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Taxes and the Family: The Impact of the Tax Exemption for Dependents on Marital Fertility*

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In this paper I use data from the Panel Study on Income Dynamics to examine the relationship between the dependent exemption feature of the United States federal income tax (an unambiguous subsidy to dependents) and the fertility behavior of married couples over the period 1979–1983. The exemption decreases the price of a child to a household, thus having a direct relationship to the timing and/or number of children observed in a family. Conditional logit results support this hypothesis by showing that the exemption has a positive and significant impact on the likelihood of having a birth during the period under study.

The federal tax exemption for dependents in the U.S. tax system is an unambiguous subsidy for children, and subsidizing children creates an incentive for increased births to a family. Economic theory suggests that fundamental family behavior such as fertility is linked to economic variables; this point has been substantiated in numerous empirical studies.[1] Further, it is well established that people respond to tax incentives.[2] Therefore the existing tax incentive for fertility may play a role in the observed fertility behavior of American families.

Children are assumed to provide utility for their parents; the standard demand model for children is structured as a utility maximization problem subject to income constraints (Becker 1960; Schultz 1973; Willis 1974). The cost of a child will depend on the price of the inputs to the child. The dependent exemption directly lowers the cost of having a child relative to the cost of other consumption goods. Theoretically, this outcome will have a positive effect on fertility.

The notion that the exemption directly affects child costs is not novel. Lindert (1978) and Schultz (1981) both suggest that the exemption is a factor in the cost of a child. To encourage families politicians have expressed support for the idea of increasing the amount of the exemption as a means of lowering the cost of having a child (Moynihan 1986). In a time-series study of the impact of the average tax value of the exemption on the U. S.

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general fertility rate, Whittington, Alm, and Peters (1990) find a positive and significant relationship between the exemption and the birth rate. The elasticity of the birth rate with respect to the exemption is small; as expected, the exemption is not the principal motivation for having a child. It is, however, one of the few policy tools that directly lowers the cost of a child.

Espenshade and Minarik (1987) explore the impact of the exemption on fertility in their examination of the demographic implications of the Tax Reform Act of 1986. They note that the increase in after-tax income created by the exemption will not offset the cost of an additional child, and they dismiss the importance of the price effect of the exemption. The exemption, however, lowers the relative price of a child. According to Espenshade and Minarik, the monetary cost of raising a child to age 18, for a family of low socioeconomic status, is $70,000, or $3,889 annually. The average annual nominal tax value of the exemption for a family in the 15% tax bracket is currently $300. Therefore the exemption as a percentage of annual child costs is 8%, not an inconsequential subsidy amount. This finding is consistent with calculations presented in Whittington et al. (1990), where we demonstrate that the real tax value of the exemption as a percentage of annual child costs ranges from 4% to 14% for a middle-income family. Further, we find that at the margin the price effect of the exemption matters even if the exemption seems small relative to household income or child costs.

The real tax value of the exemption to a household will vary across time because of changes in the statutory value of the exemption and the tax rates, changes in taxable income, and changes in the price level. The incentive to fertility will be greatest when the value of the exemption is largest. In this paper I explore the effect of this changing value of the exemption on the short-term fertility decisions of families, and I find evidence that households respond significantly to differential values of the exemption. I discover a positive relationship between observed births and changes in the average value of the exemption, which substantiates the aggregate finding (Whittington et al. 1990).

Model specification and estimation issues are discussed in the next section, followed by estimation results, conclusions, and policy implications.

Model Specification, Econometric Issues, and Data

In order to identify the effects of the changing exemption on fertility, I require multiple-year information on the family. Further, the data must contain measurements of relevant economic and demographic variables. The Panel Study on Income Dynamics (PSID) satisfies these criteria and therefore is used in the analysis. This is a longitudinal data set that provides information on household structure (including births) as well as financial data such as income, wages, and taxes at the family level.

The specific problem I examine in this paper is the fertility response of households to changes in variables assumed to contribute to the probability that a family will have a child in each of five consecutive years. Each family has some propensity to have a child; that propensity is not observed. If the propensity to have a child crosses some family-specific threshold level, a birth is observed. The observed dependent variable is defined as

$$Y_i = \begin{vmatrix} 1 \text{ if } Y_i^* > k_i \\ 0 \text{ if } Y_i^* \leq k_i \end{vmatrix} \tag{1}$$

where Y_i is the birth of a child to a household, Y_i^* is the unobserved propensity to have a child, and k_i is the individual household threshold.

The threshold level, which is not observed, differs across families. Ignoring this unobserved heterogeneity can generate distorted estimation results (Heckman, Hotz, and Walker 1985). Therefore it is desirable to use a fixed-effects model to allow for the unobserved family-specific characteristics that will influence the fertility decision.

The conditional logit offers a fixed-effects approach that allows for the dichotomous nature of the dependent variable (Chamberlain 1980). Because conditional logit is a differencing model, family-specific characteristics will be differenced out. The unobserved family characteristics are assumed constant in both value and impact over the period studied; in other words, they do not contribute differentially to births from one year to the next. An advantage of this approach is that the problem of inconsistency, which often occurs with fixed-effects models because of the large number of incidental parameters, is circumvented. The limitation of the model is that level effects are not determined (Pitt and Rosenzweig 1990): estimation results will tell us how changes affect a particular household, but will not allow us to evaluate how differing values of a regressor will affect different households.

The conditional likelihood function, presentation following Greene (1990), is

$$L = \prod_i \text{Prob}[Y_{i1} = y_{i1}, Y_{i2} = y_{i2}, \ldots, Y_{it} = y_{it} | \sum_t y_{it}]. \tag{2}$$

The likelihood is conditioned on the number of 1s in the set. If all observations are equal – all 1 or all 0 – they do not contribute to the likelihood function. Consider a two-period case. If $y_{i1} = 0$ and $y_{i2} = 0$, then Prob (0 and 0'$\Sigma = 0$) = 1. Likewise, if $Y_{i1} = 1$ and $Y_{i2} = 1$, then Prob ((1 and 1)'$\Sigma = 2$) = 1. If logs are taken, these cases will drop out. The important result is that only observations with some differentiation in the dependent variable will be used in the likelihood function. Thus, families that have no births over the observed period are not relevant and are dropped, as are families that have a birth in each period (although the PSID included no families reporting a birth in each year).

Independent Variables

All of the estimators in the panel data model must be variables that can change in value, by differing amounts, over the period of observation. All family-specific constants such as race, fecundity, and desired family size are captured in the family intercept term and thus are differenced out. Variables that change by the same amount for each person each year, such as age of the husband or the wife, also are omitted because they would produce no differential effect.

The independent variable of interest is the real tax value of the exemption for dependents. The tax value of this exemption is determined by the real statutory value of the exemption (1983 = 100) multiplied by the family's marginal tax rate. The PSID has included a generated value of the tax rate since the 1976 interview year. Marginal tax rates ranged from 0% to 70% in the late 1970s and early 1980s: in 1982 the top bracket rate fell to 50%. The statutory value of the exemption was \$750 from 1972 until 1979, when it increased to \$1,000; indexation raised the value to \$1,040 in 1985. The Tax Reform Act of 1986 significantly lowered marginal tax rates and doubled the statutory exemption. The Consumer Price Index, used to deflate nominal values of the exemption, changed substantially in the period under investigation. The movement of these components generates differentiation in the value of the exemption across households and across time. During the period that I study, the real value of the exemption ranges from \$1,000 to \$1,377, base year 1983. The tax value to families ranges from \$0 to \$812. This variation allows for examination of the role that the exemption plays in fertility decisions.

The tax value of the exemption to a specific family is

$$\text{(family marginal tax)} \cdot \text{(real statutory exemption).} \quad (3)$$

This exemption value lowers the price of a child.[3] As a subsidy for number of children, the exemption is assumed to have a positive relationship to fertility.

Because female wage rates are central to fertility decisions, they are included in this model as a measure of the time cost of rearing children. A problem arises in using observed market wages as the measure of this time cost because not all women work in the formal labor market. There are no observations on wage rates for women who do not participate in the formal wage sector, but clearly, assigning a time cost of 0 to these women is incorrect; the value of their time is mostly likely greater than 0. Therefore, I use the Heckman (1980) selectivity technique to impute an offered wage for all women.[4] This wage is used as a proxy for the value of time: as the wage rises, the time cost of children increases, creating a disincentive to fertility. A negative relationship between fertility and the imputed wage of women is expected.[5]

After-tax household income is also thought to contribute to the fertility decisions of a family. Income is modeled as net of female earnings so that the income effect will not be confounded with the price effect of the female wage. The relationship between income and fertility remains clouded because of competing quality and quantity effects (Becker and Lewis 1976).

Fertility also may be influenced by other tax policies, such as mortgage interest deductions or child care credits. The impact of these measures, however, is indirect because receipt of the tax reduction is contingent on specific behavior such as the purchase of a home or of formal child care. Moreover, the actual value of the child care credit depends on the quality decisions made by the family and on the parents' labor supply behavior. Because of the complexity of these issues, full consideration of these additional tax policies is beyond the scope of this paper. Some models, however, include a simple measure of the potential child care credit to determine the robustness of the principal model to inclusion of other tax variables.[6]

Because of the time required to produce a child, regressors may have a lagged impact on the dependent variable (Schultz 1981). I consider several forms of a lag structure, including simple single-year lags as well as distributed lags.

Endogeneity of the Marginal Tax Rate

Fertility and female labor supply are likely to be determined simultaneously. In recognition that female labor-force participation influences the marginal tax rate of the household, the tax rate may be endogenous to the fertility decision rather than strictly exogenous. Therefore the change in a family's tax rate may be determined jointly with a change in births to that family. The tax value of the exemption equals the exemption multiplied by the family's marginal tax rate. If the marginal tax rate is endogenous, the tax value of the exemption is endogenous. This means that the exemption value may be correlated contemporaneously with the error term of the fertility equation.

In order to control for the potential endogeneity of the marginal tax rate, I generate a predicted value using instrumental variables.[7] Multiplying the predicted tax rate by the real exemption value generates a predicted exemption value that is strictly exogenous. Then I compare results using the predicted value to results using the actual value.

Data

The fertility decisions analyzed are drawn from households in the Panel Study on Income Dynamics (PSID) from the five-year period 1979–1983.[8] The PSID contains both a low-income sample and a random probability sample; the low-income group is eliminated from my sample. The remaining 2,930 original families and their branches represent essentially a random cross-section of income levels and family characteristics (Becketti et al. 1988).

I address the role of the exemption in marital fertility decisions only. The joint fertility/marital status decision is a more complex issue involving multiple competing risks, and is beyond the scope of this paper. My sample is limited to continuously married couples, with the same spouse, over the period 1977–1983. This seven-year span covers the years included as current values of variables and those years used as lag values. This restriction reduces the sample to 1,539 families.

As an additional restriction on participation in the sample, I specify that the wife's age must be in the 15–44 range during the entire study period. This is the population generally considered to be at risk of pregnancy; 834 families meet this qualification. Households with missing values on variables used in estimation are also eliminated from the examination group, leaving a relevant sample of 827 families.[9] Of these families, 294 had at least one birth in the period 1979–1983: 217 families had only one birth during the five years, 72 families had two births, and five families had three. For most families (81%) these were first or second births. Descriptive statistics of the variables for these 294 families are presented in Table 1.

I selected the period 1977–1983 (including lags) because changes occur during that period in both the statutory value of the exemption and the marginal tax rates. In 1979 the exemption increased from $750 to $1,000 (nominal value). Tax brackets also changed slightly in that year. A major change in tax rates occurred in 1982, when the top marginal rate was reduced from 70% to 50%. Because of these statutory changes, the exemption value does not simply decline with inflation over time.

Results of Estimation

Table 2 presents the maximum-likelihood estimation results of the fertility model with the actual tax value of the exemption used as a regressor. The current value of the tax exemption in Model 1, though positive in sign, has an insignificant effect on the fertility outcome of the same year. The one-year lagged value in Model 2, however, exerts a significant positive effect on fertility. Model 3, a three-year rectangular lag on the exemption value, also supports the conclusion that births lag changes in the exemption value. The rectangular lag gives equal weight to each year.

Models 4 and 5 examine the separate effects of the tax exemption for families with younger and older wives respectively. By making this separation I can control for the possibility that women will age out of prime fecundity (Model 4) and also can distinguish between number and timing effects (Model 5).

Model 4 includes only young women, age 30 or younger throughout the sample years. These women are more likely to bear children than the older group because they are in a very fecund age group. The exemption exerts a significant effect on fertility for these young women; this finding assures us that the principal result is not occurring because the full sample is aging out of prime fecundity concurrently with the erosion of the tax value of the exemption.[10]

Model 5 examines only the fertility behavior of families in which the wife was age 30 or more throughout the sample years; 54 families meet this criterion. Evidence of response to the exemption value in this older group would suggest that the exemption may be influencing not only the timing of births but also the number of children born. The

Table 1. Variables and Descriptive Statistics

Variable Name	Description	Mean (Standard Deviation)
	Fertility Model	
Birth	Binary measure of birth (0 = no birth, 1 = birth)	.256 (.444)
Exemption	Value of the personal exemption for dependents in 1983 dollars	1145.4 (136.81)
Marginal Tax Rate	Tax Rate of husband and wife (combined) on last dollar earned	.257 (.101)
Income[a]	Sum of male after-tax and family nonwage income in 1983 dollars	19.760 (14.614)
Wife Wage	Log of imputed wage of wife in 1983 dollars	1.538 (.266)
	Wage Model: Additional Variables	
Wife Age	Age in years	28.733 (3.970)
Race	1 = White, 0 otherwise	.925 (.263)
Wife Education	Years of schooling completed	13.429 (2.159)
Large City	1 = Resident in city with population >100,000, 0 otherwise	.202 (.402)
Wife Employed	1 = Wife employed, 0 otherwise	.451 (.498)
South	1 = Family lives in southern U.S., 0 otherwise	.297 (.457)
West	1 = Family lives in western U.S., 0 otherwise	.188 (.391)
NE	1 = Family lives in northeastern U.S., 0 otherwise	.182 (.386)
Wife Wage	Wage of wife, for wives reporting a wage in 1983 dollars	6.525 (1.555)

[a] Income is measured in thousands of dollars.

exemption is significant at the 10% level, an indication that most likely the exemption is affecting timing behavior and number of children.

These results are not unique to the five-year period selected for and presented in this paper. Samples from 1975–1981 and 1979–1985 generate similar coefficients on the tax variables (results not shown). The current-year value of the exemption is insignificant, but the lagged value is positive and significant at the 1% level in each of the sample groups.[11] The lack of PSID data on tax rates and female wages limits analyses in years preceding 1975.

In all of the models in Table 2 the magnitude of the coefficient on the personal exemption is small, as would be expected. The elasticities, however, indicate a powerful fertility response to changes in the exemption value. The elasticity, which measures the percentage change in the birth probability generated by a 1% change in the exemption, is

Table 2. Maximum Likelihood Conditional Logit Estimates: Differential Effects on Probability of Observing a Birth in a Household, 1979–1983
(Absolute value of t-statistic in parentheses)

	Model				
Independent Variable	1	2	3	4	5
Real Tax Value	.0002	.0007***	.0011***	.0011***	.0008*
of Exemption	(1.023)	(4.241)	(3.494)	(3.61)	(1.73)
Real After-Tax					
Income, Net of	.00001	.00007	−.0005	.0042	−.0005
Wife's Earnings[a]	(0.008)	(0.047)	(0.344)	(1.33)	(0.23)
Log of Imputed	−.4607	−.5315*	−.5074	−.0563	−.7889
Wage of Wife	(1.524)	(1.715)	(1.628)	(0.11)	(1.28)
Log-Likelihood	−507.98	−515.73	−519.06	−258.65	−89.46
Average Elasticity of					
Birth Probability with					
Respect to Exemption	.230	.839	1.31	1.21	1.19

[a] Income is measured in thousands of dollars.
Model 1: No lag on exemption.
Model 2: One-year lag on exemption.
Model 3: Three-year rectangular lag on exemption.
Model 4: Women aged 30 or younger in 1983; one-year lag on exemption (n = 148).
Model 5: Women aged 30 or older in 1978; one-year lag on exemption (n = 54).
* Significant at the 10% level.
*** Significant at the 1% level.
Coefficients are presented as $\delta p/\delta x = P(1-P)\beta$.

.839 in Model 2; a 1% increase in the exemption value would cause a .839% increase in the birth probability. If the mean exemption value of the present study increased by $30, just over 10%, the average birth probability would increase by just over 8%.

Consider how this change might affect tax expenditures of the federal government. There were slightly more than 3,900,000 births in the US in 1988. An 8% increase in the birth rate would mean 312,000 additional births. Assume a marginal tax rate of 15% and an exemption of $2,000, as is currently the statutory amount. Net of the increase in the value of the exemption to those already receiving it, the additional tax expenditures for a 10% increase in the real exemption could be over $100,000,000 because of increased fertility. The magnitude of the coefficient and the elasticity are larger in Model 3; the rectangular lag (giving equal weight to each period) indicates that the average cumulative value of the exemption is important.

The imputed wage has a negative impact on the decision to have a child, and sometimes approaches significance at the 10% level. There is a large difference in the value of time across women, but very little change for an individual woman across the five-year period. This lack of variation dampens the differential effect of the wage on fertility for a particular woman. It appears, however, that an increase in the market wage for a woman will discourage fertility.

Income is sometimes negative but is never significant; this result is not uncommon for fertility research. It may indicate that children are an inferior good, but more likely, it illustrates the theoretically recognized confusion of price effects of quality and quantity with income effects.[12]

Table 3 presents the results from models using a predicted tax value in lieu of the actual

Table 3. Maximum-Likelihood Conditional Logit Estimates: Probability of Observing a Birth in a Household, 1979–1983, with Predicted Marginal Tax Rate Used in Lieu of Actual Marginal Tax Rate (Absolute value of t-statistic in parentheses)

	Model			
Independent Variable	1	2	3	4
Predicted Tax	.0010***	.0006***	.0006***	.0006**
Value of Exemption	(5.39)	(3.05)	(2.92)	(2.56)
Real After-Tax Income	−.0007	.0008	.0010	.0014
Net of Wife's Earnings[a]	(0.47)	(0.58)	(0.69)	(0.84)
Log of Imputed Wage	−.4500	−.4790	−.4158	−.3646
of Wife	(1.42)	(1.57)	(1.35)	(1.06)
Maximum Value of			.0003*	.0003*
Child Care Credit			(1.78)	(1.70)
Log Likelihood	−507.01	−517.12	−515.55	−405.7
Average Elasticity of Birth Probability with Respect to Exemption	1.15	.71	.70	.74

[a] Income is measured in thousands of dollars.
Model 1: No lag on predicted exemption value.
Model 2: One-year lag on predicted exemption value.
Model 3: Maximum value of child care credit given to every family; one-year lag on exemption and child care credit.
Model 4: Families with fewer than two children in 1979; one-year lag on exemption and child care credit (n = 233).
* Significant at the 10% level.
** Significant at the 5% level.
*** Significant at the 1% level.
Coefficients are presented as $\delta p/\delta x = P(1-P)\beta$.

value. I followed this procedure in order to control for the potential endogeneity of the actual tax value of the exemption. The real exemption is multiplied by an estimated tax rate for each household in each year. Most striking is the large increase in magnitude and significance of the current-year exemption (Model 1). Instrumenting the tax rate causes the elasticity to increase to 1.15 in Model 1 (from .230) because the coefficient value increases from .0002 to .0010. Notice that this is a same-period phenomenon; the lagged exemption parameter in Model 2 actually decreases slightly in value with the use of a predicted tax rate. This occurs because the difference between the actual and the predicted tax value is likely to reflect the conflicts between current female labor-force participation and fertility.[13]

A measure of the value of the child care credit is added to the regression in Model 3. Every family is assigned the maximum credit available regardless of parity or the wife's labor-force status. In practice, however, only families that actually use paid child care are eligible. There is also a ceiling on child care expenditure per child for the first and second children. If the ceiling is met, there is no additional credit for child care expenditures on third (or higher) children. Yet, because the credit potentially can be used, it may affect fertility decisions. The real value of the credit was the same for each family until 1982. Since then the credit has been a function of the taxpayer's income; therefore it varies across families. Results in Model 3 suggest that the credit affects fertility positively. Although the tax exemption has a smaller effect when the credit is included, it remains statistically significant at 1%.

Model 4 examines only couples who are most likely to be eligible for the child care credit. This category includes couples who started the sample period with fewer than two young children (under age 6) and continued to have two or fewer young children throughout the period. The exemption may have no value for a third child when paid child care is used if the expenditure limit is reached. This means that the group isolated in Model 4 is most likely to have a positive child care value. The results, however, are essentially identical to those of the full sample: both the credit and the exemption influence positively the probability of a birth. As mentioned previously, the paths through which the child care credit influences fertility are complex, and far less direct than the exemption; that topic warrants further investigation. It is clear, however, that inclusion of another tax variable does not substantially erode the principal finding of this work.

Conclusions

The results presented in this paper suggest that the tax value of the personal exemption can play a role in the household decision to have a child. When the average tax value of the personal exemption increases, some families are more likely to have additional children. This may be a timing effect; households may select the time to have a child in part on the basis of the changing price of a child. As the exemption grows in value, the price of a child falls, all else being equal. The results also offer some evidence (Table 2) that the exemption affects the number of children born.

Again it is important to note that these results allow us to compare the differential fertility of a family in response to changes in prices and income. These results, however, do not allow us to make predictions about the effect of different levels of prices and income across different households. We can make the observation that when the value of the exemption increases for a household, that household has a stronger birth probability. Yet we cannot determine that households with larger exemption values are more likely to have babies than those with smaller exemption values.

Economists have demonstrated that economic variables enter the decision-making process of households even in such fundamental areas as fertility. Recently Büttner and Lutz (1990) found a positive relationship between an explicit pronatalist policy and fertility in the German Democratic Republic. The present study establishes that tax variables also must be considered as potential direct determinants of fertility. Congress currently is considering several pieces of legislation that would increase substantially the value of the dependency exemption. The Gore-Downey proposal, for example, would replace the exemption with a refundable tax credit of $800, which more than doubles the average value of the current exemption. Other legislators have proposed smaller tax credits but suggest that such credits would be given in conjunction with the existing tax exemptions ("That Sinking Feeling" 1991). All of these proposals will serve as incentives to fertility. In fact, the U.S. birthrate has increased since the Tax Reform Act of 1986, in which the average exemption value was increased (Kelly 1991).

In this paper I do not argue for or against increased family exemptions, credits, and allowances. It seems, however, that the potential exists for policy makers to influence fertility substantially with the legislative rush to adopt tax policy that further subsidizes dependents.

Notes

[1] Examples of recent studies include Blau and Robbins (1989), Borg (1989), Happel, Hill, and Low (1984), and Heckman, Hotz, and Walker (1985).

[2] This is discussed at length in Aaron and Pechman (1981). Another useful reference is Hausman and Poterba (1987), in which the authors examine the effects of the Tax Reform Act of 1986 on household behavior.

[3] A full economic model of the relationship between fertility and the exemption can be found in Whittington (1989). The presentation here draws from the main conclusions of that formal model.

[4] The wage is estimated in a two-stage process. First I estimate a probit model of working versus not working (in the market). Next, I estimate a wage equation, using OLS, for those women who are in the market controlling for selection bias. The estimated wage coefficients are used to impute a wage for every woman. (Variable definitions are in Table 1.) The coefficients are as follows: − .644 + .109 Wife Education + .034 Race + .187 Large City + .039 Wife Age − .0006 Wife Age Squared + .106 South + .049 West − .039 Northeast. Education, Large City, and South are significant at the 1% level. The selectivity coefficient, lambda, is positive and significant at the 10% level. The adjusted R^2 is .26. The variables used to estimate the labor-force participation and selected wage equations are standard in the literature. Signs and values on the coefficients are consistent with theoretical expectations and with previous empirical work in this area, such as Cogan (1981), Hanoch (1980), and Heckman (1980). (The full results are available from the author on request.)

[5] A complete explanation of this hypothesized relationship can be found in Schultz (1981).

[6] See Averett (1991) for a full discussion. See also Blau and Robins (1989, 1991) for discussion of the relationships between fertility, child care costs, and labor supply of mothers.

[7] I calculate the predicted tax rate using the following equation: .0016 + .0091 Race + .0052 Wife Education + .000001 Income + .0009 Wife Age + .0047 Large City + .0058 South + .0044 West + .0040 Northeast − .0006 CPI − .000008 Wife Age Squared + .0065 Marginal Tax Rate Lagged. Race, Wife Education, Income, CPI, and Marginal Tax Rate Lagged are significant at the 10% level or greater. The adjusted R^2 is .59. (Variable definitions are in Table 1.)

[8] The number of years examined (five) is a technical limitation of the software rather than a model restriction.

[9] The size of the data sample used in this work is consistent with research samples employed by other economists who examine fertility issues, as are the inclusion requirements. Heckman, Hotz, and Walker (1985) reduce a data set of 5,000 Swedish women to 570 sample members for use in their empirical study by placing restrictions on age, marital status, and fertility history. Olsen and Wolpin (1983) place age restrictions on their sample of married Malaysian women. Happel, Hill, and Low (1984) limit their sample from the National Longitudinal Survey to women aged 14 to 24 in 1968 who are currently married with spouse present and fully employed, and who have experienced a first birth within the five-year observation period.

[10] The mean age of women giving birth has been increasing as delayed childbirth has become a more common phenomenon. Birth rates of women in their thirties are not inconsequential (Bloom 1982).

[11] These results are available upon request.

[12] See Becker and Lewis (1976) for a discussion of the dilemmas associated with income and fertility.

[13] When the statutory exemption value and the actual marginal tax rate are entered as separate regressors, the current period exemption parameter is positive and the current period marginal tax rate parameter is negative. This result is consistent with the likelihood that current-period female labor supply increases family income, thus pushing up the marginal tax rate. Therefore the tax rate is correlated negatively with fertility because labor-force participation is correlated negatively with fertility (Cain and Dooley 1976). Lagged labor-force participation tends to increase fertility (Michael 1985).

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