1990 on. Second, I look at whether a woman only lives with an unmarried man, who may be a romantic partner or a platonic roommate. I consider these two measures as providing approximately lower and upper bounds of effects on the stock of cohabitating couples.[31] Third, I observe whether a woman lives with only another woman, as certain evidence of living in a platonic arrangement.[32]

Table 4 indicates that a higher relative wage does not meaningfully increase cohabitation, and instead, leads women to increasingly live in a platonic arrangement. The estimated effect on official reports of cohabitation represents a 1% decline in cohabitation and is statistically insignificant. In the following columns, I find that 30% of women who would have married and resided with a husband instead live with another woman (a 1.2 p.p. increase relative to the 4 p.p. decline in living with a husband). There is a similar increase in the share of women living alone, although less precisely estimated, accounting for 35% of the decline in living with a husband. By comparison, I find a smaller increase (by 0.9 p.p, or 22.5% of the previously married women) in the propensity to live with an unmarried man. Overall, these effects are consistent with a low desirability of marginal spouses.

As a second measure of mate quality, I analyze whether these is an improvement in the attributes of women's spouses. The primary outcome of interest is spousal education, which has been frequently been cited as influential in the matching decision. Charles and Luoh (2010) argue that marrying a spouse with higher education is a signal of "marrying up," due to the fact that normal patterns of assortative mating would predict matching with a mate of the same education level. This ordered matching outcome also aligns with women's revealed preferences. Through a series

[31] Ideally, I would be able to capture flows into cohabitation from marriage, however the data prevent me from doing so. The effects I report will be equivalent to this if a higher relative wage does not significantly increase the dissolution of cohabitating couples. Since gains from specialization account for a relatively small portion of the incentive for cohabitation relative to marriage, this may be a reasonable assumption.

[32] Implicitly, I assume that the relative wage does not affect the likelihood of being in a homosexual relationship.

of speed dating experiments, Fisman et al. (2006) show that women value the intelligence of their partner, more so than men. I also analyze impacts on spousal age, though I place less emphasis on these as a measure of spousal quality since the empirical evidence of women's preferences over age are mixed (Mansour and McKinnish, 2013; Hitsch et al., 2010; Low, 2016; Lee and McKinnish, 2017; Choo and Siow, 2006; Belot and Francesconi, 2013).

Table 5 indicates that a higher relative wage causes women to be more likely to be married to spouses that are more educated. A 10% increase in the relative wage leads to a 15 percent increase in the probability of marrying a partner more educated than oneself (5.1 p.p.), which results from equal declines in the probability of marrying a partner less-educated and same-educated relative to oneself. These effects are summarized in the fourth column, in which I find a 0.26 year increase in the difference between spousal education and own education. I interpret my these estimates as evidence that a higher relative wage leads woman to be married to men that are closer to their preferences, an improvement in spousal quality.

Appendix Table A.10 indicates that spousal age also responds to the relative wage. A higher relative wage causes a woman to be less likely to marry a spouse older than herself ($p<.1$), and more likely to have same-age and younger spouses, though the latter effects are not individually significant. While there is not a consensus in the literature, previous research suggests that same age and younger spouses are associated with having a more attractive spouse and greater initial marital satisfaction for women, respectively (Mansour and McKinnish, 2013; Lee and McKinnish, 2017).[33]

To gain insight into *unobservable* spouse quality, I turn to the NSFH, decribed in Appendix Section A.2.4. Unfortunately, the small number of young, married households in the survey (3,000) provide too little power to support an identification strategy with the proxy I construct. Therefore, I am only able to provide descriptive evidence of the relationship between observed relative wife to husband income in the household and the measures of interest. Corresponding to the model, I focus on households where men are the dominant earner (80% of these households). With this in mind, I find that a higher relative income is associated with greater happiness with the marriage among women and less reporting of marriage trouble by women and men. This provides speculative evidence that a higher relative wage could also raise the unobserved quality of husbands, on top of

[33]Men have a strong preference for younger spouses, however, and so this is likely be less preferable for them.

the improvement in spousal attributes documented above.

7.3 Labor Market

Table 6 analyzes women's labor market outcomes. In the first column, a 10% increase in the relative wage causes women to work 1 additional hour per week. This is a small change in hours relative to the mean, but is able to explain the entirety of the rise in weekly hours of work. This increase in hours worked could be caused by the change in the composition of women - single women tend to work more hours - or by changes in working behavior conditional on marital status. Using the maximal difference in working hours between single and married women over this period, I estimate that the change in the composition of married women can explain at most 20% of the increase in hours of work, and the remaining 80% is changes in working behavior among married and single women.[34, 35]

The remainder of Table 6 shows a statistically insignificant effect on weeks worked, but that women earn 5% more weekly income, and a 5% more in annual income ($p<.1$). In the last column, I find a statistically insignificant effect on employment. This is consistent with the model's prediction that, if there is a sufficiently high lower bound of spouse quality, women who are marginal on the extensive labor margin may be inframarginal to marriage. These estimates suggest that on average a lower relative wage does not deter women from working, but it does reduce hours worked, consistent with specialization within households.

Financial independence is an additional outcome of interest because it may provide a channel by which a higher relative wage can reduce women's susceptibility to emotionally or physically abusive relationships (Edin and Kefalas, 2005; Aizer, 2010; Munyo and Rossi, 2015). Table 7 shows that a 10% increase in the relative wage leads to a 3.4 percentage point increase in a woman's share of household earnings, a 7% increase. There are also substantial increases in the likelihood that women control all of the income in the household. A 10% increase in the relative wage leads to a 2.4 p.p. decline in the probability that a woman is in a male breadwinner household, a 20% decline, accompanied by an equivalent increase in households where there is a female breadwinner. These

[34] Since marriage is endogenous to the relative wage, I can not obtain consistent estimates of changes in hours of work by marital status.

[35] The difference in single and married women's hours in the CPS between 1976 and 2010 is 4 hours (in 1981), which I multiply that by a 4.8 p.p. increase in single women.

effects indicate that a higher relative wage reduces women's reliance on a male earner, which could be a mechanism for previously documented reductions in domestic violence.

7.4 Heterogeneous Responses

Next I investigate whether differential responses to the relative wage may have contributed to the steeper decline in marriage among low-skilled women exhibited in Figure 1. As a starting point, I estimate the effect of the relative wage for each level of education in Panel A of Table 9. The coefficients indicate that the marriage and labor market response to the relative wage was qualitatively similar across low- and high skilled women, which is further supported by the large p-values for the test of equality.

These results may mask heterogeneity in marital responses, however, if differential behavior emerges at a later age. For example, low- and high-skilled women may place equal importance on the pecuniary incentive to marry at younger ages, but respond differently to the incentive at later ages as marriage norms and joint child-rearing become greater concerns. I provide a framework for this in Section 2.

Table 10 suggests this may be the case. It shows that for low-skilled women, a higher relative wage leads to postponement of marriage both at "younger" (22-30) and "older" (31-44) ages; while for high-skilled women, a higher relative wage only leads to delay of marriage at younger ages.[36] This pattern of responses can help to explain two salient trends across these groups: increasing age at first marriage for all women, and reduction in marriage between ages 33 to 44 among low-skilled women (Lundberg et al., 2016). As might be expected, a higher relative wage leads to increased divorce between ages 31 to 44, but not 22 to 30, for both groups of women.

Panel B of Table 9 shows that the response to the relative wage is uneven across race groups, with whites consistently producing the largest response. I find a somewhat smaller responses among blacks, and often insignificant effects on Hispanics. The inability to detect an effect among Hispanics may in part be due to a lack of power, however, as Hispanics formed just 6% of the sample in 1980 (Table 1).

[36] Additionally, I find imprecise evidence that high-skilled women may actually marry more as a result of a higher relative wage at older ages. This behavior could be explained by - though is not statistical proof of - highly educated women flexing a higher bargaining power in order to find a partner with whom to have children as they approach peak childbearing years.

7.5 Spillovers to Children's Family Structure

The decline in marriage is likely to affect the family structure in which children are raised, a topic which has gained significant attention of late (Bertrand and Pan, 2013; Autor et al., 2015). Table A.12 speaks to this question by presenting the effects on marriage disaggregated by whether any children are in the household.[37] The effects are additive such that the sum of the effect on "married with children" and "married without children" is equal to the effect on "married."

The results are mixed. Overall, a 10% increase in the relative wage reduces the share of women that have children by 5 percent. This is driven by a substantial (11%) reduction in the share of women that are married with children. Instead, a higher share of women divorce *prior to* having children ($p < .05$) or remain childless in marriage.[38] There is also some substitution towards raising children outside of marriage, which offsets 40% of the decline in married women with children. Hence, a higher relative wage leads fewer women to marry and have children, with, arguably, low-quality spouses, but also increases the share of single mothers. The net effect on children, then, will depend on the relative welfare implications of each of these circumstances.

8 Additional Specifications and Robustness

8.1 First-Difference and Reverse Causation

To bolster the findings, I now turn to address a remaining threat to identification: the potential for reverse causation in the model. In my context, reverse causation may result from the presence of an unobserved variable in the marriage market that is correlated with trends in employment and preferences for marriage. I follow Autor et al. (2013) and Peri et al. (2014), and begin by revisiting estimation with a first-differenced (10-year differences) specification, using data that has been collapsed to a marriage-market-by-year panel. Specifically, I estimate:

$$\begin{aligned}\Delta Y_{erst} =& \beta_1 \Delta ln \widehat{RelativePotentialWage}_{erst} + \beta_1 \Delta ln \widehat{AveragePotentialWage}_{erst} \\ &+ \delta_{rt} + \chi_{et} + \gamma_{st} + \rho_{rs} + \Delta X_{erst}\phi + \upsilon_{erst}\end{aligned} \tag{5}$$

[37] Results are very similar when I only examine women with children under 18 in the household.

[38] A less likely possibility is that women divorce but do not obtain custody of their children, which happens in the minority of cases.

Appendix Table A.11 shows the results from this model. The estimated effects of the relative wage on the likelihood of being married and on the likelihood of never having been married are both within the tight confidence interval around my main estimate. This provides additional verification that the results are not sensitive to the empirical specification.

Next, in separate regressions, I analyze whether the change in the relative wage between 1980-1990, 1990-2000, or 2000-2010 is predictive of past marriage outcomes, between 1960 and 1970. A significant result here would imply that markets that are predicted to have an increase relative wages historically had dissimilar trends from other markets.[39] I present the results in the first and second columns of Table 8. Overall, there is little indication of a long term trend driving the results. Using the change in relative wage options from 1980-1990 as the independent variable - the decadal change in wages closest temporally to the observe outcomes - there is no statistically significant relationship between future wage options and lagged marriage outcomes. While the coefficient is still of reasonable magnitude (half the size of the coefficient in my preferred specification), the standard error is seven times as large, such that the 95% confidence interval includes an effect size of comparable magnitude in the opposite direction as the main estimate.

Of the nine marriage outcomes analyzed, none of the relationships are statistically significant, and the direction of the effect is not entirely consistent. In the subsequent columns, I perform this check for the remainder of the key outcomes and also examine effects on poverty and single motherhood, which may be correlated with marriage decisions. I continue to find no statistically meaningful evidence for reverse causation.

8.2 Responses to Male and Female Wages

An alternative way to scrutinize the effects of the gap in wages is by entering the male and female potential wages separately in a regression.[40] The coefficients on the male and female wage then represent the combined effect of the increase in income and the reduction or growth in the relative wage, respectively. Appendix Table A.13 shows, as expected, that the coefficients for the

[39] One caveat to this is that the shares in the potential wage are from 1970, which might contain information about outcomes in 1970 and mechanically induce a relationship. I would expect this influence to be minor, however, since I condition on marriage market fixed effects.

[40] These coefficients can also be simply calculated using the estimated effects of the relative and average wage. Setting β_R as the coefficient on the relative wage; β_A as the coefficient on the average wage, then $\beta_{Female} = \beta_R + \frac{\beta_A}{2}$ and $\beta_{Male} = \frac{\beta_A}{2}$ - β_R.

main outcomes are always of opposite sign. However, the female coefficient is often more imprecisely estimated and I can nearly always reject the hypothesis that the coefficients are of equal magnitude - the coefficient on the male potential wage is typically at least twice as large.

A notable deviation from this pattern is the similar-sized effect of male and female wages on women's hours of work. A 10% increase in women's wages leads to the same 1 hour increase in women's hours of work that is produced by a 10% decline in men's wages. These estimates imply an own- (potential) wage elasticity of weekly hours worked of 0.28 and -0.26 cross-wage elasticity, which aligns relatively well with prior estimates of women's responsiveness to spousal wages using other sources of variation (Blau and Kahn, 2007).

In Appendix Table A.14 I probe the importance of *declining* male wages. In particular, I analyze whether the effects are concentrated in markets where men experienced the least growth in potential wages, in the first quartile of potential wages. Contrary to this, Appendix Table A.14 shows that the effects of the relative wage are dispersed throughout the distribution of growth in male potential wages.[41] It appears that the decline in men's real wages did not play a particularly outsize role in these outcomes.

8.3 Competing Hypotheses

An aversion to women earning more than men, the "identity effect," may also generate declines in marriage as the relative wage increases (Bertrand et al., 2015). In particular, this theory predicts declines in marriage when the relative wage exceeds one. I look for the role of this channel by estimating differential effects of the relative wage along the within-year distribution of relative wages (at each quantile). If the identity effect is the only, or primary, channel for the effects of the relative wage, the estimated effects should be concentrated at the highest quantile of relative wages.

Figure A.3 shows the percentage effect of a 10% increase in the relative wage at each quartile of the relative (potential) wage distribution. For marriage, I find little heterogeneity in the impact of the relative wage. On the other hand, I find that the relative wage has a slightly larger impact on the likelihood of being never married for women with a lower relative wage. This may be due to the

[41] The table shows estimates from a variant on equation 5 that does not include a control for the average wage. As a result, the effects can be interpreted as the combined effect of the change in income and change in the relative wage at each level of growth in the male wage.

fact that women with a *lower* relative wage have the least credible threat to leave a relationship, and therefore benefit most from increases in their bargaining power (Thornqvist and Vardardottir, 2013). Importantly, I do not find that increases in the relative wage have larger effects for women at the upper end of the relative wage distribution. This suggests that the aversion to women earning more than men is not the primary channel, although the proxy is not optimally designed to detect this subtle effect.

Prior work has also recognized the role of the rise of male wage inequality, incarceration, and the decline of manufacturing in marriage decisions (Loughran, 2002; Charles and Luoh, 2010; Autor et al., 2017). In Appendix Table A.15, I show that the results I have presented, including the relevance of the potential wage, are insensitive to the addition of controls for the inequality in the male wage, male incarceration, and population. Once marriage market fixed effects are included, the qualitative results are unchanged by the addition of the other controls. The results are also robust to the inclusion of interactions between initial manufacturing share and year fixed effects. This ensures that the effects I find are distinct from mechanisms shown in prior work.

8.4 Migration

In Appendix Table A.16, I consider the role of migration in the effects of the relative wage. Such migration may occur if a higher relative wage is viewed by women as an amenity, or a higher relative wage creates local externalities such as more supportive workplaces for women. In Panel A, I find that a higher relative wage leads to greater inter-state migration.[42] This increased migration may be a concern for the interpretation of the results if women that migrate alter the composition of women in the state.

I look for evidence of the importance of this channel by separating the effect of the relative wage into the impact on new-arrivals and women that have not migrated in the last 5 years. The change in outcomes among recent migrants gives an upper bound of the role of selective migration in my measured effects.[43] Using this conservative measure, migration could account for up to

[42] Migration is defined by the presence of individuals that moved states in the last 5 years, which is available in the 1980, 1990, and 2000 Censuses. The 2010 ACS asks respondents in the last year, but not in the last 5 years, and therefore is excluded from the analysis. The estimated effects of the relative wage in Panel A of Table A.16 differ from the main results because of this altered sample.

[43] To prevent concerns of endogenous stratification, the outcomes are a combination of migration status and marriage status, e.g. moved in the last 5 years and never married.

52% of the estimated increase in never-married women, 20% of the increase in divorce, 28% of the pairing with higher educated spouses, and 38% of the increase in female breadwinners. This implies that increases in the relative wage alter women's outcomes largely by influencing women's decision making among present women, rather than contemporaneous migration decisions.

9 Conclusion

The role of women in the American household has undergone a substantial shift over the last three decades. Despite the significant attention given to this trend, particularly the decline in marriage, the counterfactual to this transition has been under-explored. This paper presents new theoretical predictions and evidence on the significance of the declining gender wage gap for spouse quality, marriage, and women's labor market outcomes. For identification I rely on variation from shifts in demand over this period, which favored traditionally "female" occupations, and affected marriage markets differentially due to historical patterns of industry location.

Building on existing models of marriage matching, I show that equalizing wages between men and women reduces the pecuniary gains women experience from marriage, and hence raises the minimum spouse quality that women require from a husband. This causes a reduction in marriages in which a wife perceives her husband to have undesirable spouse quality, and in turn, increases spouse quality among married women. Women's hours conditional on working increase, while extensive margin labor supply effects are shown to depend on the distribution of spouse quality.

I provide empirical support for each of the predictions of the model. First, I find that a 10% increase in the relative (potential) wage increases the likelihood that women marry a higher-educated spouse by 16%. I also find suggestive evidence that marital satisfaction increases when wives earn a higher share of household income. Second, I show that the marriage rate declines by 7%. The reduction in marriage is explained by greater delay of marriage as well as increased propensity to divorce. Third, consistent with the marginal husband being undesirable, I find that 65% of women that do not marry opt to live with a female roommate or alone, and I do not find strong evidence for substitution towards cohabitation.

Fourth, I find that a higher relative wage increases women's labor supply. A 10% increase in the relative wage leads women to work an additional hour per week, and earn 5% more annually. These

effects hold even when conditioning on a woman's own wage, and the magnitude of these effects can not be explained by changes in the marital status of women, indicating that higher relative wages shifted working behavior conditional on marital status. Overall, the findings suggest that women consider the relative wage, in addition to own wage, in labor market decisions.

These results suggest that relative earnings power is an influential factor in the family formation and labor market decisions of women. This indicates that reducing the gender wage gap is not only a matter of "fairness in the workplace," but also places men and women on more equal footing in the marriage market. Moreover, this paper provides an important first step towards building an understanding of the welfare effects of the gender wage gap by highlighting empirical channels for improvements in welfare. I leave advancing the evidence on this question for future research.

References

Abramitzky, R., A. Delavande, and L. Vasconcelos (2011): "Marrying Up: The Role of Sex Ratio in Assortative Matching," *American Economic Journal: Applied Economics*, 3, 124–157.

Aizer, A. (2010): "The Gender Wage Gap and Domestic Violence," *American Economic Review*, 100, 1847–1859, 00079.

Angrist, J. (2002): "How Do Sex Ratios Affect Marriage and Labor Markets? Evidence from America's Second Generation," *The Quarterly Journal of Economics*, 117, 997–1038.

Autor, D., D. Dorn, and G. Hanson (2017): "When Work Disappears: Manufacturing Decline and the Falling Marriage-Market Value of Men," Working Paper 23173, National Bureau of Economic Research, dOI: 10.3386/w23173.

Autor, D., D. Figlio, K. Karbownik, J. Roth, and M. Wasserman (2015): "Family Disadvantage and the Gender Gap in Behavioral and Educational Outcomes," Working paper, Institute for Policy Research at Northwestern University.

Autor, D. H., D. Dorn, and G. H. Hanson (2013): "The China Syndrome: Local Labor Market Effects of Import Competition in the United States," *American Economic Review*, 103, 2121–68.

Autor, D. H., L. F. Katz, and M. S. Kearney (2008): "Trends in U.S. Wage Inequality: Revising the Revisionists," *The Review of Economics and Statistics*, 90, 300–323, 01097.

Autor, D. H., F. Levy, and R. J. Murnane (2003): "The Skill Content of Recent Technological Change: An Empirical Exploration," *The Quarterly Journal of Economics*, 118, 1279–1333.

Autor, D. H. and B. Price (2013): "The Changing Task Composition of the US Labor Market: An Update of Autor, Levy, and Murnane (2003)," *Unpublished manuscript*.

Autor, D. H. and M. Wasserman (2013): "Wayward Sons: The Emerging Gender Gap in Labor Markets and Education," Tech. rep., Third Way.

Bacolod, M. P. and B. S. Blum (2010): "Two Sides of the Same Coin U.S. Residual Inequality and the Gender Gap," *Journal of Human Resources*, 45, 197–242.

Bailey, M. J. (2006): "More Power to the Pill: The Impact of Contraceptive Freedom on Women's Life Cycle Labor Supply," *The Quarterly Journal of Economics*, 121, 289–320.

Bailey, M. J., M. Guldi, and B. J. Hershbein (2014): "Is There a Case for a "Second Demographic Transition"? Three Distinctive Features of the Post-1960 U.S. Fertility Decline," in *Human Capital in History: The American Record*, ed. by L. P. Boustan, C. Frydman, and R. A. Margo, The University of Chicago Press.

Bailey, M. J., B. Hershbein, and A. R. Miller (2012): "The Opt-In Revolution? Contraception and the Gender Gap in Wages," *American Economic Journal: Applied Economics*, 4, 225–254.

Baker, M. and K. Cornelson (2016): "Gender Based Occupational Segregation and Sex Differences in Sensory, Motor and Spatial Aptitudes," Working Paper 22248, National Bureau of Economic Research.

Bartik, T. J. (1991): *Who Benefits from State and Local Economic Development Policies?*, W.E. Upjohn Institute for Employment Research, 01347.

Beaudry, P. and E. Lewis (2014): "Do Male-Female Wage Differentials Reflect Differences in the Return to Skill? Cross-City Evidence from 1980–2000," *American Economic Journal: Applied Economics*, 6, 178–194, 00000.

Becker, G. S. (1973): "A Theory of Marriage: Part I," *Journal of Political Economy*, 81, 813–846.

Belot, M. and M. Francesconi (2013): "Dating Preferences and Meeting Opportunities in Mate Choice Decisions," *Journal of Human Resources*, 48, 474–508.

Bertrand, M., P. Corts, C. Olivetti, and J. Pan (2016): "Social Norms, Labor Market Opportunities, and the Marriage Gap for Skilled Women," Working Paper 22015, National Bureau of Economic Research, dOI: 10.3386/w22015.

Bertrand, M., E. Kamenica, and J. Pan (2015): "Gender Identity and Relative Income within Households," *The Quarterly Journal of Economics*, 130, 571–614.

Bertrand, M. and J. Pan (2013): "The Trouble with Boys: Social Influences and the Gender Gap in Disruptive Behavior," *American Economic Journal: Applied Economics*, 5, 32–64.

Bitler, M. P., J. B. Gelbach, H. W. Hoynes, and M. Zavodny (2004): "The Impact of Welfare Reform on Marriage and Divorce," *Demography*, 41, 213–236.

Black, S. and E. Brainerd (2004): "Importing Equality? The Impact of Globalization on Gender Discrimination," *Industrial and Labor Relations Review*, 57.

Black, S. E. and C. Juhn (2000): "The Rise of Female Professionals: Are Women Responding to Skill Demand?" *American Economic Review*, 90, 450–455, 00071.

Black, S. E. and A. Spitz-Oener (2010): "Explaining Women's Success: Technological Change and the Skill Content of Women's Work," *The Review of Economics and Statistics*, 92, 187–194.

Black, S. E. and P. E. Strahan (2001): "The Division of Spoils: Rent-Sharing and Discrimination in a Regulated Industry," *The American Economic Review*, 91, 814–831.

Blau, F. D. and L. M. Kahn (1997): "Swimming Upstream: Trends in the Gender Wage Differential in 1980s," *Journal of Labor Economics*, 15, 1–42.

——— (2000): "Gender Differences in Pay," *Journal of Economic Perspectives*, 14, 75–99.

——— (2007): "Changes in the Labor Supply Behavior of Married Women: 19802000," *Journal of Labor Economics*, 25, 393–438.

——— (2016): "The Gender Wage Gap: Extent, Trends, and Explanations," Working Paper 21913, National Bureau of Economic Research, dOI: 10.3386/w21913.

Blau, F. D., L. M. Kahn, and J. Waldfogel (2000): "Understanding Young Women's Marriage Decisions: The Role of Labor and Marriage Market Conditions," *Industrial and Labor Relations Review*, 53, 624–647.

Carrell, S. E. and M. L. Hoekstra (2010): "Externalities in the Classroom: How Children Exposed to Domestic Violence Affect Everyone's Kids," *American Economic Journal: Applied Economics*, 2, 211–228.

Charles, K. K. and M. C. Luoh (2010): "Male Incarceration, the Marriage Market, and Female Outcomes," *Review of Economics and Statistics*, 92, 614–627.

Choo, E. and A. Siow (2006): "Who Marries Whom and Why," *Journal of Political Economy*, 114, 175–201.

Deming, D. J. (2015): "The Growing Importance of Social Skills in the Labor Market," Working Paper 21473, National Bureau of Economic Research.

Diamond, R. (2016): "The Determinants and Welfare Implications of US Workers' Diverging Location Choices by Skill: 1980-2000," *American Economic Review*, 106, 479–524.

Duflo, E. (2003): "Grandmothers and Granddaughters: Old-Age Pensions and Intrahousehold Allocation in South Africa," *The World Bank Economic Review*, 17, 1–25, 00886.

——— (2012): "Women Empowerment and Economic Development," *Journal of Economic Literature*, 50, 1051–1079.

Edin, K. and M. J. Kefalas (2005): *Promises I Can Keep: Why Poor Women Put Motherhood Before Marriage*, Berkeley: University of California Press, 1 edition ed.

Fernandez, R., A. Fogli, and C. Olivetti (2002): "Marrying Your Mom: Preference Transmission and Women's Labor and Education Choices," Working Paper 9234, National Bureau of Economic Research, dOI: 10.3386/w9234.

Fisman, R., S. S. Iyengar, E. Kamenica, and I. Simonson (2006): "Gender Differences in Mate Selection: Evidence From a Speed Dating Experiment," *The Quarterly Journal of Economics*, 121, 673–697.

Glynn, S. J. (2010): "The New Breadwinners: 2010 Update," Tech. rep., Center for American Progress.

——— (2014): "Breadwinning Mothers, Then and Now," Tech. rep., Center for American Progress.

Goldin, C. (2006): "The Quiet Revolution That Transformed Women's Employment, Education, and Family," *American Economic Review*, 96, 1–21.

Goldin, C. and L. F. Katz (2002): "The Power of the Pill: Oral Contraceptives and Womens Career and Marriage Decisions," *Journal of Political Economy*, 110, 730–770.

Goldin, C., L. F. Katz, and I. Kuziemko (2006): "The Homecoming of American College Women: The Reversal of the College Gender Gap," *Journal of Economic Perspectives*, 20, 133–156.

Hitsch, G. J., A. Hortasu, and D. Ariely (2010): "Matching and Sorting in Online Dating," *American Economic Review*, 100, 130–163.

Katz, L. F. and K. M. Murphy (1992): "Changes in Relative Wages, 1963-1987: Supply and Demand Factors," *The Quarterly Journal of Economics*, 107, 35–78, 03779.

Kearney, M. S. and R. Wilson (2017): "Male Earnings, Marriageable Men, and Nonmarital Fertility: Evidence from the Fracking Boom," Working Paper 23408, National Bureau of Economic Research, dOI: 10.3386/w23408.

King, M., S. Ruggles, J. T. Alexander, S. Flood, K. Genadek, M. B. Schroeder, B. Trampe, and R. Vick (2010): "Integrated Public Use Microdata Series, Current Population Survey: Version 3.0. [Machine-readable database]." .

Knowles, J. (2012): "Why are Married Men Working So Much? An Aggregate Analysis of Intra-Household Bargaining and Labor Supply," *The Review of Economic Studies*, rds043, 00000.

Lee, W.-S. and T. McKinnish (2017): "The Marital Satisfaction of Differently-Aged Couples," *Journal of Population Economics*.

Loughran, D. S. (2002): "The Effect of Male Wage Inequality on Female Age at First Marriage," *Review of Economics and Statistics*, 84, 237–250.

Low, C. (2016): "Pricing the Biological Clock: Reproductive Capital on the US Marriage Market," *Unpublished manuscript*.

Lundberg, S. and R. A. Pollak (2013): "Cohabitation and the Uneven Retreat from Marriage in the U.S., 1950-2010," Working Paper 19413, National Bureau of Economic Research.

Lundberg, S., R. A. Pollak, and J. Stearns (2016): "Family Inequality: Diverging Patterns in Marriage, Cohabitation, and Childbearing," *Journal of Economic Perspectives*, 30, 79–102.

Mansour, H. and T. McKinnish (2013): "Who Marries Differently Aged Spouses? Ability, Education, Occupation, Earnings, and Appearance," *Review of Economics and Statistics*, 96, 577–580.

McCrary, J. and H. Royer (2011): "The Effect of Female Education on Fertility and Infant Health: Evidence from School Entry Policies Using Exact Date of Birth," *American Economic Review*, 101, 158–195.

Mulligan, C. B. and Y. Rubinstein (2008): "Selection, Investment, and Women's Relative Wages Over Time," *The Quarterly Journal of Economics*, 123, 1061–1110.

Munyo, I. and M. Rossi (2015): "Real Exchange Rate, the Wage Gender Gap and Domestic Violence," *Unpublished manuscript*.

O'Neill, J. and S. Polachek (1993): "Why the Gender Gap in Wages Narrowed in the 1980s," *Journal of Labor Economics*, 11, 205–28.

Peri, G., K. Y. Shih, and C. Sparber (2014): "Foreign STEM Workers and Native Wages and Employment in U.S. Cities," Working Paper 20093, National Bureau of Economic Research.

Pollak, R. A. (2005): "Bargaining Power in Marriage: Earnings, Wage Rates and Household Production," Working Paper 11239, National Bureau of Economic Research.

Qian, N. (2008): "Missing Women and the Price of Tea in China: The Effect of Sex-Specific Earnings on Sex Imbalance," *The Quarterly Journal of Economics*, 123, 1251–1285, 00219.

Ruggles, S., J. T. Alexander, S. Flood, R. Goeken, M. B. Schroeder, and M. Sobek (2010): " Integrated Public Use Microdata Series: Version 5.0 [Machine-readable database]." .

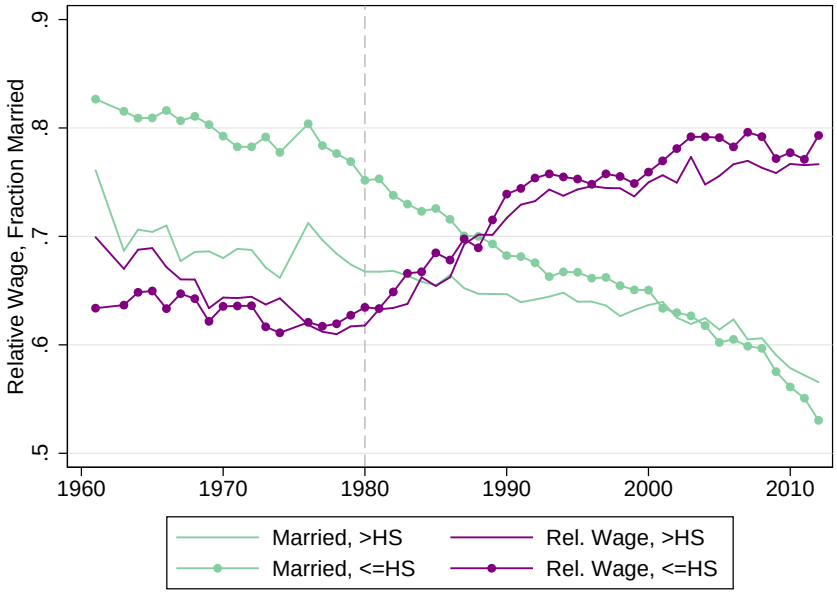
Schaller, J. (2015): "Booms, Busts, and Fertility: Testing the Becker Model Using Gender-Specific Labor Demand," *The Journal of Human Resources*.

Thornqvist, T. and A. Vardardottir (2013): "Bargaining Over Risk: The Impact of Decision Power on Household Portfolios," *Unpublished manuscript*.

Weinberg, B. A. (2000): "Computer Use and the Demand for Female Workers," *Industrial and Labor Relations Review*, 53, 290–308.

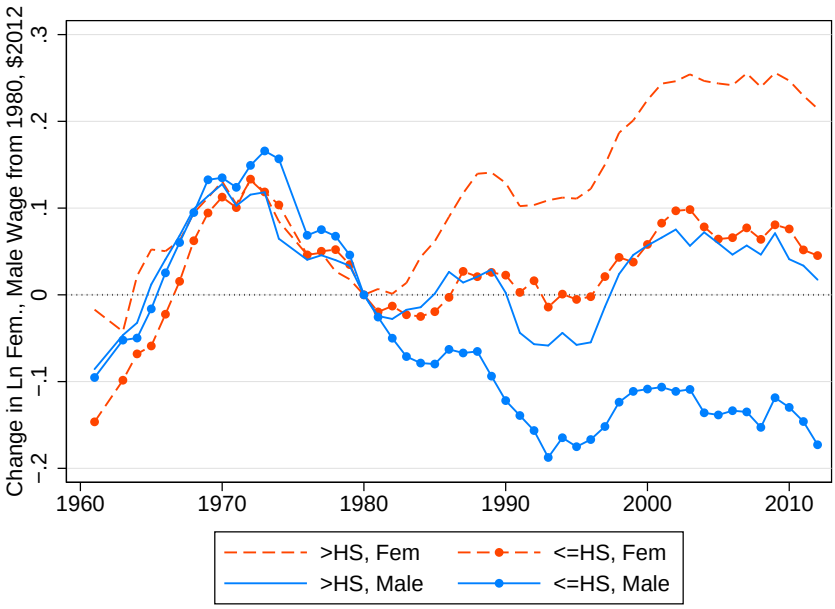
10 Figures

Figure 1: Women's Hourly Wage as a Fraction of Men's Wage, and Marriage Rates



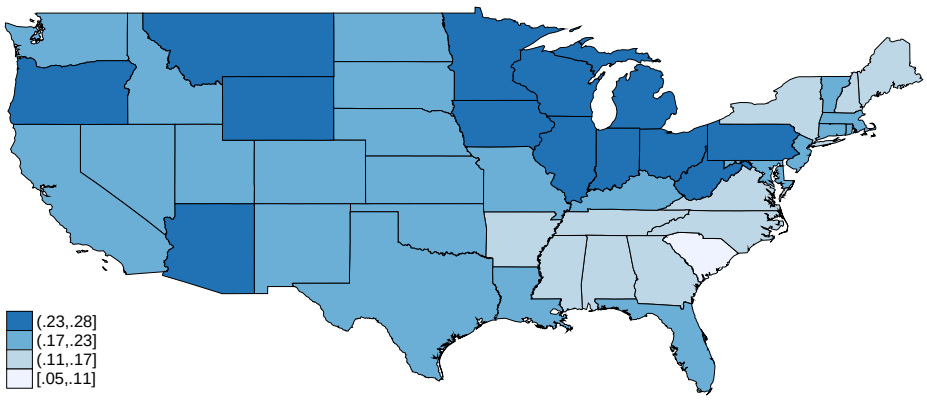
Notes: This figure depicts the relative wage, defined as the ratio of average female hourly wage to average male hourly wage, together with marriage rates. Average hourly wages are calculated from the March Annual Demographic files (1962-2012) as annual earnings divided by total hours worked. Sample 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 2: Change in Female, Male Ln Wage from 1980



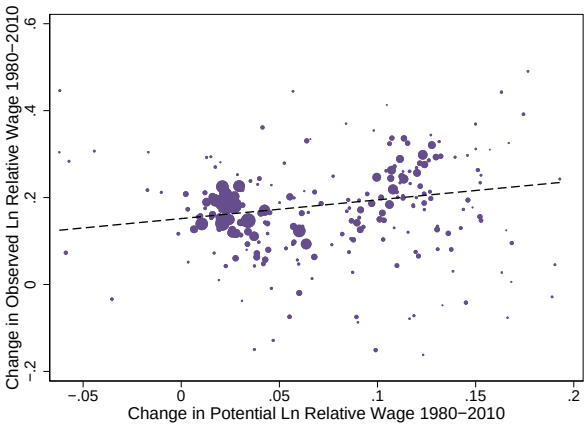
Notes: This figure depicts the growth in log female hourly wage and log male hourly wage relative to 1980. Average hourly wages are calculated from the March Annual Demographic files (1962-2012) as annual earnings divided by total hours worked. Data include individuals age 18 to 64 with positive hours worked and positive earned income.

Figure 3: Variation Across States in Closing the Gap -
Change in $\log(\frac{\text{female wage}}{\text{male wage}})$, 1980-2010

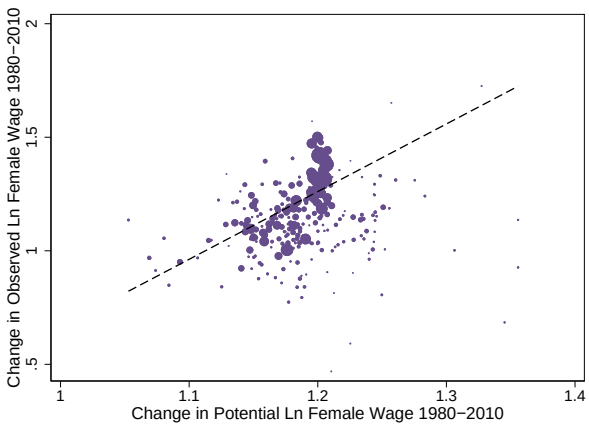


This figure shows the state-level growth in the log female to male wage ratio between 1980 and 2010. Source: 1980-2000 decennial censuses, 2010 ACS; author's calculation.

Figure 4: 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.

11 Tables

Table 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 2: Relationship between Potential Wages and Observed Wages

	Corr. w/ Actual			Cross-Effects?	
	Relative	Female	Male	Female	Male
ln Rel. Wage (Potential)	0.833***				
	(0.225)				
ln Female Wage (Potential)		0.426**		0.571***	-0.232
		(0.202)		(0.186)	(0.255)
ln Male Wage (Potential)			0.481***	-0.228	0.613***
			(0.156)	(0.277)	(0.203)
Partial R-Squared	0.067	0.039	0.041		
Obs	1064	1064	1064	1064	1064

Notes: This table shows the coefficients from estimating Equation 4, omitting cohort controls. 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 Sources: Potential wage: 1970 decennial census, 1980 - 2011 March CPS, Wages: 1980-2000 decennial censuses, 2010 ACS.

Table 3: Impact of Relative Wage on Marriage

	(1) Married	(2) Divorced	(3) Never Married
A: Relative only			
Effect of 10% Increase in Rel. Wage	-0.051***	0.019***	0.032***
	(0.014)	(0.006)	(0.010)
R-Squared	0.867	0.661	0.902
Obs	23573	23573	23573
B: Relative controlling for Average			
Effect of 10% Increase in Rel. Wage	-0.048***	0.017***	0.031***
	(0.009)	(0.006)	(0.008)
Effect of 10% Increase in Avg. Wage	0.079***	-0.044***	-0.027***
	(0.011)	(0.007)	(0.009)
Mean Y	0.645	0.102	0.245
Obs	23573	23573	23573

Notes: This table shows the coefficients from estimating Equation 4 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 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 4: Impact of Relative Wage on Cohabitation and Platonic Living Arrangements

	Cohab.	Only Other Adult in HH is:			Live Alone	2+ Other Adults
	(1)	(2)	(3)	(4)	(5)	(6)
	Official Rept.	Husband	Single Male	Female		
Effect of 10% Increase in Rel. Wage	-0.004	-0.040***	0.009**	0.012***	0.014	0.006
	(0.018)	(0.011)	(0.004)	(0.003)	(0.013)	(0.012)
Mean Y	0.159	0.457	0.066	0.059	0.259	0.159
Obs	16925	23573	23573	23573	23573	23573
Average Wage	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table shows the coefficients from estimating Equation 4 rescaled to represent the effect of a 10% increase in the relative (potential) wage. The dependent variable is shown in the column heading, and the unit of observation is a cell defined by an education x race x state x birth cohort x year. Direct cohabitation is an indicator for whether the head of household reports living with an unmarried partner (only available from 1990 on). The outcomes in columns 2, 3, and 4 are indicator variables that take on the value of 1 if an individual lives in a two adult (over 18) household where the other adult is her husband, a single male, or female, respectively. The outcomes in columns 5 and 6 are indicators for living alone or with 2 or more other adults. 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 5: Impact of Relative Wage on Spousal Education

	Spouse Ed., Relative to Own			Spouse Minus Own Ed.
	(1)	(2)	(3)	(4)
	Less	Same	More	
Effect of 10% Increase in Rel. Wage	-0.023*	-0.028	0.051***	0.258***
	(0.012)	(0.017)	(0.013)	(0.064)
Mean Y	0.319	0.357	0.324	0.017
Obs	22663	22663	22663	22663
Average Wage	Yes	Yes	Yes	Yes

Notes: This table shows the coefficients from estimating Equation 4 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 6: Impact of Relative Wage on Women's Labor Market Outcomes

	Conditional On Working				Unconditional	
	(1)	(2)	(3)	(4)	(5)	(6)
	Wkly Hrs	Weeks Worked	ln(Wkly Inc)	ln(Inc)	Any Earnings	In Labor Force
Effect of 10% Increase in Rel. Wage	1.021***	-0.274	0.059**	0.054*	-0.011	0.001
	(0.224)	(0.441)	(0.023)	(0.030)	(0.015)	(0.013)
Mean Y	36.823	43.487	5.747	9.420	0.723	0.718
Obs	23222	23222	23186	23188	23573	23573
Average Wage	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table shows the coefficients from estimating Equation 4 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 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 4 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 8: First Differenced Estimates, Pre-Exposure Outcomes in Marriage Market

	Dep. Var: 60-70 Change in:					
	Marr.	Nev. Marr	Divorced	Single Mom	Hours Work	Poverty
A: 1980-1990 Relative Wage						
Effect of 10% Increase in Rel. Wage	-0.022	0.057	-0.013	-0.025	0.668	0.075
	(0.099)	(0.089)	(0.039)	(0.045)	(4.362)	(0.138)
Obs	231	231	231	231	202	230
B: 1990-2000 Rel. Wage						
Effect of 10% Increase in Rel. Wage	0.060	-0.084	0.042	0.036	2.031	0.178
	(0.093)	(0.098)	(0.047)	(0.051)	(6.729)	(0.149)
Obs	231	231	231	231	202	230
C: 2000-2010 Rel. Wage						
Effect of 10% Increase in Rel. Wage	-0.102	0.133	-0.030	0.012	1.155	-0.010
	(0.097)	(0.109)	(0.049)	(0.045)	(5.388)	(0.127)
Obs	231	231	231	231	202	230

Notes: This table shows the coefficients from estimating Equation 5 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. Pre-exposure outcomes observed in the 1960 & 1970 Censuses.

Table 9: 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	-0.005	0.058***	0.026*	0.970***
	(0.009)	(0.009)	(0.007)	(0.020)	(0.015)	(0.015)	(0.238)
Effect of 10% Increase in Rel. Wage x High Skill	-0.059***	0.021	0.033***	-0.004	0.032	0.064***	1.153**
	(0.014)	(0.013)	(0.011)	(0.021)	(0.024)	(0.020)	(0.433)
Equality P-value	.283	.364	.082	.952	.323	.036	.691
B: Interaction with Race							
Effect of 10% Increase in Rel. Wage x Black	-0.005	0.023**	-0.010	-0.001	0.039**	-0.006	1.088***
	(0.010)	(0.011)	(0.007)	(0.020)	(0.019)	(0.015)	(0.361)
Effect of 10% Increase in Rel. Wage x Hispanic	-0.008	0.008	0.001	0.006	0.000	-0.001	0.278
	(0.011)	(0.011)	(0.009)	(0.024)	(0.017)	(0.013)	(0.384)
Effect of 10% Increase in Rel. Wage x White	-0.075***	0.044***	0.028***	0.024	0.042***	0.054***	1.226***
	(0.011)	(0.010)	(0.006)	(0.018)	(0.014)	(0.012)	(0.277)
Obs	23573	23573	23573	16925	22663	23573	23222
Equality P-value	0.000	0.018	0.000	0.582	0.102	0.001	0.052

Notes: This table shows the coefficients from estimating Equation 4 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 10: Postponing or Opting Out? Differential Responses by Age and Education

	22-30	31-44
A: Never Married		
Effect of 10% Increase in Rel. Wage x Low Skill	0.033**	0.038***
	(0.013)	(0.011)
Effect of 10% Increase in Rel. Wage x High Skill	0.091***	-0.029*
	(0.017)	(0.016)
Obs	9286	14287
Mean Y - Low-Skill	0.032	0.012
Mean Y - High-Skill	0.047	0.014
B: Divorce		
Effect of 10% Increase in Rel. Wage x Low Skill	-0.005	0.022**
	(0.007)	(0.010)
Effect of 10% Increase in Rel. Wage x High Skill	0.009	0.042***
	(0.009)	(0.015)
Obs	9286	14287
Mean Y - Low-Skill	0.008	0.013
Mean Y - High-Skill	0.005	0.013

Notes: This table shows the coefficients from estimating Equation 4 interacted with indicators for education rescaled to represent the effect of a 10% increase in the relative (potential) wage. Interactions of the average potential wage with education are also included. The age of the sample 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.1 Theory Appendix

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 2b and 3b 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.[44]

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 2a and 3a. For all men,

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

[44] 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 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.

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 2b is negative under the assumptions of the model.

For women that work if married, q_f^* is given by Equation 3b. 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: $\frac{\partial(1-t_f)}{\partial w_f} = \frac{1}{\beta n}$.[45]

Proof of Prediction 5

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

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

increases if $\alpha < \frac{1}{2}$ and is indeterminant when $\alpha > \frac{1}{2}$.

A.2 Empirical Appendix

A.2.1 Details on Industry and Occupation Definitions and Wage Construction

Tables A.1 and A.2 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.1: 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.2: 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.2.2 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, hereafter 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.3, I show the results of estimating Equation 4, 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).[46] 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 (by four times) 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

[46] 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 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 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.3: Correlation with Observed Wages: Bridge with Other Variation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
A: Variation by demographic-industry							
ln Rel. Wage Option	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 Option	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 Option	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

A.2.3 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.4 shows the power of three alternative wage proxies where all three rely on variation from 21 occupations[47], the second and third utilize Census wage information, and the third utilizes the alternative categorization of education groups.

Table A.4: Sensitivity to Fewer Occupations, Census Wages, College-Education Groupings

	(1)	(2)	(3)
	21 Occs	+ Census	+ Col. Groups
ln Rel. Wage (Potential)	0.712***	0.774***	0.627**
	(0.220)	(0.253)	(0.243)
Partial R-Squared	0.048	0.054	0.028
Obs	1064	1064	1024

This table estimates Equation 4, removing cohort-varying controls, where the outcome is wages from the Census and the wage proxy is constructed as described in Section 5 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.5 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.

[47]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.5: Do Effects of Relative Wage Differ For College-Educated?

	Marr.	Nev. Marr.	Divorced	Cohab	Sp. Less Ed.	Same Ed.	Hrs. Work
Effect of 10% Increase in Rel. Wage x Col+	-0.023**	0.017*	0.007	0.002	-0.037**	0.047***	0.280
	(0.009)	(0.009)	(0.009)	(0.011)	(0.018)	(0.017)	(0.457)
Effect of 10% Increase in Rel. Wage x HS-	-0.057***	0.059***	-0.001	0.014	-0.030*	-0.021	-0.334
	(0.009)	(0.010)	(0.008)	(0.011)	(0.017)	(0.018)	(0.464)
Mean Y	0.645	0.245	0.102	0.124	0.318	0.356	36.785
Obs	45371	45371	45371	41456	42279	42279	43963

Notes: This table shows the coefficients from estimating Equation 4 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.2.4 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.[48] 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

$$Y_i = \beta_1 lnRelativeIncome_i + \beta_2 lnTotalIncome_i + \beta_3 X_i + \epsilon_i \tag{6}$$

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

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 $lnHusbandIncome$[49] 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.6 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 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 7.2, 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.6: 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

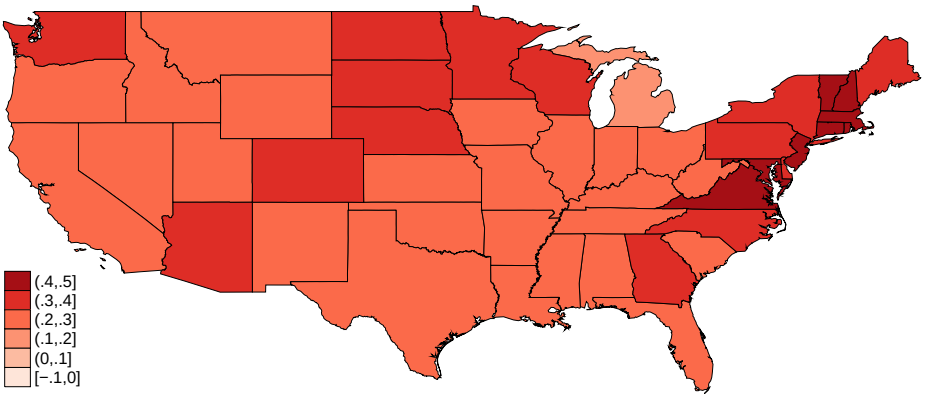
Responses of married men and women in households where the wife is between the ages of 22 and 44 and earns less than her husband. Survey questions are described in the test. Regressions weighted by married couple case weight ("spweight") and robust standard errors are shown. Source: Wave 1 of NSFH.

[49] 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 $WifeShareIncome = \frac{\text{WifeIncome}}{TotalIncome}$.

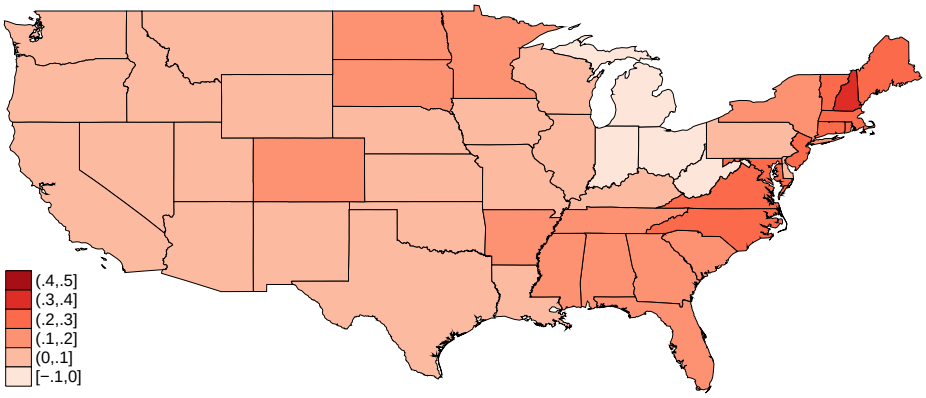
A.2.5 Further Tables and Figures

Figure A.1: Variation Across States in Change in - log Female and log Male Wages, 1980-2010

A. Log female wage ($2012)

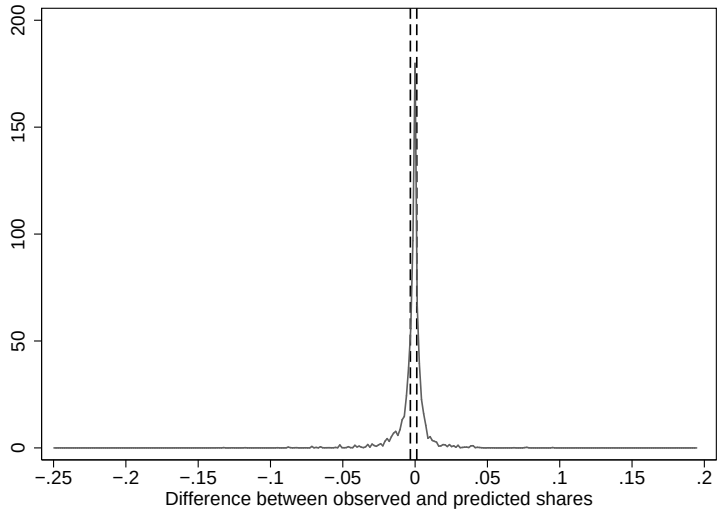


B. Log male wages ($2012)



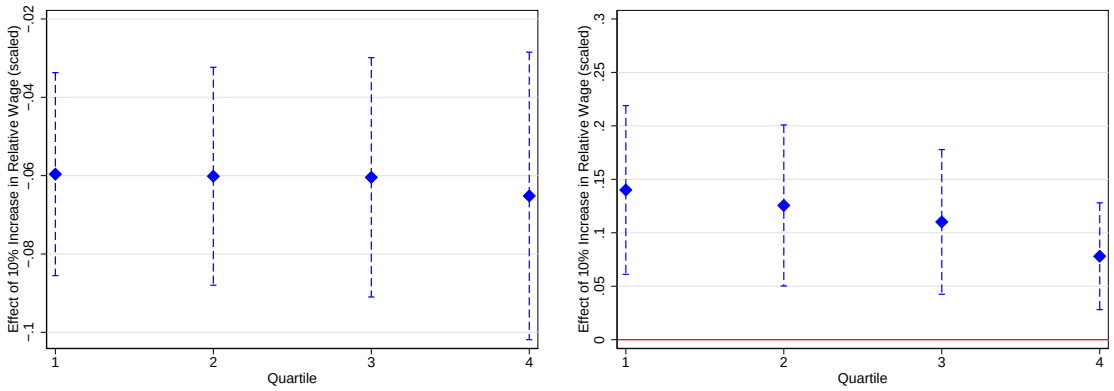
Source: 1970-2000 decennial censuses, 2010 ACS; author's calculation.

Figure A.2: 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.3: Impact of Relative Wage on Marriage - By Quartile of the Relative Wage Distribution



(a) Married (b) Never Married

Notes: This figure shows the coefficients from a modified version of Equation 4, which includes interactions between relative wage and the quartile of the distribution, on a sample of women ages 22-44. Coefficients from interaction between relative wage and the quartile of the distribution scaled by mean of the outcome variable and represent the effect of a 10% increase in the relative wage. Relative wage quartile defined separately for each census year. Standard errors clustered at the state level, and cells are weighted by the female population in cell.Includes control for average wage options. Sources: Potential wage: 1970 decennial census, 1980 - 2011 March CPS, Marriage: 1980-2000 decennial censuses and 2010 ACS.

Table A.7: 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.8: 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.9: 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.10: 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
R-Squared	0.416	0.190	0.340	0.252	0.371	0.430	0.429	0.430
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 4 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.11: Estimates from First-Differenced Specification

	(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	-0.039***	0.030**	0.011*	-0.007	0.042***	0.032**	0.099
	(0.013)	(0.014)	(0.006)	(0.020)	(0.013)	(0.014)	(0.324)
Effect of 10% Increase in Avg. Wage	0.057***	-0.015	-0.037***	0.021	-0.036**	-0.038***	-0.276
	(0.014)	(0.014)	(0.008)	(0.014)	(0.018)	(0.013)	(0.459)
Mean Y	0.645	0.245	0.102	0.159	0.324	0.233	36.823
Obs	798	798	798	527	797	798	798

Notes: This table shows the coefficients from estimating Equation 5 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.12: 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
R-Squared	0.835	0.860	0.584	0.771	0.861	0.582	0.487
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 5 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.

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

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

Notes: This table shows the coefficients from estimating Equation 4, 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	-0.024	0.055***	0.034**	0.101
	(0.016)	(0.015)	(0.007)	(0.022)	(0.014)	(0.015)	(0.359)
10% Increase in Rel. Wage x Q2 of D. Male Wage	-0.021	0.019	0.003	0.016	0.043**	0.013	-0.002
	(0.015)	(0.013)	(0.008)	(0.020)	(0.017)	(0.013)	(0.326)
10% Increase in Rel. Wage x Q3 of D. Male Wage	-0.007	0.019	-0.004	0.022	-0.021	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	-0.012	-0.013	0.030*	-0.304
	(0.016)	(0.015)	(0.007)	(0.024)	(0.025)	(0.016)	(0.424)
Mean Y	0.645	0.245	0.102	0.159	0.324	0.233	36.823
R-Squared	0.863	0.905	0.776	0.642	0.814	0.691	0.919
Obs	795	795	795	525	795	795	795

Notes: This table shows the coefficients from a modified version of Equation 5, 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: Robustness to Additional Controls

	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	-0.037***	0.024***	0.012*	-0.003	0.030**	0.030**	0.083***
	(0.008)	(0.008)	(0.006)	(0.010)	(0.014)	(0.014)	(0.021)
B: + Male Wage Variance							
Effect of 10% Increase in Rel. Wage	-0.038***	0.022***	0.015***	-0.001	0.027*	0.033**	0.083***
	(0.008)	(0.008)	(0.005)	(0.010)	(0.014)	(0.015)	(0.021)
*C: + 1970 Manuf.*Yr. FE*							
Effect of 10% Increase in Rel. Wage	-0.037***	0.026***	0.011**	-0.001	0.017	0.028**	0.077***
	(0.009)	(0.008)	(0.005)	(0.010)	(0.014)	(0.013)	(0.023)
Obs	23278	23278	23278	22181	22465	23278	793

Notes: This table shows the coefficients from estimating Equation 4 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.16: 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 4 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.17: Sensitivity 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
Effect of 10% Increase in Rel. Wage	-0.035***	0.021**	0.012*	0.017	0.057***	0.024	0.729**
	(0.010)	(0.010)	(0.007)	(0.013)	(0.018)	(0.015)	(0.294)
Effect of 10% Increase in Avg. Wage	0.043**	-0.001	-0.043***	0.004	-0.023	-0.017	-0.376
	(0.020)	(0.016)	(0.016)	(0.031)	(0.029)	(0.022)	(0.668)
Effect of 10% Increase in L. Rel. Wage	-0.017**	0.013*	0.007	-0.033*	-0.008	0.018	0.382*
	(0.008)	(0.007)	(0.006)	(0.017)	(0.016)	(0.012)	(0.217)
Effect of 10% Increase in L. Avg. Wage	0.037*	-0.026	-0.000	-0.003	-0.014	-0.031	0.525
	(0.020)	(0.016)	(0.019)	(0.033)	(0.035)	(0.021)	(0.687)
Mean Y	0.645	0.245	0.102	0.159	0.324	0.233	36.823
Obs	23573	23573	23573	16925	22663	23573	23222

Notes: This table shows the coefficients from estimating a modified version Equation 4 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.