Is the Male Marriage Premium Due to Selection?
The Effect of Shotgun Weddings on the Return to Marriage

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Abstract: In standard cross-sectional wage regressions, married men appear to earn 10 to 20 percent more than comparable never-married men. One proposed explanation for this male marriage premium is that men may be selected into marriage on the basis of characteristics valued by employers as well as by spouses or because they earn high wages. This paper examines the selection hypothesis using a "natural experiment" that may make marital status uncorrelated with earnings ability for some men. We compare the estimated marriage premium between white men whose first marriages are followed by a birth within seven months and other married white men in the United States. Married men with a premarital conception generally have a lower return to marriage than other married men. Our results suggest that a substantial portion of the marriage premium is due to selection.

JEL classification: J31, J12

Key words: shotgun marriages, male marriage premium

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1. Introduction

Research on the determinants of wages has found that married men appear to earn more than comparable single men (e.g., see Korenman and Neumark 1991). Traditional estimates of this return to marriage range from 10 to 40 percent and have motivated several studies of its causes. Proposed explanations for the male marriage premium include employer discrimination and productivity differences due to specialization afforded by marriage. Selection bias may also account for the return to marriage. Women may select spouses in part on the basis of characteristics that employers also value but are unobservable to econometricians, and the measured marriage premium may simply reflect the return to these characteristics. Estimates of the marriage premium may also suffer from selection bias if men who have high wages or faster wage growth are more likely to marry.

In this paper we exploit a quasi-natural experiment in marriage to correct for selection bias in estimates of the male marriage premium. A natural experiment that randomly assigns treatment status can be used to obtain unbiased estimates of the effect of treatment when traditional estimates are subject to endogeneity bias because of selection or omitted variables (Meyer 1995). As discussed by Angrist (1995), traditional estimates may give the effect of treatment on the treated, or the selected average treatment effect, instead of the effect of treatment on the entire population, or the average treatment effect. Usual estimates of the effect of marriage on wages estimate the return to marriage among married men; if variation in marital status is not random, unmarried men might not earn the same premium if they married.

Our natural experiment uses the dates of first marriage and children's births to examine whether the return to marriage differs between men who have a child within seven months of

marriage and other married men. We assume that nonmarital conceptions followed by marriage, or "shotgun weddings," make marriage a random event. If so, shotgun weddings allow econometricians to avoid the selection issues associated with traditional estimates of the male marriage premium. About 14 percent of first marriages for white men are followed by a birth within seven months in our data, which are from the National Longitudinal Survey.

We also explore whether wages affect men's marital status. If high-earning men are more likely to marry, as posited by Becker (1976), estimates of the marriage premium that do not control for the endogeneity of marriage will be biased upwards. Research on the relationship between the availability of "marriageable" men and women's marriage patterns indicates that men's average earnings and employment rates are positively correlated with the incidence of marriage among women in the U.S. (Lichter, LeClere and McLaughlin 1991). Since women may be reluctant to marry low earners, men's earnings may affect their own marital status as well. To address this issue, we estimate the effect of men's wages on the likelihood of marriage using both cross-sectional and panel data techniques.

Our cross-sectional results indicate that married men without a premarital conception receive an immediate positive wage premium, while married men with a premarital conception receive a positive return to marriage over time before controlling for individual heterogeneity. When individual heterogeneity is controlled for using fixed effects, the estimates generally fail to indicate a marriage premium. Other results indicate that higher-wage men are more likely to get married. Selection bias therefore appears to play a substantial role in traditional estimates of the marriage premium.

2. Summary of the Literature

Although almost all previous research finds a significant return to marriage for men in cross-sectional wage regressions, studies using panel data have reached differing conclusions on whether selection bias contributes to the male marriage premium.

Korenman and Neumark (1991) find little evidence that selection into marriage biases estimates of the marriage premium. Their specifications using pooled cross-sectional data from the National Longitudinal Survey (NLS) Young Men Cohort indicate a positive correlation between marriage and wages. When individual fixed effects are included to control for unobservable, time-invariant characteristics, the estimated return to marriage is substantially lower but remains positive and significant. They also find that the return to marriage increases with marital duration. Korenman and Neumark indicate that young men with high wages or high wage growth rates in the NLS data are not more likely to get married.

Nakosteen and Zimmer (1997), in contrast, find that men with high earnings are more likely to get married and less likely to get divorced. Using panel data from the Panel Survey of Income Dynamics (PSID), they estimate standard earnings regressions and then include the residuals and predicted earnings in probability regressions of whether men married or divorced. They conclude that single men with higher earnings residuals are more likely to get married, while married men with higher predicted earnings are less likely to get divorced.

In an earlier paper, Nakosteen and Zimmer (1987) control for selection bias using a Heckman-style selection correction model. The model is identified by assuming that family background variables affect selection into marriage but not wages. Using cross-sectional data from the PSID, they find that the correlation between marriage and earnings is positive but not significant when selection is controlled for. However, the selection correction term is not

significant in the second-stage regressions and the standard errors on the estimated marriage coefficients are large, suggesting that the results have no clear interpretation.

Cornwell and Rupert (1997) conclude that selection underlies the marriage premium. They include random and fixed individual effects in wage regressions using NLS data from 1971, 1976, 1978 and 1980. They find that any return to marriage is an intercept shift rather than a return to marriage over time, and controlling for fixed individual characteristics attenuates the marriage premium. Cornwell and Rupert also report that men who marry between 1971 and 1980 already receive a marriage premium in 1971, so it appears that men who get married have characteristics that earn positive returns in the labor market even before marriage.

Gray (1997) pools data from the NLS and the follow-up National Longitudinal Survey of Youth (NLSY) to examine changes in the marriage premium between the two sample time periods. Like Blackburn and Korenman (1994), Gray reports a significant decrease in the marriage premium over time. His results indicate that the marriage premium in the first sample period resulted from the productivity effects of marriage. In the later sample period, the marriage premium disappears when selection is controlled for with individual fixed effects.

Research has also reached differing conclusions on whether productivity differentials contribute to the marriage premium. Loh (1996) finds no evidence that increased specialization between household and nonhousehold production, as measured by wives' labor force participation, underlies the return to marriage. Daniel (1995) reports, in contrast, that the marriage premium falls as wives' hours of work increase. Using payroll records from a large U.S. manufacturing firm, Korenman and Neumark (1991) find that married men receive higher performance ratings and work in higher job grades. The marriage premium disappears when controlling for these two factors, suggesting that married men may be more productive than

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single men. Absent direct data on workers' productivity, the interaction of marriage, productivity and wages is unlikely to be resolved.

We attempt to better understand the role of selection in the return to marriage. In doing so, our study differs from previous research. We examine only the transition to men's first marriage in order to obtain clear estimates of the effect of getting married on men's wages. Earlier research has included divorced and remarried men, but the implications of the selection and productivity hypotheses are not clear for divorce or remarriage for several reasons. Alimony and child support payments may motivate divorced men to earn higher wages. Divorce implies negative selection by the first spouse, and the presence of an ex-spouse and dependents may affect selection into subsequent marriages. In addition, divorced men should retain any human capital they acquired through specialization within marriage.

Our natural experiment approach, not previously used in this literature, tests whether selection bias contributes to the marriage premium. In addition, we test whether wages affect the likelihood of marriage using probability and hazard rate models to see if marital status should be viewed as endogenous in a wage equation. By estimating the marital status models separately for marriages with and without a premarital conception, we also test our assumption that marriages with a premarital conception are unrelated to men's earnings.

3. Empirical Methodology

Estimates of the male marriage premium may be subject to selection bias because employers and potential spouses value the same characteristics or because only high-earning men get married. If uncorrected, both sources of selection bias would lead to an overestimate of the marriage premium.

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The first potential source of selection bias is that employers and spouses value the same characteristics in men, and the estimated marriage premium in cross-sectional data reflects the return to these characteristics, which econometricians do not observe. More formally, the true model of wages is

$$\ln \text{Wage}_{it} = \alpha + \beta X_{it} + \gamma M_{it} + \delta A_{it} + \varepsilon_{it}, \tag{1}$$

where X_{it} is observable characteristics of individual i at time t, M_{it} is an indicator of marital status, and A_{it} is unobservable characteristics that affect wages. If A_{it} and M_{it} are positively correlated, then the estimated coefficient on M_{it} will also measure the return to A_{it} and be biased upward. For example, loyalty and dependability are likely to be positively correlated with wages and marital status.

The standard correction, as in Korenman and Neumark (1991), is to assume that A_{it} is fixed over time. Then, using panel data, unobservable characteristics can be controlled for by differencing observations from individual means or by including an individual fixed effect:

$$\ln \text{Wage}_{it} = \alpha + \beta X_{it} + \gamma M_{it} + \delta A_i + \varepsilon_{it}, \tag{2}$$

where A_i is a fixed effect for individual i.

The fixed effects methodology does not correct for bias due to unobservable characteristics that are correlated with marital status but not time-invariant. It also does not correct for the other possible source of selection bias, that selection into marriage depends on wages or wage growth. If men are selected into marriage on the basis of wages, then $Wage_{it}$ and

M_{it} are interdependent and the estimated coefficient on the marriage variable will be biased upward if high earnings or fast wage growth increase the likelihood of marriage. The standard corrections for the endogeneity problem are instrumental variables estimation or a Heckman-style selection correction method. Both methods require that marital status be well correlated with at least one variable that is uncorrelated with the error term in equation (1). However, few variables seem like natural candidates for identification; birth order (Behrman and Taubman 1986), religion (Meng and Sentance 1984), and parents' education (Ginther 1996; Griffin and Ganderton 1996) have been found to be correlated with earnings.

Our natural experiment of shotgun weddings offers an alternative means of correcting for selection and endogeneity bias. Although the fraction of premarital conceptions that result in marriage has been declining over time, a significant number of premarital pregnancies resulted in marriage during our sample timeframe. Among women who had their first child in 1960-64, 63 percent of white women and 26 percent of black women who had premarital conceptions married before the birth of the child; the respective rates fell to 49 percent and 11 percent by 1975-79 (O'Connell and Rogers 1984).

In a true natural experiment in marriage, some men would randomly be assigned spouses and we would then compare the wages of married and single men. A premarital conception may randomly assign some men to marriage who otherwise would not marry or cause them to marry sooner. The plausibility of premarital conceptions as a natural experiment depends on two critical assumptions: that the likelihood of a premarital conception and the likelihood that a couple marries, given a premarital conception, are uncorrelated with a man's wages. In other words, we assume that premarital conceptions and shotgun weddings are unplanned, random events. This implies that women have sexual relations with men that they would not necessarily

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marry at that time. The women subsequently decide to marry when a premarital conception

occurs. If marriages with a premarital conception are randomly assigned and there is selection

bias in the traditional estimate of the marriage premium, the estimated marriage premium should

be lower for married men with a premarital conception than for other married men. If our natural

experiment assumption is not valid, there should be no difference in the estimated coefficients

for the two types of married men; if women attempt to use pregnancy to prompt marriage with

"desirable" men, the results should be the opposite of our hypothesis.

We test our hypothesis by estimating cross-sectional and fixed effects regressions that

include separate marital status indicator variables for the two types of married men, or

$$\ln \text{Wage}_{it} = \alpha + \beta X_{it} + \gamma \text{Non-Shotgun}_{it} + \rho \text{Shotgun}_{it} + \varepsilon_{it} \qquad (3)$$

and

$$\ln \text{Wage}_{it} = \alpha + \beta X_{it} + \gamma \text{Non-Shotgun}_{it} + \rho \text{Shotgun}_{it} + \delta A_i + \varepsilon_{it}, \qquad (4)$$

where the variable *Non-Shotgun$_{it}$* equals one if a man is married and the marriage was not

followed by a birth within seven months and zero otherwise, and *Shotgun$_{it}$* equals one if the

man's marriage was followed by a birth within seven months and zero otherwise. The

comparison group is never-married men. The regressions are also estimated with only one

marital status indicator variable to obtain benchmark estimates similar to those reported in other

studies.

4. Data

We use data from the NLS Young Men Cohort to examine the correlation between marriage and wages. The NLS is a longitudinal data set that followed a group of young men aged 14-24 in 1966 for fifteen years. The data set includes the date men's present marriage began and children's birth dates, which allow us to determine whether a marriage was shortly followed by a birth. We define a premarital conception that results in marriage, or a legitimated birth, as a marriage that is followed by a birth within seven months. Of course, not all legitimated births are the outcome of a shotgun marriage since the marriage may have already been planned before the pregnancy began or was realized. In addition, the pregnancy may have been planned to bring about the marriage because the man is a desirable spouse, a possibility that we address below.

We use data from the 1970 and 1976 waves of the NLS and restrict the data to white men who had completed their schooling by 1970 and who had complete records for the variables used in the empirical analysis. The NLS data set was also used in Korenman and Neumark (1991) and Cornwell and Rupert (1997), but we use focus on earlier survey waves than previous research because most shotgun marriages occur when men are in their teens or early twenties. In addition, using earlier waves yields more transitions into the first marriage. Transitions involving divorce and remarriage, not first marriages, primarily identify Korenman and Neumark and Cornwell and Rupert's fixed effects estimates.

Only men who have never been married or who are presently in their first marriage (with spouse present) are included in the sample. We drop those men who divorced, separated, were widowed, or whose spouse is not present because of difficulties in determining whether these men had a premarital conception that resulted in marriage. As discussed above, the applicability

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of the selection hypothesis is unclear for men who divorce or remarry. The final sample size is 530 out of the 5225 records in the NLS.

Table 1 gives descriptive statistics for the sample stratified by marital status in 1970. There are several clear differences between the groups. Never-married men earn less and are younger than married men. Married men with a premarital conception earn less than other married men, have less schooling and have been married longer. Men with a premarital conception married at younger ages than other men.

A considerable fraction of the men who were single in 1970 married during the six-year sample timeframe. Over 65 percent of single men in our sample married for the first time during the six-year period; the fixed effects estimates will be identified from these men since we do not include men who were divorced or separated. About 9 percent of the men who married during the sample period had a child within seven months of marriage, allowing us to combine the fixed-effects and natural experiment methodologies.

As in previous research, we include variables measuring the number of years of marriage and its square as well as marital status indicator variables in some specifications of equations (3) and (4). The indicator variables capture the immediate effect of marriage on wages and are equivalent to an intercept shift, while the years married variables capture the effect of marriage over time. A positive correlation between years married and wages suggests that the marriage premium is due to productivity differences because specialization and human capital accumulation are gradual processes; a positive correlation between the dummy variable and wages is consistent with selection or discrimination underlying the marriage premium since these causes should shift the intercept rather than have a gradual effect.

The equations estimated also contain annual weeks worked, weekly hours, tenure in years and its square, and dummy variables for residence in the South, residence in an urban area, whether wages are set by collective bargaining, armed forces service, highest grade completed (5 categories), industry (11), occupation (8), year of birth (12) and sample year (2). Unlike some previous research, we do not include a dummy variable for the presence of nonspouse dependents because all married men with a premarital conception have a nonspouse dependent. All of the standard errors are White-corrected for individual-specific heteroscedasticity.

5. Results

The estimation results indicate a large positive return to marriage for white men. Panel A of Table 2 shows the estimated coefficients of the indicator variables of marital status in the wage regressions. To conserve space, we only report the coefficients on the marriage variables. The first column reports the results of estimating equation (3) with only one marital status indicator variable. Married white men earn about 19 percent more than never-married white men, and the estimate is significant at the 0.01 level. This estimate is slightly larger than other estimates of the marriage premium using the NLS data because we use an earlier timeframe and restrict the sample to never-married men and men currently in their first marriage.

Column 4 of Table 2 shows the results of including individual fixed effects in the regression. The estimated coefficient for white men falls by about one-half when time-invariant individual characteristics are controlled for. The results indicate a marriage premium of 9.6 percent when individual fixed effects are included, and the estimate is statistically significant only at the 0.08 level. The large decline in the marriage premium when time-invariant characteristics are controlled for is consistent with the selection hypothesis.

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The results in panel A of Table 2 provide limited support for our hypothesis that married men with a premarital conception have a lower return to marriage than other married men. In the pooled cross sections, white men without a premarital conception earn a marriage premium of 20.1 percent, and white men with a premarital conception earn a marriage premium of 18.9 percent. However, the estimated standard errors are large enough that the two estimates are not statistically distinguishable. In the fixed effects estimates, white men without a premarital conception have a marriage premium of about 10 percent (p-value 0.08). The marriage premium for white men with a premarital conception is not statistically different from zero and is about three-fifths the magnitude of the estimate for other married men; however, the two estimates are not statistically different from each other at conventional levels. The decline in the estimates of the marriage premium when fixed effects are included is again consistent with the selection hypothesis.

The specifications that include the years married variables as well as a marital status indicator variable also show a positive return to marriage in the pooled cross-sectional regressions. Panel B of Table 2 shows the estimated coefficients of the marriage indicator variable and the years married and its square variables. The intercept shift and return to each additional year of marriage are positive and significant for white married men when the two types of marriages are combined. Evaluated at the sample mean of 5 years of marriage, married white men earn about 20.6 percent more than never-married men, which is similar to the estimate reported in the first column of panel A of Table 2.

When the fixed effects are included, the estimated return to marriage is not significantly different from zero when the two married types are pooled. As column 4 of panel B shows, there is neither a significant intercept shift nor a significant return to each year of marriage. These

results indicate that time-invariant individual characteristics play a role in determining both marital status and wages, and failure to control for this leads to an overestimate of the returns to marriage. Cornwell and Rupert (1997) report similar findings, whereas Korenman and Neumark (1991) and Gray (1997) find a positive marriage premium even after including fixed effects in the NLS data. This discrepancy can be attributed to the inclusion of an earlier survey wave and to the exclusion of divorced and remarried men from our sample.

The results in panel B of Table 2 suggest some differences in the returns to marriage between married men with a premarital conception and other married men. In the pooled cross-sectional regressions, married white men without a premarital conception experience an intercept shift of 15.7 percent but have no significant return to each additional year of marriage. Married white men with a premarital conception, in contrast, experience a marriage premium over time but not an intercept shift. None of the fixed effects estimates are significant, which is consistent with the selection hypothesis.

Our results indicate that selection affects traditional estimates of the marriage premium. The estimated marriage premium falls when fixed individual effects are included to control for time-invariant characteristics that may affect both marital status and wages, and there is no evidence of a significant marriage premium when years of marriage and fixed individual effects are controlled for. In addition, married men with a premarital conception, whose marriages may involve less selection based on earnings ability, earn different returns to marriage than other men in some specifications. Married men who have a premarital conception do not have the intercept shift wage jump experienced by other men. Any marriage premium earned by men with a shotgun wedding occurs over time, perhaps due to improved productivity motivated by the need to provide for the child.

6. Further investigation of differences between married and unmarried men

Our results indicate that selection plays a substantial role in traditional estimates of the marriage premium, but they do not conclusively demonstrate that earnings ability affects men's marital status. Indeed, our natural experiment approach may be invalid; the likelihood of marriage, given a premarital conception, may depend on the man's earnings ability. We therefore examine the validity of our assumption that marriage is exogenous with respect to earnings and characteristics that affect earnings among men with premarital conceptions. We also use probability and hazard rate models to test whether earnings affect the likelihood of marriage.

6.1 Are shotgun marriages independent of wages?

The critical assumption underlying our natural experiment approach is that the decision to marry if there is a nonmarital conception is independent of the man's wage and his earnings ability. The small body of research on the effect of men's characteristics on the likelihood that a nonmarital conception is legitimated suggests that shotgun marriages are not related to men's earnings ability. Zavodny (1998) finds that white men's employment status and educational attainment do not significantly affect the likelihood of legitimation in a sample from the NLS. Marsiglio (1987) reports that the educational attainment of men's parents, which is likely to be correlated with men's earnings ability, does not affect the likelihood of legitimation among adolescent fathers in the NLS. Marsiglio also finds that poverty status does not affect the probability that young white fathers marry within 12 months of conception.

One method of gauging the reasonableness of our assumption is to compare wages and other characteristics at the time of marriage between men with a premarital pregnancy and other

men. Table 3 shows the mean wage, age and years of completed schooling at the time of marriage for married men in our NLS sample. The sample used in Table 3 includes only men who married in 1966 or later because the NLS began in 1966. If men with a premarital conception earn more or have more schooling than other men getting married, it might raise concerns that the marriages are related to men's earnings ability. However, there is little indication that married men with a premarital pregnancy are "more desirable" than other men at the time of marriage; white men with a premarital conception earn less, are younger and have less education than other white men getting married. All of the differences at the time of marriage between men with a premarital conception and other men reported in Table 3 are statistically significant.

We also attempted to compare wages and other characteristics at the time of the child's birth between men who marry when there is a nonmarital conception and men who do not marry. The 1981 survey wave of the NLS asked men the dates of birth of children not living in the household, and the 1976 survey wave asked the beginning and end dates of up to two previous marriages in addition to the start date of the current marriage. We can therefore determine whether a man reported children born outside of marriage and compare the characteristics at the time of birth between these men and the men in our sample who married and had a birth within seven months. However, only 19 white men reported nonmarital births and had complete responses the year of the birth. In addition, complete survey responses for the year of the birth are only available for 40 white men who had shotgun weddings. Because of the small sample size, our comparison of men who did and did not marry in the event of a nonmarital pregnancy is only suggestive.

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Columns 3 and 4 of Table 3 report the mean characteristics of men who did and did not marry after a nonmarital conception. White men who married tended to earn less but had more education than those who did not marry, but the differences are not significant. White men who did not marry were significantly older than fathers who did marry. Although these comparisons are not definitive proof that marriage after a nonmarital conception is not related to the man's earnings, these results give little reason to be concerned about our underlying assumption.

6.2 Transitions into marriage

Including individual fixed effects in the regressions controls for time-invariant unobservable characteristics that affect selection into marriage but does not control for the possibility that marital status and wages are simultaneously determined. Our natural experiment approach controls for selection and endogeneity bias if a premarital conception makes marriage independent of earnings ability. To investigate whether wages affect marital status, we examine whether the likelihood of getting married depends on men's earnings using probability and hazard rate models.

We first examine whether the probability that men in our NLS sample marry between 1970 and 1976 depends on characteristics in 1970, including the wage. We estimated Probit models for white men who are not yet married in 1970, where the dependent variable is one if the man married by 1976 and zero otherwise. The covariates included the log of the hourly wage, age, years of schooling completed, annual weeks worked, hours per week worked, tenure in years, and dummy variables for the presence of nonspouse dependents, collective bargaining status, residence in the South, urban residence and armed forces service. The standard errors are corrected for heteroscedasticity. The Probit regressions were also estimated

separately for men with shotgun weddings and men with non-shotgun weddings to further test our assumption that marriages with a premarital conception are not related to earnings.

Table 4 shows the estimated coefficients on the wage variable in the Probit regression. Columns 1 and 2 report that the probability of marrying over 1970-1976 is positively correlated with earnings in 1970. However, there is no significant correlation between the probability of marriage and earnings for white men who married with a premarital conception (column 3). These results are consistent with the hypothesis that marital status depends on wages and also provide further support for our natural experiment assumption.

We also used a hazard rate model to estimate whether earnings affect marital status. Hazard rate models estimate the correlation between variables and the time until failure (in this case, marriage). We used a discrete-time exponential hazard rate model in which the risk of a never-married man getting married each year depended on that period's real hourly wage, employment status, age, Southern and urban residence, current school enrollment and armed forces status, armed forces service and completed schooling (in 4 categories). The sample includes white men who were not yet married in 1965. The model was estimated for the years 1966-1976, and men were coded as a "failure" the year they began their first marriage and then were dropped from the sample thereafter. Because the NLS survey was not conducted in 1972 and 1974, men married in those years were classified as marrying in 1971 and 1973. For men not currently working, wages were imputed as zero. The sample size was 376 white men, of whom 301 married by 1976 (39 with premarital conceptions).

Higher wages result in a higher marriage hazard except for white men with a premarital conception. Table 4 shows the estimated hazard ratios for the wage variable; a coefficient above 1 indicates that an increase in the wage increases the hazard of failure (marriage). Higher wages

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increase the risk of marriage for white men without a premarital conception. For white men with a premarital conception, higher wages lower the risk of marriage. The results are similar if a Weibull hazard rate model is used instead of the exponential model.

The results of the probability and hazard rate models suggest that marital status depends on men's earnings. The Probit model and the hazard rate analysis indicate that men with higher wages are more likely to get married. For men with a premarital conception, however, higher wages do not increase the likelihood of marriage.

7. Conclusion

This paper examines the effect of selection bias on estimates of the marriage premium among white men. Using the natural experiment of premarital conception as an exogenous cause of marriage, we find differences in the estimated marriage premium for men who married with a premarital conception and other married men. Before controlling for individual fixed effects, married men without a premarital conception have a significant immediate return to marriage as measured by the intercept, and married men with a premarital conception earn a marriage premium over time. When fixed effects are controlled for, men do not earn a significant marriage premium.

Our results are consistent with Cornwell and Rupert's (1997) conclusion that selection plays a large role in the marriage premium but are in contrast with the findings of Korenman and Neumark (1991). These results also support Gray's (1997) finding that increased selection underlies the fall in the marriage premium over time. The availability of contraception and abortion has increased over time, decreasing the number of marriages that result from an unplanned pregnancy (Akerlof, Yellen and Katz 1996). If shotgun marriages involve less

selection on men's earnings ability than other marriages, then the demise of shotgun weddings will have led selection to play a larger role in the marriage premium over time.

The robustness of our results depends in part on the credibility of the natural experiment employed in this research. We examine the credibility of our natural experiment assumption by comparing men with shotgun weddings to other men and by estimating the effect of wages on the probability and the hazard rate of getting married. Comparisons of mean characteristics at the time of marriage or birth do not indicate that men who marry in the event of a nonmarital conception differ from other men. Hazard rate models for men without a premarital conception indicate that the marriage hazard is correlated with higher wages, while the results suggest that the marriage hazard is independent of wages for men with a premarital conception. Our natural experiment assumption appears to be valid in our sample, and the results suggest that marital status is not independent of earnings for men without a premarital conception.

Our findings suggest that much of the cross-sectional return to marriage for white men is the result of selection bias and time-invariant individual characteristics. Future research should incorporate the effects of divorce and remarriage on the returns to marriage and consider how the selection and productivity hypotheses apply to these men. Use of additional panel data such as the PSID should be pursued to further investigate the effects of premarital conception on the probability of and the return to marriage.

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Table 1. Descriptive statistics for white male NLS sample in 1970 [a]

| | | Currently Married | |
| | Never | No Premarital | Premarital |
Characteristics in 1970	Married	Conception	Conception
Hourly wage ($)	2.95	4.15	3.74
	(1.30)	(1.58)	(1.51)
Schooling completed (years)	12.6	12.8	12.1
	(2.2)	(2.3)	(1.9)
Age (years)	21.9	25.5	24.5
	(2.9)	(2.7)	(3.1)
Lives in South (%)	32.3	27.8	22.2
Lives in urban area (%)	68.3	68.0	59.3
Served in armed forces (%)	15.0	23.3	13.0
Covered by collective bargaining (%)	27.5	31.4	29.6
Has nonspouse dependents (%)	4.2	68.0	100.0
Years married	--	3.7	4.2
Age at marriage	--	21.2	19.9
Married in 1976 (%)	65.3	--	--
Married in 1976 with premarital conception (%)	6.0	--	--
Sample size	167	309	54

[a] Standard deviations shown in parentheses.

Table 2. Estimates of the marriage premium[a]

Covariate	Pooled Cross Sections			Fixed Individual Effects		
	Combined	No Premarital Conception	Premarital Conception	Combined	No Premarital Conception	Premarital Conception
A. Indicator Variable of Marital Status:						
Married	0.181	0.183	0.173	0.092	0.095	0.057
	(0.029)	(0.029)	(0.043)	(0.052)	(0.054)	(0.144)
B. Indicator Variable of Marital Status and Years of Marriage:						
Married	0.120	0.146	-0.052	0.067	0.079	-0.037
	(0.033)	(0.034)	(0.077)	(0.060)	(0.063)	(0.156)
Years married	0.018	0.013	0.056	-0.002	-0.004	0.021
	(0.009)	(0.009)	(0.020)	(0.014)	(0.014)	(0.030)
Years married^2/100	-0.016	0.007	-0.184	-0.045	-0.045	-0.098
	(0.053)	(0.058)	(0.128)	(0.070)	(0.072)	(0.189)

[a] The dependent variable is the natural log of the hourly wage. The regressions also include tenure, tenure squared, annual weeks worked, weekly hours, indicator variables for collective bargaining, Southern and urban residence, armed forces service, year, year of birth (11), completed schooling (4), industry (10), and occupation (7). Heteroscedasticity-corrected standard errors are shown in parentheses. The sample size is 1060.

Table 3. Comparison of mean characteristics at time of marriage and time of birth [a]

Mean Characteristics	Time of Marriage		Time of Birth (Nonmarital Conception)	
	No Premarital Conception	Premarital Conception	Married	Not Married
Hourly wage (real $)	2.85	2.18	2.55	2.73
	(1.24)	(0.87)	(0.97)	(2.41)
Schooling completed (years)	12.8	12.0	12.1	11.6
	(2.1)	(1.8)	(1.8)	(1.5)
Age (years)	22.6	20.9	21.1	22.8
	(2.9)	(2.9)	(3.1)	(3.3)
Sample size[b]	270	40	40	19

[a] Standard deviations shown in parentheses.
[b] The samples only include men with complete responses for the survey year they married or the survey year their child was born. If a survey was not administered the year of the marriage or the birth, we attributed men their wage and education in the preceding year.

Table 4. Determinants of likelihood men will marry: Probit and hazard rate models [a]

Covariate	Probit, 1970-1976			Hazard Rate, 1966-1976		
	Combined	No Premarital Conception	Premarital Conception	Combined	No Premarital Conception	Premarital Conception
Hourly wage	0.848	0.900	-0.129	1.166	1.205	0.776
	(0.289)	(0.296)	(0.412)	(0.054)	(0.058)	(0.141)
Sample size	167	157	68	376	372	345

[a] The dependent variable in the Probit model is one if a man marries over 1970-1976 and zero otherwise. The regressions also include age, schooling, tenure, annual weeks worked, weekly hours, indicator variables for nonspouse dependents, collective bargaining, Southern and urban residence and armed forces service. The hazard rate model is an exponential hazard, and the hazard ratios are shown. The hazard specifications also include age, and indicator variables for Southern and urban residence, current enrollment, employment and armed forces status, armed forces service and 4 schooling categories. Heteroscedasticity-corrected standard errors are shown in parentheses.