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Working with Children? The Probability of Mothers Exiting the Workforce at Time of Birth

Julie L. Hotchkiss
Georgia State University

M. Melinda Pitts
Federal Reserve Bank of Atlanta

Mary Beth Walker
Georgia State University

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Abstract: Recent trends in the labor force participation of women have brought much public attention to the issue of women opting out. This paper explores the decision of working women to exit the labor market at a time of major transition—the birth of a child—utilizing linked vital statistics, administrative employer, and state welfare records. The results indicate that, consistent with utility maximization theory, women are not just opting out but rather are accurately assessing the potential opportunity and direct labor market costs of their exit decisions and are making workforce exit decisions based on measurable costs and benefits.

JEL classification: J22, J21, C24

Key words: female labor force participation, children, firm and industry dynamics

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Please address questions regarding content Julie Hotchkiss, Research Department, Federal Reserve Bank of Atlanta, 1000 Peachtree Street, N.E., Atlanta, GA 30309-4470, 404-498-8198, julie.l.hotchkiss@atl.frb.org; M. Melinda Pitts (contact author), Research Department, Federal Reserve Bank of Atlanta, 1000 Peachtree Street, N.E., Atlanta, GA 30309-4470, 404-498-8930, melinda.pitts@atl.frb.org; or Mary Beth Walker, Department of Economics, Andrew Young School of Policy Studies, Georgia State University, P.O. Box 3992, Atlanta, GA 30302-3992, 404-413-0254, mbwalker@gsu.edu.

Working With Children?
The Probability of Mothers Exiting the Workforce at Time of Birth

I. Introduction

Recent declines in the labor force participation of married women have brought the issue of women "opting out" of the labor force to the forefront of both the lay press and academic literature (Golden 2006, Hotchkiss 2006, Reimers and Stone 2007). The term "opting out" suggests that women give up their careers to care for their family, with little regard for either current career status or future career prospects. Although the bulk of empirical work suggests that declines in labor force participation rates of women are not solely attributable to changing priorities for home and career (for example, see Boushey 2005), the literature has not come to a consensus on the evidence of "opting out" behavior. Most of the evidence relies on cross-sectional data to draw conclusions about the marginal decisions of women. However, it is difficult to use stock measures of labor force status, marital status, education and number of children to identify the dynamic nature of workforce decisions.

The focus of this analysis is on workforce decisions made at a time of major transition for working women: the birth of a child. This is done with a unique data set that combines vital statistics birth information with employment data, which allows for the modeling of the specific decision to exit the workforce rather than the decision to participate in the labor force. These data also allow us to capture more information on the immediate factors that affect the decisions to exit the workforce, including information on the mother and child's health, the characteristics of the mother's industry and firm, and the mother's employment history. Evidence is provided that women's

decisions to exit the workforce upon the birth of a child are based on an evaluation of the costs and benefits of the decisions that is consistent with utility maximizing behavior.

II. Background

A vast literature quantifies the labor market penalty associated with a worker exhibiting intermittent labor force attachment. The penalty is typically measured in terms of lower wages accruing to workers who move frequently in and out, or who spend extended amounts of time out, of the labor market (Hotchkiss and Pitts 2005). A number of different hypotheses have been suggested to explain the intermittent wage penalty. It is typically assumed to be market-based and result from both employer and employee preferences and barriers to reentry into the market. While the presence of the penalty is fairly widely accepted, the source of the penalty has not been definitively identified, nor is it clear whether workers consider the penalty as a potential cost upon reentry in making the decision to exit.

The presence of this labor market penalty for intermittent behavior is particularly germane to the labor market experience of women, as they are much more likely than men to exhibit intermittent labor market behavior. Indeed, not only has intermittent labor market attachment been shown to lead to lower future wages, but it has also been shown to contribute significantly to observed wage differentials between men and women (Hotchkiss and Pitts 2007). One of the common events in a woman's life that is most likely to lead to an out-of-labor force spell is the birth of a child. Even larger than the intermittent wage penalty literature is the literature documenting the important role that children play in the labor supply decisions of women (for example, see Blau and Kahn

2007 and Cohany and Sol 2007). Young children, in particular, are theorized to significantly increase the reservation wage of women, making women more likely to exit the labor force upon the birth of a child.

This paper links these two bodies of literature by exploring whether a woman considers the potential costs of exiting the workforce when deciding whether to stop working after the birth of a child. The costs are measured in terms of both opportunity and future directs costs associated with a spell of labor market intermittency. The analysis makes use of a unique combination of administrative data to explore more dimensions of the labor force participation decision than has previously been possible. Birth records from vital statistics are combined with matched employer-employee administrative data over the period 1994-2002. These data provide a census of working mothers in the state of Georgia in this time period and contain detailed information on individual human capital, health, and labor market characteristics. The goal is to determine whether the decision to exit upon the birth of the child is being guided by an assessment of the marginal costs and marginal benefits of that decision, or, alternatively, by unobservable determinants. Such an assessment should prove useful to policy makers if they desire to shape policy to affect that decision.

The availability of multiple years of data will also allow us to determine the pattern over time of women's decisions to exit the workforce as well as the changing importance of the determinants of that decision. The dramatic change in the labor force participation of women since the late 1990s has received much attention. After decades of growth, the rate of participation flattened in 1997 and has been declining since 2000, with the decline concentrated among highly educated women with young children

(Bradbury and Katz 2005). Hotchkiss (2006) and Reimers and Stone (2007) both find that changes in behavior and characteristics, as well as the strength of the labor market, play a role in the trend; however, a substantial portion of the variation in participation remains unexplained. This analysis will examine the impact of women's behavioral changes on the changing pattern of workforce participation. Figure 1 shows the incidence of women exiting the workforce after giving birth, based on the data used in this analysis. The exit rate flattened in the late 1990s and then began increasing in 2000 (with a slight down tick in 2002, which is the last year of available birth data). This exit pattern is consistent with the fall in national labor force participation rates since the late 1990s.

[Figure 1 here]

In order to illustrate the inherent trade-off between higher current marginal utility of leisure and potential future labor market costs, this paper first presents the decision to exit the labor market in the context of a simple two-period life-cycle labor supply model. The theoretical model provides a framework to support the empirical analysis, which is a standard probability analysis of the decision to exit the labor market upon the birth of a child.

III. Theoretical Model

A woman is assumed to choose a level of consumption of leisure that allows her to maximize the present value of her lifetime utility over two periods, subject to a budget constraint. The two time periods are the present (time period one) and the future (time

period two).[1] The wage the woman earns in period two is a decreasing function of the amount of leisure she consumes in period one, thus incurring a wage penalty in period two as a result of period one leisure consumption. This period two wage penalty is market-based and derived from both employer preferences and barriers to reentry into the market, controlling for the level of human capital. Time is normalized so that the amount of leisure consumed in a period corresponds to the proportion of overall time during the period spent on leisure. The problem is formalized as follows:

$$\begin{aligned} &\max_{L_1, L_2} U(L_1, \beta L_2) \\ &\text{s.t. } W_1 + \gamma W_2 \geq L_1 W_1 + \gamma L_2 W_1 \text{ and } L_1, L_2 \leq 1 \end{aligned} \tag{1}$$

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. In addition, $W_2 = W_2(L_1)$ where $\partial W_2 / \partial L_1 < 0$ (period two wages are a decreasing function of the amount of time spent in leisure in period one).[2] Solving the optimization problem in (1) yields the following Lagrangian and first order conditions, where L_1^* and L_2^* represent the optimal amount of leisure chosen:[3]

$$\mathcal{L} = U(L_1, \beta L_2) + \lambda[W_1 + \gamma W_2 - L_1 W_1 - \gamma L_2 W_2]; \tag{2}$$

$$\mathcal{L}_{L_1} = \frac{\partial U}{\partial L_1} - \lambda\left[W_1 - \gamma(1 - L_2)\frac{\partial W_2}{\partial L_1}\right] \qquad \mathcal{L}_{L_1} > 0 \text{ if } L_1^* = 1; \tag{3}$$

[1] Time period one begins when the mother makes the decision to remain working or exit the workforce after the birth of a child.

[2] Lower returns to labor market activity in period two, reflected here through lower wages, may also manifest themselves in greater difficulty re-entering the labor market. This assumption reflects long-standing empirical evidence of the presence of a penalty associated with labor market intermittency. For example, see Polachek and Siebert 1993, Jacobsen and Levin 1995, Stratton 1995, Baum 2002, and Hotchkiss and Pitts 2005.

[3] Women are assumed to not choose to spend 100 percent of their time working.

$$\mathcal{L}_{L_2} = \beta \frac{\partial U}{\partial L_2} - \lambda \gamma W_2 \geq 0 \qquad \mathcal{L}_{L_2} > 0 \text{ if } L_2^* = 1; \tag{4}$$

$$\mathcal{L}_{\lambda} = W_1 + \gamma W_2 - L_1 W_1 - \gamma L_2 W_1 . \tag{5}$$

If L_2^*=1, the woman does not work in period two, then there are no labor market costs associated with choosing to exit the labor market in period one (L_1^*=1). However, in the event that the woman works in period two, this leads to an interior solution ($L_2^* < 1 \Rightarrow \mathcal{L}_{L_2} = 0$) and constraint (4) becomes:

$$\lambda = \frac{\beta}{\gamma W_2} \frac{\partial U}{\partial L_2} . \tag{6}$$

Substituting (6) into constraint (3) and letting $U_{L_t} = \frac{\partial U}{\partial L_t}$ (*t=1,2*) yields:

$$U_{L_1} - \frac{\beta U_{L_2}}{\gamma W_2} \left[W_1 - \gamma (1 - L_2) \frac{\partial W_2}{\partial L_1} \right] \geq 0 . \tag{3'}$$

If the woman exits the workforce in period one, then L_1^*=1 and constraint (3') becomes (re-arranging terms):

$$U_{L_1} > \beta \frac{U_{L_2}}{W_2} \left[\frac{W_1}{\gamma} - (1 - L_2) \frac{\partial W_2}{\partial L_1} \right]. \tag{3"}$$

In words, this constraint indicates that in order for exiting the labor market in period one to be the optimal choice for a woman, the marginal utility of leisure consumed in period one has to be greater than the wages foregone (and interest lost on those wages) by not working in period one (W_1 / γ), plus the cost of today's leisure on tomorrow's wages ($\partial W_2 / \partial L_1$), scaled by the amount of work in period two $(1 - L_2)$.[4] This is represented in

[4] Recall that $\partial W_2 / \partial L_1 < 0$.

terms of the dollar value of the marginal utility of leisure consumed in period two (U_{L_2}/W_2) discounted back to period one (β). The empirical challenge is to identify individual, labor market, and job characteristics that affect the marginal utilities of leisure in periods one and two and the cost of today's exit decision on tomorrow's labor market outcome (reflected in equation 3" through $\partial W_2/\partial L_1$).

IV. Empirical Model

The propensity for a woman to exit the workforce at the time of birth can be expressed in terms of the theoretical model in the previous section. The following observed indicator variable is defined for each woman (omitting the subscript *i* for ease of exposition):

$$e = \begin{cases} 1 \text{ if } U_{L_1} - \beta \dfrac{U_{L_2}}{W_2}\left(\dfrac{W_1}{\gamma} - (1-L_2)\dfrac{\partial W_2}{\partial L_1}\right) > 0 \\ 0 \text{ otherwise} \end{cases} \tag{7}$$

Assuming linearity and conditioning on working prior to birth, estimates for the following reduced-form stochastic equation are obtained via maximum likelihood probit:

$$\Pr(e_i = 1 \,|\, \text{working prior to birth}) = \alpha_0 + X_i'\alpha_1 + Y_i'\alpha_2 + Z_i'\alpha_3 + \varepsilon_i \,. \tag{8}$$

The probability of exiting the workforce after birth is determined by demographic, human capital, and geographic characteristics, X_i; health characteristics of the woman and her child, Y_i; and the characteristics of pre-birth firm and industry, Z_i. The specification in equation (8) is modified to include time dummy variables and time interactions with some characteristics previously found useful in explaining the changes in labor force participation rates observed since the mid-1990s.

The variables included in Z_i correspond to the firm and industry in which the woman was most recently employed prior to the birth of her child.[5] It includes firm size, average industry quarterly wage, the rate of industry turnover, industry job creation and destruction, the number of establishments in the industry, the average establishment size in the industry, as well as indicator variables for whether a firm has been born in the last year, is expanding, contracting, or will die within the next year. If there is a high level of turnover in the industry, which might suggest low reward for job tenure, then the woman would expect the future cost for absence to be low. In a growing industry, the opportunity cost for exiting the workforce could be is higher, as a growing industry could experience future high wage growth due to higher demand for workers. Similarly, the cost for exiting an industry experiencing high levels of job destruction would be low due to a higher degree of uncertainty about future employment and lower expected future wage growth. Likewise, the cost of exiting would be expected to be higher in an expanding or new firm and lower in a contracting or dying firm.

Characteristics that increase the return to market work will increase the opportunity cost of leisure and thus decrease the probability of exit. Generally, labor force participation is expected to increase at a decreasing rate with age, and to increase with education, job tenure, and experience; the same relationships are expected to hold for the exit decision. Job specific human capital should lower the probability of leaving a

[5] One might be concerned that industry characteristics as determinants of a woman's exit decision might be endogenous. In other words, a woman may have chosen a specific industry of employment anticipating intermittent labor market activity. To mitigate this potential for bias, many demographic characteristics are included to help control for individual heterogeneity. Industry dummy variables are also included to draw any endogeneity bias away from the impact specific characteristics of those industries might have on the exit decision. In addition, the industry characteristics of interest are those associated with the timing of the exit decision, and these characteristics change over time, thus any remaining bias is expected to be negligible.

job as the returns to that investment will likely be less at another job. The maximum quarterly earnings in the four quarters prior to birth along with current job tenure are used to proxy for specific human capital (after controlling for general human capital with age, education, and experience).

Characteristics that are expected to increase the individual's reservation wage, thus increasing the probability of exiting the workforce include: multiple births, the number of prior children, the presence of a father with a high level of education, the receipt of TANF/AFDC benefits in the first quarter after the birth of the child, labor and delivery complications that impair the mother's health, medical risk factors unrelated to pregnancy, and adverse health outcomes for the infant. The absence of a father, or the presence of a father with low levels of education, could work to decrease the probability of exit due to budget constraints.

Lifestyle choices, such as drinking and smoking during pregnancy, as well as prenatal care utilization, are included as proxies for rate of time preference. Individuals who engage in risky behavior or who do not obtain prenatal care might be expected to value current leisure more than future and thus could be more likely to exit the workforce after giving birth, controlling for any adverse health outcomes that could also influence the employment decision. On the other hand, the mother's failure to change risky behavior or to obtain prenatal care could indicate a lack of interest in the child. Thus, the sign of these variables cannot be determined *a priori*.

There is a well-established relationship between labor force participation decisions and the strength of the labor market (for example, see Hotchkiss and Robertson 2006). Strong labor markets increase the opportunity cost of being absent and should

thus decrease the probability of exiting. The seasonally adjusted quarterly unemployment rate for the state is included to capture this relationship.

Previous studies of the change in labor force participation rates of women since the mid-1990s have found that changing behavior among well-educated and married women are important factors (Bradbury and Katz 2005). In order to identify potential behavioral changes in the decision to exit the labor market upon the birth of a child, year dummy variables are interacted with measures of education and marital status. Year dummy variables are also included separately in order to capture changes in exit decisions over time not explained by observed characteristics.

Geographic characteristics of the woman's county of residence are included as controls for differences in employment opportunities and resources available for working mothers, such as quality child care.

V. Data

This paper utilizes Vital Statistics birth records from the State of Georgia for the period 1994 to 2002 linked with three sets of state administrative records and the Public Use Microsample of the Census (PUMS). The first two, the Employer File and the Individual Wage File, are compiled by the Georgia Department of Labor for the purposes of administering the state's Unemployment Insurance (UI) program. The third data set contains Welfare Recipient Data from the Georgia Department of Human Resources. All the data used in the analysis are highly confidential and strictly limited in their distribution.

The vital statistics birth records contain demographic information for the mother and father, including age, race, education, and marital status, as well as information on behavior during pregnancy, adverse outcomes, comorbid conditions, and complications associated with either the mother or the infant. The Welfare Recipient data provides information on the level of TANF/AFDC benefits received in a quarter.

The Employer File provides an almost complete census of firms in non-farm sectors, covering approximately 97 percent of non-farm workers, with records on all UI-covered firms. The establishment level information includes the number of employees, the total wage bill and the NAICS classification of each establishment.[6] The Individual Wage File contains quarterly earnings information for all of those workers.[7] Regrettably, this data set contains no information about the worker's demographics (e.g., education, gender, race, etc.), thus making it impossible to draw a control group of women not giving birth. There is no specific information about the worker's job (e.g., hours of work, weeks of work, or occupation). The worker's earnings and employer information can be tracked over time and linked to the vital records data using an individual identifier.

Because the Individual Wage file contains a firm rather than establishment identifier, a choice of which NAICS code to assign to each worker who was employed by a multi-establishment firm is required. Following the Department of Labor convention, a 6-digit NAICS code is assigned based on the largest share of the firm's total employment.

[6] White et al. (1990) provide an extensive discussion about the use of these employment data, commonly referred to as the Quarterly Census of Employment and Wages (QCEW), or ES-202 data.

[7] Included in earnings are pay for vacation and other paid leave, bonuses, stock options, tips, the cash value of meals and lodging, and in some states, contributions to deferred compensation plans (such as 401(k) plans). Covered employer contributions for old-age, survivors, and disability insurance (OASDI), health insurance, unemployment insurance, workers' compensation, and private pension and welfare funds are not reported as wages. Employee contributions for the same purposes, however, as well as money withheld for income taxes, union dues, and so forth, are reported even though they are deducted from the worker's gross pay.

The NAICS code for that industry is used to estimate industry dummy variables at the three-digit level. Women working in the agricultural and mining industries are dropped due to poor coverage and industry size.

A woman is defined as being in the workforce if she worked in any of the four quarters prior to the birth quarter. This definition of workforce participation is designed to capture women who are forced to take time out of their job due to pregnancy related issues and to remove issues of seasonality from the data. A woman is defined as exiting the workforce if she is not working in the second quarter after the birth quarter. [8] The earnings used to proxy for specific human capital is the highest quarterly earnings in four quarters preceding the birth quarter, again in order to minimize any impact of pregnancy related illnesses. Georgia labor market experience and current job tenure are calculated using data on the three years prior to the occurrence of birth. Construction of these variables over a longer period of time is not possible due to data limitations. [9] The number of jobs worked in a quarter in the year preceding birth is constructed as the maximum number of jobs held in any quarter in the year prior to birth and is designed to capture the woman's attachment (or lack thereof) to any particular job.

Job creation in the woman's pre-birth employment industry is measured by the share of jobs in that industry created due to the opening of a new firm or the expansion of an existing firm in the year prior to the exit decision. Conversely, job destruction is measured by the share of jobs in the woman's pre-birth employment industry that were

[8] For example, if a woman gave birth in Quarter 4 of 2000 the pre-birth labor force status would be based on Quarter 4 of 1999 and the first three quarters of 2000 and the exit decision would be based on her labor market status in Quarter 2 of 2001.

[9] As the employment data is limited to employment information for the State of Georgia, individuals who moved to Georgia in the three years prior to birth could have lower levels of labor market experience recorded than was actually incurred.

lost due to closure or contraction of a firm in the year prior to the exit decision. The industry turnover rate is measured by the share of employees in the woman's pre-birth employment industry who were not employed by the same employer in the previous year.[10] A firm is considered to have just been born if there was employment in the last four quarters that was preceded by four quarters of zero employment. A firm is considered to be dying if within the next year there is a quarter of zero employment followed by three quarters of zero employment. A firm is considered to be contracting if the employment in the current quarter is less than employment in that quarter in the previous year and vice versa for expanding.

The prenatal care measure is captured by the number of prenatal care visits and the square of the number of prenatal care visits to capture the nonlinearity due to higher usage by at-risk mothers. The smoking and alcohol dummy variables are equal to one if the mother indicated the use of tobacco or alcohol during pregnancy. In addition, controls for infant health and medical risk factors for the mother, independent of pregnancy, are also included. The unemployment rate is the quarterly seasonally adjusted unemployment rate for the state of Georgia, obtained from the Bureau of Labor Statistics. The county-level characteristics are obtained from Public Use Microsample of the Census

After excluding observations with missing data, the analysis is performed on 636,928 women who were in the Georgia workforce prior to giving birth for the years 1994-2002. The data were separated for analysis on the basis of whether this was a first birth (FB) for, or a subsequent birth (SB) for the mother. The FB analysis includes

[10] Job loss, job creation and the turnover rate are the average of the four quarters preceding the exit decision.

293,249 women and the SB analysis includes 343,679 women who had previously chosen to be a working mother and then gave birth to their second (or more) child.

The data means are presented in Table 1. Overall, approximately one-third of the women chose to exit the labor force upon the birth of a child. The average age was 25 for the FB and 28 for the SB birth group. FB mothers were less likely to be black than SB mothers (30.1 versus 40.5 percent), more likely to have 4 or more years of college (30.1 versus 20.7 percent), and had lower levels of AFDC/TANF benefits ($26.91 versus $75.29 per quarter, on average), as would be expected. The racial difference in the two samples is due both to the fact that black mothers are more likely to continue to work after the birth of a child and that they have more children on average.

[Table 1 here]

63.0 percent of the FB sample and 65.1 percent of the SB sample were married, with 21.5 and 19.0 percent of FB and SB, respectively, being single with a father named on the birth certificate. For the approximately 84 percent of observations with a father named (whether married or not), the average age of the father was 28.2 for FB and 30.7 years for SB. As with the mothers, a much larger share of the fathers are black in SB than in FB while the average education of the father is lower for SB than FB.

There does not appear to be any systematic differences in the industry and firm characteristics for the two groups. The average firm has approximately 2500 workers and 27 establishments. The median quarterly earnings are $3,733.28 for FB and $4,319.87 for SB. Over the three years prior to giving birth, both groups have almost nine quarters of experience, have changed labor market status an average of three times, have just over five quarters of job tenure, and hold an average of approximately 1.4 jobs per quarter.

VI. Results

The first set of results are from a maximum likelihood probit estimation of equation (8) using the FB sample of women (column 2 in Table 2). The second set of results corresponds to estimation of the same model, but uses only SB mothers; in this case the analysis examines the impact of an additional child on the work decision, given that the woman has already chosen to be a working mother (column 3 in Table 2). The expectation is that factors influencing the decision to exit the labor market for these women will be different than for FB mothers. All estimates are obtained conditional on the woman having been employed in any quarter during the year prior to giving birth.

[Table 2 here]

As previously discussed, the covariates used in estimation can be divided into roughly four categories: industry characteristics that reflect the potential opportunity and direct cost of absence from the workforce, demographic and human capital characteristics of the mother and father, medical factors corresponding to the mother and the child, and non-observed factors and changing behavior that are captured through year dummy variables and their interactions with select characteristics. Results for each of these categories are discussed in turn, based on average marginal effects.

A. Industry and Firm Characteristics

Industry and firm characteristics have estimated effects that line up with prior expectations. Women employed in industries with higher levels of job creation over the past year are less likely to exit the workforce after the birth of a child regardless of

whether it is the first or subsequent birth. A ten percentage point increase in the share of jobs created in a quarter in the mother's industry of employment lowers the probability of exit by 0.2 percentage points for FB and 0.5 percentage points for SB. This suggests that rapidly growing industries signal higher opportunity costs of leaving, both in terms of current earnings and future earnings. Job destruction has the opposite effect; women employed in industries where jobs are being destroyed are more likely to leave the workforce, with the effect once again being slightly larger for the women who already have children. The results are similar at the firm level; working in a firm that has just been born within the last year decreases the probability of exiting while working in a firm that is dying or contracting increases the probability of exiting.

Industries with larger numbers of establishments are associated with higher probabilities of exit for both the FB and SB samples, likely indicating a greater expectation of finding a job in the future. However, larger average firm size within the industry and larger firm size are associated with lower probabilities of exit; suggesting that larger firms are better able to make accommodations for working mothers.

B. Human Capital and Demographic Characteristics

The woman's own labor market experiences are very important in determining exit. The impact on workforce exit of multiple job changes in the year preceding the woman's pregnancy is substantial and very precisely estimated. A one unit increase in the variable, from two job changes to three, for example, increases the probability of exit by approximately two percentage points. This seems reasonable, as a higher number of job changes could indicate both a lack of attachment to particular jobs as well as

confidence in the ability to find other jobs, both of which would lower the marginal cost of any given exit decision. The effect of tenure on the current job is also as anticipated; an additional quarter of tenure on the current job lowers the probability of exit by just over half a percentage point. More job tenure means a higher level of firm-specific human capital, the return to which would be lost upon exit.

Women holding multiple jobs in a quarter are much less likely to exit the workforce. For example, increasing the number of jobs, say from one to two, lowers a woman's exit probability by over six percentage points for both FB and SB mothers. Holding multiple jobs prior to the birth of a child most probably signals a poverty effect, which would tend to increase the marginal cost of an exit.

The woman's own quarterly wage from the year prior to the birth of the child has the expected negative impact on the probability of exit. Higher paid women face higher opportunity costs and therefore a higher penalty for leaving the workforce. The results indicate that a $1000 increase in quarterly wages is associated with about half a percentage point decrease in the probability of workforce exit.

Some of the most interesting results relate to the impacts of the mother's and the father's educational attainments. These coefficients are estimated very precisely and are similar in both of the models. A woman who has not completed high school is about two percentage points more likely to exit work than women with high school diplomas, likely reflecting the lower opportunity cost experienced by the lowest educated workers. Women with educational attainment above the high school level have much lower probabilities of leaving the workforce, with the exception of FB women with between one and three years of college. For that subgroup, the marginal effect shows a very small

increase in the probability of exit, relative to a FB woman with a high school diploma. The model specification allows the impact of a college education or more to vary over time; these interaction effects are discussed below.

The impact of the father's education level differs sharply from that of the mother. If the infant's father has not completed high school, the FB mother's probability of exit is over six percentage points lower than for fathers with a high school diploma, holding constant the educational level of the mother. On the other hand, if the infant's father has four or more years of college, the woman is substantially more likely to exit, by nearly ten percentage points for the FB sample and by over seven percentage points for SB. Note that these results pertain to the almost 85 percent of the sample that has a father named on the birth certificate. The model also includes marital status; being married raises the probability of exit by over 6 percentage points for FB mothers but has no significant effect in the SB sample. The effect of marriage is allowed to vary over time, as well; these marginal effects are discussed below as well.

Medicaid status has a strong positive impact on the probability of the mother's exit from the workforce; the effect is around four percentage points for both groups. This result could reflect opportunity cost – if one's best option is a low-paying job, the costs of child care can outweigh the gains from working. Another possible interpretation is that the incentive to work is lower if one faces the loss of medical benefits for the new infant. Similarly, women with higher TANF (or AFDC, in the earlier years) benefits immediately after giving birth are more likely to exit the workforce, all else equal, but only very marginally.

The demographic and economic characteristics of the women's geographic locations also influence their decisions regarding exit from the workforce after the birth of a child. The percent of the mother's county of residence that is urban and the county median income are both included to measure these influences. These variables both have positive impacts on the probability of exit. Holding the percent urban constant, higher median income probably indicates greater general prosperity; hence women are more likely to exit the workforce. Women who live in more urbanized areas possibly face greater and more varied re-entry employment opportunities, whether they are first time mothers or working mothers; this lower marginal cost of an exit means that they are more likely to choose to exit the workforce. The overall unemployment rate has only a very small and imprecisely estimated impact on labor force exits; this probably results from the inclusion of the woman's own employment and employer characteristics.

C. Health Characteristics

The set of variables that capture aspects of the infant's and the mother's health and behavior yield some interesting findings. Mothers are more likely to exit the workforce if their infant is premature or low birth weight, with somewhat stronger effects for SB women. However, once birth weight and gestation length are controlled for, congenital anomalies such as downs syndrome or heart problems have only small and mostly insignificant impacts on returning to the workforce. Health problems associated with the mother also have no impact on workforce participation, so that presumably if the mother was able to work prior to the birth of the child with the health conditions, birth

does not alter behavior. Another plausible explanation is that the need for group health insurance is offsetting the increased opportunity cost of work.

Birth certificate data contain two self-reported variables that indicate whether the mother used alcohol or tobacco products during the pregnancy. Both variables have positive and precisely estimated coefficients for SB mothers. Alcohol use increases the probability of exit is about 3.4 percentage points and the use of tobacco increases the probability of exit by 0.7 percentage points. Because both tobacco and alcohol use during pregnancy are strongly discouraged, the fact that these women reported this behavior suggests that they have a high rate of time preference. This, in turn, suggests that they might tend to discount any costs associated with leaving the workforce. The effects of alcohol and tobacco use are very small and are not significantly different from zero for the FB sample.

D. Behavioral Change and Unobserved Factors

The impacts of several variables are allowed to vary over the period of the data. Year dummy variables are included to capture any time trends which are not associated with the other covariates. College education and marital status are also both interacted with the year dummies.

The previous discussion stated that women with four or more years of college education were substantially less likely to exit the workforce than women who ended their education with only a high school diploma. However, this effect varies over time. Marginal effects measuring the difference in the probability of exit for college educated women as compared to women with high school diplomas are computed within each

year. The results are displayed in Figure 2; they indicate that women with college degrees are less likely to exit in every year relative to women with high school diplomas, *ceteris paribus*. However, this difference declined throughout the 1990s, reaching a minimum of less than five percentage points less in 2000 for women experiencing their first birth, before increasing again to nearly an eight percentage point difference in 2001 and 2002.

[Figure 2 here]

Figure 3 illustrates that over this time period the impact of being married seems to have undergone more change than the impact of education. Marriage has a much stronger positive impact on the probability that a first-time mother exits the labor market, compared to SB mothers. In 2000, a married FB mother was about nine percentage points more likely than a single FB mother to exit the labor market, whereas a married SB mother was four percentage points more likely to exit than a single SB mother. Starting in the late 1990s, the impact of marriage on exiting the labor market flattened out and then dropped sharply in 2001, with the effect becoming negative for SB in 2001 and 2002. This change in the impact of marital status on the exit decision partially coincides with the decline in overall labor force participation observed through the year 2000.

[Figure 3 here]

These marginal effects do not reveal whether the time-varying effects result from changes in the behavior of married, single, college-educated, or non-college educated women, or all of the above. Figures 4a and 4b, which present the predicted probabilities of exit by marital status and education, provide some insights into that issue. The patterns for single women suggest that across the business cycle, the substitution effect is

dominating the income effect, with more extreme swings for the single high school educated. When the economy was strong in the mid-1990s, the opportunity cost of exiting the labor force increased and the single mothers responded with a reduction in exit rates after birth. However, as the economy entered a recession, the opportunity cost of exiting decreased, especially with the availability of welfare for single mothers, and the average probability of exit increased. For married, college-educated women the opposite occurred. The predicted probability of exit increased during the period of a strong economy and then decreased as the economy weakened. Perhaps the increase in spousal income during the boom was enough to allow the income effect to dominate.[11] However, when the economy took a downturn in 2001, the rate of exit began to decline, possibly indicating the need to self insure the family against a spell of unemployment or lower wages, given that married women are less likely to qualify for public assistance if their spouse has income.

[Figures 4a and 4b here]

Figures 4a and 4b also highlight dramatic behavioral differences between FB and SB mothers. Among FB mothers, college educated women are consistently more likely to exit the labor market than those with just a high school degree. However, college educated SB mothers are *less* likely to exit than their high school graduate counterparts. These figures illustrate how simple marginal effects can mask a more complex difference in behavior across characteristics.

[11] Although earnings information for the spouse is not available, over seventy percent of the married mothers with college degree are married to husbands with a college degree. This is consistent with Hernstein and Murray (1994) who found evidence of assertive mating; i.e. husbands and wives tend to have similar skills and education levels.

VII. Importance of Accounting for Health and Job Characteristics

A contribution of this paper is the ability to link health and employer characteristics to the labor supply decisions of women. In order to illustrate the marginal contribution of this information, both models are re-estimated without the novel regressors. Coefficients on the key variables of interest, education and marital status, are compared across the two models to determine how health and employer related characteristics contribute to the understanding of women's labor supply decisions. These results are presented in Tables 3a and 3b. Column one of each table presents the results for the traditional labor supply model that includes demographic and geographic characteristics, local economic conditions, the age, education, and race of the father as a proxy for spousal income, other income, and year effects. The health characteristics of the mother and child are added in column 2 and the characteristics of the mother's pre-birth industry, firm, and employment are added in column 3. No interactions are included in these models in order to obtain single summary statistics for college education and marital status.

[Tables 3a and 3b here]

In general, it appears that the exclusion of the characteristics of the mother's prebirth industry, firm, and employment leads to an overstatement of the effect of education and marriage on the exit decision. The negative effect of four or more years of college education in the FB declines only slightly from a negative 9.8 to a negative 9.6 with the inclusion of the health characteristics. However, the inclusion of the prebirth employment related characteristics results in a decline to a negative 6.9 percentage points. The impact of having less than a high school education, however, dropped from

an estimated 7.5 percentage point increase in exit probability to only a 2.1 percent increase, when employment characteristics are included. A similar trend holds in the SB sample, with the marginal impact of a college degree dropping from -12.0 percentage points to -7.8 percentage points. The coefficients on the married dummy and the single-father named dummy show the similar results of the effects being overstated in the models that exclude employment conditions. There was a slight increase in the effect of marriage with the inclusion of the health variables but then substantial declines once employment-related conditions are included. The pattern for single-father named is similar, with the effect in the final model dropping to virtually zero for both groups. In general it appears that the inclusion of the employment-related variables allows for a better separation of the effect of education and marital status from the effect of human capital.

VIII. Conclusion

The primary conclusion from the analysis in this paper is that women appear to be responding rationally to the costs and benefits associated with the decision to exit the labor market at the birth of a child. In other words, after controlling for a myriad of demographic, human capital, health, and labor market characteristics, women appear to be accurately assessing the potential opportunity and direct labor market costs of their exit decision. The estimated dynamic relationships indicated changing behavior for both married women and college-educated women, yet these changes cannot fully explain the observed pattern of labor force participation rates among women overall.

In general, the results provide fairly consistent evidence that the higher the marginal utility of not working (higher reservation wage), the higher the probability of observing a woman exit the labor market. For example, health concerns of the child, such as low birth weight and premature birth increase the exit probability. Being married and having a husband with more education also leads to a higher reservation wage and greater likelihood of exiting. In addition, higher rates of time preference, as demonstrated through smoking and alcohol use during the pregnancy, leads to a greater probability of exiting.

Further evidence of rational behavior showed up through the impact of pre-birth employment characteristics on the decision to exit the labor market. Industries with lower levels of job creation and higher levels of job destruction offer lower opportunity costs to leaving employment. Women employed in industries with these characteristics (and firms with similar characteristics) are estimated to be more likely to exit the labor market after the birth of a child. In addition, higher earning women face a higher opportunity cost to exiting, and these women are less likely to exit. Factors that reduce the risk of not finding a job upon reentry, such as employment in a relatively large industry or firm, are associated with higher estimated probabilities of exit. The evidence provided in this paper, that women's decision to exit the labor workforce are consistent with utility maximization theory, does not support the notion that women are "opting out." Rather, women are making workforce exit decisions based on measurable costs and benefits. This result suggests the presence of powerful tools if policy makers desired to affect those decisions. While specific policy goals are left to a different forum, the tools

are clear. Any measures designed to alter the cost of exiting will be effective in influencing decisions toward that end.

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Figure 1. Percent of Mothers exiting the Georgia workforce upon the birth of a child, 1994-2002.

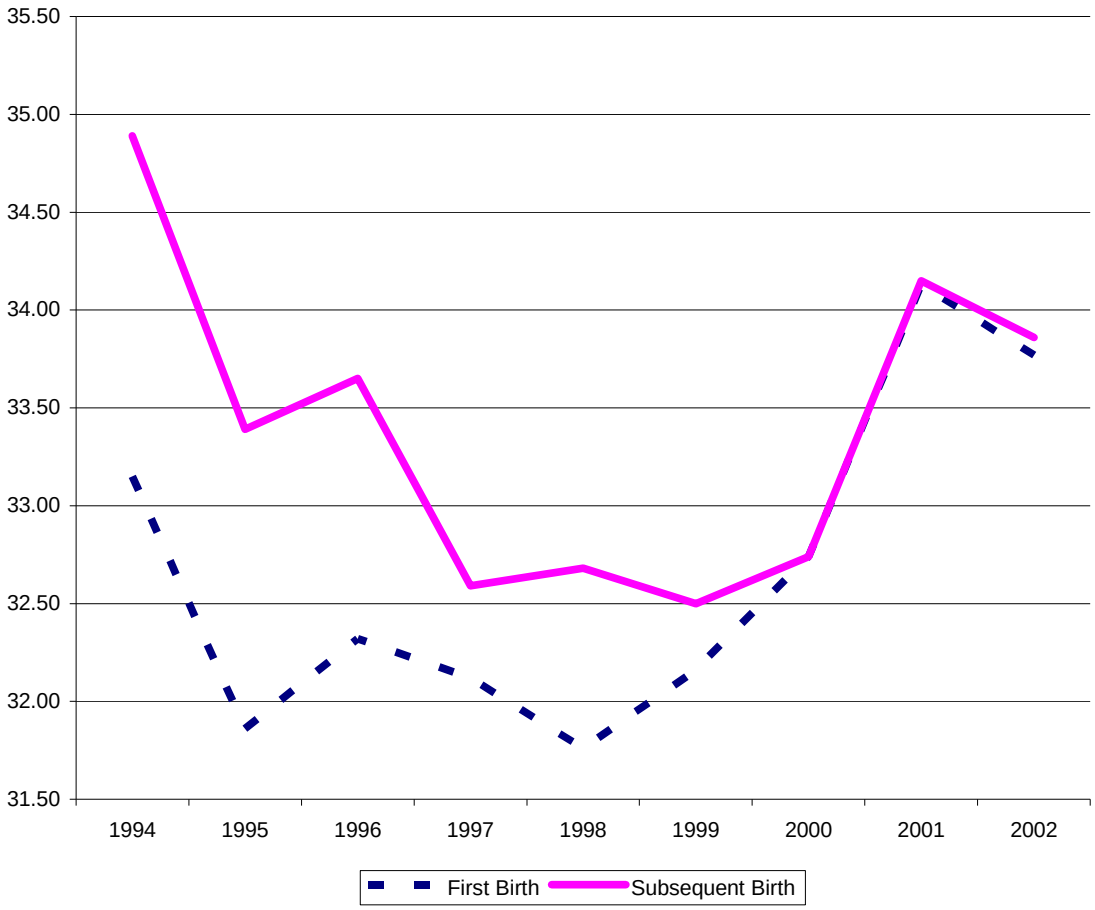

Figure 2. Average marginal effect of four or more years of college on the probability of exiting the workforce upon the birth of a child, 1994-2002.

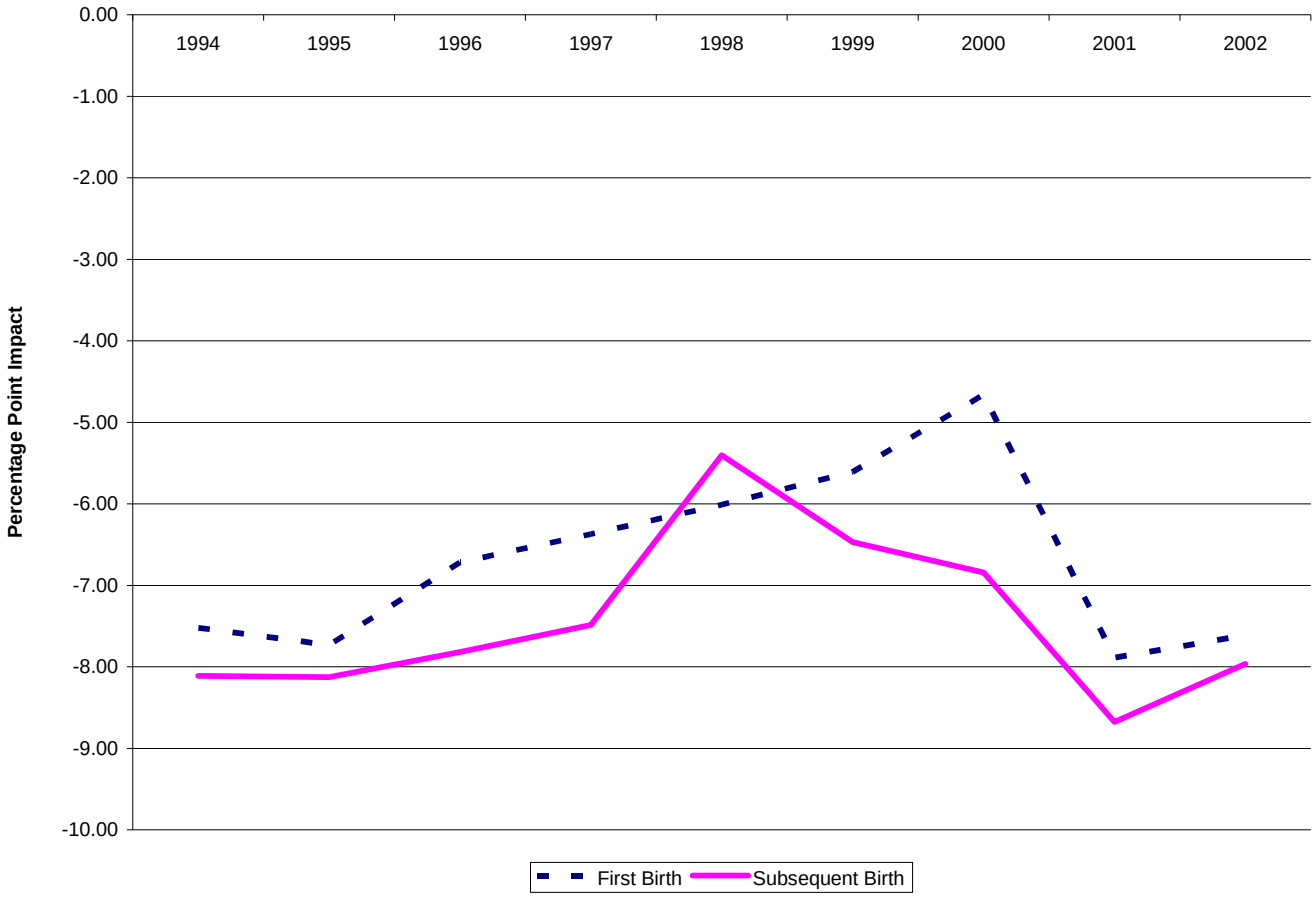

Figure 3. Average marginal effect of marriage on the probability of exiting the workforce upon the birth of a child, 1994-2002.

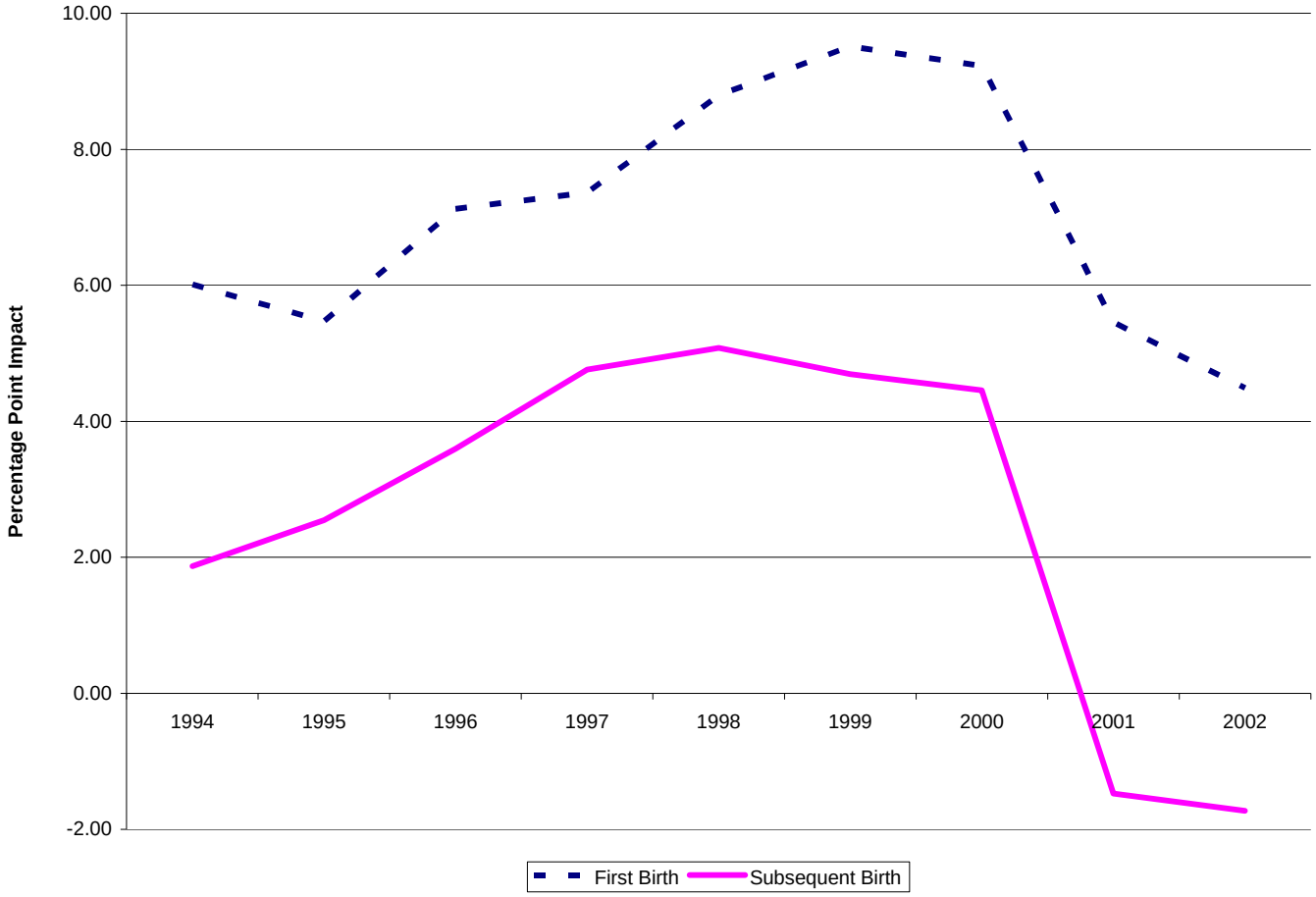

Figure 4a. Predicted Probability of Exit by Years of Education and Marital Status, 1994-2002: FB Sample.

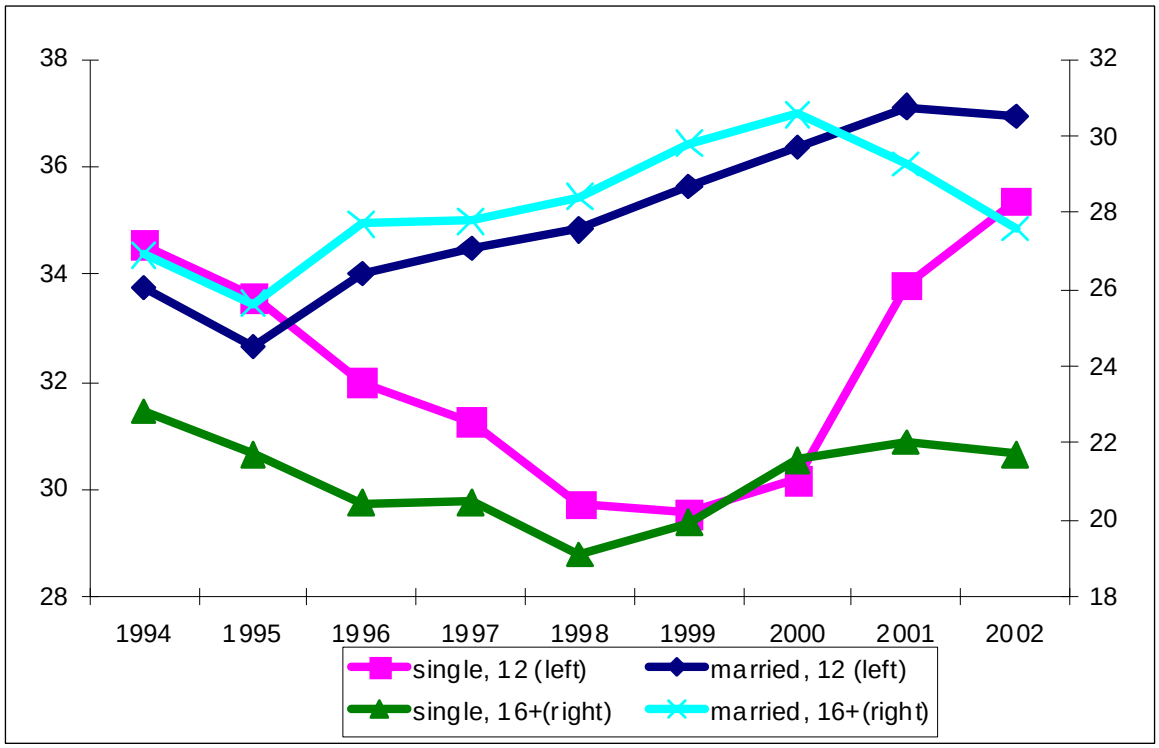

Figure 4b. Predicted Probability of Exit by Years of Education and Marital Status, 1994-2002: SB Sample.

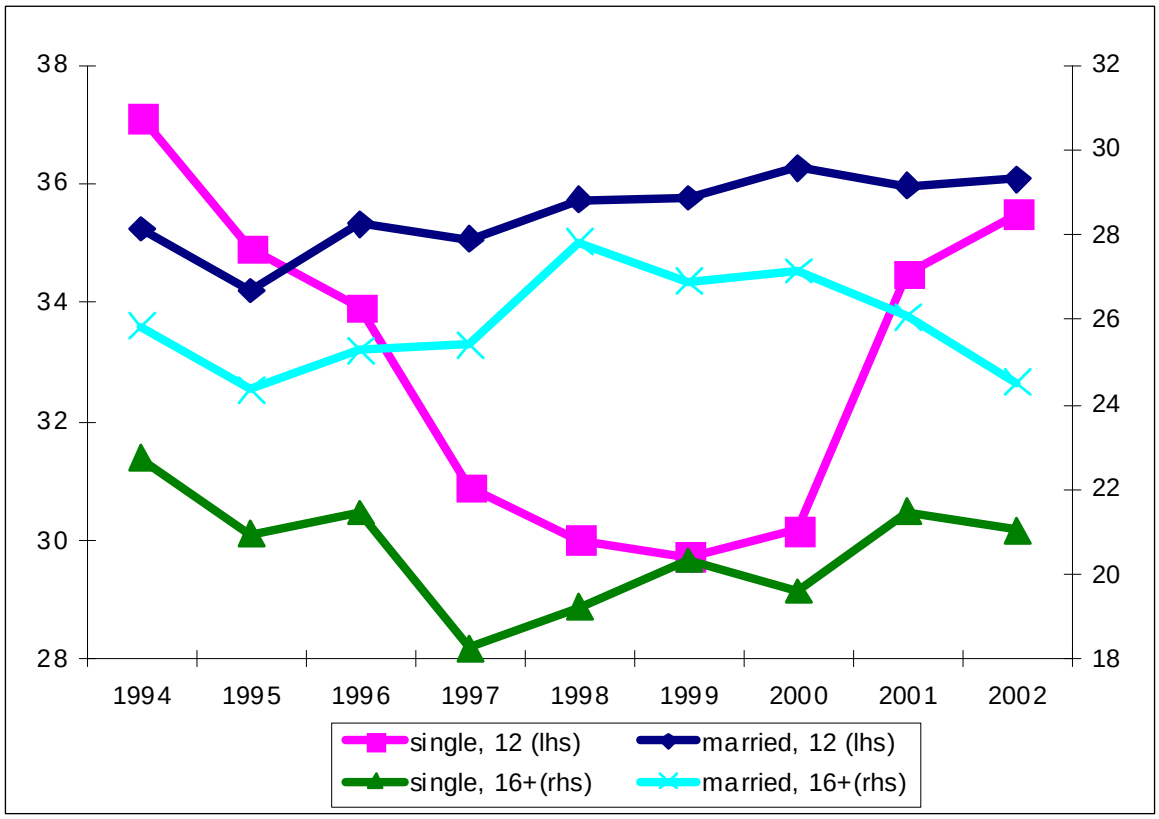

Table 1. Sample means (std. dev.)

Variables	First Birth	Subsequent Birth
N	293,249	344,296
Exit	0.3269 (0.46919)	0.3347 (0.4719)
Industry and Firm Characteristics		
Share of Jobs Destroyed per Quarter	0.1610 (0.0631)	0.1628 (0.0644)
Share of Jobs Created per Quarter	0.1887 (0.0641)	0.1876 (0.0653)
Number of Establishments	61.6499 (58.8026)	58.6157 (57.0502)
Number of Employees per Establishment	18.0343 (29.9336)	19.7240 (31.6685)
Turnover	1.8514 (0.5769)	1.8539 (0.5894)
Average Industry Wage/1000 ($)	7.0771 (3.6585)	6.9521 (3.4839)
Firm Characteristics		
Firm Size	25.3607 (56.3693)	25.2073 (57.3266)
Just Born	0.0259 (0.1589)	0.0255 (0.1575)
Dying	0.0096 (0.0976)	0.0130 (0.1133)
Contracting	0.3276 (0.4693)	0.3417 (0.4743)
Expanding	0.4816 (0.4997)	0.4678 (0.4990)
Job Characteristics		
Quarterly Earnings/1000 ($)	6.1244 (12.6651)	5.2767 (10.1176)
Labor Market Experience	8.9751 (3.4239)	8.8196 (3.4230)
Number of Labor Market Status Changes	2.7373 (2.1742)	2.8489 (2.2827)
Current Job Tenure	5.3753 (4.0228)	5.4325 (4.1184)
Number of jobs per Quarter	1.4233 (0.6740)	1.3735 (0.6464)
Mother's Characteristics		
Age	25.1940 (5.6267)	27.7710 (5.6253)
Black	0.3013 (0.4588)	0.4047 (0.4908)
Hispanic	0.0220 (0.1468)	0.0285 (0.1664)

Less than High School Education	0.1401 (0.3471)	0.1779 (0.3824)
1-3 Years of College Education	0.2312 (0.4216)	0.2319 (0.4220)
4 or More Years of College Education	0.3013 (0.4588)	0.2070 (0.4052)
Married	0.6300 (0.4828)	0.6506 (0.4768)
Single - Father Named	0.2150 (0.4108)	0.1902 (0.3924)
Medicaid Recipient	0.3007 (0.4585)	0.3260 (0.4687)
AFDC/TANF Benefit Level	26.9142 (131.4023)	75.2915 (243.6732)
Father's Characteristics (if named)		
Father's Age	28.2454 (6.2867)	30.6742 (6.3715)
Father Black	0.2582 (0.4376)	0.3510 (0.4773)
Father Hispanic	0.0264 (0.1604)	0.0368 (0.1884)
Father Less than High School Education	0.1241 (0.3297)	0.1533 (0.3603)
Father 1-3 Years of College Education	0.2106 (0.4078)	0.2018 (0.4013)
Father 4 or More Years of College Education	0.3076 (0.4615)	0.2275 (0.4192)
Geographic Characteristics		
Percent of County that is Urban 2000	0.5220 (0.4426)	0.4989 (0.4456)
Median County Income/1000 ($) 2000	44.6790 (11.2108)	43.4262 (11.0595)
Seasonally Adjusted Quarterly Unemployment Rate	4.3091 (0.4974)	4.2974 (0.5031)
Infant Health Outcomes		
Less than 32 Weeks Gestation	0.0196 (0.1387)	0.0171 (0.1297)
Any Congenital Anomaly	0.0107 (0.1031)	0.0101 (0.1000)
Single Birth	0.9854 (0.1198)	0.9841 (0.1251)
Birth weight less than 2500 grams	0.0851 (0.2790)	0.0713 (0.2573)
Mother's Health and Behavior		
Any Complication of Labor and Delivery	0.3488 (0.4766)	0.2495 (0.4327)
Mother Used Tobacco During Pregnancy	0.0737 (0.2612)	0.1118 (0.3152)
Mother Used Alcohol During Pregnancy	0.0068 (0.0821)	0.0093 (0.0961)

Number of Prenatal Care Visits	12.5324 (3.9286)	11.8988 (4.0949)
Number of Previous Live Births Now Living		1.5489 (0.9002)
Cardiac Disease	0.0025 (0.0498)	0.0021 (0.0454)
Diabetes (non-gestational)	0.0180 (0.1328)	0.0204 (0.1413)
Renal Disease	0.0008 (0.0276)	0.0008 (0.0275)
Acute or Chronic Lung Disease	0.0018 (0.0428)	0.0019 (0.0433)
Chronic Hypertension	0.0060 (0.0773)	0.0072 (0.0848)

Table 2. Maximum likelihood estimates of the probability of exiting the labor force at time of birth; standard errors in parentheses, marginal effects in brackets.

Variables	First Birth	Subsequent Birth
Constant	-0.6635*** (0.1194)	-1.1280*** (0.1131)
Industry Characteristics		
Share of Jobs Destroyed per Quarter	0.0980*** (0.0235) [0.0315]	0.1353*** (0.0215) [0.0423]
Share of Jobs Created per Quarter	-0.0572** (0.0293) [-0.0184]	-0.1513*** (0.0270) [-0.0473]
Number of Establishments/100	0.0008*** (0.0002) [0.0003]	0.0005** (0.0002) [0.0002]
Average Number of Employees per Establishment	-0.0021*** (0.0006) [-0.0007]	-0.0012** (0.0005) [-0.0004]
Turnover	-0.0298 (0.0202) [-0.0096]	-0.0195 (0.0186) [-0.0061]
Average Industry Wage/1,000 ($)	-0.0050* (0.0031) [-0.0016]	-0.0007 (0.0031) [-0.0002]
Firm Characteristics		
Firm Size (Number of Employees/100)	-0.0007*** (0.0001) [-0.0002]	-0.0005*** (0.0001) [-0.0002]
Just Born	-0.1185*** (0.0185) [-0.0372]	-0.1666*** (0.0181) [-0.0504]
Dying	0.5966*** (0.0267) [0.2068]	0.5094*** (0.0226) [0.1700]
Contracting	0.1086*** (0.0107) [0.0352]	0.0918*** (0.0103) [0.0289]
Expanding	0.0072 (0.0103) [0.0023]	-0.0153 (0.0100) [-0.0048]
Job Characteristics		
Quarterly Earnings/1,000 ($)	-0.0165*** (0.0003) [-0.0053]	0.0146*** (0.0028) [-0.0046]
Labor Market Experience	-0.0810*** (0.0010) [-0.0260]	-0.1018*** (0.0012) [-0.0318]
Number of Labor Market Changes	0.0664***	0.0708***

	(0.0017) [0.0214]	(0.0017) [0.0221]
Current Job Tenure	-0.0195*** (0.0011) [-0.0063]	-0.0173*** (0.0011) [-0.0054]
Number of jobs per Quarter	-0.1907*** (0.0044) [-0.0613]	-0.2106*** (0.0043) [-0.0658]
Mother's Characteristics		
Age	0.0850*** (0.0050) [0.0171]	0.1070*** (0.0046) [0.0202]
Age Squared	-0.0013*** (0.0001)	-0.0015*** (0.0001)
Black	-0.0967*** (0.0109) [-0.0309]	-0.1192*** (0.011) [-0.0372]
Hispanic	-0.0832*** (0.0199) [-0.0564]	-0.1237*** (0.0185) [-0.0739]
Less than High School Education	0.0628*** (0.0088) [0.0211]	0.0656*** (0.0074) [0.0214]
1-3 Years of College Education	-0.0544*** (0.0075) [0.0028]	-0.0867*** (0.0069) [-0.0068]
4 or More Years of College Education	-0.2379*** (0.0208) [-0.0753]	-0.2623*** (0.0229) [-0.0801]
Married	0.2069*** (0.0563) [0.0658]	0.0642 (0.0565) [0.0199]
Single- Father Named	0.0634 (0.0532) [0.0193]	-0.0428 (0.0535) [-0.0131]
Medicaid Recipient	0.1348*** (0.0081) [0.0439]	0.1179*** (0.0073) [0.0373]
AFDC/TANF Benefit Level	0.0005*** (0.0000) [0.0001]	0.0002*** (0.0000) [0.0001]
Father's Characteristics		
Father's Age	0.0066* (0.0035) [0.0017]	0.0131*** (0.0033) [0.0027]
Father's Age Squared	-0.0001 (0.0001)	-0.0002*** (0.0000)
Father Black	-0.2931*** (0.0121) [-0.0910]	-0.2766*** (0.0117) [-0.0848]
Father Hispanic	-0.0929*** (0.0198) [-0.0260]	-0.1589*** (0.0179) [-0.0439]

Father Less than High School Education	-0.0531*** (0.0096) [-0.0636]	-0.0460*** (0.0082) [-0.0452]
Father 1-3 Years of College Education	0.0616*** (0.0082) [0.0026]	0.0518*** (0.0075) [0.0018]
Father 4 or More Years of College Education	0.2848*** (0.0090) [0.0958]	0.2225*** (0.0090) [0.0725]
Geographic Characteristics		
Percent of County that is Urban 2000	0.0789*** (0.0067) [0.0254]	0.0362*** (0.0065) [0.0113]
Median County Income/1,000 ($) 2000	0.0009*** (0.0003) [0.0003]	0.0028*** (0.0003) [0.0009]
Seasonally Adjusted Quarterly Unemployment Rate	-0.0246 (0.0161) [-0.0079]	0.0304** (0.0149) [0.0095]
Infant Health Outcomes		
Less than 32 Weeks Gestation	0.1124*** (0.0202) [0.0369]	0.1401*** (0.0199) [0.0448]
Any Congenital Anomaly	0.0126 (0.0243) [0.0041]	0.0244 (0.0237) [0.0077]
Single Birth	-0.3745*** (0.0211) [-0.1274]	-0.3248*** (0.0190) [-0.1064]
Birth weight less than 2500 grams	0.0311*** (0.0103) [0.0101]	0.0685*** (0.0104) [0.0217]
Mother's Health and Behavior		
Any Complication of Labor and Delivery	-0.0089* (0.0054) [-0.0028]	0.0046 (0.0055) [0.0014]
Mother Used Tobacco During Pregnancy	0.0018 (0.0100) [0.0006]	0.0218*** (0.0079) [0.0068]
Mother Used Alcohol During Pregnancy	0.01560 (0.0308) [0.0051]	0.1064*** (0.0252) [0.0339]
Number of Prenatal Care Visits	-0.0017 (0.0019) [-0.0001]	-0.0031* (0.0016) [-0.0006]
Number of Prenatal Care Visits Squared	0.0001* (0.0001)	0.0001** (0.0001)
Number of Previous Live Births Now Living	---	-0.0105*** (0.0029) [-0.0033]
Cardiac Disease	0.0115 (0.0511)	0.0243 (0.0513)

	[0.0037]	[0.0076]
Diabetes (non-gestational)	0.0126 (0.0194) [0.0041]	-0.0287* (0.0169) [-0.0089]
Renal Disease	0.0227 (0.0901) [0.0073]	0.0324 (0.0853) [0.0102]
Acute or Chronic Lung Disease	-0.0472 (0.0592) [-0.0150]	-0.0211 (0.0549) [-0.0066]
Chronic Hypertension	-0.0101 (0.0342) [-0.0032]	0.0406 (0.7010) [0.0128]
Year Dummies		
1995	-0.0290 (0.0190) [-0.0094]	-0.0592*** (0.0194) [-0.0184]
1996	-0.0476*** (0.0193) [-0.0245]	-0.0711*** (0.0194) [-0.0400]
1997	-0.0655*** (0.0210) [-0.0447]	-0.1215*** (0.0207) [-0.0752]
1998	-0.0960*** (0.0234) [-0.0733]	-0.0934*** (0.0226) [-0.1008]
1999	-0.0929*** (0.0272) [-0.0994]	-0.0466* (0.0260) [-0.1131]
2000	-0.0706*** (0.0279) [-0.1183]	-0.0165 (0.0268) [-0.1173]
2001	0.1595*** (0.0217) [-0.0795]	0.1828*** (0.0213) [-0.0738]
2002	0.1864*** (0.0217) [-0.0235]	0.1780*** (0.0214) [-0.0214]
Year Dummies interacted with four or more years of college		
1995	-0.0101 (0.0271) [-0.0033]	-0.0088 (0.0293) [-0.0028]
1996	0.0250 (0.0269) [0.0084]	0.0081 (0.0289) [0.0026]
1997	0.0360 (0.0266) [0.0120]	0.0147 (0.0285) [0.0047]
1998	0.0470* (0.0266) [0.0157]	0.0867*** (0.0280) [0.0282]
1999	0.0606**	0.0505*

	(0.0265) [0.0203]	(0.0281) [0.0164]
2000	0.0925*** (0.0263) [0.0312]	0.0385 (0.0278) [0.0125]
2001	-0.0050 (0.0266) [-0.0017]	-0.0173 (0.0280) [-0.0056]
2002	-0.0465* (0.0267) [-0.0153]	-0.0628** (0.0279) [-0.0200]
Year dummies interacted with married		
1995	-0.0157 (0.0246) [-0.0048]	0.0252 (0.0240) [0.0077]
1996	0.0404* (0.0246) [0.0124]	0.0613*** (0.0237) [0.0190]
1997	0.0489** (0.0245) [0.0150]	0.1059*** (0.0234) [0.0331]
1998	0.1005*** (0.0245) [0.0312]	0.1155*** (0.0232) [0.0362]
1999	0.1238*** (0.0245) [0.0381]	0.1019*** (0.0230) [0.0318]
2000	0.1091*** (0.0244) [0.0340]	0.0928*** (0.0229) [0.0289]
2001	-0.0266 (0.0248) [-0.0080]	-0.1141*** (0.0230) [-0.0340]
2002	-0.0581** (0.0250) [-0.0173]	-0.1229*** (0.0232) [-0.0365]

Notes: *** significantly different from zero at the 99 percent confidence level; ** significantly different from zero at the 95 percent confidence level; *significantly different from zero at the 90 percent confidence level. Three digit industry dummy variables are also included.

Table 3a. Maximum likelihood estimates of the probability of exiting the labor force at time of first birth; standard errors in parentheses, marginal effects in brackets.

Variable	[1]	[2]	[3]
Less than High School Education	0.2006*** (0.0084) [0.0752]	0.1912*** (0.0085) [0.0714]	0.0626*** (0.0088) [0.0210]
1-3 Years of College Education	-0.0762*** (0.0072) [-0.0273]	-0.0734*** (0.0072) [-0.0262]	-0.0549*** (0.0075) [-0.0181]
4 or More Years of College Education	-0.2881*** (0.0087) [-0.0981]	-0.2815*** (0.0087) [-0.0958]	-0.2164*** (0.0094) [-0.0688]
Married	0.3831*** (0.0516) [0.1257]	0.3990*** (0.0517) [0.1303]	0.2443* (0.0537) [0.0766]
Single - Father Named	0.2553*** (0.0510) [0.0811]	0.2638*** (0.0511) [0.0832]	0.0703 (0.0531) [0.0212]
Health Characteristics		y	y
Industry, Firm, and Employment Characteristics			y

Table 3b. Maximum likelihood estimates of the probability of exiting the labor force at time of subsequent birth; standard errors in parentheses, marginal effects in brackets.

Variable	[1]	[2]	[3]
Less than High School Education	0.1966*** (0.0071) [0.0736]	0.1803*** (0.0072) [0.0672]	-0.0662*** (0.0074) [0.0216]
1-3 Years of College Education	-0.1106*** (0.0065) [-0.0393]	-0.1063*** (0.0065) [-0.0377]	-0.0876*** (0.0069) [-0.0278]
4 or More Years of College Education	-0.3617*** (0.0084) [-0.1209]	-0.3498*** (0.0085) [-0.1169]	-0.2530*** (0.0127) [-0.0777]
Married	0.3272*** (0.0509) [0.1087]	0.3426*** (0.0510) [0.1134]	0.0945* (0.0538) [0.0294]
Single - Father Named	0.2176*** (0.0505) [0.0704]	0.2178*** (0.0506) [0.0699]	-0.0304 (0.0533) [-0.0092]
Health Characteristics		y	y
Industry, Firm, and Employment Characteristics			y

Notes: *** significantly different from zero at the 99 percent confidence level; ** significantly different from zero at the 95 percent confidence level; * significantly different from zero at the 90 percent confidence level. Three digit industry dummy variables are also included. [1] includes Mother's, Father's and Geographic characteristics and year dummies; [2] adds in mother's health and behavior and infant health outcomes; [3]adds in industry, firm, and job characteristics plus 3-digit industry dummies.