Are All the Good Men Married?
Uncovering the Sources of the Marital Wage Premium

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ABSTRACT

A longstanding and yet unsettled question in labor economics is: does marriage cause men's wages to rise? Cross-sectional wage studies consistently find that married men earn significantly higher wages than do men who are not currently married. However, it is well-known that inferring causal relationships from cross-sectional analysis is inappropriate because of the biases introduced by unobserved heterogeneity. As a means of circumventing this problem, this paper uses data on identical twins to control for unobserved heterogeneity. Our estimates suggest that marriage increases men's wages by as much as 27%, and that little, if any, of the cross-sectional relationship between marriage and wages is due to selection. In addition, we find little evidence that the marital-wage premium is a consequence of household specialization.

JEL Codes: J12, J16

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A longstanding and yet unsettled question in labor economics is: does marriage cause men's wages to rise? Cross-sectional wage studies consistently find that married men earn significantly higher wages than men who are not currently married. Even after controlling for a broad set of covariates, this estimated differential is large, ranging from 10% to 50%. Among the competing explanations for this marital wage premium, three receive the most attention. The first is that marriage makes men more productive by allowing them to specialize in non-household production. The second is that employers discriminate in favor of married men and the third is that the unobservable characteristics that make men more productive in the labor market also make them more attractive in the marriage market. The primary difference between the first two explanations and the third is that the first two suggest that the marriage has a causal effect on men's wages, while the third implies that the estimated marital wage premium is the result of an omitted variable bias. This paper attempts to identify the causal effect of marital status on earnings by using data on monozygotic (MZ) twins to control for unobserved heterogeneity.

Data on monozygotic twins have most frequently been used to obtain estimates of the returns to schooling (for example, Ashenfelter and Kruger (1994) and Behrman, Rosenzweig and Taubman (1996)). These studies control for differences in genetic endowments and family background by examining the relationship between within-twin variation in schooling and wages. In a similar fashion, we use within-twin variation in marital status, to examine the effect of marriage on men's wages.[2] We find that when the data are treated as a cross-section, the

[2] A common criticism of twin studies estimates of the returns to schooling is that they may exacerbate the biases caused by unobserved heterogeneity since there are likely to be unobservable differences even between identical twins, and it is difficult to imagine what, besides those unobservable differences, would lead twins to choose

estimated marital wage premium is 20%. When we look within monozygotic twins, the estimated premium does not fall. In fact, the point estimate increases to approximately 27%. These results are robust to alternative specifications of the wage equation and various attempts to control for measurement error. The findings indicate that little, if any, of the marital wage premium is due to the selection of more productive men into marriage.

Previous studies of the marital wage premium, have attempted to control for unobservable heterogeneity by using panel data to difference out individual-level fixed effects (e.g. Korenman and Neumark 1991; Loh 1996; Cornwell and Rupert 1997; Gray 1997; Stratton 2002). Estimates from these studies vary considerably. While some authors report that the marital wage premium disappears once individual level fixed effects have been controlled for, others report that the marital wage premium remains positive and significant.

There are numerous potential problems with these fixed-effects estimates. First, these estimates are likely to be biased if past earnings shocks affect current marital status. For example, if men are more likely to get married after receiving a positive wage shock, then fixed-effects estimates of the causal effect of marriage on wages are likely to be biased downwards due to regression to the mean.[3] In addition, fixed-effects estimates will also be biased if unobserved productivity is time-varying. For example, fixed-effects estimates of the marital wage premium will be biased upwards if men postpone marriage until increases in their unobserved productivity lead to higher wages.

Only one other paper, Krashinsky (2002), uses twin data to study the impact of marriage on wages. As in Ashenfelter and Krueger (1994), his data were collected from the Twinsburg Twins Festival in Twinsburg Ohio. Krashinsky's cross-sectional results imply that married male

different levels of education. Our study may be less open to this criticism since there is arguably a larger random component to marital status.

[3] See Angrist and Krueger (1999) for a full discussion.

twins earn 23% more than unmarried twins. However, the within-twin estimates drop the returns marriage to 6% but the standard errors are large (7.7%), and, thus, it is difficult to infer much about the causal relationship between wages and marriage from his study.

Empirical Framework

We assume that w_{ij}, the logarithm of wages for individual $i \in \{1,2\}$ from family j is given by:

$$\mathrm{w}_{\mathrm{ij}} = b\mathrm{M}_{\mathrm{ij}} + g\mathrm{X}_{\mathrm{ij}} + m_{\mathrm{ij}} + \mathrm{f}_{\mathrm{j}} + \mathrm{u}_{\mathrm{ij}} \qquad (1)$$

where M_{ij} takes on the value of one if the man is married and zero otherwise, X_{ij} is a vector of control variables including age, experience and years of schooling, m_{ij} is an individual-specific, genetically-determined earnings endowment, f_j is a family-specific earnings endowment and u_{ij} is a mean zero i.i.d. error term. It is assumed that m_{ij}, f_j and u_{ij} are unobservable to the econometrician.

The parameter of interest in this study is b, the marginal impact marriage on wages. If more productive men select in to marriage, then M_{ij} will be positively correlated with either m_{ij} or f_j (or both) and the OLS estimate of b will be biased upwards. A major goal of this and other studies of the marital wage premium is to eliminate this selection bias so that the resulting estimate of b can be interpreted as the causal effect of marriage on wages.

For an MZ twin pair, equation (1) can be rewritten as:

$$w_{1t} = bM_{1j} + g X_{1t} + m_{1j} + f_j + u_{1j} \qquad (2)$$

$$w_{2t} = bM_{2j} + g X_{2t} + m_{2j} + f_j + u_{2j} \qquad (3)$$

The principle identifying assumption in our analysis is that, for MZ twins, $m_{1j} = m_{2j}$. That is, we assume that the genetically determined, individual-specific earnings endowment is identical across twins. Given this assumption it is possible to difference equations (2) and (3) so that

$$w_{1j} - w_{2j} = b(M_{1j} - M_{2j}) + g(X_{1j} - X_{2j}) + (u_{1j} - u_{2j})\,. \qquad (4)$$

Differencing equations (2) and (3) sweeps out individual-specific and family-specific earnings endowments. As a result, the least squares estimate of equation (4) produces an unbiased estimate of b.[4] If the estimates of b from equations (1) and (4) are similar, then this suggests that marital status is unrelated to unobserved productivity.

Data Description

Our data come from the Socioeconomic Survey of Twins[5]. This survey was sent to a subset of twins from the Minnesota Twins Registry (MTR). The MTR is the largest birth-record based twin registry in the United States, and is comprised of about 80% of the approximately 10,400 surviving intact pairs born in Minnesota from 1936 through 1955. In these years, a total of 2,912 same-sex pairs were live-born. The MTR staff was able to locate both members of 1,673 (78%) of the surviving pairs and sent them a four-page Bibliographic Questionnaire (BQ)[6]. Then, between May and November of 1994, the Socioeconomic Survey of Twins was sent to the members of the pairs who had filled out the BQ and for whom the MTR still had a current

[4] A well-known problem with first-differencing equations (2) and (3) is that it tends to exacerbate measurement error bias in any of the right-hand side variables, especially if the right-hard side variables are highly correlated within twins (Griliches, 1979). We have estimated b both in the cross-section and within twin instrumenting for education (here education is treated as a continuous variable) using a strategy suggested by Ashenfelter and Krueger (1994). The results are very similar to the non-IV estimates indicating that measurement error is not biasing our results.

[5] See Behrman et al. (1996) for further discussion of the data.

[6] Surveys were, in fact, only sent to 1,629 pairs since in 44 cases one of the twins either was incapacitated or asked not to be contacted. The overall response rate was approximately 80% for individuals and 71% for concordant pairs.

address. In total, data are available from both members of 487 male twin *pairs*, of which 304 pairs are monozygotic (MZ). Our analysis focuses solely on these MZ pairs.

Our indicator of marital status is current marital status.[7] It takes on a value of 1 if the individual is currently married and 0 otherwise. Our measure of schooling is constructed using the respondent's report of their highest completed degree. From these reports we construct four indicator variables for whether the individual has less than a high school degree, a high school degree but no college degree, a college degree but no post-graduate degree or a post-graduate degree. The other right-hand side variables include tenure at current job and region of the country dummy variables. For the cross-section analysis we also include age and age squared as additional control variables.

Sample Construction

We restrict our sample in a number of ways. First, we consider only individuals who have a relatively strong attachment to the labor force, those who work at least 26 weeks per year and at least 20 hours per week. In order to prevent our results from being driven by outliers, we also drop observations in which individuals earn above $75/hour (less than 3% of the sample) or below $4.25/hour, which was the Federal minimum wage in 1994 when the survey was conducted. We also drop small number of observations who report working more than 52 weeks per year and more than 100 hours per week. Finally, we restrict the sample to include only those twins pairs in which each twin worked full time for at least three-quarters of the years since turning age 30. Observations with missing data are dropped. We loose 143 twin pairs due to missing values and an additional 95 twin pairs due to our sample selection criteria. Cleaning the

[7] We also explored including an indicator for divorced and widowed and the results are not qualitatively different from those we report here.

data leaves us with 128 MZ twin pairs. The twins in 31 (24%) of these pairs differ in their marital status.

In order to determine whether our sample is representative of the U.S. population, Table 1 compares the means of various demographic and job tenure variables for the twins in our sample to those of a similarly selected cohort of men in the 1995 March Supplement of the Current Population Survey (with the exception that we are not able to restrict the CPS sample to include only those individuals who have worked for at least three-quarters of the years since turning age 30.) The CPS sample is similar to our sample of twins with regards to average age, weeks worked per year, hours worked per week and percent married. In addition, consistent with previous studies, we find that unmarried men earn less, are younger, are less educated and have lower job tenure than their married counterparts.

Results

The first column of Table 2 presents the cross-sectional regression results of the logarithm of wages on the marriage indicator and our other explanatory variables. The coefficient on marital status is .20 (t-statistic = 2.1). Thus, in the cross-section, married men earn a 20% higher wage than unmarried men controlling for other characteristics. The parameter estimates also indicate wages increase with education. A man with a high school diploma earns 52% more than a high school dropout and the college graduate earns 35% more than a high school graduate. The estimated impact of education is in line with other cross-sectional work on the returns to education (e.g. Ashenfelter and Krueger, 1994).

The second column of Table 2 reports the within-twin coefficient estimates of the return to marriage. The coefficients indicate that men who are married earn 27% more than unmarried men (t-statistic=2.8). Furthermore, under the assumption that within-twin differences in marital status are exogenous, then the 27% increase in wages associated with marriage has a causal interpretation. The estimated returns to education are still positive but are substantially smaller than the OLS results. Since, these education coefficients are imprecisely estimated, we cannot infer much about the returns to education.

It is noteworthy that the implied marital-wage premium from the within-twin regression is similar in magnitude to the cross-sectional estimate, suggesting that men are not selecting into marriage based on unobserved heterogeneity in earnings capacity. Thus, we find no evidence that the observed marital-wage premium arises due to the selection of more productive men into marriage.

In order to investigate the extent to which the specialization hypothesis explains the wage premium paid to married men, we include a variable measuring wife's full-time work experience in our within-twin regressions. This variable is set equal to zero for unmarried men. If specialization in non-household production underlies the marital wage premium, then we would expect the coefficient on wife's full-time work experience to be negative and the coefficient on marital status to drop dramatically. However, the coefficient estimates in column three provide little support for the specialization hypothesis; the coefficient on wife's full time work experience is positive (and insignificant) and the coefficient on the marriage dummy is still large, .19 (t-statistic = 1.30).

As discussed above, there are a number of popular explanations for why marriage might cause men's wages to increase: married men receive favorable discrimination and marriage allows men to specialize in non-household production. We offer a third explanation. Because the income of married men affects the well-being of their spouse and children, married men may become more aggressive in the labor market. Thus, the marriage premium may reflect the fact that married men work harder and more assertively seek out raises and better job opportunities.

Conclusion

In this paper, we examine why married men earn more than men who are not currently married. We use data on monozygotic twins to distinguish between the selection hypothesis (that more productive men are more likely marry) and the hypothesis that marriage causes men's wages to rise. Our results provide little support for the selection hypothesis. Even within MZ twins, the marital wage premium remains large and the point estimate is on par with that from cross-sectional regressions. Thus, the answer to the question posed in the title of our paper, appears to be "no". Not all the good men are married. Rather, our results suggest that marriage causes men's wages to rise. In addition, we find no evidence that the causal force underlying the marital-wage premium is household specialization.

References

Angrist, Joshua and Alan Krueger. 1999. "Empirical Strategies in Labor Economics," in *The Handbook of Labor Economics*, edited by Orley Ashenfelter and David Card (New York: Elsevier, pp. 1277-1366.)

Ashenfelter, Orley and Alan Krueger. 1994. "Estimates if the Economic Return to Schooling from a New Sample of Twins," *American Economic Review* 84(45): 1157-1173

Behrman, Jere, Mark Rosenzweig and Paul Taubman. 1996. "College Choice and Wages: Estimates Using Data on Female Twins," *Review of Economics and Statistics* 78(4): 672-685.

Cornwell, Christopher and Peter Rupert. 1997. "Unobservable Individual Effects, Marriage and the Earnings of Young Men," *Economic Inquiry* 21(2): 285-94.

Gray, Jeffrey. 1997. "The Fall in Men's Return to Marriage: Declining Productivity Effects or Changing Selection?" *Journal of Human Resources* 32(3): 481-504.

Griliches, Zvi. (1979) "Sibling Modes and Data in Economics: Beginnings of a Survey," *Journal of Political Economy*, 87(5) Part 2, S37-S64.

Korenman, Sanders and David Neumark. 1991. "Does Marriage Really Make Men More Productive?" *Journal of Human Resources* 26(2): 282-307

Krashinsky, Harry. 2002. "Do Marital Status and Computer Usage Really Change the Wage Structure?" forthcoming, *Journal of Human Resources*.

Loh, Eng Seng. 1996. "Productivity Differences and the Marriage Wage Premium for White Males." *Journal of Human Resources* 31(3): 568-589.

Schoeni, Robert. 1990, "The Earnings Effects of Marital Status," Population Studies Center Report 90-172, University of Michigan.

Stratton, Leslie. 2002. "Examining the Wage Differential for Married and Cohabitating Men," *Economic Inquiry* 40(2): 199-212.

Table 1
Comparison of Minnesota Twin Sample and Same Age Group from the Current Population Survey

Variable	Twins Sample		CPS	
	Unmarried	Married	Unmarried	Married
Hourly wage	17.2 (10.3)	21.6 (10.4)	15.2	18.8
Age in years	45.3 (5.2)	47.4 (5.2)	46.0	47.1
Weeks Worked Per Year	51.0 (2.4)	50.4 (4.0)	49.8	50.7
Hours Worked Per Week	44.6 (11.0)	46.1 (9.4)	43.3	45.5
Less Than High School	0	.9 (9.4)	12.1	9.9
High School	63.4 (48.8)	52.9 (50.0)	59.6	54.8
College	19.5 (40.1)	25.8 (43.8)	18.2	20.0
More Than College	17.1 (38.1)	20.4 (40.4)	10.0	15.4
Tenure	11.7 (9.3)	14.5 (9.8)	—	—
Northeast	0	0.4 (6.7)	18.7	20.5
Midwest	82.9 (38.1)	86.7 (34.1)	22.2	24.1
South	2.4 (15.6)	4.0 (19.6)	33.9	34.4
West	14.6 (35.7)	8.9 (28.5)	25.1	20.9
N	41	225	3,736	13,862

Table 2

Regression of Logarithm of Wages on Marital Status

Variable	Cross Section (1)	Within-MZ (2)	Within-MZ (3)
Currently Married	.20* (.094)	.27** (.098)	.19 (.11)
High School	.52* (.26)	.15 (.40)	.18 (.40)
College	.87** (.26)	.23 (.41)	.25 (.41)
More Than College	.86** (.27)	.27 (.42)	.29 (.41)
Age	.097 (.10)	—	—
Age Squared	-.00086 (.0011)	—	—
Tenure	.012 (.011)	.017 (.014)	.017 (.014)
Tenure Squared	-.00030 (.00033)	-.00044 (.0043)	-.00046 (.00043)
Midwest	.066 (.081)	.51 (.54)	.51 (.54)
South	.18 (.18)	.25 (.57)	.22 (.57)
West	.10 (.12)	.32 (.56)	.32 (.56)
Wife Full-time Work Experience	—	—	.0056 (.0043)
Constant	-.72 (2.51)	1.91 (.67)	1.88 (.68)
N	266	266	266
R^2	0.20	0.10 (within)	.11 (within)

*Significant at 5% level
**Significant at 1% level