ABSTRACT

Title: FERTILITY, EMPLOYMENT, AND WAGES DURING MIDLIFE

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Do mothers earn lower wages than women who remain childless even after they enter midlife? Although prior research has documented a "motherhood wage penalty" among women in their childbearing years, research has not examined whether the motherhood wage penalty persists into midlife. This analysis uses data from the 1996 and 2001 panels of the Survey of Income and Program Participation to examine women's employment and wages by motherhood status, parity, and first birth timing. Employment analyses suggest that mothers, especially those with three or more children, are less likely to be employed than childless women. In addition, wage analyses find that mothers have lower wages than childless women even after accounting for differences in demographic, human capital, and job-related characteristics. Overall, findings indicate that motherhood has long-term implications for women's economic attainment during midlife.

FERTILITY, EMPLOYMENT, AND WAGES DURING MIDLIFE

By

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Chapter 1: Introduction

Over the past fifty years there have been substantial changes in women's fertility and labor force patterns. While it was normative in the 1950s for women to leave the labor force at marriage and childbirth, recently the largest gains in women's labor force participation have been among mothers and married women (Cherlin 1990; Hayghe 1997; Klerman and Leibowitz 1994). In 2002, 55 percent of women with a child under age 1 were in the labor force (Downs 2003). In addition, trends indicate that women in the United States are delaying childbirth (Chen and Morgan 1991), and larger proportions of women are remaining childless (Downs 2003). The changes in women's labor force participation and childrearing coupled with an increase in the availability of family leave and job protections have increased the number of options available to women to combine work and family obligations. Although women who have a strong preference for family may forgo work and vice versa, women are increasingly able to combine work and motherhood simultaneously. This analysis will explore the long term implications of women's fertility decisions by examining the relationship between fertility and women's wages and employment during midlife.

Often termed the "family wage gap" or the "motherhood wage penalty," prior research has documented lower wages among mothers than women who remain childless (Anderson, Binder, and Krause 2002, 2003; Avellar and Smock 2003; Budig and England 2001; Neumark and Korenman 1994; Taniguchi 1999; Waldfogel 1995, 1997, 1998). The exact cause of the motherhood wage penalty is unclear. Hypotheses include (1) lower work effort and productivity of mothers (2)

employment of mothers in "mother friendly" lower-paying occupations, (3) discrimination against mothers by employers, (4) the accumulation of less work experience, and (5) differences between mothers and childless women in unobserved characteristics such as career ambition that may influence their wages (often termed "unobserved heterogeneity"). However, research does not find a fatherhood wage penalty and suggests that fathers may even experience a wage premium (Lundberg and Rose 2000). Therefore, the negative effects of having children on women's wages points to larger issues of gender inequality.

The focus of previous literature on the relationship between motherhood and wages has centered on women in their childbearing years. However, the wage depressing effect of having children may vary over the life course. Research by Anderson, Binder, and Krause (2002) indicates that the motherhood wage penalty persists as children age, but the penalty is highest when children are young. The finding that the wage penalty decreases as children age lends support for the hypothesis that motherhood has larger short-term than long-term implications for women's earnings. Research, however, has not examined this hypothesis. The goal of this thesis is to determine whether the motherhood wage penalty persists after women have aged beyond their childbearing years. A persistent wage depressing effect of motherhood suggests that having children has negative long-term consequences for women's economic well-being. The majority of women in the U.S. have children, thus, any negative economic consequences that are born by women should be of public concern.

Chapter 2: Background

Although using slightly different methodologies, research on the motherhood wage penalty has consistently found a 3-10 percent wage penalty per child after controlling for observable characteristics and unobserved heterogeneity. The precise cause of the motherhood wage penalty has not been determined. This section will review five hypotheses that have been formulated.

First, researchers have suggested that mothers earn lower wages than childless women because they perform more housework and childcare duties and their heightened fatigue leaves them with less effort to expend in the workplace (Becker 1985). Their lower workplace productivity results in lower earnings. Studies have not been able to quantify the effect of work effort on the motherhood wage penalty although some have attempted to measure work effort. Bielby and Bielby (1988) compared self-reports of work effort among coworkers with and without children. They found that while mothers of preschoolers reported lower job effort in comparison to childless women, there was not a significant difference between non-mothers and mothers of older children. Overall, Bielby and Bielby's (1988) analysis provides limited support for the work effort hypothesis and their findings suggest that if mothers exert less work effort it is most likely to occur when children are young. Thus, it is unlikely that lower work effort by mothers has strong long-term implications for their economic well-being.

The second hypothesis is that mothers have lower wages because they enter "mother-friendly occupations" that make it easier to combine work and family responsibilities, but these occupations are heavily female and have lower pay.

According to the theory of compensating differentials, employers can pay women lower wages in return for offering better working conditions such as more job flexibility, less demanding work tasks, or the ability to work part time (Becker 1991; Filer 1985). Although it is difficult to directly measure mother-friendliness, a study using data from the 1977 Quality of Employment Survey did not find evidence that mothers employed full time enter "female" jobs that are more compatible with family demands (Glass and Camarigg 1992). In addition, Budig and England (2001) found that controls for the percent of females in an occupation and whether the occupation was in the child care sector did not have a significant effect on the motherhood wage penalty. Overall, research has not supported the hypothesis that mothers earn lower wages because they enter mother-friendly occupations. Women may change occupations over the life course and their occupational classification at ages 45-54 may differ from their occupation at the time of childbirth. Because of the difficulty of measuring occupational careers and the mother-friendliness of individual occupations, this study is unable to address this hypothesis other than by including controls for broad occupation groups.

The third hypothesis is that mothers are discriminated against by employers. Employers may have negative perceptions of mothers' commitment to the workplace which lead them to offer lower wages, invest less in their employees, or deny promotions to women with children. In addition, employees may experience lower wage growth over time when they use family-friendly policies (Glass 2004). Discrimination is hard to measure directly. The persistence of a wage penalty in the absence of differences in demographic characteristics, human capital, and

occupational characteristics has been used to suggest that discrimination may account for some of the remaining wage differences between mothers and childless women. Similar to prior research, this analysis will not be able to directly operationalize discrimination. The finding of a persistent motherhood wage penalty after controlling for other variables will suggest that mothers may be discriminated against in the workplace but readers should use caution in drawing definitive conclusions.

The fourth hypothesis is that mothers have lower wages than childless women because they accumulate less work experience. According to human capital theory workers with more experience should have higher wages. Even though a large proportion of employed women return to work within a year after their first birth, many do not and mothers still tend to spend less time in the labor force than non-mothers (Joesch 1994; Klerman and Leibowitz 1999; O'Connell 1990). Prior studies report that although work experience accounts for a portion of the motherhood wage gap among women in their childbearing years, the gap persists even after controlling for work experience (Anderson Binder and Krause 2002, 2003; Budig and England 2001; Taniguchi 1999). This analysis will control for accumulated work experience when examining the relationship between fertility and midlife wages.

The last hypothesis is that mothers and childless women differ on a set of unobservable characteristics that lead mothers to earn lower wages. The motherhood wage gap may exist because mothers have lower work ambition or have less career commitment than childless women. Researchers have used fixed effects and first difference models to control for unobserved differences between mothers and childless women. Even after controlling for unobserved heterogeneity, mothers still

earn lower wages than childless women (Anderson, Binder, and Krause 2002, 2003; Avellar and Smock 2003; Budig and England 2001; Neumark and Korenman 1994; Waldfogel 1997, 1998).

The focus of this analysis will be to determine whether a wage gap exists between mothers and childless women during midlife (ages 45-54). I will control for the impact of education, occupation, and work experience on the wage penalty, but data limitations preclude me from directly accounting for work effort, mother friendliness, discrimination, or unobserved heterogeneity. This analysis will also examine women's midlife employment status to determine whether there is sample selection bias in the wage equations.

Chapter 3: Conceptual Model

This analysis takes a life course perspective by focusing on whether the timing of women's entry into motherhood is associated with midlife economic achievement as reflected in employment status and hourly wage earnings at ages 45-54. The relationship between women's fertility and economic achievement is complex because women's fertility decisions are closely related to their career expectations and the attainment of human capital. The interrelationship between women's employment and fertility histories makes it difficult to ascertain a causal relationship between fertility and wages (see Budig 2003). This section will describe the association between women's fertility decisions and human capital attainment, and the influence of human capital on the relationship between fertility and economic achievement.

Section 1: Relationship Between Fertility and Human Capital Attainment

Motherhood can negatively impact women's accumulation of human capital both through lower education and the accumulation of less work experience. Educational attainment usual occurs early in the life course making the impact of motherhood on educational attainment greatest if the first birth occurs during the teenage years. Klepinger, Lundberg, and Plotnick (1995) report that having a teenage birth leads to a 1-3 year reduction in women's educational attainment. Having a teenage birth also reduces women's teenage work experience and leads to lower wages at age 25 (Klepinger, Lundberg, and Plotnick 1999). Therefore, a reduction in education resulting from a teenage birth is likely to have long-term implications for women's employability and earnings potential.

Fertility can also have negative implications for women's accumulation of work experience. Although the labor force participation rates of mothers with infants have increased over the past several decades (Downs 2003), most women take time off from work for the birth of a child, and after childbirth some women who were previously employed will enter part-time work or exit the labor force to care for their child. The costs associated with employment in the form of child care and reduced time spent with children rise with each additional birth. Overall, mothers accumulate less work experience than childless women because of the high prevalence of work interruptions and lower returns from employment which may have implications for their wage growth and earnings in midlife.

Although fertility can impact women's accumulation of human capital, women's educational attainment and labor force attachment may also influence their fertility. Research has found a positive association between human capital and age at first birth (Blackburn, Boom, and Neumark 1993). Entry into motherhood is usually associated with a career interruption for women. Since women with higher levels of education or work experience have greater earnings potential, the costs associated with childbearing in the form of foregone wages or work interruptions are greater than the costs for women with less education and work experience. Due to these high opportunity costs, women with a strong career orientation may postpone childbearing until their career is established, have fewer children to minimize work-family time demands, or forgo motherhood entirely. In this way, women's human capital attainment and work aspirations may influence their fertility decisions.

In sum, while motherhood can impact women's educational attainment and accumulation of work experience, a woman's human capital may also influence her fertility decisions. Despite the interrelationship between women's fertility decisions and accumulation of human capital, research suggests that there is a direct relationship between women's fertility experiences and wages during their childbearing years. Prior research finds that differences in human capital between mothers and childless women account for some, but not all of the negative effect of motherhood on wages. However, the relationship between fertility and human capital points to the importance of controlling for human capital when examining the relationship between fertility and economic attainment.

Chapter 4: Hypotheses

In this section I will discuss three hypotheses about the expected relationship between motherhood and women's wages during midlife.

Section 1: Motherhood and Women's Wages

Although it is possible that mothers catch up to their childless counterparts, I hypothesize that the wage penalty associated with motherhood will persist into the midlife years. Mothers earn lower wages than childless women earlier in the life course and it is likely that the wage gap weakens but does not completely disappear over time. Although several of the hypotheses formulated to explain the motherhood wage gap imply that the largest wage differences should occur when women are caring for young children, there is no indication that mothers will completely overcome the wage depressing effect of having children and catch up to the wages of their childless counterparts. Therefore, it is likely that the motherhood wage penalty declines as women age, but I expect to find a persistent wage gap between mothers and childless women at older ages.

Section 2: Parity and Women's Wages

I hypothesize that the motherhood wage penalty will increase with parity. If wage differences between mothers and childless women result from the real or perceived strain between work and motherhood the conflict should be greater among women with more children. Therefore, I expect that the negative effects of children on women's economic achievement should be greater among women with multiple children.

Section 3: First Birth Timing and Women's Wages

I expect variation in the motherhood wage gap by first birth timing. First birth timing marks the beginning of childrearing in the life course. Most women in the U.S. take time off from work or reduce their work effort surrounding childbirth, making birth timing an indicator of the timing of potential career interruptions. The impact of having children on women's employability and earnings potential should differ by the timing of first childbirth. Women with a teen birth experience the first potential negative effects of motherhood on their employability and earnings potential early in the life course. Since teen births are often followed by subsequent births the impact of motherhood on their economic attainment could be substantial. In contrast, women who begin childbearing in their twenties experience job interruptions at a time when they are beginning to build a career. A prior analysis by Taniguchi (1999) examined the relationship between first birth timing and women's wages during their childbearing years and found the largest motherhood wage gap between women who had a birth in their twenties and childless women. Women who delay childbearing into their thirties have more time for continuous employment prior to childbirth, thereby establishing their careers, which may help buffer them from the negative long-term effects of motherhood on their employability and earnings. Overall, I expect to find a motherhood wage penalty among women who have a child before age thirty, but I hypothesize that mothers who delay childbearing are buffered from the negative effects of childrearing on their midlife earnings.

The next section reviews the data and methods used in this analysis. Then I examine the selection of women into employment by regressing employment on

fertility characteristics. Finally, I ascertain whether a motherhood wage gap exists during midlife and its relationship with parity and first birth timing.

Chapter 5: Data and Methods

This analysis will use pooled data from the 1996 and 2001 panels of the Survey of Income and Program Participation (SIPP). The SIPP is a multistage stratified sample of the noninstitutionalized population over age 15 in the U.S. and is conducted by the U.S. Census Bureau.[1] The SIPP collects monthly demographic and economic information on individuals in households over a 3 to 4 year period. The inclusion of a complete employment history makes the SIPP especially useful for this analysis because it permits the measurement of actual work experience over the life course. The SIPP also includes a fertility history which allows for the construction of measures of parity (number of children) and age of entry into motherhood (first birth timing).

This analysis will use data in a cross-sectional design from the core and topical module in wave 1 (the first interview) and retrospective information from the fertility history topical module in wave 2 (the second interview). The 1996 and 2001 panels were pooled to increase sample size. The original pooled sample included 10,729 women ages 45-54. Women who had imputed values for employment or parity were excluded from the analysis. The final sample size consists of 10,011 women ages 45-54. Weights were used in the multivariate analysis but divided by the average weight to maintain the actual sample size. A restricted sample (n = 6,557),

[1] The 1996 Panel consists of 12-waves and an initial sample of 36,805 households. The 2001 Panel consists of 9-waves and an initial sample size of 35,097 households. For more information on the SIPP go to http://www.bls.census.gov/sipp/.

consisting of women who report income or wages from exactly one job or business in the past four months, is used in the wage analysis.[2]

Section 1: Dependent Variables

Employment. Women are considered employed if they had at least one job for an "employer, business, or some other work arrangement" in the past four months, and not employed otherwise

Hourly Wage. Respondents who are paid by the hour are asked their hourly wage. An hourly wage for salaried workers and self-employed workers is calculated by summing monthly earnings (before deductions) reported in each of the past four months, and dividing by the number of weeks worked in the past four months and the usual hours worked per week. Wages are in 2001 constant dollars.

As mentioned earlier, respondents who report earnings from multiple jobs are excluded form the wage analysis. The prevalence of multiple jobholders in this analysis (6.6 percent) is similar to the prevalence reported in the 1996 Current Population Survey (CPS). Data from the May Supplement of the 1996 CPS indicate that 6.5 percent of employed women ages 45-54 worked at more than one job

[2] The SIPP collects hourly wages for workers who are paid by the hour. Salaried and self-employed workers report their gross monthly income before deductions. Wages and income are reported for up to two jobs, two businesses, and moonlighting where applicable. In addition to reporting earnings, respondents indicate the number of usual hours worked per week in the past for month period for each job or business they worked. The number of weeks with a job and the number of weeks with a job but absent without pay are reported for each month, but are not job specific. In the SIPP data reported, it is unclear whether a respondent with multiple jobs works both jobs each week, and whether usual hours worked can be added to create "total hours worked per week at all jobs." Because of the lack of weekly information for each job or business, I restricted the wage analysis to women who reported earnings from exactly one job or business in the past four months. Their job or business-specific earnings were summed over the past four months and divided by the number of weeks worked and usual hours worked per week to provide an indicator of their hourly wage.

(Stinson 1997) and multiple jobholders are less likely to be married, more likely to be white, and more likely to be employed in the service industry than other employed women.[3] The exclusions of multiple jobholders and unemployed women from the wage equation may introduce some selection bias.

Section 2: Independent and Control Variables

Parity. Female respondents are asked to report the number of children they have ever had (excluding stepchildren, stillbirths, adopted children, or foster children). The exclusion of non-biological children may lead to an underestimation of parity. Estimates from the National Survey of Family Growth suggest that 2.5 percent of ever-married women born in 1951-1955 have ever adopted a child and the majority of women are childless at the time of adoption (Chandra and Abma 1999). If the respondent reports having one or more children, she is classified as being a mother and if she reports no children she is "childless." Parity is dummy-coded with the top-code at five or more children.

First Birth Timing. Age at first birth is a measure of first birth timing, or entry into motherhood. A woman's age at first birth is calculated by subtracting her birth year from the year her first child was born. Birth timing categories include teenage birth, first birth at ages 20-24, 25-29, or 30 and older.

First Birth Timing by Parity. A series of dummy variables represent the interaction between first birth timing and parity. Parity is top-coded at three or more for

[3] These characteristics are for all female multiple jobholders regardless of age.

simplicity. These dummy variables allow for the examination of parity and first birth timing simultaneously. It is hypothesized that the impact of first birth timing on midlife wages may vary by parity.

Education. Education is a series of dummy variables corresponding to the highest degree attained. Categories include less than high school degree, high school degree, some college, bachelor's degree, or advanced degree.

Work Experience. Work experience is measured in years. Respondents report the year in which they first worked six straight months. They were then asked how many years they have not worked at least six straight months since they first worked six straight months. Years of "potential work experience" was created by subtracting the year the respondent first worked six straight months from the interview year. Actual work experience is calculated by subtracting the number of years the respondent did not work six straight months from the total years of potential work experience. This measure of work experience is limited because it does not capture labor force interruptions that were less than 6 months.

Marital Status. Marital Status is a measure of marital status at the time of interview. Categories include married, widowed, divorced, separated, never married, and cohabiting. Any woman who is not currently married but is living with an "unmarried partner" is classified as cohabiting regardless of her past marital history.

Race. Groups include non-Hispanic White, non-Hispanic Black, non-Hispanic Other, and Hispanic. The sample size of American Indians and Asian and Pacific Islanders was too small to include them as distinct groups.

Age. Current age is the respondent's age at interview and is measured in years ranging from 45 to 54.

Metropolitan Residence. Metropolitan residence is a dummy variable indicating whether the respondent lives in a metropolitan area. It is hypothesized that women in metropolitan areas will have greater access to employment opportunities and higher wages, possibly due to the presence of more employers and the higher cost of living associated with residing in a metropolitan area.

Current School Enrollment. Current school enrollment is a control variable indicating whether the respondent is currently enrolled in school (either full or part time).

Current Hours Worked. Hours worked refers to respondents' self-report of their usual hours worked per week. The SIPP collects information on usual hours worked for up to two jobs and two businesses. The sample in the wage analysis is restricted to women who work only one job or business. Therefore, hours worked refers to the usual hours worked at the primary job or business. A dummy variable indicating part time work (less than 35 hours per week) is included in the wage analysis.

Occupation. Current occupation is divided into eight categories based on 1980 Standard Occupational Classification (SOC) codes and coded as the following dummy variables: executive administrative and managerial, professional specialty, technicians and related support, sales, administrative support including clerical, service, manual (farming, forestry, fishing precision production, craft, and repair operators, fabricators, and laborers), and self-employment. Women who are self-employed are classified as self-employed regardless of their occupation. Occupational dummy variables are included in the wage analysis.

Union Membership. Union is a dummy variable indicating whether the respondent is a member of a union or covered by a union or employee association contract. Women who are members of a union may be able to negotiate higher wages and have more workplace protections than women who are not in a union or covered by an employee association contract. Union status is only relevant for women who are currently employed; therefore this variable is excluded from the employment analysis but is included in the wage analysis.

Disability. A person is considered to have a disability if she reports having a health or other condition that limits the amount or kind of work she can perform.

Chapter 6: Results

This analysis examines the relationship between women's fertility decisions and their employment and wage earnings during ages 45-54. Descriptive characteristics of the sample are presented first. Then I examine the extent to which mothers and non-mothers differ in their likelihood of being employed by presenting results from the logistic regression of employment on fertility (motherhood, parity, and birth timing). I then regress women's log hourly wage on the fertility covariates to determine whether there is a persistent motherhood wage gap. The last section provides an overview of the results and suggests areas for further research.

Section 1: Univariate and Bivariate Results

Table 1 presents univariate distributions on the covariates for women ages 45-54 in the pooled (1996 and 2001) sample as well as for each panel year separately. With few exceptions, the distributions on variables of interest are very similar by panel year. The cohort of women ages 45-54 in the 1996 panel were born between 1942-1951 and are in the leading edge of the baby boom, whereas women in the 2001 panel were born in 1947-1956.

Table 1: Unweighted Descriptive Statistics by SIPP Panel Year for Women Ages 45-54

	Total		1996	2001
	Number	% of All Women	% of All Women	% of All Women
Full Sample				
Parity				
Childless	1,470	14.7	14.6	14.7
Mother	8,541	85.3	85.4	85.3
1 Child	1,602	16.0	15.1	17.0
2 Children	3,505	35.0	34.6	35.5
3 Children	2,009	20.1	20.0	20.2
4 Children	832	8.3	8.6	8.0
5 or More Children	593	5.9	7.0	4.6
First Birth Timing				
Teenager	1,880	18.8	19.0	18.5
Ages 20-24	3,458	34.5	37.0	31.7
Ages 25-29	2,028	20.3	19.5	21.1
Ages 30 and Older	1,175	11.7	9.8	13.9
Current Marital Status				
Married	6,546	65.4	65.3	65.5
Widowed	462	4.6	5.3	3.9
Divorced	1,623	16.2	16.7	15.6
Separated	353	3.5	3.7	3.3
Never Married	690	6.9	6.4	7.5
Cohabiting (not married)	337	3.4	2.5	4.3
Race/Ethnic Origin				
White, non-Hispanic	7,408	74.0	74.8	73.1
Black, non-Hispanic	1,304	13.0	12.8	13.3
Other, non-Hispanic	438	4.4	4.2	4.6
Hispanic	861	8.6	8.2	9.1
Geography				
Metropolitan Residence	7,354	73.5	70.6	76.7
Educational Attainment				
Less Than a High School Degree	1,353	13.5	14.6	12.3
High School Degree	3,165	31.6	32.1	31.1
Some College	3,018	30.1	30.1	30.2
Bachelor's Degree	1,481	14.8	13.6	16.2
Advanced Degree	994	9.9	9.7	10.2
School Enrollment				
Enrolled	500	5.0	5.5	4.4
Employment Status				
Employed	7,640	76.3	75.3	77.5
Disability Status				
Work-Limiting Disability	1,382	13.8	14.0	13.6
Restricted Sample (Wage Universe)				
Work Status				
Part-Time	1,228	18.7	19.2	18.2
Union Member Status				
Union Member	1,288	19.6	20.2	19.0
Occupation				
Executive, Administrative, Managerial	954	14.5	13.6	15.7
Professional Specialty	1,273	19.4	19.2	19.7
Technicians and Related Support	196	3.0	2.9	3.1
Sales	508	7.7	7.9	7.5
Admin Support Including Clerical	1,506	23.0	24.2	21.6
Service	807	12.3	11.8	12.8
Farming, Forestry, Fishing, Precision Production, Craft, Repair, Operators, Fabricators, and Laborers	688	10.5	11.1	9.8
Self Employed	625	9.5	9.3	9.8
n Full Sample	10,011	100.0	53.9	46.1
n Restricted Sample (Wage Universe)	6,557	100.0	53.0	47.0

Columns 3 and 4 of Table 1 show that women in the 2001 panel are as likely as women in the 1996 panel to be mothers, but they have fewer children on average. Although similar proportions of women in both panels have had a first birth as a teenager, women in the 2001 panel were more likely to delay childbearing. In addition to these slight shifts in fertility across cohorts, there are also subtle changes in human capital and occupational distributions. Women in the 2001 panel have slightly more education and higher employment rates than women in the 1996 sample. They are also more likely to be employed in managerial and service sector occupations. This is likely due to the slight cohort differences between both samples and period changes in the labor market. Due to these slight changes in panel year, a control for panel year will be included in the multivariate analyses.

The first two columns in Table 1 present frequencies and distributions for the covariates based on the pooled sample. Eighty-five percent of women in both panels are mothers, and the majority of mothers have fewer than three children. More than half of mothers had their first birth during their twenties, and 12 percent of mothers delayed having a child until they reached their thirties. Almost 70 percent of women were living with a partner either in marriage or in a cohabiting union. The sample is predominately non-Hispanic White (74 percent) and lives in a metropolitan area (73 percent). The majority of women are employed (76 percent) and work full time.

The bottom portion of the table includes variables in the wage analysis. As mentioned earlier, the sample for the wage analysis excludes multiple jobholders and women who did not work for pay in the past four months. About 85 percent of employed women are in the wage analysis, and these women are most likely to be

employed full time (81 percent) and in administrative support (23 percent) or professional specialty occupations (19 percent).

Table 2 presents bivariate relationships between employment, median wage, and the fertility measures. The second column shows that 80 percent of childless women are employed compared with 76 percent of mothers. However, lower rates of maternal employment are only apparent for mothers with three or more children. Mothers with one or two children have employment rates that are similar to those of childless women.

Table 2: Employment Status and Median Wage by Fertility Variables for Women Ages 45-54

	N	% Employed	Median Hourly Wage (in 2001 dollars)[1]
Parity			
Childless	1,470	79.6	14.77
Mother	8,541	75.8	11.81
1 Child	1,602	79.2	12.95
2 Children	3,505	79.8	12.31
3 Children	2,009	73.8	11.07
4 Children	832	69.8	10.33
5 or More Children	593	57.8	8.86
First Birth Timing			
Teen	1,880	70.3	10.00
Ages 20-24	3,458	75.3	11.29
Ages 25-29	2,028	80.8	13.16
Ages 30 and Older	1,175	77.0	14.39
Birth Timing*Parity			
Teen First Birth, 1 Child	207	72.9	11.14
Teen First Birth, 2 Children	550	77.6	11.07
Teen First Birth, 3+ Children	1,123	66.2	9.03
First Birth 20-24, 1 Child	472	79.2	11.98
First Birth 20-24, 2 Children	1,467	78.7	11.65
First Birth 20-24, 3+ Children	1,519	70.8	10.64
First Birth 25-29, 1 Child	443	84.9	12.97
First Birth 25-29, 2 Children	968	83.5	13.28
First Birth 25-29, 3+ Children	617	73.7	13.18
First Birth 30 and Older, 1 Child	480	76.5	14.69
First Birth 30 and Older, 2 Children	520	78.1	14.03
First Birth 30 and Older, 3+ Children	175	75.4	14.36

[1]Median hourly wage is only reported for those included in the wage analysis.

The same can be said for mothers with a first birth at ages 25-29: 81 percent are employed. However, mothers who start childbearing as teenagers have the lowest employment rates (70 percent) followed by mothers with a first birth in their early twenties (75 percent). Mothers who delay past age 30 are only slightly less likely to be employed than childless women (77 percent). In sum, women with more than two children and women with a first birth before age 25 are substantially less likely than childless women to be currently employed.

In order to determine whether the effects of first birth timing vary according to parity, I also present bivariate results using the cross-classification of first birth timing and parity. Overall, within every birth timing category, women with three or more children are the least likely to be employed. Interestingly, mothers with a first birth at ages 25-29 and fewer than three children are more likely to be employed than childless women. However, the parity effects are greatest for women whose first birth was prior to age 30. For delayers past age 30, there is very little difference in employment rates by parity.

The last column of Table 2 presents median hourly wages by fertility covariates. Wage differences appear more substantial than employment differences. Mothers earn almost $3.00 an hour less than childless women, and their wages decrease steadily with parity and increase with first birth timing. However, when examining the median wage by both parity and first birth timing, the negative relationship between wage and parity only exists among mothers with a first birth before age 25. This may be due to differences in demographic or human capital characteristics between mothers who delay childbearing and mothers with a birth

before age 25. Tables 5 and 6 will examine wages after controlling for these observable characteristics.

The next section will utilize multivariate models to examine whether differences in demographic characteristics, educational attainment, prior work experience, and job-related characteristics explain the gap in employment rates and wages between mothers and childless women. Since wage information is only available for employed women, results from the wage analysis could be biased if there is a selection of mothers out of employment who are distinctly different from mothers who are employed. The employment analysis examines the extent to which mothers are less likely than childless women to be employed during midlife.

Section 2: Multivariate Results: Fertility and Employment

Table 3 contains coefficients, standard errors, and odds ratios from the logistic regression of employment on motherhood. As seen in the bivariate table, mothers are less likely than childless women to be employed ($p < .01$). A portion of this gap can be explained by differences in demographic characteristics such as marital status, race, age, and metropolitan residence (Model 2). However, the majority of the employment gap between mothers and childless women is due to the lower educational attainment of mothers. When only controlling for demographic variables, mothers are 84 percent as likely as childless women to be employed. There is no significant difference in employment between mothers and childless women after controlling for demographic characteristics and educational attainment. The last model includes controls for women's prior work experience and the presence of a work limiting disability. After the inclusion of these controls, mothers are

significantly more likely than childless women to be employed. Many mothers leave the labor force for some part of the time during their children's preschool years. Compared to a childless woman, a mother with the same years of work experience at ages 45-54 is likely to have fewer years of work experience at younger ages and more years of work experience at a recent age, and is therefore more likely to be currently employed.

Table 3: Logistic Regression of Employment on Motherhood Among Women Ages 45-54

	(1) Model with Survey Year Control				(2) Survey Year and Demographic Controls[1]				(3) Survey Year, Demographic, and Education Controls[2]				(4) Survey Year, Demographic, Education, and Labor Force Controls[3]			
	Coef		S.E.	O.R.	Coef		S.E.	O.R.	Coef		S.E.	O.R.	Coef		S.E.	O.R.
Motherhood Status																
Childless (ref)	-----		-----	-----	-----		-----	-----	-----		-----	-----	-----		-----	-----
Mother	-0.22	**	0.07	0.80	-0.17	*	0.08	0.84	0.05		0.08	1.05	0.32	**	0.10	1.37
Survey Year=2001	0.13	**	0.05	1.13	0.13	**	0.05	1.14	0.08		0.05	1.08	-0.17	**	0.06	0.84
Marital Status																
Married (ref)					-----		-----	-----	-----		-----	-----	-----		-----	-----
Widowed					-0.45	***	0.10	0.64	-0.29	**	0.11	0.75	-0.01		0.14	0.99
Divorced					0.42	***	0.07	1.53	0.43	***	0.08	1.54	0.69	***	0.10	2.00
Separated					-0.35	**	0.12	0.71	-0.18		0.12	0.83	0.07		0.16	1.07
Never Married					-0.10		0.10	0.91	0.05		0.11	1.05	0.35	*	0.15	1.42
Cohabiting					0.09		0.14	1.09	0.30	*	0.14	1.35	0.11		0.18	1.12
Race																
White (ref)					-----		-----	-----	-----		-----	-----	-----		-----	-----
Black					-0.35	***	0.07	0.70	-0.14	†	0.08	0.87	-0.24	*	0.10	0.79
Other					-0.49	***	0.11	0.61	-0.32	**	0.12	0.73	0.04		0.14	1.04
Hispanic					-0.82	***	0.08	0.44	-0.15	†	0.09	0.86	-0.15		0.11	0.86
Age					-0.05	***	0.01	0.95	-0.04	***	0.01	0.96	-0.09	***	0.01	0.92
Metro					0.23	***	0.05	1.25	0.12	*	0.06	1.12	0.03		0.07	1.03
Education																
Less Than H.S. Degree									-1.12	***	0.07	0.33	-0.64	***	0.09	0.53
High School Degree (ref)									-----		-----	-----	-----		-----	-----
Some College									0.28	***	0.06	1.32	0.12		0.08	1.13
Bachelor's Degree									0.65	***	0.09	1.92	0.46	***	0.10	1.58
Advanced Degree									1.25	***	0.12	3.51	0.87	***	0.14	2.38
Current School Enrollment									-0.14		0.12	0.87	-0.28	*	0.14	0.75
Work experience (years)													0.11	***	0.00	1.11
Disability													-2.26	***	0.08	0.10
Intercept	1.30	***	0.07	-----	3.90	***	0.42	-----	3.15	***	0.44	-----	3.45	***	0.53	-----
n	10,011				10,011				10,011				10,011			
LR X^2	17.7	***			286.9	***			870.2	***			3771.4	***		

† p<.10, * p<.05, **p<.01, ***p<.001

Employment is defined as having at least one job (that is, a job for an employer, a business, or some other work arrangement) during the four months prior to the interview

[1]Demographic controls include marital status, race, age, and metropolitan status

[2]Educational controls are educational attainment and current school enrollment

[3]Labor Force Controls include years of work experience and disability status

As expected, there is a significant relationship between many of the other covariates and women's employment. Marital status, race, age, and metropolitan residence are included in the second model. Women who are widowed or separated are less likely than married women to be employed; however, this association becomes insignificant after controls are added for education and labor force characteristics. Divorced women are more likely than married women to be employed even after all of the control variables are included, possibly due to their greater economic need. Race differences in employment are also notable. Model 2 shows that the odds of employment for Black women are 70 percent of the odds for White women. Women of other races and Hispanic women are even less likely to be employed. Additionally, women who are younger and those who live in metropolitan areas have greater odds of employment than other women.

Overall, the difference in employment between mothers and childless women is largely due to the lower educational attainment of mothers. Women with low levels of education are more likely to be mothers and less likely to be employed than other women. There may, however, be variation in employment based on how many children a woman has (parity) and how old she was when she had her first child (first birth timing). Models in Table 4 regress employment on parity and first birth timing, first separately and then jointly. The coefficients for the control variables are excluded from the table because they mirror those shown in Table 3 from the regression of employment on motherhood but they are available upon request.

Table 4: Logistic Regression of Employment on Fertility Variables Among Women Ages 45-54

	(1) Model with Survey Year Control				(2) Survey Year and Demographic Controls[1]				(3) Survey Year, Demographic, and Education Controls[2]				(4) Survey Year, Demographic, Education, and Labor Force Controls[3]			
	Coef		S.E.	O.R.	Coef		S.E.	O.R.	Coef		S.E.	O.R.	Coef		S.E.	O.R.
Panel A																
Parity																
Childless (ref)	-----		-----	-----	-----		-----	-----	-----		-----	-----	-----		-----	-----
1 Child	-0.03		0.09	0.97	-0.03		0.09	0.97	0.10		0.10	1.11	0.21	†	0.12	1.23
2 Children	0.01		0.08	1.01	0.00		0.08	1.00	0.13		0.09	1.14	0.32	**	0.11	1.37
3 Children	-0.33	***	0.08	0.72	-0.28	**	0.09	0.76	-0.02		0.09	0.98	0.33	**	0.12	1.39
4 Children	-0.52	***	0.10	0.59	-0.40	***	0.11	0.67	-0.07		0.11	0.93	0.46	***	0.14	1.58
5 or More Children	-1.04	***	0.11	0.36	-0.80	***	0.11	0.45	-0.25	*	0.12	0.78	0.42	**	0.15	1.52
Panel B																
First Birth Timing																
Childless (ref)	-----		-----	-----	-----		-----	-----	-----		-----	-----	-----		-----	-----
Teen	-0.50	***	0.08	0.61	-0.40	***	0.09	0.67	0.12		0.10	1.13	0.53	***	0.12	1.70
Ages 20-24	-0.24	**	0.08	0.79	-0.20	*	0.08	0.82	0.03		0.09	1.03	0.32	**	0.11	1.37
Ages 25-29	0.08		0.09	1.08	0.11		0.09	1.11	0.14		0.10	1.15	0.36	**	0.12	1.43
Ages 30 and Older	-0.16	†	0.10	0.85	-0.12		0.10	0.88	-0.17		0.11	0.85	-0.02		0.13	0.98
Panel C																
Birth Timing*Parity																
Childless (ref)	-----		-----	-----	-----		-----	-----	-----		-----	-----	-----		-----	-----
Teen First Birth, 1 Child	-0.38	*	0.17	0.68	-0.36	*	0.18	0.70	0.09		0.18	1.09	0.41	†	0.24	1.50
Teen First Birth, 2 Children	-0.12		0.12	0.89	-0.12		0.13	0.89	0.29	*	0.13	1.33	0.51	**	0.16	1.66
Teen First Birth, 3+ Children	-0.69	***	0.09	0.50	-0.55	***	0.10	0.58	0.03		0.10	1.03	0.57	***	0.13	1.76
First Birth 20-24, 1 Child	-0.02		0.13	0.98	-0.03		0.14	0.97	0.16		0.14	1.17	0.15		0.17	1.16
First Birth 20-24, 2 Children	-0.05		0.09	0.95	-0.06		0.10	0.94	0.13		0.10	1.14	0.33	**	0.12	1.40
First Birth 20-24, 3+ Children	-0.47	***	0.09	0.63	-0.37	***	0.09	0.69	-0.09		0.10	0.91	0.35	**	0.12	1.42
First Birth 25-29, 1 Child	0.36	*	0.15	1.44	0.35	*	0.15	1.42	0.42	**	0.16	1.53	0.56	**	0.19	1.76
First Birth 25-29, 2 Children	0.26	*	0.11	1.29	0.25	*	0.11	1.28	0.24	*	0.12	1.27	0.44	**	0.14	1.55
First Birth 25-29, 3+ Children	-0.33	**	0.11	0.72	-0.24	*	0.12	0.78	-0.18		0.12	0.84	0.15		0.15	1.16
First Birth 30 and Older, 1 Child	-0.19		0.13	0.82	-0.18		0.13	0.84	-0.19		0.13	0.83	-0.09		0.17	0.92
First Birth 30 and Older, 2 Children	-0.10		0.12	0.90	-0.09		0.13	0.92	-0.21		0.14	0.81	-0.13		0.16	0.88
First Birth 30 and Older, 3+ Children	-0.25		0.19	0.78	-0.14		0.19	0.87	-0.04		0.21	0.96	0.47	†	0.25	1.59

† p<.10, * p<.05, **p<.01, ***p<.001

[1]Demographic controls include marital status, race, age, and metropolitan status

[2]Educational controls are educational attainment and current school enrollment

[3]Labor Force Controls include years of work experience and disability status

Panel A in Table 4 presents results from the regression of employment on parity. There is not a significant difference in employment among mothers with fewer than three children and childless women. However, the relative odds of employment drop steadily for mothers with three or more children. Compared with childless women, mothers with three children are 72 percent as likely to be employed whereas mothers with four children are 59 percent and mothers with five or more children are 36 percent as likely to be employed. Model 2 shows that demographic characteristics account for a marginal amount of the difference in employment among mothers with three or more children and childless women. The decline in the parity coefficients from Model 2 to Model 3 shows that education has a strong impact on the odds of employment. After adding controls for educational attainment, there is not a significant difference in the odds of employment between childless women and mothers if they have fewer than five children. However, mothers with five or more children are 22 percent less likely than childless women to be employed even after controlling for education and demographic characteristics. Women with five or more children may be distinctively different from other women, or the employment gap may be due to the time demands of raising five or more children that are likely spread across a long span of women's childbearing years and may prevent them from developing an attachment to the labor force. In Model 4 we see that mothers who accumulate the same amount of work experience as childless women are more likely than childless women to be employed during midlife. As noted before, the coefficients in Model 4 should be interpreted with caution because work experience is highly correlated with women's current employment. Overall, the coefficients in

Panel A suggest that mothers with three or more children are less likely than childless women to be in the labor force primarily due to their lower educational attainment.

Panel B in Table 4 presents results from the regression of employment on the timing of the first birth. Model 1 shows that mothers who have a child before age 25 are significantly less likely than childless women to be employed during their midlife years ($p < .01$). While there is not a significant difference in employment between childless women and mothers with a first birth between the ages of 25-29, mothers who delay childbearing past age 30 are marginally less likely than childless women to be employed ($p < .10$). Similar to models including motherhood or parity, the gap in employment by first birth timing is explained by demographic and educational differences. Model 3 shows that the relative odds of employment for mothers with a first birth before age 25 are not statistically significant after controlling for differences in demographic characteristics and educational attainment. The effect of education is particularly notable for mothers with a teenage first birth. This suggests that women who have a teen birth and who are able to continue their education are substantially more likely to be employed during midlife than similar mothers with less education. After adding controls for prior work experience to the model with demographic and educational controls (Model 4), mothers with a child before age 30 have a greater odds of employment than childless women. This suggests that mothers who have children before they reach their thirties would be more likely than childless women to be employed during midlife if they were able to minimize the amount of time they spent out of the labor force.

Panel C combines Panels A and B by regressing employment on the cross-classification of first birth timing and parity. Panel A showed that mothers with more than three children were less likely to be employed than childless women before controlling for differences in educational attainment, and Panel B revealed that having a child before age 25 is associated with lower employment before controlling for educational characteristics. A striking finding in Panel C is that mothers with a first birth at ages 25-29 and fewer than three children are more likely than childless women to be employed. The relationship is obscured in Panel B because the negative effect of having three or more children counterbalances the strong positive effect of having one or two children among mothers with a first birth at ages 25-29. Women who wait until at least age 25 to have children are able to complete their education and enter the labor force unencumbered by children. If they go on to have only one or two children, they are likely to maintain a strong attachment to the labor force. Having a third child changes things considerably. Women with a first birth at ages 25-29 and three children are less likely than childless women to be employed, primarily because of their lower levels of education and work experience. However, Table 2 shows that very few women who delay childbearing into their late twenties or thirties have more than two children.

Overall, the employment analysis suggests that mothers are less likely to be employed during midlife than childless women but the odds of employment differ by parity and first birth timing. Although much of the difference in employment can be explained by demographic and human capital characteristics, mothers with a first birth at ages 25-29 and fewer than three children are more likely than childless

women to be employed even without controlling for other covariates. Models 3 and 4 show that education and work experience have a strong association with the odds of employment during midlife. It is not surprising that women's human capital and labor force commitment are related to their odds of midlife employment. Findings from the employment analysis suggest that women with lower levels of education are less likely to be employed, and thus will be underrepresented in the proceeding wage analysis. If the wage analyses find that mothers earn less than childless women, the gap may be an underestimation because women with lower educational attainment are more likely to be mothers and are more likely to select out of employment than women with higher levels of education. The next section will use a restricted sample of employed women who report earnings from one job or business in the past four months to examine whether a motherhood wage gap exists among employed women during their midlife years.

Section 3: Multivariate Results: Fertility and Wages

This section examines the relationship between fertility decisions and midlife wages. The first section will examine the relationship between motherhood and wage and the subsequent sections will assess the impact of parity and first birth timing, first separately then jointly.

Table 5 shows OLS results from the regression of log hourly wage on motherhood. Motherhood is associated with a .21 decrease in the log hourly wage, or a 19 percent decrease in hourly wage (exp(-.21)). The coefficient for motherhood remains unchanged after controlling for marital status, race, age, and metropolitan residency (Model 2). However, the addition of controls for educational attainment

reduces the motherhood wage penalty by half (Model 3). After controlling for demographic characteristics and educational attainment, the wages of mothers are 10 percent lower than those of childless women (exp(-.11)). The .10 point decrease in the log hourly wage after controlling for education and the significant education coefficient suggests that mothers' educational attainment is strongly related to their midlife wage. The fourth model adds controls for prior work experience and job-related characteristics. The wage gap between mothers and childless women remains statistically significant but is reduced from 10 percent to 8 percent after accounting for differences in prior work experience and job-related characteristics.

Table 5: OLS Regression of Log Hourly Wage on Motherhood Among Employed Women Ages 45-54

	(1) Model with Survey Year Control			(2) Survey Year and Demographic Controls[1]			(3) Survey Year, Demographic and Education Controls[2]			(4) Survey Year, Demographic, Education, and Labor Force Controls[3]		
	Coef		S.E.	Coef		S.E.	Coef		S.E.	Coef		S.E.
Motherhood Status												
Childless (ref)	-----		-----	-----		-----	-----		-----	-----		-----
Mother	-0.21	***	0.02	-0.21	***	0.02	-0.11	***	0.02	-0.08	***	0.02
Survey Year=2001	0.02		0.02	0.02		0.02	0.00		0.02	-0.01		0.01
Marital Status												
Married (ref)				-----		-----	-----		-----	-----		-----
Widowed				-0.11	**	0.04	-0.04		0.04	-0.03		0.04
Divorced				0.01		0.02	0.02		0.02	0.00		0.02
Separated				-0.09	†	0.05	-0.03		0.04	0.00		0.04
Never Married				-0.08	*	0.04	-0.06	†	0.03	-0.06	†	0.03
Cohabiting				-0.07		0.05	0.01		0.04	0.00		0.04
Race												
White (ref)				-----		-----	-----		-----	-----		-----
Black				-0.07	**	0.03	0.00		0.02	-0.02		0.02
Other				-0.03		0.04	-0.01		0.04	0.05		0.04
Hispanic				-0.30	***	0.03	-0.11	***	0.03	-0.07	*	0.03
Age				0.00		0.00	0.00		0.00	-0.01	*	0.00
Metro				0.20	***	0.02	0.15	***	0.02	0.14	***	0.02
Education												
Less Than High School Degree							-0.27	***	0.03	-0.18	***	0.03
High School Degree (ref)							-----		-----	-----		-----
Some College							0.17	***	0.02	0.12	***	0.02
Bachelor's Degree							0.43	***	0.02	0.32	***	0.02
Advanced Degree							0.66	***	0.03	0.48	***	0.03
Current School Enrollment							0.04		0.03	0.01		0.03
Work Experience (years)										0.01	***	0.00
Disability										-0.16	***	0.03
Currently Working Part-Time										-0.07	***	0.02
Union or Union/Employee Contract										0.16	***	0.02
Occupation												
Professional Specialty (ref)										-----		-----
Manage										0.08	**	0.03
Tech										0.01		0.05
Sales										-0.17	***	0.03
Cleric										-0.11	***	0.03
Service										-0.33	***	0.03
Labor										-0.16	***	0.03
Self Employed										-0.43	***	0.03
Hourly Wage Earner										-0.05	**	0.02
Intercept	2.65	***	0.02	2.78	***	0.14	2.37	***	0.13	2.50	***	0.13
n	6,557			6,557			6,557			6,557		
r^2	0.013			0.046			0.180			0.264		

† p<.10, * p<.05, **p<.01, ***p<.001

[1]Demographic controls include marital status, race, age, and metropolitan status

[2]Educational controls include educational attainment and current school enrollment

[3]Labor Force Controls include years of work experience, disability status, part-time work, union membership or coverage by a union or employee association contract, occupation, and dummy for hourly worker

Human capital and demographic characteristics are related to women's midlife wage. Model 3 shows that education is highly associated with wage. In comparison to

women with a high school degree, women with less than a high school degree earn 24 percent less, on average (exp(-.27)). High levels of education are associated with higher wages. College graduates earn substantially higher wages than women with only a high school degree. As stated earlier, mothers have lower educational attainment than childless women and controls for education reduce the motherhood wage gap by 50 percent. Demographic characteristics are also important. Widowed and never married women earn significantly lower wages, and separated women marginally lower wages than married women. Model 3 shows that wage differences by marital status are largely due to differences in educational attainment between married women and widowed, separated, or never married women.

Wage disparities are also evident by race. Model 2 shows that on average, Black women earn 7 percent less than non-Hispanic White women (exp(-.07)), and Hispanic women earn 26 percent less than non-Hispanic White women (exp(-.30)). After accounting for differences in educational attainment, the coefficient for the race wage gap for Black and White women shrinks from -.07 to zero, and the coefficient between Hispanic and White women shrinks from -.30 to -.11 (Model 3). This suggests that Black women earn less than non-Hispanic White women due to their lower levels of education; however, lower levels of education do not completely explain the wage difference between Hispanic and non-Hispanic White women.

Model 2 in Table 5 shows that living in a metropolitan area is associated with higher wages. This is likely due to the higher cost of living and greater availability of

well-paying jobs in metropolitan areas compared to non-metropolitan areas. Overall, differences in demographic and geographic characteristics between mothers and childless women do not explain the motherhood wage gap. As expected, increasing work experience and membership in a union or coverage by an employee association contract is associated with higher overall wages.

Occupational differences in wages are also notable. In comparison to women in professional specialty occupations, the wages of women in managerial occupations are 8 percent higher (exp(.08)). Women in non-managerial non-technical occupations earn lower wages than women in professional specialty occupations, with the largest gap occurring for self-employed women (35 percent lower) and women working in the service sector (28 percent lower). The lower wages of women in service occupations is especially notable because the service sector is rapidly growing (Bureau of Labor Statistics 2001-2002). This occupational variation, however, accounts for little of the wage penalty between mothers and childless women. After controlling for all covariates in the model, the wages of mothers are still 8 percent lower than those of childless women.

In sum, the regression of log hourly wage on motherhood shows that mothers have lower wages than childless women even after controlling for demographic characteristics, educational attainment, prior work experience, and job-related characteristics. The inclusion of educational controls leads to a .10 point decline in the motherhood effect, suggesting that women's educational attainment is an important predictor of women's midlife wage. Women's prior work experience is associated with a smaller .02 point reduction in the effect of motherhood on log

hourly wage. Overall, however, even after controlling for these characteristics a significant motherhood wage penalty remains ($p < .001$). This suggests that there is a direct relationship between motherhood and women's wage during midlife.

Table 6 presents results from the regression of log hourly wage on parity and first birth timing, first separately and then jointly. The coefficients for the control variables are similar to those presented in Table 5 from the regression of log hourly wages on motherhood and are therefore not presented. Model 1 shows that an increase in parity is associated with a larger wage gap. Unlike the pattern in Table 4 where only having three or more children was related to a lower odds of employment, mothers have increasingly lower wages than childless women at each parity level. The wages of mothers with one child are 13 percent lower (exp(-.14)) and mothers with five or more children are 40 percent lower (exp(-.51)) than the wages of childless women. The strength of these effects is especially noteworthy because non-working women have been excluded from the analysis.

Table 6: OLS Regression of Log Hourly Wage on Fertility Variables Among Employed Women Age 45-54

	(1) Model with Survey Year Control			(2) Survey Year and Demographic Controls[1]			(3) Survey Year, Demographic and Education Controls[2]			(4) Survey Year, Demographic, Education, and Labor Force Controls[3]		
	Coef		S.E.	Coef		S.E.	Coef		S.E.	Coef		S.E.
Panel A												
Parity												
Childless (ref)	-----		-----	-----		-----	-----		-----	-----		-----
1 Child	-0.14	***	0.03	-0.15	***	0.03	-0.07	*	0.03	-0.06	*	0.03
2 Children	-0.16	***	0.02	-0.17	***	0.03	-0.09	***	0.03	-0.08	**	0.02
3 Children	-0.27	***	0.03	-0.26	***	0.03	-0.14	***	0.03	-0.10	***	0.03
4 Children	-0.32	***	0.04	-0.30	***	0.04	-0.15	***	0.04	-0.10	**	0.03
5 or More Children	-0.51	***	0.04	-0.46	***	0.05	-0.24	***	0.04	-0.16	***	0.04
r^2	0.03			0.06			0.18			0.27		
Panel B												
First Birth Timing												
Childless (ref)	-----		-----	-----		-----	-----		-----	-----		-----
Teen	-0.38	***	0.03	-0.36	***	0.03	-0.13	***	0.03	-0.10	***	0.03
Ages 20-24	-0.25	***	0.02	-0.25	***	0.03	-0.11	***	0.03	-0.09	***	0.02
Ages 25-29	-0.11	***	0.03	-0.12	***	0.03	-0.10	***	0.03	-0.08	**	0.03
Ages 30 and Older	-0.04		0.03	-0.05		0.03	-0.08	**	0.03	-0.06	*	0.03
r^2	0.04			0.07			0.18			0.26		
Panel C												
Birth Timing*Parity												
Childless (ref)	-----		-----				-----		-----	-----		-----
Teen First Birth, 1 Child	-0.27	***	0.06	-0.26	***	0.06	-0.05		0.06	-0.05		0.05
Teen First Birth, 2 Children	-0.26	***	0.04	-0.25	***	0.04	-0.06		0.04	-0.05		0.04
Teen First Birth, 3+ Children	-0.48	***	0.03	-0.45	***	0.03	-0.20	***	0.03	-0.15	***	0.03
First Birth 20-24, 1 Child	-0.21	***	0.04	-0.20	***	0.04	-0.09	*	0.04	-0.08	*	0.04
First Birth 20-24, 2 Children	-0.21	***	0.03	-0.22	***	0.03	-0.09	**	0.03	-0.07	*	0.03
First Birth 20-24, 3+ Children	-0.31	***	0.03	-0.30	***	0.03	-0.15	***	0.03	-0.11	***	0.03
First Birth 25-29, 1 Child	-0.13	**	0.04	-0.15	***	0.04	-0.08	*	0.04	-0.06	†	0.04
First Birth 25-29, 2 Children	-0.09	**	0.03	-0.10	**	0.03	-0.10	**	0.03	-0.09	**	0.03
First Birth 25-29, 3+ Children	-0.12	**	0.04	-0.12	**	0.04	-0.12	**	0.04	-0.08	*	0.04
First Birth 30 and Older, 1 Child	-0.02		0.04	-0.04		0.04	-0.05		0.04	-0.05		0.04
First Birth 30 and Older, 2 Children	-0.04		0.04	-0.06		0.04	-0.13	**	0.04	-0.11	**	0.04
First Birth 30 and Older, 3+ Children	-0.06		0.07	-0.06		0.07	-0.06		0.06	0.02		0.06
r^2	0.05			0.07			0.18			0.27		

† p<.10, * p<.05, **p<.01, ***p<.001

[1]Demographic controls include marital status, race, age, and metropolitan status

[2]Educational controls include educational attainment and current school enrollment

[3]Labor Force Controls include years of work experience, disability status, part-time work, union membership or coverage by a union or employee association contract, occupation, and dummy for hourly worker

In Model 2 we see that marital status, race, age, and metropolitan residence account for little to none of the variation in wages between mothers and childless women. As in the motherhood analysis in Table 5, education accounts for almost half of the gap in wages between childless women and mothers at each parity level (Model 3). Even with educational controls, however, increasing parity is associated with a greater motherhood wage gap

The fourth model accounts for variability in prior work experience and job-related characteristics. After controlling for these characteristics the coefficients for women with one or two children remain relatively stable but the wage gap for mothers with three or more children decreases. This suggests that mothers with three or more children are more likely than mothers with fewer than three children to be in a disadvantaged position in the labor market through their accumulation of less work experience and employment in lower paying occupations.

Panel B in Table 6 assesses the relationship between wages and first birth timing. The earlier women begin childbearing, the greater the wage gap between them and women who forego motherhood. Women who had a child during their teens have wages that are 32 percent (exp(-.38)) lower than childless women, whereas there is no significant difference between the wages of women with a first birth after age 30 and childless women. Differences in marital status, race, age, and metropolitan residence do not explain much of the wage gap by first birth timing.

Model 3 shows that, as in the other panels, educational differences account for a substantial amount of the wage gap between mothers and childless women. The wage gap between women with a teen birth and childless women is decreased from

32 percent to 12 percent (exp(-.13)) after controlling for both demographic characteristics and educational attainment. Although the wage gap between women with a teen birth and childless women remains significant, the large decrease points to the importance of educational deficits for teen mothers.

The wage gap between mothers with a first birth after age 30 and childless women becomes statistically significant after education controls are added to the model. This suggests that mothers who delay childbearing into their thirties are a select group of women with higher educational attainment. Model 4 shows that controlling for work experience and job-related characteristics accounts for a minimal portion of the wage gap between childless women and mothers by first birth timing. However, a substantial motherhood wage gap remains but it does not vary significantly by birth timing.

Panel C presents results from the regression of log hourly wage on the interaction of first birth timing and parity. Coefficients in the first column show that mothers who delay childbearing past age 30 have similar wages to childless women regardless of parity. Mothers who have their first births as teenagers, especially those with three or more births, experience the largest wage penalty. For example, the coefficient for mothers with a teen birth and two children is -.26 compared to -.48 for teen mothers with three or more children. Panel C also shows that parity is more important for mothers who begin childbearing before age 25 than for women who delay childbearing until after age 25.

The second model shows that differences in demographic variables do not explain the wage gap between mothers and childless women. The third model adds

controls for education, and shows that the low wages of women with a teen birth who have fewer than three children can be completely explained by their low levels of education. Controlling for the lower educational attainment of teen mothers with three or more children cuts the wage gap from 36 percent (exp(-.45)) to 18 percent (exp(-.20)). The 18 percent wage gap is reduced to 14 percent (exp(-.15)) after controlling for prior work experience and job-related characteristics. In sum, net of differences in demographic, human capital, and job-related characteristics, we find that although mothers with a teen birth and fewer than three children do not have substantially lower wages than childless women, those with three or more children have wages that are 14 percent lower than those of childless women.

Similar to the pattern for teen mothers, mothers who began childbearing during their early twenties have lower wages than childless women and the penalty increases with parity. Unlike the case with teen mothers, however, Model 3 shows that controlling for education does not explain away the wage gap for mothers with a first birth at age 20-24 with one or two children. In Model 4 which includes all controls, mothers with a first birth at age 20-24 with fewer than three children still experience a 7-8 percent wage penalty ((exp(-.08)), (exp(-.07))) compared to 10 percent (exp(-.11)) for similar mothers with three or more children.

We saw in Panel B that waiting until age 25-29 to have a child is associated with an 11 percent wage penalty (exp(-.12)); however when we also consider parity in Panel C, there is not a clear increase in the penalty with additional births. Mothers who delay childbearing past age 30 have spent their early working careers childless, and thus have likely built up valuable experience which translates into higher wages

over the remainder of their careers. Interestingly, it is delayers with two children (and not three or more) who experience a significant wage penalty in the full model. Education has a strong impact on women's wages in all three fertility panels in Table 6.

Chapter 7: Discussion and Conclusion

Previous research has documented a wage gap between mothers and childless women during their childbearing years. The aims of this analysis were to determine whether the motherhood wage penalty persists into midlife and whether the penalty differs by fertility characteristics. Although the interrelationship between women's fertility (motherhood status, parity, first birth timing), education, accumulated work experience, and economic attainment (employment, hourly wage) make it difficult, if not impossible to assert causality, this analysis has attempted to disaggregate the effect of each factor on women's midlife economic attainment.

Regression results show that mothers earn lower wages than childless women during midlife. More specifically, mothers earn 19 percent less than childless women, although this gap decreases to 10 percent after controlling for demographic characteristics and educational attainment, and to 8 percent after controlling for work experience and job-related characteristics. The substantial decline in the motherhood coefficient after controlling for education points to the importance of the attainment of education for women's wages. The small decline in the motherhood coefficient after accounting for differences between mothers and childless women in work experience and job-related characteristics suggests that women's labor force attachment has a smaller impact on their midlife wages than their educational attainment.

In addition to the negative relationship between motherhood and wage, results show that the motherhood wage penalty differs by parity and first birth timing. Increasing parity is associated with a larger wage penalty. Mothers with one child

earn 13 percent less than childless women whereas mothers with three children earn 24 percent less than childless women. Similar to results in the motherhood models, the wage penalty associated with parity declines after controlling for demographic characteristics, education, and work experience. However, a significant wage gap between mothers and childless women remains at all parity levels.

The third aim of this analysis was to determine whether the motherhood wage gap varies by first birth timing. First birth timing was hypothesized to have an association with women's midlife wage because it indicates when in the life course women experience labor force interruptions and additional family demands. Results suggest that timing matters. Mothers with a first birth before age 30 have significantly lower wages than childless women. However, mothers who delay childbearing into their thirties do not experience a wage penalty until controls for education, accumulated work experience, and job-related characteristics are added to the models. It is likely that these delayers resemble childless women in their career orientation for the majority of their life course. This may help buffer them from the negative impact of motherhood on their economic attainment.

In sum, the existence of a motherhood wage penalty among the women in this analysis calls for further research on the persistence of the wage gap over the life course and the mechanisms that lead to lower wages among mothers. Women's human capital, as reflected in their educational attainment, is more important as a predictor of women's wages than prior work experience, but both factors are important determinants of women's wages. This finding emphasizes the importance of accounting for women's educational attainment and labor force commitment when

examining the relationship between women's fertility and economic attainment. Parity and first birth timing were also significant correlates with women's midlife wage which points to the importance of examining multiple fertility measures rather than grouping women into a dichotomous motherhood category.

It is also noteworthy that findings from the employment analysis suggest that mothers are less likely than childless women to be employed, mainly due to their lower educational attainment. This has implications for the wage analysis because women with low levels of education are more likely to be mothers and are underrepresented in the wage analysis because they are less likely to be employed. The selection out of midlife employment by women with lower levels of education may lead to an underestimation of the motherhood wage penalty due to sample selection bias in the wage equations.

There are several limitations of this analysis that should be acknowledged. First, it would be useful to have longitudinal data on women rather than retrospective employment and fertility histories to help control for unmeasured differences between mothers and childless women (i.e. unobserved heterogeneity). Research has found mixed support for the importance of unobserved heterogeneity, but even when present, it does not explain all of the wage differences between mothers and childless women (Anderson, Binder, and Krause 2002, 2003; Avellar and Smock 2003; Budig and England 2001; Neumark and Korenman 1994; Waldfogel 1997). We should, however, be cautious in interpreting these results in the absence of controls for possible unmeasured differences between mothers and childless women.

The second limitation is the lack of information on all labor force interruptions. The measure of accumulated work experience indicates the number of years the respondent worked at least six of the twelve months each year. It does not capture labor force breaks for six months or less. Detailed information on parental leave and time out of the labor force surrounding a birth would add to this analysis. Research finds that women who stay out of the labor force for an extended time after childbirth experience a greater wage penalty than mothers who return soon after the birth of their child (Anderson, Binder, and Krause 2003), suggesting that short job interruptions may be less detrimental for women's earnings than longer interruptions. It is possible, however, that women who take shorter job interruptions have access to maternity leave. Prior research by Waldfogel (1998) suggests that access to parental leave may reduce the wage depressing effects of motherhood and women with access to parental leave are more likely to return to work for their previous employer after childbirth than mothers without access to parental leave (Waldfogel, Higuchi, and Abe 1999). More precise information on work interruptions around the time of childbirth and access to maternity leave would be important additions to this analysis. Although the SIPP includes questions on maternity leave and employment surrounding childbirth, questions are not asked of most women in this sample.[4]

Despite the limitations of this analysis, the persistence of a motherhood wage penalty during midlife calls for additional research. Future studies should examine the mechanisms that lead to lower wages among mothers. In addition, the increasing labor force participation of more recent cohorts of women coupled with a rise in

[4]Labor force participation surrounding pregnancy in the 1996 SIPP is asked of women with a first birth in the past 16 years while questions in the 2001 SIPP are asked of women with a first birth in the past 11 years. These time frames do not cover all of the women in this analysis.

delayed childbearing pose questions about the relationship between fertility and wages for more recent cohorts of women.

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