Individual and partner employment type impact on fertility

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Abstract

We use American Community Survey data extracted from the IPUMS system to develop a database of household partners and then analyze the impact of individual and partner employment types on the probability of a birth in the last 12 months. Using a variety of controls for both individual and partner we find that when the individual (woman) is self employed, partnerships have lower fertility rates regardless of the employment classification of the partner when compared to the situation of individual and partner both wage-employed.

Introduction

Economists and demographers have long been interested in the factors that determine whether a partnership will produce children as well as those influencing the number of children produced by a partnership (see for example Hanappi et al. (2017), Luci-Greulich and Thevenon (2014), Maxwell (1998)). These papers often examine specific policies, specific regions or countries, and specific time periods making general, broad applicability of results challenging. An additional, and potentially confounding, factor is that research and discussions can focus on either period fertility rates, births to women in a specific period of time, or cohort fertility rates, births to women over their life course. While many factors impact both they can do so in distinct ways.

In addition to the multiple fertility rates there are also measurement issues, of fertility or of covariates, which at times necessitates truncating samples. Differences in measurement across countries limit

comparisons to only the most general results, and public concerns, and therefore policy considerations, can be significantly different. Larger, longitudinal data sets are now available (see for example Lu et al. (2017) and Joona (2018)) which allow for analysis of patterns in employment types and childbearing decisions over time and with extensive metrics.

Using American Community Survey (ACS) data we examine the impacts of self-employment by either partner on household birthrates. Our main hypothesis is that the presence of a self-employed individual in a household results in a lower chance of a birth in the prior twelve months compared to wage employment for both the individual and the partner. Fertility research is extensive with multiple areas examining factors such as age, race, education and more in either a cohort or period fertility context. The same is true for the dynamic interaction between employment and fertility decisions. The next section provides a sampling of the works related to the current paper. After that we proceed to a discussion of our data followed by results of the statistical analysis. Then we offer conclusions based on the results.

Concepts & Motivations

Fertility and employment decision processes are quite complex independently, and can be even more complicated when considered jointly. For example, using the National Longitudinal Survey of Youth 1979 (NLSY79) Rackin and Bachrach (2016) show that a woman's perception of sustained labor force participation over time creates an expectation of lower fertility compared to a woman expecting marriage. They also demonstrate a similarity between fertility expectations for young women that are comparable to those of their family. Aughinbaugh and Sun (2016) also use the NLSY79 and determine women working longer hours are more likely to postpose childbearing, have fewer children, and are overall less likely to have children compared to women working fewer hours. They also find that across racial groups, attainment of a college degree reduces the probability of having children and delays the timing of the first child. This outcome is even stronger for black and hispanic women than white. These types of findings demonstrate the need for extensive control variables related to the fertility process and experience which then intersect with the voluminous lines of research examining parental preferences for number and sex of children, work-family balance, and other characteristics of either the fertility or work decision.

An important aspect of the joint decision process revolves around potential time constraints and the tradeoffs between work and child responsibilities for one or both partners. One hypothesis examines the ability of the typical self-employed individual to manage their schedule and the implications for their contribution to raising children. Broussard et al. (2013) examine this issue and for their data conclude that self-employed individuals allocate increased hours to work and therefore do not have more time available for child rearing activities. There may also be financial motives with self-employed individuals allocating capital resources into the business with little left over to afford the costs of having and raising children. For example, Blau and Robins (1989), Blau and Robins (1991), and Connelly (1992) all examine

employment and aspects related to child care, a significant constraint for many, especially mothers, when deciding about pursuing employment, and the type of employment to seek.

Broussard et al. (2013) studied self-employment effects on the number of children in the household. They conclude self-employed married men have between 0.1 and 0.2 more children compared to those not self-employed. Their results are consistent with the hypothesis that self-employed will have larger families due to the desire to pass the business on to later generations within the family. Interestingly, those self-employed and above the age of 40 in 1990 had a higher demand for sons compared to younger self-employed individuals. They interpreted this outcome from the the increase in demand for a third child when the first two children were daughters. Once again this effect was not present for younger self-employed respondents. While similar to our work the employment classifications differ in some ways as do some of the control variables.

Noseleit (2014) reported differing behavior along an age divide for self-employed women. Self-employment among younger women reduced fertility while the opposite occurred for women aged 30 to 45. This pair of outcomes was seen as consistent with a story of postponed childbirth and not an outright reduction in fertility per se. There is also a finding of an age divide as well, with reductions in fertility for younger self-employed women. Noseleit's finding that additional children increase the likelihood of self-employment raises questions about the direction of causality between current employment, current fertility, and past fertility decisions.

In previous work, Morehouse (2016) focused on one region of the country, but found inconclusive results about the impact of employment type on fertility decisions. Wage-employed women were less likely to have a baby in the past twelve months suggesting there may be a tradeoff between work for wages and time available for family formation and child raising. We look to extend and further this research by using data for the entire US. We control for demographic variables such as educational attainment, race, native born, earnings, and region of the country, among other demographic characteristics. We do this for both the woman and her partner. As a result our work contributes to the broader discussion of trends in fertility and the dynamic relationship between the form of employment and fertility behavior.

Data

We extract the data from the IPUMS American Community Survey (ACS) datasets for 2009 to 2016. In the extraction we include a large number of household level and individual level variables. As part of the identification scheme within the ACS there are identification numbers for households and for individuals within the household. Looking at the household identifier first we identify the female head-of-household, the primary individual of interest, called *individual* for the purposes of our discussion. We then reshape the data to create one observation from the variables for both the individual and the other adult head of household, called the *partner* for discussion purposes. This construction allows us to look at both

individual and partner characteristics and how they impact the individual's fertility outcome.

The reshaping excludes individuals (women) listed as single as well as single males or males with a same sex partner which gives us just under 3.5 million observations.[1] There is a significant reduction in the sample size when we exclude observations with no data for individual or partner employment, as well as observations where not available was the selected response. Despite this reduction we still have over 1.8 million observations. The number of included variables makes it easier to discuss the data set in parts rather than as a whole.

Primary Data

The dependent variable for our paper is the fertility experience of the female head of household, the individual. The fertility variable from ACS asks the individual if she gave birth to a child in the last twelve months. This is only one of many possible measures of fertility, and is clearly a period fertility measure, not a cohort fertility measure. Joona (2018) is an excellent recent paper using cohort fertility and examining self employment impacts. Table 1 shows the fertility statistics for individuals, which are all women from age 15 to 50.

Table 1: Fertility variable summary statistics

Variable	**Obs**	**Mean**	**St. Dev.**
fertility	1,863,177	.0800874	.2714285

In the more common representation this translates to a fertility rate of 80 per 1,000 women of childbearing age.

In addition we are interested in the employment type of both the individual and the partner. Each individual and partner have a variable (classwkr) describing their employment type. We create a variable combining their employment into four possible cases.[2] We focus on four cases for this paper, where both individual and partner are self-employed, where both are wage-employed, and where one is the wage-employed and the other is self-employed. We limit ourselves to these cases to examine the differential between these types of employment as opposed to the situation of not working. These combinations leave us with the following breakdown for these cases, expressed as an *individual/partner* pairing.

Both individual and partner wage employed makes us 82% of the sample across all years, while individual and partner are both self-employed in just over 2.5% of the sample. The individual age employed and the partner self employed accounts for 9.3% of the sample. The individual self employed and partner wage employed makes up the rest of the sample accounting for 5.7% of total observations.

[1] We ignore also the characteristics of other family members on the individual fertility behavior for this paper and recognize there could be missing influences on fertility as a result.

[2] There are other employment types in addition these but they are small number of observations in comparison, subject to missing data more and as a result we exclude them. Much of the literature focuses on these employment classifications as well.

Table 2: Employment Factor Variable Breakdown

Employment Category	Observations
selfself	47,790
wagewage	1,535,747
selfwage	105,453
wageself	174,187
Total	**1,863,177**

Control Variables

In addition to the fertility and employment variables there are a host of control variables employed as well for both individual and partner. We include age for both to attempt to control for the normal change in fertility over the life cycle. We also include income, number of own children under age five, usual hours worked per week, and the sex of the partner and report these in table 3.[3]

Table 3: Control variable summary statistics

Variable	**Mean**	**St. Dev.**	**Min**	**Max**
age (i)	38.07517	7.624712	16	50
age (p)	40.20172	8.086882	16	55
total income (i)	37,494.86	43,858.47	-15,400	995,000
total income (p)	66,509.16	68,277.08	-15,500	1,279,000
children < 5	.3729431	.6494599	0	7
hours worked (i)	32.69336	15.9156	0	99
hours worked (p)	43.09218	13.03035	0	99
native(i) (born in US=1)	.8256333	.3794246	0	1
native(p) (born in US=1)	.8280824	.377309	0	1
sex (p) (female=1)	.001677	.0409133	0	1

Table 3 shows the average age of the population is above the midpoint of the range, though advancements in fertility treatments may reduce the impact this would have on fertility in this study. The income measures appear fairly consistent with reported income levels from various sources such as the U.S. Department of Commerce, the U.S. Bureau of Labor Statistics, and others over the same time period. Hours worked is interesting with partner hours in excess of 40 hours per week while individual hours are just above 32.5 hours per week. Most of the individuals and partners in the data set are born in the United States, in excess of 80% for both variables. We include a variable here for partner sex and this requires a bit further explanation.

The data for our study start in 2009 and ends in 2016, a timeframe when there were changes in both public opinion and legal standing for same sex marriages. U.S. Supreme Court decisions in 2013 regarding California Proposition 8 and the federal Defense of Marriage Act highlight the change in legal standing. As a result there are possibly more same sex marriages in the second half of our data sample.

[3]As mentioned above, the individual are all females.

The individual in our analysis is always a woman, while the partner could be either sex, therefore we include a variable to capture this to determine if partner sex has an impact on individual fertility. As can be seen from table 3, barely more than one-tenth of one percent of partners are women.

The summary statistics related to education and race for individuals and partners as well as state and year frequencies are available in tables 6-11 in the Appendix.

Results

We model the relationship using a logistic regression of the general format

$$Pr(fertility = 1) = F(\beta_0 + \Delta Employment + \Gamma Controls) \tag{1}$$

with $F(\bullet)$ is the cumulative logistic distribution, Δ and Γ represent coefficient matrices for the collection of variables within the matrices of *Employment* and *Controls*. We make use of the Stata *margins* command to calculate marginal effects for each of the variables. The complete set of regression results and marginal effects are available in the appendix, tables 12 - 19. We focus on the specific variables of interest to our hypothesis in this results discussion.

Prior to running the logistic regression we adjusted the income variables in an effort to control for the correlations between our independent variables. We regressed income against education and age for both individuals and partners and captured the residuals using them in place of the original income variable.[4] As we did in the section discussing the data we divide our discussion of the results to focus on the primary variables of interest separate from control variables.

Our hypothesis is that the presence of a self-employed individual in the home will reduce the probability of having a child in the past year. The logical choice for the excluded category in this situation is *wagewage*, where both the individual and partner are wage-employed. We present the regression coefficients for these and select control variables in table 4. We include complete regression results and marginal effects in the Appendix . The marginal effects are easier to interpret and we include them in table 5, again with complete results available in the appendix.

In the situation where both the individual and the partner are self-employed we see a small, but statistically significant marginal effect. This effect is equivalent to approximately 1.7 births per 1,000 women of childbearing age. When the individual is self-employed but the partner is wage-employed there is again a small, but statistically significant, decline in the fertility rate. This time the decline is approximately 2.79 births per 1,000 women of childbearing age. The final case comparison is when the individual is wage-employed but the partner is self employed. In this situation it is the case that there is not a significant difference from the case where both individual and partner are wage employed. So

[4]The regression output for this is not included here but is available upon request from the authors.

Table 4: Logistic regression results for selected variables

Variable	**Coeff.**	**Std. error**	**p-value**
selfself	-.0668338	.0244328	0.006
selfwage	-.110838	.014713	0.000
wageself	.0145071	.0118896	0.222
age (i)	-.085855	.0009382	0.000
age (p)	-.0227711	.0008307	0.000
adjusted income (i)	2.18e-07	9.24e-08	0.018
adjusted income (p)	-2.82e-07	5.68e-08	0.000
native (i)	-.1795569	.0117564	0.000
native (p)	-.0732224	.0115456	0.000
hours worked (i)	.0040328	.0002193	0.000
hours worked (p)	.0016617	.0002597	0.000
children < 5	1.720185	.0043242	0.000
sex (p)	.0145337	.0832096	0.861

regarding these three combinations of employment it appears to be the case that when the individual (woman) is self-employed, regardless of the employment type for the partner, there is a reduction in births compared to the case where both individual and partner are wage-employed.

As age increases for the individual and the partner there is a decline in births per year, that is both potentially large and statistically significant. Individual age matters more than partner age, however both lead to a decline with a one year increase from the average age levels. Individual income has a positive impact on births that is statistically significant but small enough to be unimportant in terms of the impact on fertility. It is interesting that partner income has the opposite sign, so that as partner income increases there is a negative effect seen on the individual's fertility. However, once again the magnitude of the coefficient is small enough that it is safe to conclude that it is of minor concern.

Whether or not the individual and partner were born in the United States matters. If the individual was born in the United States the effect is a decline in fertility of nearly 5 births per 1,000 women of childbearing years, while the partner effect is also negative at nearly 2 births per 1,000 women of childbearing years. The next marginal effects seem to go against both the literature and common formulations of variable impacts on fertility. As hours worked increase, there is a small but statistically significant positive impact on fertility rates. Increases in hours worked could be correlated with income and be picking up the ability to afford larger families, though again the impact is quite small in magnitude. The presence of more children under five in the household has a large impact on the fertility rate. This result does not seem to conform to other work in the literature and goes against the common tale of smaller families with more resources devoted to each child. We did also include a partner variable for this, though it was removed automatically for collinearity. While there could be some reasons that explain this for specific segments of the population it seems unlikely, given the large national sample, that this result would have the magnitude and sign that it does. Lastly, the small number of female partners makes the

result of the partner sex variable unsurprising. With barely more than .1% in the sample there is not enough information yet to generate a statistically significant result.

Table 5: Marginal effects for selected variables

Variable	**dy/dx**	**std. error**	**p-value**
selfself	-.0017159	.0006089	0.005
selfwage	-.0027877	.0003537	0.000
wageself	.000387	.0003189	0.225
age (i)	-.0022605	.000024	0.000
age (p)	-.0005995	.0000219	0.000
adjusted income (i)	5.75e-09	2.43e-09	0.018
adjusted income (p)	-7.42e-09	1.50e-09	0.000
native (i)	-.0047276	.0003093	0.000
native (p)	-.0019279	.0003066	0.000
hours worked (i)	.0001062	5.79e-06	0.000
hours worked (p)	.0000438	6.84e-06	0.000
children < 5	.0452912	.0002103	0.000
sex (p)	.0003827	.0021908	0.861

Conclusion

The extensive amount of research on the relationship between fertility and employment has yet to create broad based consensus. As time changes so do individual preferences, for both work and children, changing the baseline for both employment and fertility. Unfortunately our research does not yet resolve this issue. What we do find is that employment type does matter in most situations. When the individual, the woman in our data, is self-employed instead of wage-employed there is a negative and statistically significant impact on fertility regardless of whether the partner is self-employed or wage-employed compared to the situation of both individual and partner wage-employed. When the individual is wage-employed and the partner is self-employed there is no statistically significant difference from the baseline of both wage-employed. As a result we have some evidence that self-employment for the woman negatively impacts the period fertility rate, even though there may be different impacts from a cohort perspective.

Other results, for example age, roughly correspond to the literature with negative impacts on the birth rate at age increases. Birth in the United States also exerts a negative impact on the birth rate. Some results were counter to expectations. For example the impact on fertility from the income variable, corrected for age and education effects, was positive for the individual and negative for partner. We have no easy answer for this except to suggest the changing attitude towards child rearing within partner relationships with more partners taking leave for child rearing could manifest itself through this variable. The same circumstances could explain the magnitudes of the coefficients on *hours worked* for both the partner and the individual. Without a doubt the most surprising outcome was the coefficient on children under 5. It was large, statistically significant, and signed opposite to expectations.

Furthering our initial research, we will examine the interactions between the different employment categories and several of the control variables. For example, interacting the age variable with the different employment types could yield information about distinct fertility/employment outcomes that may confirm results within the cohort fertility literature. In addition location aspects such as interactions of birth places with states of residence could yield differences in fertility and employment across states and other locations. Also of interest will be education and racial interactions with variables such as income and the employment categories.

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Appendix

Table 6: Percentage of observations by year

Year	**Freq.**	**Percent**	**Cum.**
2009	259,385	13.92	13.92
2010	249,753	13.40	27.33
2011	231,427	12.42	39.75
2012	229,187	12.30	52.05
2013	228,960	12.29	64.34
2014	222,600	11.95	76.28
2015	221,362	11.88	88.17
2016	220,503	11.83	100.00
Total	1,863,177	100.00	

Table 7: Percentage of observations by state

Variable	Percent	Variable	Percent
Alabama	.0149701	Montana	.0033185
Alaska	.0021893	Nebraska	.0072596
Arizona	.0184051	Nevada	.0080894
Arkansas	.00953	New Hampshire	.0046979
California	.1083858	New Jersey	.0288867
Colorado	.0193465	New Mexico	.0049367
Connecticut	.0116028	New York	.0553447
Delaware	.0026562	North Carolina	.0323603
District of Columbia	.0015581	North Dakota	.0028355
Florida	.0526262	Ohio	.0381107
Georgia	.0317882	Oklahoma	.0120976
Hawaii	.0040426	Oregon	.0129413
Idaho	.005833	Pennsylvania	.0415028
Illinois	.0428596	Rhode Island	.003143
Indiana	.0225244	South Carolina	.0143636
Iowa	.0118824	South Dakota	.0031527
Kansas	.0105599	Tennessee	.0213233
kentucky	.0149728	Texas	.0824989
Louisiana	.0127401	Utah	.0116366
Maine	.0040801	Vermont	.0021721
Maryland	.019595	Virginia	.0291819
Massachusetts	.0222008	Washington	.0243745
Michigan	.0317002	West Virginia	.0053081
Minnesota	.0212052	Wisconsin	.0218981
Mississippi	.0080116	Wyoming	.0021957
Missouri	.0211032		

Table 8: Individual race frequency

Race	Freq.	Percent	Cum.
White	1,520,695	81.62	81.62
African American	104,120	5.59	87.21
American Indian or Alaska Native	13,337	0.72	87.92
Chinese	30,094	1.62	89.54
Japanese	5,634	0.30	89.84
Other Asian or Pacific Islander	90,849	4.88	94.72
Other race	62,991	3,38	98.10
Two major races	31,974	1.72	99.81
Three or more major races	3,483	0.19	100.00
Total	1,863,177	100.00	

Table 9: Partner race frequency

Race	**Freq.**	**Percent**	**Cum.**
White	1,527,263	81.97	81.97
African American	117,740	6.32	88.29
American Indian or Alaska Native	13,061	0.70	88.99
Chinese	25,831	1.39	90.38
Japanese	3,541	0.19	90.57
Other Asian or Pacific Islander	79,068	4.24	94.81
Other race	63,285	3.40	98.21
Two major races	30,341	1.63	99.84
Three or more major races	3,047	0.16	100.00
Total	1,863,177	100.00	

Table 10: Individual education frequency

Educational attainment	**Freq.**	**Percent**	**Cum.**
n/a or no schooling	10,520	0.56	0.56
nursery school to grade 4	4,220	0.30	1.02
grade 5, 6, 7, or 8	31,543	1.69	2.72
grade 9	8,659	1.00	3.72
grade 10	20,926	1.12	4.84
grade 11	25,782	1.38	6.22
grade 12	599,990	32.20	38.43
1 year of college	276,210	4.82	53.25
2 years of college	167,783	9.01	62.26
4 years of college	439,170	23.57	85.83
5+ years of college	64,046	14.17	100.00
Total	1,863,177	100.00	

Table 11: Partner education frequency

Educational attainment	**Freq.**	**Percent**	**Cum.**
n/a or no schooling	13,475	0.72	0.72
nursery school to grade 4	5,593	0.23	0.79
grade 5, 6, 7, or 8	24,569	1.32	2.11
grade 9	14,138	0.76	2.87
grade 10	13,877	0.74	3.61
grade 11	16,668	0.89	4.51
grade 12	476,269	25.56	30.07
1 year of college	267,447	14.35	44.42
2 years of college	215,165	11.55	55.97
4 years of college	507,319	27.23	83.20
5+ years of college	312,985	16.80	100.00
Total	1,863,177	100.00	

Table 12: Logistic regression output (state results)

Variable	Coeff.	Std. err	Pvalue.
Dependent=fertility			
State(alaska excluded)			
alabama	0.0353753	0.0715737	0.621
arizona	0.0835087	0.070108	0.234
arkansas	-0.0723196	0.0745477	0.332
california	0.1921375	0.0670089	0.004
colorado	0.1012743	0.0699156	0.147
connecticut	0.1996465	0.0727526	0.006
delaware	0.1839081	0.0905146	0.042
district of columbia	0.5036303	0.0927486	0.00
florida	0.1366976	0.0678533	0.044
georgia	0.0924495	0.0686996	0.178
hawaii	0.2542481	0.0819838	0.002
idaho	0.0239607	0.0770044	0.756
illinois	0.1086143	0.0680673	0.111
indiana	0.0202655	0.0697414	0.771
iowa	-0.032648	0.0724073	0.652
kansas	0.0000462	0.0727666	0.999
kentucky	0.0172336	0.0714567	0.809
louisiana	0.0520292	0.07212	0.471
maine	0.0188224	0.0858636	0.826
maryland	0.1427374	0.0700361	0.042
massachusetts	0.2189398	0.069559	0.002
michigan	0.0344181	0.0688682	0.617
minnesota	0.0334637	0.0698439	0.632
mississippi	-0.0255389	0.075971	0.737
missouri	-0.0067037	0.0699061	0.924
montana	-0.0203703	0.086572	0.814
nebraska	0.0449882	0.0753553	0.55
nevada	0.2113102	0.074625	0.005
new hampshire	0.1806757	0.0825412	0.029
new jersey	0.2093582	0.0688758	0.002
new mexico	0.0499507	0.0800213	0.532
new york	0.1855874	0.0676688	0.006
north carolina	0.0747691	0.0686662	0.276
north dakota	-0.0278197	0.0879591	0.752
ohio	-0.0283578	0.0684459	0.679
oklahoma	-0.0830611	0.0721421	0.25
oregon	0.0867987	0.0719703	0.228
pennsylvania	0.0838366	0.0682629	0.219
rhode island	0.2149523	0.0878242	0.014
south carolina	0.0911593	0.0715845	0.203
south dakota	0.0017116	0.0858324	0.984
tennessee	0.018236	0.0700441	0.795
texas	0.0410927	0.0672082	0.541
utah	0.0397452	0.0711261	0.576
vermont	0.1026333	0.0984743	0.297
virginia	0.1507715	0.06876	0.028
washington	0.1085429	0.0691729	0.117
west virginia	-0.01211	0.0811553	0.881
wisconsin	0.0175004	0.0700566	0.803
wyoming	-0.0126152	0.093931	0.893

Table 13: Logistic regression output (year results)

Variable	**Coeff.**	**Std. err**	**Pvalue.**
Dependent=fertility			
Year			
2010	-0.0340841	0.0122362	0.005
2011	-0.0157485	0.0124629	0.206
2012	-0.0482158	0.0125475	0
2013	-0.0232436	0.0124778	0.062
2014	-0.0082767	0.012511	0.508
2015	0.000443	0.0125187	0.972
2016	0.000741	0.0124954	0.953

Table 14: Logistic regression output (race results)

Variable	**Coeff.**	**Std. err**	**Pvalue.**
Dependent=fertility			
Race(i)			
white	-0.0270277	0.0693353	0.697
african american	0.0185339	0.0729558	0.799
american indian or alaska native	0.0100041	0.0825818	0.904
chinese	0.1180415	0.0783775	0.132
japanese	0.2372099	0.0907899	0.009
other asian or pacific islander	0.0406993	0.0722303	0.573
other race, nec	-0.015595	0.0737308	0.832
two major races	0.083789	0.0722326	0.246
Race(p)			
white	0.0364805	0.0730851	0.618
african american	0.077432	0.0761049	0.309
american indian or alaska native	-0.0875162	0.0860788	0.309
chinese	0.0503147	0.0829717	0.544
japanese	0.0556551	0.105948	0.599
other asian or pacific islander	0.0180089	0.0760458	0.813
other race, nec	-0.010277	0.0771401	0.894
two major races	0.0186839	0.0760171	0.806

Table 15: Logistic regression output (education results)

Variable	**Coeff.**	**Std. err**	**Pvalue.**
Dependent=fertility			
Educ(i)			
nursery school to grade 4	-0.1651836	0.0943061	0.08
grade 5, 6, 7, or 8	-0.1178921	0.0588139	0.045
grade 9	-0.2908034	0.0640365	0.00
grade 10	-0.3673161	0.0642656	0.00
grade 11	-0.3357944	0.0608629	0.00
grade 12	-0.228412	0.0496124	0.00
1 year of college	-0.1807465	0.0500268	0.00
2 years of college	-0.0680842	0.0502662	0.176
4 years of college	0.0551997	0.0498243	0.268
5+ years of college	0.1330957	0.0501873	0.008
Educ(p)			
nursery school to grade 4	-0.2814976	0.0797849	0.000
grade 5, 6, 7, or 8	-0.2816518	0.0497292	0.000
grade 9	-0.3374907	0.0543865	0.000
grade 10	-0.430611	0.0541418	0.000
grade 11	-0.4068514	0.0512983	0.000
grade 12	-0.2247715	0.0420043	0.000
1 year of college	-0.1782412	0.0425525	0.000
2 years of college	-0.1432455	0.0431121	0.001
4 years of college	-0.0852471	0.0424348	0.045
5+ years of college	-0.094996	0.0428946	0.027
constant	0.0905376	0.1514337	0.55

Table 16: Marginal effects output (state results)

Variable	Coeff.	Std. err	Pvalue.
Dependent=fertility			
State(alaska excluded)			
alabama	0.0008682	0.0017357	0.617
arizona	0.0020972	0.0017074	0.219
arkansas	-0.0016865	0.0017745	0.342
california	0.0050853	0.0016245	0.002
colorado	0.0025652	0.0017052	0.132
connecticut	0.0053034	0.0018224	0.004
delaware	0.0048481	0.0023855	0.042
district of columbia	0.0155475	0.0029746	0.000
florida	0.0035221	0.0016482	0.033
georgia	0.0023317	0.0016687	0.162
hawaii	0.0069362	0.0021798	0.001
idaho	0.0005848	0.0018695	0.754
illinois	0.0027608	0.0016521	0.095
indiana	0.0004938	0.0016862	0.77
iowa	-0.0007757	0.0017388	0.655
kansas	1.12E-06	0.001756	0.999
kentucky	0.0004193	0.0017284	0.808
louisiana	0.0012871	0.0017544	0.463
maine	0.0004583	0.0020872	0.826
maryland	0.0036884	0.001717	0.032
massachusetts	0.0058708	0.0017172	0.001
michigan	0.0008443	0.001666	0.612
minnesota	0.0008205	0.0016909	0.628
mississippi	-0.0006089	0.0018229	0.738
missouri	-0.0001613	0.0016859	0.924
montana	-0.0004868	0.0020725	0.814
nebraska	0.0011092	0.0018367	0.546
nevada	0.0056452	0.0018921	0.003
new hampshire	0.0047554	0.0021309	0.026
new jersey	0.0055877	0.0016912	0.001
new mexico	0.0012344	0.0019613	0.529
new york	0.0048963	0.0016466	0.003
north carolina	0.0018699	0.0016656	0.262
north dakota	-0.0006625	0.0020987	0.752
ohio	-0.0006752	0.001649	0.682
oklahoma	-0.0019272	0.0017201	0.263
oregon	0.0021833	0.0017602	0.215
pennsylvania	0.0021058	0.0016553	0.203
rhode island	0.0057527	0.0023364	0.014
south caroline	0.0022978	0.0017505	0.189
south dakota	0.0000413	0.0020726	0.984
tennessee	0.0004439	0.0016934	0.793
texas	0.0010112	0.0016236	0.533
utah	0.0009774	0.0017253	0.571
vermont	0.0026013	0.002512	0.3
virginia	0.0039112	0.0016785	0.02
washington	0.0027589	0.0016849	0.102
west virginia	-0.0002906	0.001951	0.882
wisconsin	0.0004258	0.0016936	0.801
wyoming	-0.0003026	0.0022532	0.893

Table 17: Marginal effects output (year results)

Variable	**Coeff.**	**Std. err**	**Pvalue.**
Dependent=fertility			
Year			
2010	-.00089677	.0003219	0.005
2011	-.0004179	.0003306	0.206
2012	-.0012601	.0003275	0.000
2013	-.0006146	.0003298	0.062
2014	-.0002204	.0003331	0.508
2015	.0000118	.0003348	0.972
2016	.0000198	.0003342	0.953

Table 18: Marginal effects output (education results)

Variable	**Coeff.**	**Std. err**	**Pvalue.**
Dependent=fertility			
Educ(i)			
nursery school to grade 4	-.0042802	.0023627	0.070
grade 5, 6, 7, or 8	-.0031224	.0015929	0.050
grade 9	-.007114	.0016243	0.000
grade 10	-.0086804	.0015973	0.000
grade 11	-.008049	.0015549	0.000
grade 12	-.0057489	.0013836	0.000
1 year of college	-.0046499	.0013935	0.000
2 years of college	-.0018456	.0014034	0.188
4 years of college	.0015857	.001396	.256
5+ years of college	.003968	.001411	0.005
Educ(p)			
nursery school to grade 4	-.0076025	.0020437	0.000
grade 5, 6, 7, or 8	-.0076061	.0014241	0.000
grade 9	-.0088875	.0014943	0.000
grade 10	-.0108782	.0014591	0.000
grade 11	-.010387	.0014221	0.000
grade 12	-.0062289	.0012867	0.000
1 year of college	-.0050456	.0013005	0.000
2 years of college	-.0041207	.0013152	0.002
4 years of college	-.0025189	.0013016	0.053
5+ years of college	-.0027943	.0013132	0.033

Table 19: Marginal effects output (race results)

Variable	**Coeff.**	**Std. err**	**Pvalue.**
Dependent=fertility			
Race(i)			
white	-.0007129	.0018522	0.700
african american	.0004995	.0019528	0.798
american indian or alaska native	.002685	.0022126	0.903
chinese	.0033358	.0021517	0.121
japanese	.0070999	.0027036	0.009
other asian or pacific islander	.0011085	.0019366	0.567
other race, nec	-.0004136	.0019663	0.833
two major races	.0023294	.0019452	0.231
Race(p)			
white	.0009448	.0018606	0.612
african american	.002045	.0019499	0.294
american indian or alaska native	-.0021376	.0021432	0.319
chinese	.0013117	.0021363	0.539
japanese	.0014546	.0027762	0.600
other asian or pacific islander	.0004623	.0019386	0.812
other race, nec	-.0002603	.0019615	0.894
two major races	.004798	.0019381	0.804