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Female Labor Force Intermittency and Current Earnings: A Switching Regression Model with Unknown Sample Selection

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Abstract: Using the Health and Retirement Survey, this paper finds a 16 percent selectivity-corrected wage penalty among women who engage in intermittent labor market activity. This penalty is experienced at a low level of intermittent activity but appears not to play an important role in a woman's decision to undertake such activity. In addition, employer preferences appear to play a larger role than human capital atrophy in the determination of the wage penalty.

JEL classification: J22, J31, C30

Key words: intermittent participation, wage, gender differentials

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Introduction and Background

It is widely accepted that there is a penalty associated with intermittent labor force participation; women who engage in intermittent activity earn lower wages than women who do not.[1] There are several theories that explain this association between lower wages and intermittent attachment. On the supply side, these theories are based on the theory of human capital. Workers who anticipate intermittent attachment have lower levels of investment in human capital due to a shorter period of time in which to earn a return on their investment and the human capital that is acquired may atrophy during periods of absence (Polachek and Siebert 1993). Furthermore, during periods of absence from the labor force, these individuals also forego the gains in experience and human capital that would lead to higher wages (Jacobsen and Levin 1995).

On the demand side, employers view intermittent attachment as a signal that the worker may exit the labor force again. As employers lose any hiring and training expenses incurred when workers leave, employers are less willing to provide the investment necessary for higher paying jobs (Albrecht et al. 2000).

Although empirical evidence supports the presence of an intermittent attachment penalty, the evidence is mixed on its magnitude and duration. For example, Mincer and Ofek (1982) find that the wages of the intermittent worker rebound rapidly in the first five years of reentry into the labor force, resulting in small (less than two percent) long run penalties. Jacobsen and Levin (1995), however, find that, although the penalty does diminish from its initial level of 14 percent, there remains a relatively large penalty of between five to seven percent even after 20 years.

Sorenson (1993) found that women with intermittent participation earned 34 percent less than women with continuous participation, after controlling for selection into intermittency as well as the labor force.

There are several factors contributing to these differential results. The main concern addressed in this paper pertains to the lack of a valid statistical method of classifying an individual as an intermittent worker. Previous methods include classifying a worker as intermittent if they have at least one spell of absence from the labor market (Jacobsen and Levin, 1995) or if the percentage of time out of the labor force exceeds an arbitrary threshold (Sorenson 1993). Others have used a more direct measure of time out of the labor force on wages (Albrecht et. al 2000, Phipps et. al 2001, and Rummery 1992). However, if employers perceive intermittent behavior as a signal, then the frequency and length of intermittent spells as well as the time since the last spell should be taken into account.

The purpose of this paper is to explore the role past labor market intermittency plays in the determination of a woman's current wage and to examine the role any wage penalty for intermittent activity plays in the decision to engage in such activity. We will contribute to this literature by developing an index which incorporates the three elements of intermittency; frequency of spells, length of spells, and time since last spell. In addition, we statistically determine at what level of intermittency a woman will incur a penalty for absence from the labor force. This index is then used to determine the magnitude of the penalty associated with intermittent participation in the labor force. Finally, this analysis will allow us to determine the importance of a potential wage penalty in the decision to engage in intermittent activity. Using data from the Health and Retirement Survey (HRS) we are able to discern the frequency, length, and timing of intermittent spells, complete labor market experience, and family (marital and child) status throughout the lifetime. The analysis will be limited to women for two reasons; intermittent behavior is more prevalent for women and to remove potential confounding factors associated with gender discrimination.

This paper takes a life-cycle approach to women's labor supply decisions, where labor supply decisions in one period affect wages earned in another period. Theoretically, it is established that the role a wage penalty for intermittency plays in a woman's labor supply decision is related to whether leisure across time periods is complementary or substitutable. Empirically, it is found, after controlling for selection into both intermittent attachment and the labor force, that there is indeed a penalty associated with past intermittent activity, that the penalty arises at relatively low levels of intermittency, and that considerations *other than* the penalty for intermittency are more important is a woman's early labor supply decisions.

Theoretical Model

A woman is assumed to maximize her discounted lifetime utility over two periods, subject to a budget constraint, choosing (without loss of generality) the amount of leisure to consume during the two time periods.[2] The two time periods generally correspond to the past (period one) and the present (period two). The wage a woman earns in period two is a decreasing function both of the leisure she consumes in period one as well as the penalty employers place on intermittent activity. The amount of leisure consumed in period one defines the woman's degree of labor force intermittency; its negative impact on period two wages is designed to reflect potential loss of human capital as a result of intermittent behavior in period one. The direct impact of employers' distaste for intermittent behavior on period two wages is designed to capture employers' preferences regarding intermittent activity, given a worker's level of experience and human capital. Time is normalized to one so that the leisure consumed in a period corresponds to the proportion of overall time during the period spent on leisure. The problem is formalized as follows:

(1) $\max_{L_1, L_2} U(L_1, \beta L_2)$

s.t. $W_1 + \gamma W_2 \geq L_1 W_1 + L_2 \gamma W_1$

where L_1 and L_2 are the amounts of leisure consumed in period one and two; W_1 and W_2 are the wage rates earned in period one and period two; $\beta = 1/(1+\rho)$, where ρ is the woman's individual discount rate; and $\gamma = 1/(1+r)$, where r is the market rate of interest.[3] In addition,

$W_2 = W_2(L_1, \alpha)$, where:

$\partial W_2 / \partial L_1 < 0$ (Period two wages decrease as the leisure in period one, or the degree of intermittency, increases; this is the indirect penalty of intermittency resulting from lower levels of human capital in period two);

$\partial W_2 / \partial \alpha < 0$ (Period two wages decrease as employers' distaste for intermittency, α, increases; this is the direct penalty of intermittency determined by employers' preferences);

$\partial^2 W_2 / \partial L_1 \partial \alpha < 0$ (As employers' distaste for intermittency increases, the direct negative impact of intermittency on the wage in period two becomes stronger and more negative); and

$\partial^2 W_2 / \partial L_1^2 < 0$ (W_2 is concave in L_1: the $\partial^2 W_2 / \partial L_1 \partial \alpha < 0$ assumption means that as α increases, the slope of the W_2 function in L_1 must decrease(become a steeper negative slope); this is only possible when W_2 is concave in L_1).

Assuming interior solutions for L_1 and L_2, optimization leads to implicit functions for the optimum L_1^*, L_2^*, and λ^*:

(2) $L_1^* = f_{L_1}(W_1, W_2, \alpha, \beta, \gamma)$,
$L_2^* = f_{L_2}(W_1, W_2, \alpha, \beta, \gamma)$, and
$\lambda^* = f_{\lambda}(W_1, W_2, \alpha, \beta, \gamma)$.

A key question to be addressed in this analysis is how a woman's decision to partake in intermittent activity is affected by the penalty she can expect to experience in the labor market. The implicit functions above can be differentiated with respect to α to determine how a change in the penalty affects the optimal leisure choice in period one.[4] Using Cramer's rule and the implicit function theorem, the following partial derivative is derived:

$$(3) \qquad \frac{\partial L_1}{\partial \alpha} = \frac{|J_1|}{|J|} \overset{s}{=} \begin{cases} (-) \text{ if } \left(\partial^2 U / \partial L_1 \partial L_2\right) > 0 \\ (?) \text{ if } \left(\partial^2 U / \partial L_1 \partial L_2\right) < 0 \end{cases}$$

where $|J|$ is the determinant of the bordered hessian that results from differentiating the first order conditions, and $|J_1|$ is the determinant of the hessian after replacing the first column with the exogenous vector that appears on the right-hand side of the full matrix equation.[5] The symbol $\overset{s}{=}$ means "equal in sign to." The implication of this result is that if L_1 and L_2 are complements, then $\partial L_1 / \partial \alpha < 0$ and if L_1 and L_2 are substitutes, then $\partial L_1 / \partial \alpha \gtreqless 0$.[6] The empirical results, which will tell us the sign of $(\partial L_1 / \partial \alpha)$, will yield some insight as to the relationship between L_1 and L_2: if $\partial L_1 / \partial \alpha < 0$ then L_1 and L_2 can either be complements or substitutes; if $\partial L_1 / \partial \alpha \geq 0$, then L_1 and L_2 must be substitutes.

The next section operationalizes this theoretical model into an empirical specification. The behavioral model presented in this section is offered merely as a framework in which to interpret the empirical results that follow. The empirical results do not depend on the structure or assumptions of the theoretical model.

Empirical Specification

A woman has the choice of entering into one of two sectors, the "continuous attachment" sector (C) or the "intermittent attachment" sector (I). Therefore each worker faces two wage rates, the continuous sector wage rate and the individual sector wage rate. This model specifies full interaction of the chosen sector, thus there are separate wage equations for each sector:

$$(3) \qquad W_{Ci} = X_{Ci}^{'}\beta_C + \varepsilon_{Ci} \ \text{ if } I_i^* < \hat{I} \text{ and } L_i^* > 0$$

$$(4) \qquad W_{Ii} = X_{Ii}^{'}\beta_I + \varepsilon_{Ii} \ \text{ if } I_i^* \geq \hat{I} \text{ and } L_i^* > 0$$

W_{ji} (j=C,I) is the log of current wages/earnings, X_i are determinants of wages in each of the sectors, β_j are the mechanisms by which individual characteristics are translated into earnings, and ε_{ji} are the normally distributed random error terms. In addition, I_i^* represents individual i's propensity to have her earnings determined in the intermittent sector and L_i^* is individual i's propensity to be observed with current earnings. It is not clear at what threshold of intermittent activity a woman's earnings will be determined in the intermittent sector, thus the threshold, $\hat{I}$, is unknown. The testable hypothesis is whether the wage determining mechanisms across the sectors are significantly different from one another.

A woman's propensity to have her wages determined in the intermittent sector is defined as:

$$(5) \qquad I_i^* = (W_{Ci} - W_{Ii})\theta + Y_i^{'}\tau + u_i = Z_i^{'}\gamma + u_i \ .$$

Since I_i^* is unobserved, a dichotomous variable, I_i, is defined as follows:

$$(6) \qquad I_i = \begin{cases} 1 \text{ if } I_i^* \geq \hat{I} \text{ and } L_i^* > 0 \\ 0 \text{ if } I_i^* < \hat{I} \text{ and } L_i^* > 0 \\ \text{otherwise unobserved} \end{cases} .$$

A woman's propensity to be in the intermittent sector is determined by the expected difference in wages across sectors (the "penalty" for intermittency), and other factors (Y_i) that are not expected to influence earnings in either sector. Recall, the penalty for intermittency $(W_{Ci} - W_{Ii})$ arises from a combination of the employer distaste for intermittent behavior $(\partial W_2 / \partial \alpha)$ and from the impact of intermittency on human capital $(\partial W_2 / \partial L_1)$. θ captures the impact this penalty has on a woman's decision to partake in intermittent activity. When human capital is held constant in the calculation of $(W_{Ci} - W_{Ii})$, the estimate of θ will then reveal the impact of a change in α alone on a woman's intermittency decision.

The ideal measure of intermittency should reflect the amount of time spent out of the labor force, the frequency of spells, and a measure of time since last spell. This measure will capture the penalty associated with lower investment or atrophy of skills, as well as any penalty employers place on intermittent behavior. Therefore, an index of intermittency is constructed by combining the number of spells and the proportion of time spent absent from the labor force, which captures the average length of the spells, weighted by the proportion of time in the labor force that was accrued since the last spell:[7]

$$(7) \qquad I_i^* = \left[N_i \left(\frac{1}{T_i} \sum_{j=1}^{N_i} L_{ji} \right) \right]^{\omega_i},$$

where T_i = the total amount of time since first recorded labor market activity for woman *i;*
N_i = the number of spells of absence for woman *i;*
L_{ji} = the length of spell *j* for woman *i;* and
ω_i = the percent of work life accumulated since last spell of absence for woman *i.*

As the number of spells and/or the length of spells increases, the measure of intermittency increases. As the total amount of time since the woman first entered the labor force increases, or the time since the last intermittent spell increases, the measure of intermittency decreases.[8] A spell of absence, N_i, is defined as any period of consecutive years with no labor market activity sandwiched between years with some employment.[9] Requiring complete absence from the labor market in a given year to be considered part of an intermittent spell protects against short term leave, such as maternity leave, or seasonal employment being counted as a spell of intermittency.[10] Technically, I_i^* is defined for women who are not currently working ($L_i^* \leq 0$), however, since it is theorized to be a function of future expected relative earnings in the two sectors and since earnings are not observed for non-workers, I_i^* is estimated only for those currently employed.

The propensity of a woman to be observed with current earnings in either sector is determined by the following mechanism:

(8) $$L_i^* = K_i^{'}\alpha + e_i \quad .$$

And, again, since L* is unobserved, the following dichotomous variable is defined:

(9) $$L_i = \begin{cases} 1 \text{ if } L_i^* > 0 \\ 0 \text{ if } L_i^* \leq 0 \end{cases} .$$

The determinants, K_i, may contain factors that are included in X_i or Y_i, but also contain factors that are expected to determine current labor market participation but not impact current wages or past intermittent activity.

Estimation Strategy

Estimation of the parameters in Equations (3)-(9) is performed through a multi-step process. First, estimates of α and γ are obtained through estimation of a bivariate probit model with selection. Second, selection terms are calculated using the parameter estimates for α and γ. Third, parameters in the separate wage equations are estimated via a maximum likelihood method suggested by Quandt (1958) and are used to obtain estimates in a switching regression framework where the switch point is unknown and/or complicated by multiple selection issues. To estimate the switch point that best describes the data, the entire process will be repeated for different values of $\hat{I}$ and the value of $\hat{I}$ which yields the maximal likelihood function value in the third step will be determined as the appropriate threshold.

Step I: Bivariate Probit with Selection

The observation scheme described by Equations (5), (6), (8), and (9) is modeled as a bivariate probit with selection. The error terms in Equations (5) and (8), e_i and u_i, are distributed as a bivariate normal with means equal to zero, variances equal to one, and covariance equal to σ_{eu}. Estimates of the model parameters describing the propensities to be in the intermittent sector and to be currently in the labor market are obtained through maximization of the following log-likelihood function:

$$(10) \qquad \log L = \sum_{L=1,I=1} \log \Phi_2 \left[K_i^{'}\alpha, Z_i^{'}\gamma, \sigma_{eu} \right] + \sum_{L=1,I=0} \log \Phi_2 \left[K_i^{'}\alpha, -Z_i^{'}\gamma, \sigma_{eu} \right] + \sum_{L=0} \log \Phi \left[-Z_i^{'}\gamma \right] ,$$

where Φ_2 is the bivariate normal cumulative distribution function and Φ is the univariate normal cumulative distribution function.

Step II: Construction of Selection Terms

The expected value of wages in each of the regimes (continuous versus intermittent) is described as follows (the *i* subscripts have been dropped for notational ease):

$$(11) \qquad E\left[W_C \middle| L=1, I=0\right] = X_C^{'}\beta_C + E\left[\varepsilon_C \middle| e > -K^{'}\alpha,\ u < -(Z^{'}\gamma - \hat{I})\right]$$

$$= X_C^{'}\beta + \sigma_{eC}\lambda_{C1} + \sigma_{uC}\lambda_{C2}$$

$$(12) \qquad E\left[W_I \middle| L=1, I=1\right] = X_I^{'}\beta_I + E\left[\varepsilon_I \middle| e > -K^{'}\alpha,\ u \geq -(Z^{'}\gamma - \hat{I})\right]$$

$$= X_I^{'}\beta + \sigma_{eI}\lambda_{I1} + \sigma_{uI}\lambda_{I2}$$

where,

$$\lambda_{C1} = \frac{\varphi(K'\alpha)\left\{1-\Phi\left[\frac{Z'\gamma-\hat{I}-\sigma_{eu}K'\alpha}{\left(1-\sigma_{eu}^2\right)^{1/2}}\right]\right\}}{\Phi_2\left(K'\alpha,-(Z'\gamma-\hat{I});-\sigma_{eu}\right)} \qquad \lambda_{C2} = \frac{-\varphi\left(Z'\gamma-\hat{I}\right)\Phi\left[\frac{K'\alpha-\sigma_{eu}(Z'\gamma-\hat{I})}{\left(1-\sigma_{eu}^2\right)^{1/2}}\right]}{\Phi_2\left(K'\alpha,-(Z'\gamma-\hat{I});-\sigma_{eu}\right)}$$

$$\lambda_{I1} = \frac{\varphi\left(K'\alpha\right)\Phi\left[\frac{Z'\gamma-\hat{I}-\sigma_{eu}K'\alpha}{\left(1-\sigma_{eu}^2\right)^{1/2}}\right]}{\Phi_2\left(K'\alpha,(Z'\gamma-\hat{I});\sigma_{eu}\right)} \qquad \lambda_{I2} = \frac{\varphi\left(Z'\gamma-\hat{I}\right)\Phi\left[\frac{K'\alpha-\sigma_{eu}(Z'\gamma-\hat{I})}{\left(1-\sigma_{eu}^2\right)^{1/2}}\right]}{\Phi_2\left(K'\alpha,(Z'\gamma-\hat{I});\sigma_{eu}\right)}$$

φ(.) is the standard normal univariate density function, and Φ(.) and Φ_2(.) are as defined above.[11]

Step III: Maximum Likelihood Estimation of Wage Equation Parameters

As originally proposed by Quandt (1958), the following log-likelihood function characterizes the switching regression model detailed above:

$$\text{(13)} \quad \text{LogL} = d_1(1-d_2) * \log\left[\frac{1}{\sigma_C\sqrt{2\pi}}\exp\left\{\frac{-1}{2\sigma_C}\left(W_C - X_C'\beta_C - \sigma_{eC}\lambda_{C1} - \sigma_{uC}\lambda_{C2}\right)^2\right\}\right]$$

$$+\, d_1 d_2 * \log\left[\frac{1}{\sigma_I\sqrt{2\pi}}\exp\left\{\frac{-1}{2\sigma_I}\left(W_I - X_I'\beta_I - \sigma_{eI}\lambda_{I1} - \sigma_{uI}\lambda_{I2}\right)^2\right\}\right],$$

where d_1 =1 for everyone in the labor market (0 otherwise) and d_2=1 for those workers in the intermittent sector (0 if in the continuous sector). This likelihood function is expressed in terms of a known value of $\hat{I}$, which is, of course, unknown but to be determined. Several approaches have been taken to estimate switching regression models with unknown sample selection. Davis et al. (1966, 1971) examine the residuals from the OLS equations and calculate the Chow F-statistic for different values of the switch point. A variation on this technique involves estimating the OLS equations for every reasonable switch point, evaluating the log-likelihood function, and determining which switch point and corresponding parameter estimates yield the maximal log-likelihood function.[12] Alternatively, one could maximize the likelihood for a given threshold value; then maximize the likelihood function with respect to that threshold value (Quandt 1958, 1960).[13] The strategy of choice in this analysis is to maximize the likelihood function for all possible values of the threshold, then select that threshold (and parameter coefficients) as the optimal values.[14] The advantage of this technique over others that merely make use of the OLS equations separately, is that the maximization of the likelihood function yields a variance/covariance matrix for the parameter estimates with which tests may be performed. This method is repeated for values of $\hat{I}$ ranging from 0.1 to 2.72 in order to establish the optimal level of $\hat{I}$.[15]

The Data

The data sets used for the empirical analysis include the 1992 Health and Retirement Survey (HRS) public release and the HRS Covered Earnings, Version 3.1. The HRS is a nationally representative panel survey of 12,645 individuals who were either born in the period of 1931-1941 or are the spouse of an individual who is age-eligible. The first wave was administered in 1992, with follow up surveys every two years. The Covered Earnings database includes annual data on quarters of coverage and earnings for the years 1951-1991. As the information on covered earnings ends in 1991, only the 1992 wave of the HRS is utilized in the analysis.

The sample is limited to women for whom all variables are present. This resulted in a sample of 5,255 women overall and 2,404 women in the labor force. The sample means for the full sample and for workers are presented in Table 1. It is clear from this table that the cohort of women is older than the overall population (age ranges from 24 to 75 with a mean of 55 years). Demographically, the sample looks fairly similar to other nationally representative samples of women, except for a larger representation of black women. College graduates make up 14 percent of the overall sample and 19 percent of the workers. 73 percent of the women are married and they have 3.4 children on average, reflecting a nuance of the cohort age of the sample.

[Table 1 here]

Among the 46 percent of the women currently working, the average wage (1992 $) is $10.89 and 31 percent are part-time. The greatest representation of women is in the sales, clerical, and administrative support occupation and in the wholesale and retail trade industry.

The information on past work histories was obtained from the HRS Covered Earnings file, which contains information on quarters of covered earnings and the amount of covered earnings per year for individual years beginning in 1951 and continuing through 1991. This was used to calculate the index of intermittency. This index average is 0.40 and ranges from zero (those who have worked continuously since first entering the labor market) to 5. To get a better idea of what the intermittent index looks like, Figure 1 plots the frequency distribution of I^*. Among workers, 28 percent have a value of I^* equal to zero (no interruption of at least one year since the beginning of their work lives); for those with positive values of I^*, the mean value of I^* is 0.55 and the distribution is skewed right with a standard deviation of 0.67.

[Figure 1 here]

Estimation Results

The multiple equation, multi-step estimation procedure described in Equations 3-9 require the specification of some identifying restrictions. The current labor force participation equation is identified by current acute condition health indicators for both the woman and her spouse (if not married, spouse indicators are set to zero), current nonlabor income, work status of her husband (zero for single women), and an indicator of whether the woman has access to health insurance other than through her employer. Variables describing the characteristics of a woman over her lifetime are used to identify the intermittent labor force participation equation. These include the percent of her lifetime married, total number of children (and its square), and an indicator if the woman ever smoked (as a proxy for lifetime health status). The wage equations are identified through labor market experience (and its square), occupation and industry dummy variables, job tenure with employer (and its square), and indicators for union representation, part-time employment, and the availability of job benefits.

Reduced-form Bivariate Probit with Selection

The results from the first-stage bivariate probit with selection estimation are as expected and are shown in Table A.1 in the appendix. Most notable are the exclusion restrictions, which contribute significantly to the determination of the dependent variable they identify. Looking first at the labor force participation equation, older (at a decreasing rate) and black women are more likely to be labor force participants; personal poor health decreases labor force participation, but a husband with poor health increases the woman's labor force participation. Married women are less likely to participate, but married women whose husband's work are more likely to be in the labor market, suggesting that married couples' labor supply is complementary. Regarding intermittent labor market activity (again, in its reduced form), women who have spent more of their adult life married, and who have had more children, are more likely to have experienced intermittent activity, as is a woman who ever smoked in her life. The regressors in the intermittent labor force participation equation will be discussed in greater detail when the structural estimates are presented. It is of interest to note the positive and significant correlation between the error terms of the labor force participation and the intermittent equations. The implication is that there are unobserved factors that increase both a woman's likelihood to have been intermittent and to be currently in the labor force.

Wage Equation Estimation

Before discussing the parameters obtained from the wage equation estimation, it is important to establish what intermittency index threshold to which the estimates correspond. Again, after constructing selection terms based on the results from the bivariate probit with selection, the pair of wage equations are estimated splitting the sample based on varying values of the intermittency index. The range of thresholds at which the estimation was performed was 0.01 to 2.72.[16] Splitting the sample based on an intermittency index threshold of 0.05 yielded the maximal value of the likelihood function detailed in Equation 13. At this threshold level, 1,032 women were assigned to the continuous sector and 1,372 were assigned to the intermittent sector. In addition, based on a Wald Test (Honda 1982), the parameter estimates for the two sectors (continuous versus intermittent) are significantly different from one another.[17] This test indicates that the mechanisms that determine wages in the two sectors are significantly different enough to warrant separate estimation.

Turning to the wage equations estimates in Table 2, the differences in returns to some demographic and job characteristics in the two sectors are striking.[18] Women in the continuous sector are penalized more heavily for not having a high school diploma and obtain more of a return to a college degree than women in the intermittent sector. While the occupation and industry dummy variables don't vary much across sectors, women managers in the intermittent sector are at a greater *advantage* (relative to administrative support and service occupations) than managers in the continuous sector. There is a slightly greater return to being in a union for women in the intermittent sector and the coefficient on the part-time dummy is negative in both sectors, although not significantly different from zero in either sector.

[Table 2 here]

Given the coefficients on age, tenure, and experience, it appears that intermittent participation erases the benefits of years of experience, but that the loss can be overcome somewhat by making a longer commitment to one's current employer. Age and labor market experience both yield a significant return in the continuous sector (at decreasing rates), but are insignificant in the determination of wages in the intermittent sector. An additional year of experience results in an average wage boost of two percent in the continuous sector. On the other hand, additional tenure with one's employer seems to be of greater value in the intermittent sector than in the continuous sector; an additional year of job tenure raises the wage of the average woman in the intermittent sector by 2.0 percent, whereas it raises the wage of an average woman in the continuous sector by only 0.8 percent. In addition, women in both sectors select positively into the labor market, but neither group performs differently in their chosen sector than the population would on average, based on conventional levels of significance, although the continuous sector term is significantly different from zero with 88% confidence.

Wage Decomposition

Using these parameter estimates, the wage differential between women in the continuous and intermittent sectors can be decomposed as follows:

$$(14)\qquad \overline{W}_C - \overline{W}_I = \sum_k \hat{\beta}_{Ck}\left(\overline{X}_{Ck} - \overline{X}_{Ik}\right) + \sum_k \overline{X}_{Ik}\left(\hat{\beta}_{Ck} - \hat{\beta}_{Ik}\right) + \left(\hat{\sigma}_{eC}\overline{\lambda}_{C1} - \hat{\sigma}_{eI}\overline{\lambda}_{I1}\right) + \left(\hat{\sigma}_{uC}\overline{\lambda}_{C2} - \hat{\sigma}_{uI}\overline{\lambda}_{I2}\right).$$

The left hand side of the equation is the difference in mean log wages between women in the continuous and intermittent sectors. The right-hand side is divided into four terms. The first term is the difference in wages due to differences in endowments between individuals in the two sectors. This term is often called the endowment or explained portion of the wage gap because it simply represents differences in measurable attributes such as education and occupation. The second term is the difference in wages due to differences in the coefficients of the wage equations across sectors, typically called the coefficient or unexplained portion of the gap. The third term is the difference in wages due to differences across the sectors in selection into the current labor market, and the fourth term is the difference in wages due to differences across the sectors in selection into the workers' respective sector.

When decomposing a wage differential, there is always the issue of what world would prevail in the absence of differential evaluation of endowments (that is, at what coefficients should the difference in endowments be evaluated).[19] We feel it is appropriate in this case to consider the continuous sector as the default and therefore evaluate the differences in endowments based on the continuous wage structure ($\hat{\beta}_C$).

Table 3 contains the elements of the decomposed wage differential between the intermittent and continuous sectors. This table is striking for a couple of reasons. First of all, differences in endowments (observed characteristics) contribute the largest component (but just over half) to the wage differential between women in the continuous and intermittent sectors (57 percent of the selectivity-corrected wage differential). The main contributors to the endowment effect are the differences in labor market experience and tenure across the sectors. Second, selection into the labor market and into their respective sectors is such that the actual (selectivity-corrected) wage differential (16%) is larger than the wage differential observed in the data (11%). In other words, the individual selection process works to reduce the observed wage differential between women with and without intermittent work experience. This finding is consistent with the possibility that women who are more likely to choose intermittent activity also have characteristics highly valued by the labor market.[20]

[Table 3 here]

Relative Importance of the Index Components

It is of interest to know which components of the intermittency index drives these wage differentials between continuous and intermittent workers. Table 4 compares predicted selectivity-corrected wages between continuous workers and intermittent workers with varying values for each of the index components. The predicted wages are accompanied by the wage differential between that group of intermittent workers and continuous workers (as the base comparison). As seen above, the overall selectivity-corrected wage differential between continuous and intermittent workers is roughly 16 percent. The largest wage differential (23%) is between continuous workers and intermittent workers with more than two spells. The smallest wage differential (7%) is between continuous workers and intermittent workers whose average spell length is greater than or equal to six years. The implication of the numbers in this table is that number of spells (rather than spell length) generates the greatest penalty. Even long spells (length ≥ 6 years) is better for future wages than more frequent, shorter spells (number of spells > 2, averaging 3.5 years each). Having recently returned to the labor market (percent time since last spell < 0.30) also wields a hefty penalty of 21 percent, but these women also averaged more spells (2.5) than women who took their leaves longer ago (these women took an average of 1.88 spells). These results suggest that it is not atrophy of human capital (which is more likely to occur over longer spells of absence) that is driving the wage differential between continuous and intermittent workers.

[Table 4 here]

Differences in Continuous and Intermittent Women

Table 5 presents sample means for workers determined to be in the continuous and intermittent sectors based on the value of their intermittent index (I*). Women who are determined to be in the intermittent sector are slightly older; less likely to be black; more likely to be married; have much less labor market experience; have more education; more likely to be in service occupations; less likely to be in blue collar occupations; less likely to be in agriculture, construction, or transportation industries; have less tenure with their employer; and more likely to be part-time employed. Interestingly, the average number of children that intermittent women have is only slightly higher than continuous sector women (3.34 versus 3.08). In addition, women in the intermittent sector have an average of 2.2 periods of intermittency (ranging from 1 to 8 periods), each one lasting an average of 6.8 years (ranging from 1 to 38 years). Those with intermittent behavior but classified as continuous (369 out of 1,032, not shown in the table) each have only one or two periods of absence, lasting an average of 1.9 years (ranging from 1 to 6 years). These 369 women also have an average proportion of time since their last spell equal to 0.71, which is considerably longer than the average for women in the intermittent sector (0.30).

[Table 5 here]

Structural Estimation of the Intermittent Labor Force Participation Equation

The question of the importance of the expected wage differential between the continuous and intermittent sector in a woman's decision to be in one sector or another is answered by estimating the structural version of the bivariate probit described by Equations 5 and 8; each woman's predicted difference between what she would earn in the continuous and intermittent sectors is entered as a regressor in Equation 5. The prediction of what a woman would earn in each sector is typically calculated by multiplying her individual characteristics by the parameter coefficients estimated for that sector. This standard procedure is modified slightly as follows: instead of using the observed characteristic for the woman's labor market experience (and its square) and average tenure (and its square), the average for the intermittent sector is used for estimating the predicted wage for a woman in both sectors. Given the nature of the definition of the sectors, it does not make sense to use the observed (much longer) labor market experience or tenure of a woman in the continuous sector when predicting what she would be earning in the intermittent sector.[21] Other than these two labor market characteristics, however, all other characteristics belong to the woman for whom the predicted wage is being calculated. Table 6 details the bivariate probit results from this estimation when $\hat{I}$=0.05.

[Table 6 here]

First of all, as expected, the greater the number of children a woman has in her lifetime and the more of that lifetime she spends married, the greater will be her tendency to be in the intermittent sector. Women who have smoked at some point in their lives are more likely to be in the intermittent sector, likely reflecting the positive correlation between poor health and the tendency to smoke. Those with less than a high school degree don't differ in their behavior from those with a high school degree, but college graduates are considerably more likely to have a higher degree of intermittency. Fewer children *currently* under the age of 18, increases the chances a woman is in the intermittent sector. This make sense if a woman who delayed her entry into the labor market because of child rearing choices is consequently less likely to be intermittent. Older women and black women are more likely to be intermittent. The only region where intermittency is different from the South is in the West; women in the West are more likely to be intermittent than women in the South.

The coefficient on the log wage differential is positive, but insignificantly different from zero. This implies that L_1 and L_2 must be substitutes as the coefficient is greater than or equal to zero ($\partial L_1 / \partial \alpha \geq 0$).

Implications and Conclusions

The purpose of the analysis presented in this paper is to determine to what degree intermittent labor force activity influences a woman's wages and how important that influence is in her decision to experience absences from the labor market. Like the rest of the literature on this topic, a sizable wage penalty for intermittent activity was found. While the observed wage differential between women in the continuous and intermittent sectors was found to be only 11 percent, the selectivity corrected wage differential is 16 percent. The characteristics of women selecting into the intermittent sector work to lower the observed penalty associated with that sector. Controlling for that systematic selection reveals a much higher penalty for a woman drawn at random from the population.

A second notable result from the analysis is that women experience the intermittent penalty at a fairly low level of intermittency. An intermittent index was developed as a function of the number of intermittent spells, the duration of those spells, and the time since the last spell. It was found that the penalty for intermittency was experienced at a level equal to 0.05, on an index that ranges between 0 and 5.

The third main result is that the decision to experience intermittent behavior is not influenced by the wage penalty a woman can expect to suffer later. Marital status, age, the presence of children, and health considerations far outweigh any impact the intermittent wage penalty has on the propensity to choose intermittent activity. The theoretical implication of this is that leisure is considered substitutable (as opposed to complementary) across time periods.

There is evidence that family leave policies are effective in inducing women to return to the labor market after the birth of children (Waldfogel *et al* 1999). This, in combination with the finding here that family considerations are the most important determinant of intermittent activity, suggests that strengthening family leave provisions would facilitate women's continuous attachment to the labor market.

The result that women experience a penalty at low levels of intermittent activity does not support the theory of atrophy of skills as an explanation of the intermittent wage differential. In addition, given that almost half of the selectivity-corrected wage differential is accounted for by differences in the wage equation coefficients across sectors, it is likely that employer preferences play a large role in the penalty women experience for intermittent activity. The smaller penalty for women with less frequent spells of longer duration (where we would expect to see human capital atrophy to be the greatest) relative to women with more frequent, but shorter spells further supports this conclusion.

Endnotes

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[1] See, for example Stratton (1995), Jacobsen and Levin (1995), and Baum (2002). This penalty for intermittency is often offered as one source of the lower wages observed for women relative to men. The role of intermittent activity in determining this gender wage differential, however, is not the subject of this paper.

[2] Consumption goods can easily be added to the model, but doing so does not change the results for leisure consumption and merely complicates the notation.

[3] This theoretical specification assumes common preferences across women with differing levels of intermittent activity (the form of U does not depend on the value of L_1). This assumption is relaxed somewhat in the empirical analysis through specification and control of differential self-selection processes across intermittent and continuous statuses.

[4] Holding human capital constant (i.e., holding the direct impact of L_1 on W_2 constant), the penalty for intermittency reduces to α.

[5] Details of the derivation of the results that follow are contained in an appendix available upon request.

[6] Leisure across time as complements might occur if having children in the first period produces grandchildren that increases the marginal value of a unit of leisure during the second period. Leisure across time as substitutes might occur if having and spending time with children in the first period necessitates working more in period two to pay for expenses associated with having children, such as college, or to simply make up for lower earnings in period one.

[7] This index construction is analogous to the commonly used index of female labor market attachment; see Maret-Havens (1977). As the index is constructed here, number of periods of absence and duration of absences receive the same weight. It is possible that these components are weighted differently by employers in assessing to which sector a woman should belong. Exploring further variations in this index is the subject of future work. In the actual construction of the index, the number of periods a woman experiences, N_i, is scaled by the maximum number of periods observed in the data set; this ensures that each component of the index ranges between zero and one. The HRS provides no information to quantify the characteristics of women's previous employment (such as hours of work or occupation).

[8] A woman with no spell of absence would have a value of 100% of work life since last spell.

[9] This index does not account for delays in entrance into the labor force, only the penalty associated with intermittent attachment once the individual has chosen to enter the labor force.

[10] See Baum (2002) for an analysis of the impact of maternity leave on wages exclusively.

[11] Also see Lahiri and Song (2000).

[12] This procedure was used by Field (1988) to determine the returns to slave labor on different size farms.

[13] Silber (1974) made use of this technique in examining the optimum size of security issues.

[14] This strategy has been employed by Moschos (1989), Hotchkiss (1991), Hotchkiss et al (1994) and Averett and Hotchkiss (1996).

[15] Values for $\hat{I}$ larger than 2.72 resulted in numerical errors and were clearly on the declining slope of the likelihood function.

[16] See footnote 15.

[17] The Chi-square test statistic comparing all parameter coefficients except the selection terms was 52.45. This value indicates a difference in parameter estimates at a 99 percent confidence level.

[18] The estimation procedure was performed with different excluded dummy variables for occupation and industry and the results were the same as discussed here.

[19] Notably, Reimers (1983), Cotton (1988), Idson and Feaster (1990), and Oaxaca and Ransom (1994) all address this issue.

[20] Recall that neither selectivity term was significantly different from zero. However, the fact that educational attainment across sectors are such that it works to *reduce* the wage differential across sectors lends credence to this supposition. The importance of controlling for selection when comparing wages among women can also be seen in the recent work by Neal (2002) who finds the selectivity-corrected wage differential between black and white women is larger than the observed wage differential because of positive selection by white women out of the labor market.

[21] In addition, the theoretical model requires that human capital (of which experience and tenure comprise a large portion) be held constant in deriving the impact of a penalty change on intermittent behavior. The results reported below are essentially unchanged when average experience and tenure values from either the intermittent or continuous sectors are used for both sectors in calculating the wage differential (i.e., the intermittent wage penalty). The implication is that the estimated impact of the penalty ($\hat{\theta}$) can be interpreted as a measure of the impact of a change in α on intermittent behavior.

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Figure 1. Distribution of the intermittent sector index (I*).

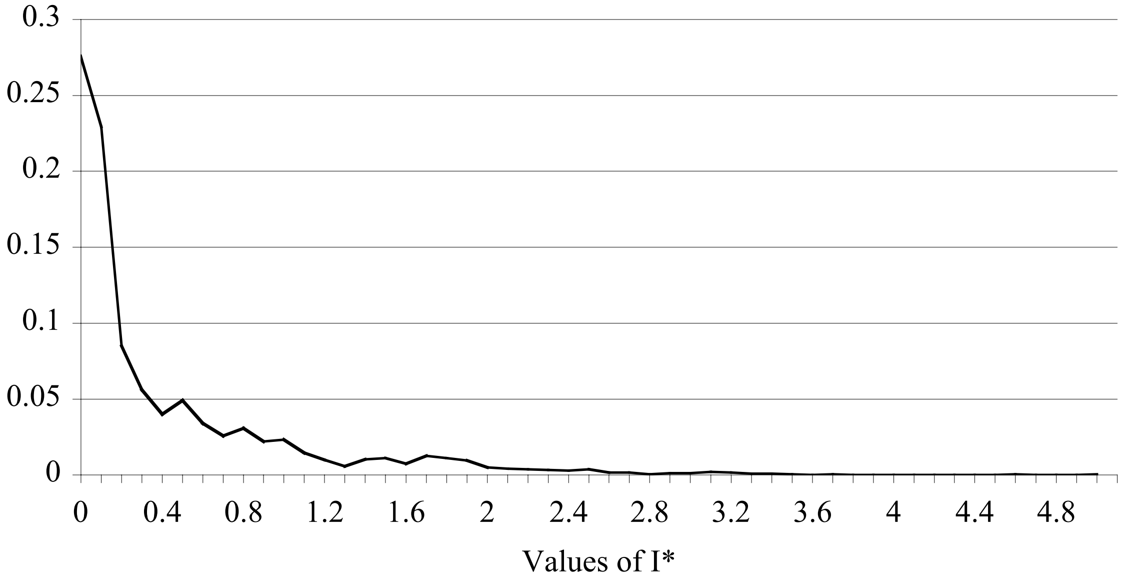

Table 1. Sample means and standard deviations.

Variables	Full Sample	Workers Only
Age	55.3132 (5.3013)	54.5054 (5.1311)
Number of children	3.3933 (2.1705)	3.2305 (2.0678)
No. Of children currently under 18 years	3.1425 (2.1104)	2.9892 (2.0211)
Non-labor income	$35,238.54 (43283.70)	$31,623.11 (34929.40)
Percent of adult life married	0.7049 (0.4061)	0.6749 (0.4194)
Black = 1	0.1688	0.1793
Married = 1	0.7307	0.7067
Less than HS = 1	0.2263	0.1468
HS graduate = 1	0.2453	0.2338
Some college = 1	0.3884	0.4251
Bachelors degree = 1	0.0854	0.1111
Graduate degree	0.0546	0.0832
Northeast = 1	0.1806	0.1934
South = 1	0.4223	0.4131
Midwest = 1	0.2405	0.2617
West = 1	0.1566	0.1319
Other health insurance available = 1	0.2925	0.1889
Ever smoked = 1	0.5385	0.5266
Acute health condition = 1	0.2761	0.2072
Husband acute health condition = 1	0.2249	0.2142
Husband work = 1	0.3935	0.4418
Employed = 1	0.4575	1.0000
Wage	--	$10.8883 (9.7717)
Labor market experience (quarters)	--	76.6780 (33.7242)
Job tenure (years)	--	12.1995 (9.3746)
% of time in the LF since first entry	--	0.7658 (0.2498)
Number of periods of intermittency	--	1.4255 (1.2882)
Average period length	--	4.1779 (5.5136)
Industry1 = 1	--	0.1926
Industry2 = 1	--	0.6468
Industry3 = 1	--	0.1606
Occupation1 = 1	--	0.2870
Occuation2 = 1	--	0.3715
Occupation3 = 1	--	0.2113
Occupation4 = 1	--	0.1302
Benefits = 1	--	0.7987
Part-time = 1	--	0.3124
Union = 1	--	0.2146
Number of Observations	**5,255**	**2,404**

Notes (Table 1):
Industry1 = 1 if Agriculture, Forestry, Fishing; Mining and Construction; Manufacturing; Transportation
Industry2 = 1 if Wholesale; Retail
Industry3 = 1 if Finance, Insurance, and Real Estate; Business and Repair Services; Personal Services; Entertainment and Recreation; Professional and Related Services; Public Administration
Occupation1 = 1 if Managerial specialty operation; Professional specialty operation and technical support
Occupation2 = 1 if Sales; Clerical, administrative support
Occupation3 = 1 if Service
Occupation4 = 1 if Farming, forestry, fishing; Precision production and repair; Operators; Armed Forces

Table 2. Maximum Likelihood Wage Equation Estimates.

Variable	Continuous Sector	Intermittent Sector
Intercept	0.3326 (0.6459)	1.1103 (1.0409)
Age	0.7292*** (0.2567)	0.3395 (0.3800)
Age Squared/1000	-0.7909*** (0.2557)	-0.3642 (0.3480)
Black = 1	-0.0058 (0.0298)	0.0437 (0.0348)
Married = 1	-0.0822*** (0.0282)	-0.0573** (0.0283)
Less than HS = 1	-0.1640*** (0.0390)	-0.1268*** (0.0410)
College Grad = 1	0.3359*** (0.0393)	0.2735*** (0.0378)
Northeast = 1	0.2270*** (0.0316)	0.1540*** (0.0319)
Midwest = 1	0.0240 (0.0291)	0.0459 (0.0285)
West = 1	0.1381*** (0.0393)	0.1435*** (0.0358)
Labor Market Exp (years)	0.0216*** (0.0067)	0.0040 (0.0073)
Labor Market Exp Squared/100	-0.0106** (0.0051)	-0.0002 (0.0075)
Job Tenure/10 (years)	0.1874*** (0.0460)	0.2495*** (0.0469)
Job Tenure Squared/1000	-0.3627*** (0.1257)	-0.2636* (0.1351)
Occupation2 = 1	-0.2669*** (0.0331)	-0.2811*** (0.0333)
Occupation3 = 1	-0.4934*** (0.0426)	-0.5138*** (0.0406)
Occupation4 = 1	-0.4560*** (0.0476)	-0.3547*** (0.0577)
Industry2 = 1	-0.0736** (0.0346)	0.0067 (0.0402)
Industry3 = 1	-0.1972*** (0.0418)	-0.1688*** (0.0451)
Union = 1	0.1032*** (0.0295)	0.1612*** (0.0304)
Part-time = 1	-0.0103 (0.0287)	-0.0056 (0.0252)
Benefits = 1	0.1530*** (0.0354)	0.1330*** (0.0298)
Lambda (labor force participation)	0.1731*** (0.0584)	0.1488*** (0.0556)
Lambda (intermittent labor force participation)	0.1105 (0.0815)	0.0188 (0.0921)
Standard Error of the Regression	0.3555*** (0.0078)	0.4113*** (0.0079)

Notes (Table 2): Standard errors are in parentheses. * => Significant at 90% confidence level, ** => Significant at 95% confidence level, *** =>Significant at 99% confidence level.
Industry1 (excluded) = 1 if Agriculture, Forestry, Fishing; Mining and Construction; Manufacturing; Transportation
Industry2 = 1 if Wholesale; Retail
Industry3 = 1 if Finance, Insurance, and Real Estate; Business and Repair Services; Personal Services; Entertainment and Recreation; Professional and Related Services; Public Administration
Occupation1 (excluded) = 1 if Managerial specialty operation; Professional specialty operation and technical support
Occupation2 = 1 if Sales; Clerical, administrative support
Occupation3 = 1 if Service
Occupation4 = 1 if Farming, forestry, fishing; Precision production and repair; Operators; Armed Forces

Table 3. Decomposition of the continuous versus intermittent wage differential.

Component of the Decomposition	Value
Observed Wage Differential:	0.1141
Selectivity-Corrected Wage Differential:	0.1572
Endowment Effect:	0.0890
Coefficient Effect:	0.0682
Selection into the Labor Market:	0.0329
Selection into the Respective Sector:	-0.0760

Table 4: Expected wages by status and characteristics of intermittent spell; penalty compared with continuous workers is in brackets.

	Sub-group Averages			
	Wage	**Number of Periods (N_i)**	**Period Length ($\frac{1}{T_i}\sum_{j=1}^{N_i} L_{ji}$)**	**Percent of Time Since Last Spell (ω_i)**
Continuous Workers (n = 1032)	$9.79	0.39	0.67	0.90
Intermittent Workers				
All (n = 1372)	$8.53 [15%][a]	2.21	6.81	0.30
Number of Spells ≤ 2 (n = 911)	$8.82 [11%]	1.54	8.47	0.34
Number of Spells > 2 (n = 461)	$7.95 [23%]	3.51	3.54	0.21
Length < 6 years (n = 781)	$8.04 [22%]	2.71	3.00	0.31
Length ≥ 6 years (n = 591)	$9.17 [7%]	1.54	11.86	0.28
Percent time since last spell < 0.30 (n = 721)	$8.16 [21%]	2.50	7.68	0.11
Percent time since last spell ≥ 0.30 (n = 651)	$8.93 [10%]	1.88	5.85	0.51

[a] This differs from the 0.1572 selectivity-corrected wage differential reported in Table 3 due to rounding.

Notes: Recall that the index of intermittency for woman *i* is defined as:

$$I_i^* = \left[N_i \left(\frac{1}{T_i} \sum_{j=1}^{N_i} L_{ji} \right) \right]^{\omega_i}$$, where *j* corresponds to a single spell of intermittency.

Table 5. Sample means of workers by intermittent status ($\hat{I} \geq 0.05$).

Variables	Continuous Sector	Intermittent Sector
Log wage	2.2823 (0.5092)	2.1681 (0.5784)
Age	53.7665 (5.4888)	55.0612 (4.7719)
Labor Market Experience (years)	23.5378 (7.6658)	15.8837 (7.4317)
Job tenure (years)	14.7364 (9.9928)	10.2912 (8.3937)
Number of children	3.08 (2.05)	3.34 (2.08)
Number of children currently under 18	2.86 (2.00)	3.09 (2.03)
% of time in the LF since first entry	0.9747 (0.0410)	0.6088 (0.2249)
Number of periods	0.3886 (0.5476)	2.2069 (1.1246)
Average period length	0.6744 (1.1486)	6.8131 (6.0084)
Weight (proportion of time in the work force since last spell)	.8963 (0.1829)	0.2984 (0.2313)
I*	0.0074 (0.0129)	0.6883 (0.6840)
Black = 1	0.2297	0.1414
Married = 1	0.6890	0.7201
Less than HS = 1	0.1521	0.1429
College grad = 1	0.1715	0.2113
Occupation1 = 1	0.2839	0.2894
Occupation2 = 1	0.3566	0.3927
Occupation3 = 1	0.1744	0.2391
Occupation4 = 1	0.1851	0.0889
Industry1 = 1	0.2655	0.1378
Industry2 = 1	0.5969	0.6844
Industry3 = 1	0.1376	0.1778
Union = 1	0.2238	0.2077
Part-time = 1	0.2229	0.3797
Benefits = 1	0.8595	0.7529
Northeast = 1	0.1928	0.1938
Midwest = 1	0.2461	0.2733
West = 1	0.1076	0.1501
Number of Observations	**1,032**	**1,372**

Notes: Standard deviations in parentheses.
Industry1 = 1 if Agriculture, Forestry, Fishing; Mining and Construction; Manufacturing; Transportation
Industry2 = 1 if Wholesale; Retail
Industry3 = 1 if Finance, Insurance, and Real Estate; Business and Repair Services; Personal Services; Entertainment and Recreation; Professional and Related Services; Public Administration
Occupation1 = 1 if Managerial specialty operation; Professional specialty operation and technical support
Occupation2 = 1 if Sales; Clerical, administrative support
Occupation3 = 1 if Service
Occupation4 = 1 if Farming, forestry, fishing; Precision production and repair; Operators; Armed Forces

Table 6. Structural estimation of the intermittent labor force participation equation.

Variable	Current Labor Force Participation	Intermittent Labor Force Participation
Intercept	-4.0911*** (1.1267)	-6.2003*** (1.8696)
$\hat{W}_C - \hat{W}_I$		0.4885 (0.5575)
Age/10	2.0266*** (0.4244)	1.7131** (0.7221)
Age Squared/1000	-2.1659*** (0.3994)	-1.2590* (0.6984)
Black = 1	0.1022** (0.0514)	-0.2700*** (0.0808)
Married = 1	-0.3052*** (0.0544)	-0.6404*** (0.1256)
Number of Children Currently Under 18	0.0059 (0.0907)	-2.0538*** (0.5133)
Less than HS = 1	-0.4896*** (0.0471)	-0.1246 (0.0892)
College Grad = 1	0.4932*** (0.0559)	0.3102*** (0.0757)
Northeast = 1	0.0223 (0.0515)	0.0302 (0.0801)
Midwest = 1	0.0612 (0.0468)	0.1250* (0.0664)
West = 1	-0.2570*** (0.0556)	0.2048** (0.0864)
Nonlabor Income/100000	-0.4990*** (0.0542)	
Acute Health Condition = 1	-0.3277*** (0.0416)	
Husband Acute Health Cond = 1	0.1101** (0.0461)	
Other Health Ins. Avail = 1	-0.5114*** (0.0421)	
Husband Work = 1	0.2525*** (0.0437)	
Ever Smoked = 1		0.1456*** (0.0516)
Percent of Adult Life Married		0.8439*** (0.1358)
Number of Children		0.2856*** (0.0597)
Number of Children Squared		-0.0049 (0.0032)
Rho	0.3599** (0.1159)	

Notes (Table 6):
Standard errors are in parentheses. * => Significant at 90% confidence level, ** => Significant at 95% confidence level, *** =>Significant at 99% confidence level.

Table A.1: Reduced form bivariate probit with selection.

Variable	Current Labor Force Participation	Intermittent Labor Force Participation
Intercept	-4.0838*** (1.1283)	-5.0549** (2.0460)
Age/10	2.0217*** (0.4249)	1.0819 (0.7824)
Age squared/1000	-2.1591*** (0.3999)	0.0251 (0.7547)
Black = 1	0.1023*** (0.0515)	-0.0643 (0.0875)
Married = 1	-0.3121*** (0.0546)	-0.4702*** (0.1433)
No. of Children Currently Under 18	0.0069 (0.0908)	-2.3140*** (0.5833)
Less than HS = 1	-0.4872*** (0.0471)	-0.1711* (0.1020)
College Grad = 1	0.4903*** (0.0559)	0.1430 (0.1022)
Northeast = 1	0.0233 (0.0515)	-0.1003 (0.0836)
Midwest = 1	0.0619 (0.0468)	0.0479 (0.0769)
West = 1	-0.2574*** (0.0556)	0.0251 (0.0996)
Nonlabor Income/100000	-0.4858*** (0.0546)	
Acute Health Condition = 1	-0.3343*** (0.0418)	
Husband Acute Health Condition = 1	0.1084** (0.0467)	
Other Health Ins. Available = 1	-0.5140*** (0.0422)	
Husband Work = 1	0.2562*** (0.0440)	
Ever Smoked = 1		0.2051*** (0.0610)
Percent of Adult Life Married		0.6285*** (0.1535)
Number of Children		0.2039*** (0.0694)
Number of Children Squared		-0.0005 (0.0043)
Occupation2 = 1		-0.0518 (0.0891)
Occupation3 = 1		-0.2376** (0.1077)
Occupation4 = 1		-0.3501*** (0.1337)

Table A.1 (continued)

Variable	Current Labor Force Participation	Intermittent Labor Force Participation
Industry2 = 1		0.1647* (0.0984)
Industry3 = 1		0.1878* (0.1120)
Labor Market Exp (years)		0.0734*** (0.0158)
Labor Market Exp Squared/100		-0.1154*** (0.0113)
Job Tenure/10 (years)		-0.5167*** (0.1142)
Job Tenure Squared/100		1.0010*** (0.3498)
Union = 1		0.1011 (0.0803)
Part-time = 1		0.0778 (0.0697)
Benefits = 1		-0.0960 (0.0841)
Rho	0.2063* (0.1237)	

Notes: Standard errors are in parentheses. * => Significant at 90% confidence level, ** => Significant at 95% confidence level, *** =>Significant at 99% confidence level.
Industry1 (excluded) = 1 if Agriculture, Forestry, Fishing; Mining and Construction; Manufacturing; Transportation
Industry2 = 1 if Wholesale; Retail
Industry3 = 1 if Finance, Insurance, and Real Estate; Business and Repair Services; Personal Services; Entertainment and Recreation; Professional and Related Services; Public Administration
Occupation1 (excluded) = 1 if Managerial specialty operation; Professional specialty operation and technical support
Occupation2 = 1 if Sales; Clerical, administrative support
Occupation3 = 1 if Service
Occupation4 = 1 if Farming, forestry, fishing; Precision production and repair; Operators; Armed Forces