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Abstract: The goal of the 1996 Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) was to end the dependency of needy parents on government benefits, in part by promoting marriage; the pre-reform welfare system was widely believed to discourage marriage because it primarily provided benefits to single mothers. However, welfare reform may have actually decreased the incentives to be married by giving women greater financial independence via the program's new emphasis on work. This paper uses Vital Statistics data on marriages and divorces during 1989–2000 to examine the role of welfare reform and other state-level variables on marriage and divorce rates. The results indicate that implementation of TANF is negatively associated with marriage and divorce rates, as are pre-TANF waivers from the AFDC program in some specifications.

JEL classification: I3, J1

Key words: welfare reform, marriage, divorce

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The Impact of Welfare Reform on Marriage and Divorce

The U.S. welfare system underwent dramatic change during the 1990s, beginning with various state-implemented experimental programs and culminating in passage of the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) in 1996. A primary goal of PRWORA was to end the dependency of needy parents on government benefits by promoting marriage as well as by encouraging job preparation and work.¹ Although there is a burgeoning literature on the effect of welfare reform on welfare caseloads, women's labor force outcomes and children's well being (e.g., Bell 2001; Schoeni and Blank 2000), few studies have examined whether welfare reform has affected transitions into and out of marriage. The effect of the welfare system on marital transitions has considerable policy implications given the recent plan by the Bush administration to use federal funds to promote marriage as an alternative to public assistance.

Prior to the 1990s reforms, the welfare system was widely regarded as providing disincentives to marriage because it primarily allocated benefits to single women with children. Some studies have concluded that more generous welfare programs were associated with higher rates of female household headship and nonmarital fertility and lower rates of marriage (e.g., Hoynes 1997; Moffitt 1992; Moffitt 1998; and the references therein).² Welfare generosity appears to be positively associated with divorce, although empirical findings tend to be weaker than for other outcomes related to family structure (e.g., Ellwood and Bane 1985; Hoffman and

¹ The full text of PRWORA can be found by searching on "H.R. 3734" in the 104th Congress at <http://thomas.loc.gov/home/c104query.html>. Other stated goals of PRWORA include reducing the incidence of nonmarital pregnancies and encouraging the formation and maintenance of two-parent families.

² However, the estimated effects of welfare tend to be sensitive to the inclusion of state and individual fixed effects, which generally result in lower significance levels (Hoynes 1997; Moffitt 1994). Earlier studies tended to not find any significant effects whereas more recent studies tend to find significant effects on marriage and fertility (Moffitt, 1998).

Duncan 1995). The estimated effects generally appear to be relatively small in magnitude and cannot explain the secular decline in U.S. marriage rates and rise in divorce rates since the 1960s, a period during which average real welfare benefits declined.

Welfare reform was designed to encourage marriage and the formation of two-parent families as well as promote work and job training. The reforms, which recast Aid to Families with Dependent Children (AFDC) as Temporary Assistance for Needy Families (TANF), gave states extreme flexibility in determining eligibility rules as well as benefit levels. Many states opted to extend eligibility to considerably more two-parent families than were previously eligible for benefits.³ Although few provisions of PRWORA were directly aimed at encouraging marriage, the imposition of time limits and other restrictions were implicitly designed to promote marriage (Moffitt, 2002a). However, as Moffitt (2002b) notes, extending welfare to two-parent families may not necessarily encourage marriage because some women will meet the TANF income eligibility requirements if they are single but not if they are married to a spouse with earned income, reducing their incentive to marry. In addition, welfare reform also may have indirectly reduced the incentives for marriage if the increased emphasis on work leads to greater financial independence for women, thereby reducing the need or desire to be married.

Research to date on the effect of welfare reform on marital status has not reached a consensus.⁴ The literature has primarily relied on data from the Current Population Survey

³ Prior to reform, two-parent families had primarily been eligible under AFDC-UP (AFDC Unemployed Parents) program. This program allowed two-parent families to receive AFDC benefits if the primary earner was working less than 100 hours per month and met the program's work history requirement in addition to the family meeting the other AFDC program rules. Welfare reform gave states more flexibility in extending benefits to two-parent families than under the AFDC-UP program. Concomitant expansions in the Earned Income Tax Credit (EITC), the child tax credit, and the State Child Health Insurance Program (SCHIP) also expanded the eligibility of low-income families for federally funded transfer programs during the 1990s.

⁴ In a related literature on the effect of welfare reform on female household headship, Fitzgerald and Ribar (2001) find weak evidence in the Survey of Income and Program Participation that pre-1996 waivers reduced female headship. Schoeni and Blank (2000) similarly find that waivers are negatively associated with female headship among high school dropouts in CPS data.

(CPS). Bitler, Gelbach and Hoynes (2002) find that welfare reform led to a moderate reduction in the fraction of women currently married and an increase in the fraction who are divorced, separated or widowed, with some differences by race and ethnicity. Schoeni and Blank (2000) do not find a significant effect of TANF on women's marriage rates but do report a positive effect of waivers-state experimental programs implemented prior to PRWORA-on marriage rates among female high school dropouts. Kaestner and Kaushal (2001), in contrast, conclude that both TANF and waivers had negligible effects on the fraction of non-college-graduate females who are married. Ellwood's (2000) results suggest that the fraction of low-income mothers who are married declined slightly more between 1986 and 1999 in states with the most aggressive welfare reform policies than in states with the least aggressive policies but are not conclusive.

This paper examines the effect of welfare reform on marriage and divorce rates using Vital Statistics data from 1989 through 2000. As discussed below, Vital Statistics data offer several advantages over the CPS data used in previous studies, including that they are a near complete universe of marriages and divorces and the data measure flows into and out of marriage instead of stocks of the number of people in various marital status categories. Because the analysis extends through 2000, we examine the effect of federal welfare reform after PRWORA as well as the effect of state waivers prior to PRWORA. We also estimate the relationship between marriage creation and destruction and welfare benefit levels, AFDC-UP programs, and Medicaid eligibility thresholds. The results indicate that welfare reform is associated with lower marriage rates and lower divorce rates, suggesting that welfare reform as enacted thus far has not promoted marriage but also has not led to increased dissolution of marriages.

THEORETICAL FRAMEWORK

As first formalized by Becker, economic models of marriage and divorce posit that individuals get married when the benefits less costs (utility) of being married are higher than the net benefits of remaining single, and analogously for divorce. In a typical utility model of marriage, an individual's utility from being single depends on that individual's earned income if single, other income if single, and individual characteristics, such as education and race. An individual's utility from being married depends on the individual's earned income if married, the spouse's income, other income if married, and individual characteristics. An individual then chooses the utility maximizing state, marriage or being single.

The utility-maximizing model does not clearly predict the effect of own income on marital status because higher own earned income raises utility in both the married state and the single state. As discussed by Fitzgerald and Ribar (2001), if income is shared among spouses, earning a higher income may make being single more attractive and discourage marriage, or there is an "independence effect." However, increased income can also have a "stabilizing effect" on unions, thereby encouraging marriage and discouraging divorce, so the net effect of higher own income is ambiguous. An increase in a potential spouse's income, in contrast, unambiguously increases the utility of being married relative to being single.

Studies typically find that better labor market opportunities for women are negatively associated with marriage rates—suggesting that the independence effect dominates for women—while better labor market opportunities for men are positively associated with marriage rates (Blau, Khan, and Waldfogel 2000; Schultz 1994). Divorce rates are typically negatively associated with men's labor market opportunities, such as the unemployment rate and average

earnings, but are either positively or not correlated with women's labor market opportunities (e.g., Hoffman and Duncan 1995).

The structure of welfare programs affects an individual's marriage and divorce incentives if program rules result in different benefits for married and single individuals. Because AFDC benefits were primarily available to single women with dependent children, the AFDC program decreased the gains from marriage and increased the gains from divorce. As discussed above, studies typically conclude that states with more generous cash benefits have lower marriage rates and higher divorce rates than other states. The presence of an AFDC-UP program, which made two-parent families eligible for AFDC benefits under certain circumstances, could theoretically reduce or even cancel out the effects of the traditional AFDC program on marriage and divorce, suggesting that states with AFDC-UP programs should have higher marriage rates and lower divorce rates than other states. However, previous research suggests that the presence of an AFDC-UP program does not significantly influence marriage rates (Schultz 1994; Winkler 1995).

Welfare reform could have both direct and indirect effects on marriage. Changes in program rules that expanded eligibility for two-parent families should increase the benefits to being married without affecting the benefits of being single. This would lead to an increase in marriage and a decrease in divorce. The predicted effect of other changes is less clear. Welfare reforms, in the form of either pre-TANF waivers or TANF, can be classified as "welfare tightening" or "welfare loosening." Welfare tightening reforms make welfare less generous by, for example, increasing work requirements and imposing time limits. Welfare loosening reforms make welfare more generous by raising earnings disregards and assets tests and providing more

funds for childcare. Overall, the reforms are usually characterized as welfare tightening and pro-work.

The work incentives created by welfare reform have ambiguous effects on marriage and divorce. As discussed above, improved labor force outcomes for women as a result of welfare reform could either increase or decrease the utility of being single relative to being married. An increase in women's earned income could lead to lower marriage rates and higher divorce rates if the independence effect dominates or to higher marriage rates and lower divorce rates if the stabilizing effect dominates. The effect of raising earnings disregards and asset limits is also theoretically ambiguous, but the net effect may be pro-marriage since the pre-reform earnings disregards and asset limits are more likely to have been binding for couples than for single women. Providing more funds for childcare could discourage marriage by reducing women's reliance on a spouse to share childcare responsibilities or could encourage marriage via a pro-natal effect. Thus, the net effects of welfare reform on marriage and divorce are an empirical question.

DATA AND METHODS

Previous studies examining the relationship between welfare and marriage patterns have used either individual- or state-level data to examine the determinants that an individual is never married, single or divorced or the determinants of state-level marriage and divorce rates, pooling data across states and years. This analysis follows the state-level approach of regressing marriage and divorce rates on measures of welfare reform, other social assistance programs, economic and demographic factors, and other controls, or

$$y_{st} = W_{st}\beta + P_{st}\delta + E_{st}\phi + D_{st}\phi + \gamma_s + v_t + \varepsilon_{st},$$

where y_{st} denotes the log of the marriage or divorce rate per 1000 women aged 15 and older in state s and year t . The time period examined is 1989-2000.⁵ Vital Statistics data on the number of marriages are available for all 50 states and the District of Columbia during this period, a total of 612 observations, but data on the number of divorces are only available for 572 observations.⁶

We use Vital Statistics data on marriages and divorces for several reasons. Previous studies that examine the effect of welfare reform use data from the Current Population Survey (CPS), which underreports both marriages and divorces (Goldstein 1999). An advantage of Vital Statistics data is that they are a near universe of marriages and divorces. As noted by Thornton and Rodgers (1987), survey data like the CPS contain more measurement error than Vital Statistics registration data because survey respondents may report inaccurate or incomplete information about household members' marital histories. Vital Statistics data are useful for examining flows into and out of marriage, which welfare reform may affect more rapidly than it affects stock measures such as the share of women who have never been married. CPS data are more useful than Vital Statistics data for examining the proportion of women who are married at a given point in time but less so for examining new marriages or divorces.⁷

⁵ We chose this period because it starts immediately prior to the onset of the 1990-1991 recession and ends immediately prior to the onset of the 2001 recession. In addition, AFDC waivers were first implemented during the early 1990s. The results for the welfare reforms variables are qualitatively similar if the time period is extended back to 1981.

⁶ Divorce data are not available for California, Indiana, and Louisiana in 1991-2000; Colorado in 1994-2000; and Nevada in 1991-1993. The marriage results are not sensitive to excluding observations from states for which any divorce data are missing.

⁷ The June supplements to the CPS in some years report the date of first marriage, so the CPS can be used to look at transitions into first marriages. In addition, CPS waves can be matched to look at marital transitions over time, but people who move do not remain in the survey, so the sample would likely disproportionately include individuals who do not experience marital transitions. The National Survey of Family Growth (NSFG) has nearly complete marital histories, but women's state of residence is not publicly available and the sample sizes are small. In addition, the most recent NSFG was in 1995, before implementation of TANF. The Survey of Income and Program Participation offers larger sample sizes than the NSFG but has more limited information on marital histories. One advantage of individual-level data is the ability to look at effects across different race and education groups as well as remarriages versus first marriages. The national Vital Statistics data do not allow such levels of disaggregation during the TANF period.

The vector W_{st} includes two measures of welfare reform: a dummy variable indicating whether a state has a major waiver in place prior to TANF (*Waiver*) and a dummy variable indicating whether a state has implemented TANF (*TANF*).⁸ The coefficients for the welfare reform variables give the estimated effect of each particular welfare reform relative to the traditional AFDC program. In other words, the coefficient of the TANF variable gives the estimated average effect of TANF relative to the AFDC program without waivers, and the waiver coefficient gives the estimated average effect of waivers from AFDC relative to AFDC without waivers.⁹ For the first year that a given welfare reform policy is in effect, the variable is equal to the fraction of the year after the policy was implemented. (Data sources and details are in the Data Appendix.)

P_{st} includes three variables measuring other aspects of public assistance programs: the value of cash benefits, the availability of AFDC-UP, and the eligibility threshold for Medicaid, the health insurance program for low-income individuals. The value of cash benefits is measured by the real maximum AFDC/TANF payment to a family of four with one adult in a given state and year. The AFDC-UP measure is a dummy variable indicating whether a state has an AFDC-UP program.¹⁰ The regressions also include a variable measuring the income

⁸ We experimented with using two separate TANF variables, one for states that ever implemented an AFDC waiver and one for other states, instead of one combined TANF variable. Theoretically, implementation of TANF may have resulted in fewer changes in welfare policies during the TANF period in states that had waivers from the AFDC programs than in states without waivers, or many individuals might have adjusted their marital status when waivers were implemented, either of which would lead to a smaller magnitude for the TANF coefficient for waiver states than for non-waiver states. Alternatively, states with AFDC waivers might implement more extensive reforms under TANF than states without waivers, leading to larger effects in the waiver states during the TANF period. The estimated coefficients of the two TANF variables were not significantly different in any of the specifications, however, so we report results for the combined variable.

⁹ The waiver variable is set equal to zero after a state with an AFDC waiver implements TANF.

¹⁰ States were required to have an AFDC-UP program by October 1990; the dummy variable remains equal to one after a state implements TANF.

eligibility threshold of pregnant women for Medicaid benefits as a fraction of the federal poverty level because Medicaid eligibility is positively associated with marriage rates (Yelowitz 1998).

The vector E_{st} includes several controls for local labor market conditions. The regressions include the overall unemployment rate and its lag, adult women's labor force participation rate, the growth rate of non-farm private employment and its lag, the poverty rate, and real median family income. All of these variables are annual averages.

D_{st} includes several additional variables to capture demographic and other factors that influence state-level marriage and divorce rates. The regressions include variables measuring the fraction of the population that is black and that is Hispanic to control for differences in marriage and divorce patterns across racial and ethnic groups (e.g., Bennett, Bloom, and Craig 1989). The regressions also control for the fraction of the state population living in metropolitan areas because urban residence tends to be negatively associated with women's marriage rates (Moffitt 1990). We include a dummy variable indicating whether a state has a "covenant marriage" option.¹¹ As discussed below, we also experimented with a variety of additional controls, none of which influenced the results.

The regressions also include state and year fixed effects, and some specifications add state-specific linear time trends. The state fixed effects γ_s control for time-invariant differences across states, and the year fixed effects ν_t control for changes in marriage and divorce rates in a given year that are common to all states. The time trends control for unobservable factors that change linearly over time within states and affect marriage and divorce rates; we show results with and without time trends because the trends absorb much of the variation in the dependent

¹¹ Whether a state allows unilateral divorce is also likely to affect marriage and (particularly) divorce rates, but we do not include this as a covariate because it does not vary over time within any state during 1989-2000.

variables. Unobservable factors that affect marriage and divorce rates are captured by ε_{st} , and the covariance matrix estimates are White/Huber corrected, which allows for arbitrary heteroscedasticity. Observations are weighted by the population of women aged 15 and older in each state/year. Table 1 presents summary statistics for the variables used in the analysis.

The analysis focuses on the relationship between marriage and divorce rates and the two welfare reform variables. The regression coefficients for the welfare reform variables implicitly measure the effect of the welfare reform in place in a state during a given year relative to the AFDC program in place in that state prior to implementation of an AFDC waiver and/or TANF. In other words, the estimated coefficients on the welfare reform variables measure the effect of waivers and TANF relative to the effect of AFDC within a given state, averaged across states. This identification method requires that not all states implement waivers or TANF at the same time. In our coding, two states first implemented major waivers from the AFDC program in 1992, and by 1997 29 states had a major waiver. Nineteen states implemented TANF in 1996 and one in 1998, with the remainder implementing TANF in 1997.¹²

Table 2 reports mean marriage and divorce rates for states, classified by welfare reform regime. The means suggest that marriage rates were lower in state/years with waivers from the AFDC program than in state/years participating in the AFDC program. The average marriage rate is slightly lower after TANF was implemented than it was during the AFDC program without waivers. The average divorce rate is also slightly lower in state/years with waivers from the AFDC program and in state/years after implementation of TANF than the average across states during the AFDC program without waivers. Of course, these differences may be due to many factors other than welfare reform. Differences in states' demographic composition,

¹² Table 1 in Bitler, Gelbach, and Hoynes (2002) lists the year when states first implemented waivers and/or TANF (as of March), and Table 2 describes some of the characteristics of the waivers and TANF programs in states.

economic conditions, or other forms of state heterogeneity could underlie the differences in the means. In addition, time trends in marriages and divorces unrelated to welfare reform could skew the interpretation of the means in Table 2 since waivers were implemented during the middle of the sample period and TANF toward the end. We therefore turn to multivariate analysis to examine the effect of welfare reform on marriage and divorce rates.

RESULTS

Because of concerns about multicollinearity and endogeneity among some of the variables described above, we present several sets of results. The first column in each table shows results when only the two welfare reform measures are included in the regressions (in addition to state and year fixed effects and, in some specifications, linear state time trends). The second column adds the other measures of public assistance generosity, the third adds the state-level controls for economic conditions, and the fourth adds the demographic and other controls. We first discuss the results for marriage rates and then for divorce rates.

Waivers from the AFDC program and implementation of the TANF program are generally negatively associated with marriage rates. Although the waiver coefficients are not statistically significant in every specification presented in Tables 3 and 4, all of the TANF coefficients are statistically significant at the 1 percent level. Waivers from the AFDC program are associated with a decline in marriage rates of about 4-6 percent, and implementation of TANF is associated with a 17-21 percent decline relative to marriage rates during the AFDC program.

Some of the non-welfare reform measures of public assistance are associated with marriage rates as well. In the results without time trends (Table 3), the real level of cash benefits

is generally positively associated with marriage rates, counter to the predicted effect. In the regressions with linear state trends, in contrast, cash benefits are negatively (but insignificantly) associated with marriage rates in some specifications. The presence of an AFDC-UP program is positively (albeit not always statistically significantly) associated with marriage rates, as expected. The estimated coefficients of the variable measuring the threshold for Medicaid eligibility are negative in all specifications but not significant.

None of the other economic or demographic variables included in the regressions are significantly associated with marriage rates. Our failure to find an association between economic conditions and marriage rates may be surprising given that previous studies suggest that marriage rates are related to macroeconomic conditions. However, the state and year fixed effects—which were not included in many previous studies—absorb much of the effect of the business cycle and time-invariant differences across states. If the state fixed effects are not included, the contemporaneous and lagged employment growth rates, the contemporaneous unemployment rate, and the female labor force participation rate are positively associated with the marriage rate, and real median income is negatively associated with the marriage rate. Demographics also apparently do not change enough within states over time during 1989-2000 to influence marriage rates.

Welfare reform is also associated with lower divorce rates. AFDC waivers and implementation of TANF are generally significantly negatively associated with divorce rates, as Tables 5 and 6 indicate. As in the marriage rate results, the effect of TANF appears to be larger in magnitude than the effect of waivers. TANF is associated with an average decline in divorce rates of about 8-15 percent while waivers are associated with a 4-6 percent average reduction in divorce rates. In addition, the magnitudes of the estimated effects of TANF on divorce rates are

smaller than the effects of TANF on marriage rates (although none of the differences appear to be statistically significant).

The specification with trends indicates that states with an AFDC-UP program have higher divorce rates even though AFDC-UP was intended to encourage the formation and preservation of two-parent families (Table 6). Cash welfare benefit maximums and the eligibility threshold for Medicaid are not significantly associated with divorce rates in any of the specifications.

The results indicate that states with a covenant marriage option have lower divorce rates in both specifications. Because the regressions include state fixed effects and the result is robust to including state trends, the results suggest that adoption of a covenant marriage law may affect divorce rates instead of merely reflecting pre-existing lower propensities for divorce in states that pass covenant marriage laws. A higher Hispanic population share is negatively associated with divorce rates when trends are not included (Table 5), and the employment growth rate is positively associated with divorce rates in all specifications that include that variable.

Robustness of Results

We tried including a wide variety of additional control variables to verify the robustness of our findings.¹³ In results not shown here, including separate controls for male and female unemployment rates does not qualitatively impact the estimated coefficients of the welfare reform variables in any of the regressions. The male and female unemployment rates are not significantly associated with marriage or divorce rates. Including the male labor force participation rate or the male employment-to-population rate also does not affect the results for

¹³ All results discussed in the paper but not shown in tables are available from the first author on request.

the welfare reform variables, although the male employment rate is negatively associated with the marriage rate in some specifications.

We also included the incarceration rate in the regressions to further control for the number of available male marriage partners. The results for the welfare reform variables are similar to those shown in the tables, and the incarceration rate is not significantly associated with the marriage rate or the divorce rate. Including a variable measuring the fraction of births that are to unmarried women, which may affect marriage rates if having a nonmarital birth influences the likelihood that women will soon marry, does not appreciably affect the magnitudes of the estimated coefficients of the welfare reform variables.¹⁴ The nonmarital birth ratio variable is not significantly associated with the marriage rate.

We also included a variable measuring the sex ratio, which is generally believed to affect marriage and divorce rates (South and Lloyd 1992). The results are similar to those shown in the tables. The sex ratio, measured here as the ratio of men aged 15 and older to women aged 15 and older, is not significantly associated with marriage or divorce rates; it is positively associated with both marriage and divorce rates if, as in most previous studies, state and year fixed effects (and trends) are not included in the regressions.¹⁵ The marriage rate results shown in Table 3 are also generally robust to not including the 40 observations from states for which divorce data were missing in any year during the sample period; the significance of the estimated coefficient of the waiver variable tends to increase in the specification with trends when the observations without divorce data are excluded.

¹⁴ Because the percent of births to unmarried women variable is likely to be endogenous with respect to marriage or divorce decisions and also may be affected by welfare reform, we do not include it in the main set of covariates.

¹⁵ The difference between our results for the sex ratio and those in most previous studies also may be due to the level of aggregation. We use state-level data that combines all racial and ethnic groups whereas many other studies use data at the local area level stratified by race and ethnicity. Brien (1997) notes that the effect of marriage markets is sensitive to the level of aggregation.

The results are somewhat sensitive to the use of weights. In all of the results discussed this far, observations are weighted by the population of women aged 15 and older in a given state and year. We weight the data in this manner in order to approximately reflect the number of marriages and divorces occurring at the national level. If the data are not weighted, the magnitude of the estimated coefficients of the welfare reform variables declines in the marriage rate models; the waiver variable suggests a decline of about 2-3 percent and the TANF variable about 10 percent (both are significant at the 5 percent level). In the divorce rate models, the magnitudes of the welfare reform variables decline and the TANF variable is no longer significant at the 5 percent level. Finally, the welfare reform results are robust to excluding observations from Nevada, which has a marriage rate of about 10 times the national average and a divorce rate of about twice the national average because of nonresidents getting married or divorced in Nevada.

DISCUSSION

Understanding the effect of welfare reform on marital transitions is important for several reasons. Along with increased earnings, marriage was a primary route off of AFDC for women with children (Fitzgerald 1991), so any policy changes that discourage transitions into marriage could lead to increased dependency on welfare. This would be particularly troubling since welfare reform as implemented involves time caps. Marital disruption is the single largest cause of the beginning of a spell of AFDC receipt (Bane and Ellwood 1983), and women experience a sizable decline in economic status after divorce (Hoffman and Duncan 1988; Smock 1993). The effect of welfare reform on transitions out of marriage therefore also has considerable implications for women and their children. Moreover, one of the major goals of reform was

raising marriage rates and lowering nonmarital birth rates, making an evaluation of the effects of reform on marriage and divorce of considerable interest to policymakers.

The results indicate that marriage and divorce rates are generally negatively associated with AFDC waivers and with implementation of TANF and are robust to a variety of specification checks. We do not find that welfare reform is "pro-marriage," on balance, but neither does it appear to encourage divorce. Our finding that welfare reform is associated with both lower marriage and divorce rates is somewhat of a paradox. A Becker-style model of utility maximization does not give unambiguous predictions for the effect of welfare reform on marital transitions, but it is unlikely to predict that changes in welfare policies would have the same effect on the likelihood of getting married as on the likelihood of getting divorced.

There are several possible explanations for our findings. Changes in welfare programs may have different effects on single persons than on married persons, perhaps because single people have different preferences than married people. If welfare reform encouraged or required more work, single women may be less likely to get married because they have higher earnings, or the independence effect dominates for these women. For married women, welfare reform may mean that they would have to work more hours if they divorced than under AFDC program rules, discouraging divorce. Using individual-level data on work histories pre- and post-welfare reform to investigate the joint effects of welfare reform on marriage and work while controlling for individual heterogeneity is therefore an area for future research. In addition, welfare reform may have introduced considerable uncertainty about the future and made people less likely to change their current marital status, consistent with our finding of a reduction in transitions into and out of marriage.

Another potential explanation for our findings is that welfare reform has discouraged divorce among married individuals but has had a much smaller effect among never married individuals. If the number of divorces has declined as a result of welfare reform, the number of remarriages would be expected to fall as well; most divorced individuals remarry, and average time until remarriage is only about three years (Kreider and Fields 2002). Our finding of a slightly larger effect of TANF on marriage than on divorce is consistent with a large effect on divorces and remarriages but a small effect among the never married, as found by Bitler, Gelbach and Hoynes (2002). Data stratified by the number of previous marriages would allow for examining this possibility, but national Vital Statistics data on remarriages versus first marriages are not available for the post-TANF period.

This analysis uses data through 2000, four years after passage of PRWORA. However, the long run effects of welfare reform on marriages and divorces may not yet be evident in our data, particularly for divorces. If welfare reform lowered the likelihood of getting married but did not affect the fraction of marriages that end in divorce, then the long run effects of welfare reform on marriage rates and divorce rates should be in the same direction and of similar magnitude. Our results suggest that TANF had slightly larger negative effects on marriage rates than on divorce rates; this is consistent with the expected short run effects if couples take longer to transition from marriage to divorce than to transition from dating to marriage. The long run impact of welfare reform on marriage and divorce should be revisited as more data become available. In the meantime, investigating the effect of welfare reform on separations may indicate the likely long run impact on divorce rates.

This paper does not report results for detailed aspects of waivers and TANF implementation within states. The major areas in which state welfare policies and rules vary in

the post-AFDC era include: the level of earnings disregards; whether time limits result in termination or reduction of benefits; whether minor parents who receive TANF benefits are required to reside with adults; whether there is a family cap that prevents benefits from rising when a new child is born; and whether a state loosened the 100-hour rule or other rules governing eligibility for the AFDC-UP program. In results not shown here, we included interactions of the waiver and TANF variables with variables indicating these five specific reforms. Neither the marriage nor the divorce regression results indicated any clear pattern in the coefficients for the specific reform variables. We suspect that difficulties in accurately coding the specific state reforms underlie our failure to find any clear effects. Bell (2001) reports that studies have had difficulty convincingly linking changes in welfare caseloads to specific reforms, similar to our findings here. Future research should further examine the effects of such policies and other specific reforms, such as child care subsidies and changes to asset limits.

DATA APPENDIX

Number of marriages and divorces: National Center for Health Statistics, *Vital Statistics of the United States* and *Monthly Vital Statistics Report*, various years.

AFDC waivers and TANF implementation: The primary source for the dating of state reforms is the tables on the website of the Assistance Secretary for Planning and Evaluation (ASPE) for the Department of Health and Human Services, http://aspe.hhs.gov/hsp/Waiver-Policies99/policy_CEA.htm. A state is coded as having an AFDC waiver if it has a "major" waiver, or that there was a significant deviation from the state's AFDC program and the waiver was in place statewide. More details on the coding of the welfare reform variables are provided in Bitler, Gelbach, and Hoynes (2002) and are available on request.

AFDC-UP program and maximum AFDC/TANF welfare benefits for a 4-person family with 1 adult: Robert Moffitt's web site, www.econ.jhu.edu/People/Moffitt/DataSets.html. Benefits deflated using the personal consumption expenditures deflator (1997=100).

Medicaid income eligibility threshold for pregnant women as percentage of federal poverty level: National Governors' Association, "State Medicaid coverage of pregnant women and children," *MCH Update*, various years, and Yelowitz (1995).

Population, by age, sex, race and ethnicity: Bureau of the Census website, <http://eire.census.gov/popest/estimates.php>.

Percentage of population living in metropolitan areas: Bureau of the Census, *Statistical Abstract*, various years. Data for 1989, 1991, 1995, and 1999 were linearly interpolated.

Poverty rate: Bureau of the Census website, <http://www.census.gov/hhes/poverty/histpov/hstpov21.html>.

Average annual unemployment rates: Bureau of Labor Statistics, *Employment and Earnings* and *Geographic Profile of Employment and Unemployment*, various years.

Percentage change in non-farm private employment: Bureau of Economic Analysis, *Survey of Current Business*, various years.

Women's labor force participation rate: Bureau of Labor Statistics, *Geographic Profile of Employment and Unemployment*, various years.

Real median income for a family of 4: Bureau of the Census website, <http://www.census.gov/hhes/income/4person.html>. Deflated using the personal consumption expenditures deflator (1997=100).

Covenant marriage: Coding based Americans for Divorce Reform website, <http://www.divorcereform.org/cov.html>.

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Table 1. Sample Means

Variable	Mean	SD	Max	Min
Marriage rate per 1000 women aged 15 and older	0.022	0.016	0.259	0.008
Divorce rate per 1000 women aged 15 and older	0.011	0.003	0.028	0.004
Share of year major AFDC waiver in effect	0.129	0.316	1.000	0.000
Share of year TANF in effect	0.322	0.456	1.000	0.000
Real max. AFDC/TANF benefits, family of 4 (\$1000)	6.034	2.358	14.088	1.710
State has AFDC-UP program	0.940	0.238	1.000	0.000
Medicaid eligibility threshold as share of poverty level	1.654	0.480	4.000	0.000
Overall unemployment rate	0.056	0.015	0.114	0.022
Female labor force participation rate	0.588	0.039	0.703	0.430
Employment growth rate	0.019	0.015	0.090	-0.051
Share of population under the poverty level	0.134	0.034	0.264	0.029
Real median income, family of 4 (\$1000)	52.595	6.916	78.410	35.419
State has covenant marriage option	0.009	0.094	1.000	0.000
Share of population living in metro areas	0.794	0.161	1.000	0.202
Share of population that is black	0.126	0.081	0.666	0.003
Share of population that is Hispanic	0.101	0.103	0.421	0.005

Note: Observations are weighted by the state/year population of women aged 15 and older. Data are at the state level for 1989-2000, except divorce data are missing for some state/year combinations during the 1990s. Dollar amounts in 1997 \$. The number of observations is 612 except for the divorce rate, which is 572 observations.

Table 2. Marriage and Divorce Rates, by State Welfare Reform Status

Variable	AFDC	Waiver	TANF
Marriage rate	0.0230 (0.0010) [333]	0.0193 (0.0004) [83]	0.0214 (0.0012) [196]
Divorce rate	0.0112 (0.0002) [315]	0.0101 (0.0003) [75]	0.0103 (0.0002) [182]

Note: Shown are average marriage and divorce rates, with standard errors in parentheses and number of observations in brackets, by welfare reform regime. Column 1 is state/year combinations with no welfare reform; column 2 is state/year combinations with a major AFDC waiver; column 3 is state/year combinations for TANF. Observations are weighted by the female population aged 15 and older in the state/year.

Table 3. Determinants of Marriage Rates, without State Time Trends

Variable	(1)	(2)	(3)	(4)
Share of year major AFDC waiver in effect	-0.059*	-0.052*	-0.047†	-0.047†
	(0.025)	(0.026)	(0.028)	(0.028)
Share of year TANF in effect	-0.197**	-0.210**	-0.192**	-0.196**
	(0.058)	(0.058)	(0.050)	(0.051)
Log of real max. AFDC/TANF benefits, family of 4		0.185†	0.230*	0.216*
		(0.100)	(0.098)	(0.104)
AFDC-UP program		0.031	0.046	0.056
		(0.023)	(0.032)	(0.038)
Medicaid eligibility threshold		-0.014	-0.018	-0.014
		(0.023)	(0.027)	(0.029)
Overall unemployment rate			0.653	0.793
			(0.980)	(0.973)
Female labor force participation rate			0.832†	0.575
			(0.486)	(0.417)
Employment growth rate			0.424	0.536
			(0.577)	(0.576)
Share of population under the poverty level			0.358	0.434
			(0.290)	(0.296)
Log of real median income, family of 4			-0.146	-0.188
			(0.242)	(0.266)
Covenant marriage state				0.068
				(0.043)
Share of population living in metro areas				-0.272
				(0.551)
Share of population that is black				-3.197
				(2.024)
Share of population that is Hispanic				-1.402
				(0.950)
Adjusted R ²	0.877	0.878	0.881	0.882
N	612	612	612	612

Note: Shown are coefficients from regressions of the determinants of marriage rates during 1989-2000. The dependent variable is the natural log of the marriage rate. The regressions for columns 3 and 4 also include one lag of the unemployment rate and employment growth rate variables. All regressions include state and year fixed effects. Robust standard errors (adjusted for clustering by state/year) in parentheses. Observations are weighted by the female population aged 15 and older in the state/year.

† p<0.10; * p<0.05; ** p<0.01

Table 4. Determinants of Marriage Rates, with State Time Trends

Variable	(1)	(2)	(3)	(4)
Share of year major AFDC waiver in effect	-0.048*	-0.044*	-0.044†	-0.047†
	(0.020)	(0.022)	(0.024)	(0.024)
Share of year TANF in effect	-0.176**	-0.166**	-0.168**	-0.174**
	(0.040)	(0.040)	(0.041)	(0.043)
Log of real max. AFDC/TANF benefits, family of 4		0.007	-0.017	-0.046
		(0.104)	(0.100)	(0.102)
AFDC-UP program		0.103*	0.097†	0.096†
		(0.043)	(0.050)	(0.051)
Medicaid eligibility threshold		-0.040	-0.041	-0.039
		(0.041)	(0.040)	(0.041)
Overall unemployment rate			-0.064	0.056
			(1.020)	(1.062)
Female labor force participation rate			-0.303	-0.264
			(0.394)	(0.393)
Employment growth rate			0.076	0.144
			(0.547)	(0.560)
Share of population under the poverty level			-0.244	-0.192
			(0.278)	(0.267)
Log of real median income, family of 4			0.051	0.022
			(0.202)	(0.202)
Covenant marriage state				0.002
				(0.055)
Share of population living in metro areas				-0.649
				(0.509)
Share of population that is black				-1.635
				(3.733)
Share of population that is Hispanic				-2.355
				(1.495)
Adjusted R ²	0.905	0.908	0.908	0.907
N	612	612	612	612

Note: Shown are coefficients from regressions of the determinants of marriage rates during 1989-2000. The dependent variable is the natural log of the marriage rate. The regressions for columns 3 and 4 also include one lag of the unemployment rate and employment growth rate variables. All regressions include state and year fixed effects and linear state time trends. Robust standard errors (adjusted for clustering by state/year) in parentheses.

Observations are weighted by the female population aged 15 and older in the state/year.

† p<0.10; * p<0.05; ** p<0.01

Table 5. Determinants of Divorce Rates, without State Time Trends

Variable	(1)	(2)	(3)	(4)
Share of year major AFDC waiver in effect	-0.050** (0.017)	-0.052** (0.017)	-0.061** (0.016)	-0.060** (0.016)
Share of year TANF in effect	-0.124* (0.054)	-0.126* (0.055)	-0.144** (0.048)	-0.154** (0.052)
Log of real max. AFDC/TANF benefits, family of 4		-0.074 (0.118)	0.032 (0.122)	-0.025 (0.115)
AFDC-UP program		-0.007 (0.021)	-0.021 (0.024)	0.011 (0.019)
Medicaid eligibility threshold		-0.014 (0.012)	-0.010 (0.013)	0.000 (0.010)
Overall unemployment rate			-0.671 (0.875)	-0.369 (0.831)
Female labor force participation rate			0.531 (0.414)	-0.187 (0.380)
Employment growth rate			1.834** (0.621)	1.819** (0.555)
Share of population under the poverty level			0.079 (0.292)	0.180 (0.263)
Log of real median income, family of 4			0.166 (0.202)	-0.013 (0.193)
Covenant marriage state				-0.083* (0.040)
Share of population living in metro areas				-0.194 (0.260)
Share of population that is black				-1.169 (1.444)
Share of population that is Hispanic				-5.086** (0.832)
Adjusted R ²	0.916	0.916	0.919	0.929
N	572	572	572	572

Note: Shown are coefficients from regressions of the determinants of divorce rates during 1989-2000; divorce data are not available for some state/years during the 1990s. The dependent variable is the natural log of the divorce rate. The regressions for columns 3 and 4 also include one lag of the unemployment rate and employment growth rate variables. All regressions include state and year fixed effects. Robust standard errors (adjusted for clustering by state/year) in parentheses. Observations are weighted by the female population aged 15 and older in the state/year. † p<0.10; * p<0.05; ** p<0.01

Table 6. Determinants of Divorce Rates, with State Time Trends

Variable	(1)	(2)	(3)	(4)
Share of year major AFDC waiver in effect	-0.045** (0.016)	-0.042** (0.016)	-0.052** (0.016)	-0.055** (0.016)
Share of year TANF in effect	-0.084 (0.059)	-0.084 (0.059)	-0.108* (0.055)	-0.123* (0.061)
Log of real max. AFDC/TANF benefits, family of 4		-0.142 (0.120)	-0.131 (0.123)	-0.166 (0.122)
AFDC-UP program		0.090** (0.020)	0.049** (0.018)	0.045* (0.018)
Medicaid eligibility threshold			0.009 (0.020)	0.015 (0.019)
Overall unemployment rate			-0.320 (0.802)	-0.124 (0.859)
Female labor force participation rate			-0.067 (0.391)	-0.023 (0.361)
Employment growth rate			1.596** (0.461)	1.418** (0.498)
Share of population under the poverty level			0.127 (0.292)	0.122 (0.280)
Log of real median income, family of 4			0.122 (0.180)	0.093 (0.168)
Covenant marriage state				-0.141* (0.064)
Share of population living in metro areas				-0.237 (0.268)
Share of population that is black				-6.519† (3.829)
Share of population that is Hispanic				-3.055 (1.890)
Adjusted R ²	0.942	0.944	0.947	0.948
N	572	572	572	572

Note: Shown are coefficients from regressions of the determinants of divorce rates during 1989-2000; divorce data are not available for some state/years during the 1990s. The dependent variable is the natural log of the divorce rate. The regressions for columns 3 and 4 also include one lag of the unemployment rate and employment growth rate variables. All regressions include state and year fixed effects and linear state time trends. Robust standard errors (adjusted for clustering by state/year) in parentheses. Observations are weighted by the female population aged 15 and older in the state/year.

† p<0.10; * p<0.05; ** p<0.01