
Income taxes and the marriage decision

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Economic incentives have been found to play an important role in the marriage decision in developed and developing countries. However, the way in which the income tax treatment of the family affects these incentives has been routinely ignored. This paper uses time-series data for the United States from 1947 to 1988 to estimate the impact of economic factors – including, for the first time, the tax consequences of marriage – on the aggregate marriage rate. The estimation results indicate that economic factors like income, female wages and education play an important and statistically significant role in the marriage decision. In particular, the tax consequences of marriage clearly affect the marriage decision: when income taxes increase with marriage, the aggregate marriage rate declines. However, the magnitude of this impact is quite small. This result suggests that some individuals respond to tax incentives in their marriage choices, but that for many individuals taxes do not affect these decisions.

‘The way taxes are, you might as well marry for love.’
Joe E. Lewis.

I. INTRODUCTION

Since the work of Becker (1973, 1974), the economics of marriage has been increasingly studied, and economic incentives have been found to play a major role in the marriage decision, both in developed and in developing countries (Freiden, 1974; Preston and Richards, 1975; Keeley, 1979; Michael and Tuma, 1985; Montgomery and Sulak, 1989). However, this work has largely neglected the way in which the income tax treatment of the family affects the economic incentives for marriage. The potential significance of taxes in family structure decisions has sometimes been casually mentioned (e.g. Becker, 1973, 1974; Cigno, 1991), and there is much anecdotal evidence that individuals marry (and divorce) because of the tax consequences of their actions. However, the empirical significance of taxes for the marriage decision is unknown. Although it is now widely granted that economic incentives affect marriage, the effects of taxes on these incentives are routinely ignored as of secondary importance.

Nevertheless, there is much work that indicates that the tax consequences of marriage can be quite large. For example, Rosen (1987) uses information from a random

sample of tax returns to calculate the ‘marriage tax’ or ‘marriage subsidy’, where the marriage tax (or subsidy) is defined as the increase (or decrease) in the joint income tax liability upon marriage. His calculations for 1988 show that the average marriage tax for all returns is only US\$119. However, this average hides much variation across individuals. Two-fifths of US couples pay an annual average marriage tax of US\$1091, and over half receive an annual marriage subsidy of US\$609; for some income classes the average tax exceeds US\$3200 and the average subsidy exceeds US\$2300. Other work shows similarly large tax effects from marriage for earlier and later years (Rosen, 1977; Feenberg, 1983; Espenshade and Minarik, 1987; Brozovsky and Cataldo, 1994; Feenberg and Rosen, 1994). The behavioural effects of such large marriage tax consequences have been examined and found to be significant for some aspects of marital behaviour (e.g. spousal labour supply). However, their potential impact on the marriage decision remains unexamined.

In this paper we examine the effects of economic factors – including income taxes – on the aggregate marriage rate in the United States, using time series data from 1947 to 1988. Our estimation results indicate that economic factors like income, female wages and education play an important and statistically significant role in the marriage decision. In particular, the tax consequences of marriage clearly affect

the marriage decision: when income taxes increase with marriage, the aggregate marriage rate declines. However, the magnitude of this impact is quite small. Some individuals respond to tax incentives in their marriage choices, but for many individuals taxes do not affect these decisions.

II. MARRIAGE AND INCOME TAX TRENDS IN THE UNITED STATES

There are a variety of measures of marriage trends, including the percentage of women married, the percentage of women never married, the marriage rate of women and the age at first marriage for women. Such measures can also be constructed for men. In the United States, all of these measures generally show the same trends in this century.¹

The first trend is a steady increase in marriage rates from 1900 until sometime after World War II. For example, the percentage of men and women married increased, and the age at first marriage for men and women declined over this period. In particular, beginning around 1930 and especially following World War II, there was a marriage boom, in which all the various indicators of marriage showed a marked increase in marriage as a social institution.

There has been, however, a steady decline in marriage since roughly the end of the 1950s, a decline that accelerated in the 1970s and then moderated in the 1980s. The percentage of women aged 15 to 44 currently married has fallen from a peak of 70% in 1955 to 55% percent in 1988, and the marriage rate per 1000 unmarried women aged 15 to 44 has fallen from 148 in 1960 to 82 in 1988. Similarly, the age at first marriage for women has increased from 20 in 1956 to 24 in 1988; similar patterns hold for men. Note, however, that current patterns of marriage are close to those that existed early in the century; that is, it is the 1950s that are different from other decades, not the later or earlier years.

The federal income tax treatment of the family has also changed significantly over time. The relevant issue here is the choice of the unit of taxation: the individual versus the family. In the presence of proportional income taxation, the choice of the unit is unimportant. However, when the individual income tax has increasing marginal tax rates, taxing the individual or the family can have significant tax consequences.²

The federal individual income tax in the United States has varied over time in its treatment of the unit of taxation. The individual income tax was established in 1913, and originally used the individual as the unit of taxation, so that all individuals were taxed using a single progressive tax schedule not linked to marital status. Such a tax system was

largely marriage neutral because an individual's tax burden did not change much upon marriage (Rosen, 1977, 1987).³ However, because of the progressive rate structure of the income tax, this system did not achieve horizontal equity across families because families with equal family income did not pay equal income taxes if the incomes of the spouses in both marriages were not equal.

The Revenue Act of 1948 officially changed the unit of taxation from the individual to the family by the adoption of income splitting for married couples. This change allowed all married persons in the United States to aggregate and to split their income for federal tax purposes, and so treated families with equal incomes equally. It is important to recognize, however, that the Revenue Act of 1948 also created a new differential between married and single persons. The progressive nature of the personal income tax meant that a couple's joint tax liability fell, sometimes significantly, when they married.

Income splitting led to the emergence of large tax differentials between married and single people. Rosen (1987) points out that by the late 1960s it was possible for a single person's income tax burden to be as much as 40% greater than that of a married couple with identical earnings. Public pressure to remedy lopsided tax liabilities led to the adoption of the Tax Reform Act of 1969, which established a separate tax schedule for single persons that ensured that single persons would incur a maximum tax liability of 120% of a married couple with equal income. However, a side effect of the 1969 changes was the development of the marriage tax or penalty. Although the tax schedule for married persons filing jointly did not change, the 1969 act effectively increased the tax liability of some married tax filers relative to single filers, especially for couples that had very similar earnings.

Just as single persons had objected to the marriage subsidy, married persons opposed the marriage tax generated by the new legislation. The secondary earner deduction was introduced in the Economic Recovery Tax Act of 1981 to minimize the increased tax liability felt by married couples with similar earnings, and, in combination with lower tax rates and liberalized child care credits, it generally resulted in a more marriage-neutral system (Feenberg, 1983). However, the secondary earner deduction was short-lived, repealed as part of the Tax Reform Act of 1986. Other changes in 1986 reduced the marriage tax. The standard deduction for married couples was increased relative to single persons, and tax rates were significantly flattened. Overall, the 1986 act reduced the average marriage penalty in the tax.

¹The trends in marriage in the United States are discussed in more detail in Espenshade (1985) and Sweet and Bumpass (1987)

²For a detailed discussion of the issues on the choice of the tax unit, see Rosen (1977, 1987), Bittker (1975), Brazer (1980), Munnell (1980) and Pechman (1987).

³As noted by Brozovsky and Cataldo (1994) and others, the pre-1948 individual income tax was not completely marriage neutral because of slight differences in the definitions of the tax base for married and single taxpayers (e.g. differences in the standard deduction or the personal exemption). However, the non-neutralities in the income tax were generally quite small in this period.

However, the tax consequences of marriage were still substantial. As noted earlier, Rosen (1987) finds for 1988 that 40% of all married couples have an annual penalty (US \$1089), while 53% have a marriage subsidy (US \$609), even though the average penalty is only \$119 per couple. Feenberg and Rosen (1994) likewise conclude that the current tax system is still not marriage neutral.

It is now well recognized that no progressive tax system can achieve both full marriage neutrality and horizontal equity across families. By opting for the family as the unit of taxation via income splitting, the United States has also implicitly chosen to treat families with equal income equally. However, income splitting necessarily implies that income taxes will change with marriage. If individuals respond to these tax effects at marriage, then marriage rates should be affected by the potential for a marriage tax or subsidy upon marriage.

III THEORETICAL FRAMEWORK

Following Becker (1973, 1974), consider a simple model of marriage. An individual decides to marry when his or her share of commodities produced in the household is greater if married than if single. These commodities are assumed to be measured by some single aggregate commodity denoted Z , which is produced in the household by combining market goods and time inputs. Necessary conditions for a male and female to marry are that his or her consumption of the household good increases with marriage, or

$$Z_f \leq Z_f^{fm} \quad (1)$$

$$Z_m \leq Z_m^{fm}, \quad (2)$$

where Z_f (Z_m) is consumption of the aggregate commodity of a single female (male) and Z_f^{fm} (Z_m^{fm}) is consumption of a married female (male). If Z^{fm} is defined to equal the total income and consumption produced by a marriage, then the necessary conditions become

$$Z^{fm} \equiv Z_f^{fm} + Z_m^{fm} \geq Z_f + Z_m \quad (3)$$

The likelihood of marriage is then affected by economic and other factors that change the returns to being single or married, with marriage rates increasing if the return to marriage increases (Becker, 1973, 1974). For example, an

increase in single income may increase the duration of the marriage search and lower the marriage rate, even though it also makes the person more attractive as a marriage partner. Similarly, if male income exceeds female income, then an increase in female income relative to male income is likely to lower marriage rates by making substitution between male and female household production less beneficial. Conversely, an increase in the complementarity between female and male time in home production will increase the gains from marriage and raise the marriage rate. An increase in the number of females relative to males will increase the gains to marriage for males and lower them for females.

Importantly, if marriage changes both the *total* income taxes that individuals pay and the *marginal* tax rate that they face, then the tax system will affect the marriage decision. However, the effects of income taxes on the marriage decision can be quite complex. To illustrate, suppose for simplicity that income taxes consist of a constant marginal tax rate on market income and a lump-sum guarantee, where these income tax parameters vary for singles and for married couples. Income taxes will now affect both the income of the individual and the cost of the household good; that is, the choice between married and single status now depends both on the total amount of taxes paid for married couples versus single individuals, and on the marginal tax rate that individuals face. If marriage increases the total taxes without changing the marginal tax rate, then the gains from marriage will unambiguously decline. However, if marriage increases the marginal tax rate alone, then there are conflicting effects on the gains from marriage. An increase in the marginal tax rate at marriage will increase the taxes paid by married couples, which will reduce the benefits from marriage. However, a higher marginal tax rate will also lower the costs of household production by reducing the opportunity cost of household time, and this will increase the benefits from marriage. The total effect of a marginal tax rate change is therefore ambiguous.⁴

This framework suggests that the gains from marriage – and the marriage rate – depend both on the *total* taxes paid and on the *marginal* tax rate faced by couples versus single people. Specifically, the marriage rate will fall if marriage increases the total taxes, and may rise or fall if marriage increases the marginal tax rate. An empirical model of the marriage decision that tests these hypotheses is presented next.

⁴To illustrate, consider the production of the composite good Z by a single individual. The choice of Z must be consistent with the individual's market budget constraint, which in the absence of income taxes is $pX = wL$, where p is the price of X , w is the market wage rate, and L is the number of hours worked in the market. Since total time T is divided between market work L and household work H , the budget constraint can be rewritten as $pX + wH = wT$. Assuming for simplicity that the general production function of Z takes the form $X = aZ$ and $H = bZ$, where $a(b)$ represents the fixed amount of X (H) required to produce one unit of Z , then the budget constraint becomes $(ap + bw)Z = wT$, or $Z = wT/(ap + bw)$. The numerator of Z represents the 'full income' of the individual, and the denominator is the 'full price' of the Z -good, consisting of the market cost per unit of Z (or ap) and the time or opportunity cost of Z (or bw). The introduction of taxes changes the expression for Z to $Z = [(wT)(1 - \tau) + \gamma]/[ap + bw(1 - \tau)]$, where τ is the marginal tax rate and γ is the lump-sum guarantee. The total taxes paid by the individual affect the full income, and the marginal tax rate affects both the full income and the full price of the composite good. A similar expression can be derived for a married couple.

IV. EMPIRICAL SPECIFICATION

We estimate the aggregate marriage rate in the United States as a reduced form equation using annual aggregate data from 1947 to 1988.⁵ The marriage rate is assumed to depend upon various economic and demographic variables, including the tax effects of marriage. Like Freiden (1974) and others, our dependent variable is the percentage of women aged 15 to 44 who are married (*MARRIAGE*). This variable is used because the income tax system affects the incentive both to marry and to stay married, and *MARRIAGE* measures both elements. Further, over 99% of all first marriages in the United States occur within the ages 15 to 44, and most divorces also occur within these ages.⁶ *MARRIAGE* is plotted in Fig. 1 for the period 1947 to 1988. Overall, *MARRIAGE* generally rises in the years immediately after World War II, and then falls in a fairly consistent manner since the late 1950s.

The independent variables of primary interest are those that reflect the income tax treatment of the family. One variable here is the marriage tax or subsidy, which measures the total tax consequences of marriage. We calculate this variable in several steps. First, we compute the income taxes paid by single men and women by applying the relevant yearly tax schedules to the median income of men and women in that year. In these calculations it is assumed that the individual always uses the standard deduction and a single personal exemption. Second, we calculate the income taxes paid by married couples by applying the tax schedules to the sum of the median income of single men and women, where the couple is assumed to file a joint return with the standard deduction and two personal exemptions. For both

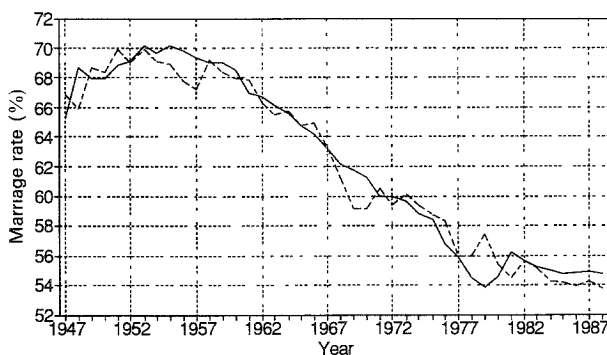


Fig 1. *Marriage rate.* (—) actual, (----) predicted

⁵Data are from standard sources, except where noted.

⁶Another measure of the marriage rate is the marriage rate per 1000 women aged 15 to 44. This alternative measure has also been used in the estimation.

⁷The simple correlation between *TAXDIF* and *MTRDIF* is 0.732. The correlation coefficient between *TAXRATIO* and *MTRRATIO* is 0.750.

⁸Whittington *et al.* (1990) discuss the construction of this wage series, and then use the series to explain the aggregate fertility rate in the United States

single and married calculations other features of the tax code (e.g. the general tax credit, the secondary earner deduction) are incorporated in those years in which these provisions apply. Third, we measure the marriage tax or subsidy either as the difference between the married tax and the total of the single taxes (*TAXDIF*), or as the ratio of the married tax to the total of the single taxes (*TAXRATIO*). *TAXDIF* is plotted in Fig. 2, and *TAXRATIO* follows the same pattern. The income tax largely subsidized marriage until 1969, at which point a large marriage tax was introduced that has remained through 1988. Note that the (nominal) value of *TAXDIF* in 1988 is US \$150, which is quite similar to the average marriage tax estimated by Rosen (1987) for that year. It is expected that an increase in the marriage tax will lower the marriage rate.

The same procedure is used to generate estimates of the marginal tax rate effects of marriage. The marginal tax rate for married couples is simply the tax rate faced by the couple. The marginal tax rate for single individuals is a weighted average of the male and female marginal tax rates, with the weights being the respective shares of income. As with the total tax variables, the marginal tax rate variables are measured in two alternative ways: as the difference between the married and the average of the single tax marginal tax rates (*MTRDIF*), or as the ratio of the married to the average of the single rates (*MTRRATIO*). *MTRDIF* is plotted in Fig. 2, and *MTRRATIO* follows a similar pattern. The difference in marginal tax rates exhibits the same general trends as the difference in total taxes, but with less variation.⁷ An increase in either measure of the marginal tax rate will have an ambiguous effect on the marriage rate.

Additional independent variables include those that measure the labour market opportunities of men and women and those that capture demographic pressures. The ratio of female to male income (*FMINCRATIO*) is included as a measure of the gains to specialization in home production. This variable is calculated by dividing the median income of females by that of males. Couples can respond to a change in relative income by substituting the time of the lower-wage spouse in home production. Because men have greater income than women, an increase in *FMINCRATIO* is expected to lower the gains to marriage and so to lower the marriage rate.

Another variable measures the market wage of women (*FWAGE*).⁸ An increase in *FWAGE* has offsetting effects on the marriage rate. It increases the return to single women, making labour-market participation more attractive and

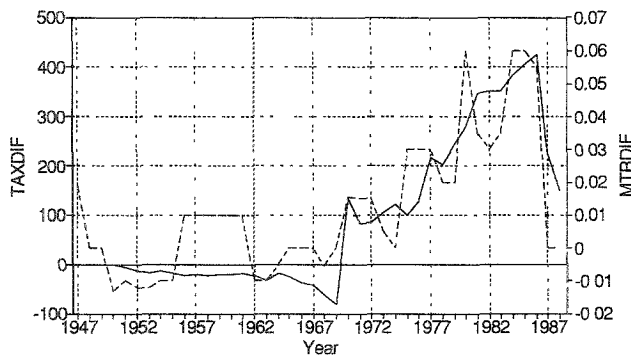


Fig. 2. Marriage tax: (—) *TAXDIF*, (---) *MTRDIF*

marriage less attractive. However, an increase in *FWAGE* also increases the mean marriage offer distribution of women, which increases the return to marriage for males and so increases the marriage rate.⁹

The number of male high school graduates as a percentage of male population aged 15 to 44 in a year (*MEDUC*) is used as a measure of male labour market opportunities. Its expected sign is ambiguous. An increase in male education raises the relative gains to males from remaining single. However, an increase also makes males more attractive marriage partners, and it increases the gains from marriage in home production.

Demographic conditions in the marriage market are measured by the female/male ratio, the immigration rate, the proportion of the population that is white, and the unemployment rate. An increase in the ratio of women to men aged 15 to 44 (*FMSEXRatio*) increases the gains to marriage for males but lowers the gains for females. Immigration (*IMMIG*) is measured as the ratio of immigrants to the resident population aged 15 to 44, and *RACE* is the percentage of the population aged 15 to 44 who are white. Unemployment (*UNEMPL*) is the percentage of those aged 15 to 44 who are unemployed. *UNEMPL* affects the returns to remaining single and to getting married in offsetting ways. An increase in the unemployment rate lowers marriage search costs, and it also makes specialization in home production more attractive. However, greater unemployment also lowers incomes, which may make marriage less likely.

Several additional variables are used in some specifications. The percentage of males aged 15 to 44 in the military is sometimes included. Several different measures of female labour-force opportunities are used in alternative specifica-

tions: the female labour-force participation rate, female education and median female income.¹⁰ A time trend is also included to capture any unobserved socioeconomic factors that may affect the marriage rate. Different specifications are also estimated with log transformations of the variables and with various lag structures on the independent variables (one- and two-year lags). All nominal variables are adjusted to real terms by the Consumer Price Index.

All specifications are estimated with generalized least squares methods. All specifications are also estimated with correction for first-order autocorrelation.

V. ESTIMATION RESULTS

The estimation results for some basic specifications are given in Table 1. Only results using the differences in single and married taxes (or *TAXDIF* and *MTRDIF*) are reported. The results using the ratios of the single and married taxes are virtually identical. Specifications with other variables generally give similar results on the tax measures, although the results are sometimes sensitive to the specific equation. Note that models 3 and 4 use log transformations of all variables.¹¹

The variables of primary interest are *TAXDIF* and *MTRDIF*. In all models an increase in the total tax burden at marriage (*TAXDIF*) has a negative and statistically significant impact (at least at the 10% significance level in a two-tailed test) on the marriage rate. This result is consistent with the economic model of marriage; that is, when the costs of being married increase relative to being single, individuals are less likely to marry.

Nevertheless, the magnitude of the total tax impact is quite small. The marriage-tax elasticity is less than -0.05 in all models, so that the marriage tax would have to fall by 20% to generate an increase in the marriage rate of 1%. This result is not surprising. It seems likely that most individuals choose to marry primarily for reasons other than tax considerations. However, it also seems likely that some individuals respond to tax incentives in the marriage decision, especially given the magnitude of the tax change at marriage for these individuals. Put differently, for most individuals the tax consequences of marriage are not decisive, but for some individuals taxes play an important role. In addition, most actual changes in tax policies in the United States have led to large, discrete changes in income tax liabilities, so that these tax policies could well have a noticeable effect on the marriage rate even with a small marriage-tax elasticity.

⁹Possible endogeneity of the female wage is examined using the Hausman (1978) specification test. We find no evidence of significant endogeneity.

¹⁰Due to multicollinearity, these variables cannot be included in the same equation. Female labour-force participation is also likely to be endogenous.

¹¹Other estimation results are available upon request

Table 1 Estimation results (t-statistics in parentheses)

Independent variable	Model			
	1	2	3 ^a	4 ^a
<i>TAXDIF</i>	-0.016* (1.883)	-0.016** (1.964)	-0.007* (1.657)	-0.007* (1.659)
<i>MTRDIF</i>	-0.260 (0.013)	—	0.001 (0.363)	—
<i>FMINCRATIO</i>	-39.309** (3.537)	-39.318** (3.600)	-0.175** (2.101)	-0.164** (2.078)
<i>FWAGE</i>	-8.438** (2.358)	-8.444** (2.416)	-0.045 (0.474)	-0.030 (0.340)
<i>MEDUC</i>	-0.401** (2.380)	-0.401** (2.418)	-0.044 (0.831)	-0.041 (0.781)
<i>FMSEX-RATIO</i>	46.838* (1.943)	46.829** (1.974)	0.275 (0.589)	0.335 (0.786)
<i>IMMIG</i>	-19.682** (2.501)	-19.673** (2.549)	-0.051* (1.923)	-0.051* (1.992)
<i>RACE</i>	-1.794** (2.640)	-1.794** (2.681)	-4.533** (4.118)	-4.648** (4.282)
<i>UNEMPL</i>	0.002 (0.009)	0.002 (0.006)	-0.001 (0.055)	0.001 (0.055)
Constant	216.060** (3.210)	216.080** (3.261)	24.313** (4.938)	24.799** (5.106)
R ²	0.925	0.925	0.965	0.954
F	43.889	50.917	78.434	66.367
DW	1.799	1.799	1.784	1.765

^a Models 3 and 4 use log transformations of all variables

* Significant at the 10% level.

** Significant at the 5% level.

A change in the marginal tax rate at marriage (*MTRDIF*) is never significant, a result that reflects the conflicting effects of the marginal tax rate on the incentive to marry. A higher marginal tax rate increases the costs of marriage by raising the total tax burden, but it simultaneously increases the gains from marriage by reducing the cost of household production.

Other variables have effects that are generally significant and consistent with our expectations. An increase in *FMINCRATIO* significantly lowers the marriage rate in all models, indicating that female income opportunities are negatively related to marriage. This result is consistent with Keeley (1979), who finds that the relative wage of females to males increases the age at marriage and also decreases the proportion of those ever married.

Greater female wages (*FWAGE*) reduce the marriage rate in models 1 and 2. This result indicates that the impact of a higher wage on female labour-force opportunities outweighs the countering influence of a higher wage on the desirability as a spouse. Winegarden (1984) also finds that female wages (interacted with female labour-force participation) negatively affect the aggregate marriage decision. Greater male education (*MEDUC*) also reduces the marriage rate in these models, a result consistent with that of Sander (1992). Again,

the gain to remaining single dominates the increased attractiveness as a spouse. Note that the coefficients on *FWAGE* and *MEDUC* have the same signs but are not significant in models 3 and 4.

An increase in the ratio of females to males (*FMSEX-RATIO*) significantly increases the marriage rate in models 1 and 2, consistent with the results of Freiden (1974). Unemployment (*UNEMPL*), however, does not have a significant effect on marriage in any model. Preston and Richards (1975) find that the unemployment rate negatively affects marriage, but their result, like ours, is never statistically significant.

Although theory offers no guidance on the expected effects of immigration rates or race, the empirical results for all models suggest that greater numbers of immigrants (*IMMIG*) and whites (*RACE*) have a significant negative impact on the marriage rate. Keeley (1979) finds that race affects the age at marriage but does not alter the marriage rate; Preston and Richards (1975) also find that race is not a significant determinant of marriage.

In Fig. 1 we compare the actual marriage rate with the predicted marriage rate, using model 1. In general, the fit is quite good, with no systematic tendency to over- or under-predict the marriage rate over time. (Note also the values of

the Durbin–Watson (DW) statistic and the F -statistic). Economic factors, including the tax effects of marriage, are therefore capable of predicting the aggregate marriage rate in the United States.

VI. CONCLUSIONS

It is clear that the likelihood of marriage depends on a variety of economic and non-economic factors. The empirical results in this paper indicate that the marriage decision also depends at least in part on tax incentives. If the income tax structure in a country penalizes marriage, then individuals will be less likely to marry. Likewise, tax systems that reward marriage will generate an increased marriage rate. Although the elasticity of this response is quite small, actual changes in tax policies are often of a large enough magnitude in many countries to have a noticeable effect on the marriage rate. At a time when ‘family values’ are increasingly the focus of public discussion in many countries, it is important to identify and to measure the impact of income taxes on family structure.

ACKNOWLEDGEMENTS

We are grateful to Janet Johnson, Elizabeth Peters, and an anonymous referee for discussions and comments, and to Raul Barreto for research assistance.

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