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JEL Classification: I24, J13, J16

Keywords: Fertility, Childlessness, Education, Marketization

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1 Introduction

In this paper, we document that the fertility rates of women with advanced degrees have converged to those of other women over the last four decades in the U.S., over both the extensive margin (childlessness) and intensive margin (number of children per mother).[1] In particular, these highly educated women have become less likely to be childless over time, and have more children conditional on entering motherhood.[2] One hypothesis proposed by the literature, discussed below, is that the opportunity cost of these women's time, along with the ability to outsource (marketize) the cost of childcare, determines their fertility rates. We examine this hypothesis by exploiting cross-state variation in childcare costs relative to wages of these women to show that this ratio can explain 16.1% of the decline in childlessness, 6.6% of the increase in fertility in the intensive margin, and 11.9% of the overall increase in fertility for women with advanced degrees.

Our hypothesis is motivated by the large increase in inequality widely documented in the US over the same time period (Autor et al., 2008; Heathcote et al., 2010). This increase in inequality presumably increases the wages of highly educated women relative to workers providing substitutes for their time at home with children (that is, home production substitute sector workers).[3]

Using data from the Current Population Survey for the years 1980-2020, we estimate models using three different outcomes. First, we use the number of a woman's own children in the household as a measure of overall fertility that does not distinguish between the extensive and intensive margin of fertility. We then further subdivide fertility into the intensive margin (the number of children conditional on having any children) and the extensive margin (the propensity to be childless).

Section 2 describes our data, stylized facts, and summary statistics. Among the stylized facts we document are: (a) since 1990, the fertility of women with advanced degrees has

[1] As discussed below, we limit our sample to white non-Hispanic women.

[2] These changes have been observed by others as well. For instance, Livingston (2018) has documented the convergence in childlessness rates by education status. This report was in turn cited in the *New York Times* (Miller, 2018).

[3] Indeed, this paper is not the first to study this hypothesis. Hazan and Zoabi (2015) documented that the cross-sectional relationship between fertility and women's education has become U-shaped since the early 2000s. Later, Bar et al. (2018) documented a similar change in the pattern between fertility and family income. Both papers share the narrative that the growing divide between rich and poor in American society has created a group of women who can afford to buy help to raise their children and run their homes at a cost that is decreasing, relative to their own wages. This enabled these women to have both career and children. As opposed to those papers, the current one focuses on the convergence in fertility rates on both the extensive and intensive margins. As explained below, we also breakdown the underlying mechanisms between a direct effect of having more children conditional on marital status and indirect effect of inducing more marriage, which tends to result in more children.

increased while it has not changed for others, (b) the childlessness rates of women with advanced degrees has declined and converged to that of other women (which has remained roughly the same), (c) the intensive margin of the number of children has increased for women with an advanced degree and converged to that of other women.

To examine the relationship between changes in fertility and the ability to marketize childcare costs, we use the ratio between the state-year average of the real hourly wage of workers in the home production substitute (HPS) sectors and a woman's real hourly wage as our measure of relative childcare cost.[4] Figure 1 shows the linear fit for the time series of this relative cost, separately for each educational group, with confidence intervals.[5] As the figure makes clear, the relative cost has increased for women with less than a college degree, and has declined for women with college degrees and more so for women with advanced degrees. Specifically, between the early 1980s and the latter part of the 2010s, this relative cost increased by 0.35, 0.25 and 0.16 log points for women with less than a high-school diploma, women with exactly a high-school diploma, and women with some college, respectively. Conversely, over the same time period, this cost has declined by 0.04 and 0.11 log points for women with college degrees and women with advanced degrees, respectively.

To analyze the effect of marketization of childcare costs on fertility, we regress our three different measures of fertility on the relative cost of childcare and allow this relationship to depend on the educational level. Our results support the notion that overall fertility, as well as fertility in both the intensive margin and extensive margin, respond strongly to the relative cost of fertility. Furthermore, women with advanced degrees are more affected by the relative cost of childcare, both in overall fertility, as well as in the intensive and the extensive margins.[6] Our interpretation is that women with advanced degrees may have a stronger desire for a career than women with lesser education. Hence, they are more sensitive to the cost associated with raising children.

There are two channels by which changing relative costs of childcare affect fertility. We refer to the first as the "direct channel", which is the increase in fertility for highly educated women that derives from a reduction in the cost of outsourcing childcare time costs.

[4] We define HPS workers as in Mazzolari and Ragusa (2013). Our empirical approach is similar to that in Hazan and Zoabi (2015) and Bar et al. (2018).

[5] This figure is similar to Figure 6 in Hazan and Zoabi (2015), except that they stop in 2011 while we continue until 2020.

[6] Interestingly, there is very little relationship between the relative cost of childcare and fertility overall; it is necessary to interact this cost with education in order to see an impact. Thus, changing relative costs of childcare are a reasonable potential explanation for the convergence in fertility rates over time between education groups.

However, there is in principle a second "indirect channel", by which changes in marketization costs may increase the propensity to marry, which in turn increases fertility. That is, when childcare costs are relatively low, women realize that they can have both a career and a family (the direct channel). This ability to have both a career and a family leads to more marriage, which in turn yields more children (the indirect channel). We quantitatively show that as much as 90% of the total impact of marketization is through the direct channel, and only a small portion (10%) is through the indirect channel.

Our paper is related to recent literature on childlessness rates. Baudin et al. (2015) document that childlessness rates in the U.S. in 1990 were U-shaped in women's education, with the minimum for women with an 11th grade education. They attribute the declining part of this U-shape is attributed to "social sterility," or that these poorly educated women do not have the resources, medical or otherwise, available to become mothers. The increasing part of the U-shape is attributed to the opportunity cost of women's time.[7] That is, highly educated women have higher time costs, and thus are less likely to become mothers. This is directly in line with the hypothesis of our paper; however, while Baudin et al. (2015) explain childlessness rates of highly educated women in 1990 by appealing to the opportunity cost of their time, we examine how the change in this opportunity cost (through marketization) can explain changes in childlessness for these women over time.[8]

There is also literature that examines the intensive margin of fertility and its relationship to childcare costs. d'Albis et al. (2017) find that much of the variation in fertility rates across European countries can be accounted for by the propensity to have a second child (that is, the intensive margin of fertility). They find that childcare services are an important factor in whether women chose to have a second child. We similarly study how childcare costs vary across US states, and can account for differences in fertility rates.

The ability to marketize the time cost of children can also affect intra-household bargaining. Doepke and Kindermann (2019) find that couples are most likely to have an additional child when both spouses agree to do so, and this is most likely when the time-burden on mothers is reduced. Gobbi (2018) shows that the inability for parents to commit to the amount of childcare they will supply leads to lower child quality in terms of education. This effect is presumably lessened should there be an option to outsource.

[7] Baudin et al. (2020) similarly study the propensity to be childless over a country's course of development, motivated by the same U-shape mechanism.

[8] It is also worth noting Gobbi (2013), who studies the effect of the intergenerational evolution of preferences on fertility, along both the extensive and intensive margins.

Our paper is also related to Cortés and Tessada (2011) and to Furtado (2016). Both papers share the idea that low skilled immigrants increase the supply of workers to the home production substitutes sector, thereby reducing the cost associate with childrearing. The former paper studies the effect this has on labor supply, while the later emphasizes the effect on fertility.[9] Also noteworthy is Mazzolari and Ragusa (2013), who found that growth in the share of wages in a city that goes to top earners is associated with significant low-skilled employment growth in the sector of services that substitute for home production activities. Another relevant paper is Aaronson et al. (2014), who also study the difference between the intensive and extensive margins of fertility. They find an effect of school expansion in the American South, which lowered the price of child quality on fertility along both margins. Finally, our paper relates to the changing income-fertility gradient, such as in Vogl (2016). He studies the relationship between fertility and income in developing countries, showing that before the demographic transition, the income-fertility gradient was positive. Our analysis, and the analysis in Hazan and Zoabi (2015) and Bar et al. (2018), suggests that the income-fertility gradient has changed again from negative to positive.

Finally, there is a large literature looking at how the ability to marketize a woman's time affects her labor supply, marriage, divorce, and fertility. Greenwood et al. (2016) employ a large macroeconomic model to document how changes in wage structures and home production substitutes simultaneously explain changes in labor supply (as in Greenwood et al., 2005b) and marriage and divorce (as in Greenwood and Guner, 2008). Similarly, marketizing childcare costs has been studied as a potential cause of the baby boom and bust (Greenwood et al., 2005a).

We proceed as follows. In Section 2 we discuss the data we use in the analysis and present stylized facts from the Fertility and Marriage June Supplement of the Current Population Survey. In Section 3 we present the empirical specifications, and our main results. Finally, in Section 4 we conclude.

2 Data and Stylized Facts

We utilize two different sets of data from the Current Population Survey (CPS) (Flood et al., 2020). We motivate our analysis with aggregated summary statistics from the Fertility and Marriage June Supplement of the CPS (henceforth: "CPS Fertility Supplement"), for which we use data from 1990-2016, and conduct the main analysis with

[9] Relatedly, Attanasio et al. (2008) builds a life cycle model of fertility and labor force participation. They argue that reductions in child care costs can quantitatively account for the increase in labor supply of young mothers.

the Annual Social and Economic (ASEC) supplement of the Current Population Survey for which we use data from 1990-2020.

We begin with the CPS Fertility Supplement, which we use for the years 1990-2016. This supplement is conducted every other year and contains rich information on marriage and fertility. Nevertheless, it has a number of disadvantages. First and foremost, the sample size is quite limited. Second, the universe varies across the years. In some years, the universe is women age 15-65, while in other years it is 15-44, and in others it is 15-50. For consistency, we study the completed fertility (children ever born) of women aged 40-44. We focus on women aged 40-44 to overcome the changes over time in the universe for the question regarding the number of children ever born.

Given the small sample size in this data set, we pool all women with education up to a college degree into one group while women with advanced degrees are in a second group.[10] Figure 2 shows the average number of children ever born to women aged 40-44 by education. The left panel of Figure 2 shows the average number of children ever born to women aged 40-44 who are married and have advanced degrees. The figure shows that between 1990 and 2016, fertility has been monotonically increasing at a pace of 0.011 child per year, or an increase of about 0.29 children over the sample period.[11] The right panel of the figure shows the average number of children ever born to women aged 40-44 who are married and have at most 16 years of schooling. As can be seen from the figure, there is no clear trend over time in the fertility of these women. The evidence suggests that overall fertility among highly educated women has increased, closing a large part of the gap between their fertility and the fertility of women with lesser education that was documented in much of the literature.[12]

Using the same sample as in Figure 2, we next document the trend in childlessness by education over time since 1990. Figure 3 shows that in 1990, the childlessness rate was about 20% for women with advanced degrees, while it was only about 10% for the group of women with lesser education. However, over the next 26 years, the childlessness rate for women with advanced degrees has declined, reaching about 10% by 2016. At the same time, the childlessness rate among women with up to a college degree bounced around,

[10] Formally we group all women with up to 16 years of schooling into the first group and women with more than 16 years of schooling into the second group.

[11] The fraction of women who are currently married among the highly educated has been rather constant. If one plots Figure 2 for women of all marital statuses, the average shifts down by about a quarter of a child, but the slope is almost identical. This observation helps motivate the indirect channel of changing marital status potentially affecting fertility.

[12] See Jones and Tertilt (2008) for evidence on the negative relationship between income and fertility and Hazan and Zoabi (2015) and Bar et al. (2018) for the change in the relationship since 1980.

leveling off at 7-8% in 2016.

A natural question is to ask is how much of the increase in fertility among the highly educated can be accounted for by the decline in the childlessness rate for this group. To get a better sense of that, in the left panel of Figure 4 we plot the distribution of the number of children ever born to women with advanced degrees at the beginning and the end of our sample. To overcome the small sample size of the CPS data, we combine the 1988, 1990, and 1992 samples and label them "1990" and similarly we combine the 2012, 2014, and 2016 samples and label them "2014".[13] The figure clearly shows that between 1990 and 2014, the drop in childlessness rates shows up in an increase in the fraction of women with 2 and 3 children. There is no change in the fraction of women at any other parity.[14] The right panel of Figure 4 shows the distribution of the number of children ever born to women with less than advanced degrees in 1990 and 2014. It is evident from the figure that there was hardly any change in the distribution at any parity.[15]

Turning towards changes over time, we make use of the Annual Social and Economic (ASEC) supplement of the CPS (our main sample), which contains substantially more observations, but lacks detailed information on fertility. Using these data, Figure 5 shows the time series of fertility for women aged 25-50, broken down by two groups of education: women with up to a college degree and women with advanced degrees. As can be seen from the figure, there has been a convergence in this measure. In the early 1980s, women with up to a college degree, had about 1.3 children at home. This declined to about 1.2 kids in the early 1990s, remained relatively constant, and then declined further to 1.1 by the second half of the 2010s. In contrast, women with advanced degrees had somewhat fewer than 0.9 kids at home in the earlier half of the 1980s. However, as time passed, these women have continuously increased their fertility, and by 2010, their fertility reached the same level as that of women with lesser education.

Figure 6 repeats Figure 5, but limits the samples to mothers. Similar to Figure 5, the figure shows convergence in fertility between the two educational group. Again, the fertility of mothers with less than an advanced degree dropped in the earlier part of the 1980s, and then remain rather flat over the next 35 years at about 1.9 kids per woman. For the women

[13] We plot the distribution for up to 5 children per woman. In both years, nearly 99% of women had at most 5 children.

[14] While the sample underlying the figure consists of married women of all races, the figure is virtually the same if we limit the sample to white women. Qualitatively, the figure is the same if we include women of all marital statuses whether white or all races. Specifically, we mean that the mass at 0 drop, and the mass at 2, and 3 increases. There is hardly any change at other parities.

[15] If anything, there is a slight increase in the fraction of women with one child and a slight decline in the fraction of women with two children.

with advanced degrees, there is an increase over time, though quantitatively, the increase is smaller for mothers than for all women. This suggests that fertility in the extensive margin has increased as well. That is, it implies that childlessness rates among highly educated women has declined. Hence, our third and final measure of fertility, measures the extensive margin. We define a woman as "currently childless" if she has no own children living in the household.

This measure of childlessness is a bit problematic. On one hand, if we look at younger women who do not have children at home, they might simply be waiting to start their families. On the other hand, if older women do not have children at home, the children may have already grown up and left the household. As such, we find the 10 year age window for which the fraction of women having no children in the household is minimized, assume that this indicates that our problem is minimized at this particular age group, and use this as our sample. We then generate an indicator "childless" that is equal to 1 if the woman has no children in the household. For women with up to some college education the age group is 30-39, and for women with college and advanced degrees the age group is 35-44. Figure 7 shows the time series for this measure of childlessness rates by education. As can be seen from the figure, in the 1980s, childlessness rates among highly educated women were higher by about 11-12 percentage points. Over time, however, they have declined for highly educated women by about 6 percentage points, while increasing among women with lesser education by about 8 percentage points. As a result, by the second half of the 2010s, they are slightly lower among women with advanced degrees.

The ASEC supplement of the CPS also allows us to estimate the connection between fertility, both in general and along the intensive and extensive margins, and the relative cost of HPS workers relative to a woman's wage. The data allow us to measure HPS workers' wages directly, but present an issue with measuring women's wages: we only see wages for women who work, rather than wage offers. Our main specifications use as a sample only women for whom we see a wage, that is, women who work. However, we include robustness specifications with imputed wages for women who do not work in all of our analyses, and find that the results are similar.[16] Given the cost of HPS workers relative to a woman's wage, we can examine how changes in this relative cost over the past four

[16]Specifically, we impute wages by running regressions year by year of wages on fixed effects for age, years of schooling, marital status, and state. For this regression, we use the sample of women for whom we observe wages. We then use these regressions to predict wages for women for whom we do not observe wages.

Relatedly, the question may arise why we use this dataset, rather than the American Community Survey (ACS), which also includes information on fertility, education, and labor income. However, Baum-Snow and Neal (2009) note that computing hourly wages using census and ACS data is inaccurate for individuals who do not work full time. They recommended using the CPS, which emphasizes the accu-

decades affect the fertility of women along both the intensive and extensive margins. We further breakdown these relationships across women from five education groups: some high school, high school graduates, some college, college graduates, and those with advanced degrees.

Our sample comprises white non-Hispanic women age 25-50, for the years 1980 to 2020, drawn from the ASEC supplement to the CPS.[17] Our measure of "marketization" is the cost of home production substitutes (HPS), relative to a woman's own wage. Specifically, we measure it by the ratio between the state-average of wages in home production substitutes sectors, relative to a woman's wage, following Hazan and Zoabi (2015) and Bar et al. (2018).[18] As can be seen in Figure 1 the relative cost of childcare has increased by 0.35, 0.25 and 0.16 log points for women with some high school education, women with exactly high-school diploma, and women with some college, respectively. Conversely, over the same time period, this cost has declined by 0.04 and 0.11 log points for women with a college degree and women with advanced degrees, respectively.

We study the propensity to marry, as well as three measures of fertility from the ASEC supplement. The propensity to marry is simply whether a woman is married and living with her spouse. The first measure of fertility is the number of own children in the household. This is our measure of fertility. The second is the number of own children in the household, conditional on having at least one child. This is our measure of the intensive margin of fertility. Our final measure is the probability of being childless, which is our extensive margin of fertility.

Table 1 reports summary statistics on the number of kids at home, the number of kids at home conditional on having any (the intensive margin of fertility), the fraction of women childless (the extensive margin of fertility), age, and total personal income in thousands of 1999 dollars for our analysis, by decade. Panel A does so for women without an advanced degree (college or less), while Panel B studies women with advanced degrees.

The number of children is higher across all decades for women with up to a college degree than for women with advanced degrees, but narrows substantially. The gap is over

racy of labor market outcomes and allows for accurately measuring hourly wages. We thus use the ASEC supplement to the CPS, which gives the best tradeoff between the accuracy of computing hourly wages and a large enough sample of women with their fertility data. Notice that this is a *not* the CPS Fertility Supplement, and it contains many more observations, despite that it does not ask the question regarding the number of children ever born.

[17] Our restriction to white non-Hispanic women allows us to abstract both from differences in the experience of women of other races/ethnicities, as well as how these differences may be changing over time.

[18] As explained in Footnote 4, we define HPS workers as in Mazzolari and Ragusa (2013). This also follows Bar et al. (2018).

0.4 children in the 1980s, but virtually disappears, falling to 0.05 by the 2010s. A similar pattern can be seen for the intensive margin of fertility. This gap is 0.12 children at the beginning of the sample, and also virtually disappears, falling to 0.01 children by the 2010s. The same pattern is again seen among childlessness. At the beginning of the sample, women with advanced degrees were 12 percentage points more likely to be childless. This difference almost entirely disappears by the end of the sample, falling to 1 percentage point. The average age of the two groups of women are very similar, and rise from about 36 at the beginning of the sample to 38 at the end of the sample. Women with advanced degrees make much more than other women, with absolute incomes rising over the time period for both groups. However, women with advanced degrees saw a much larger increase in income, with their wages rising 45% compared to 17% for other women, consistent with inequality rising.

3 Theoretical Background, Empirical Approach, and Results

In this section, we first outline the theoretical framework in Section 3.1, followed by our empirical approach in Section 3.2. We then perform our main analysis in Section 3.3, estimating the impact of marketization costs on marriage and fertility, as well as the intensive and extensive margins of fertility. We also estimate these relationships by the educational group of the potential mother. Then, as a robustness analysis in Section 3.4, we then re-do our estimates by decade of our sample in order to see whether and how the relationship between fertility and marketization has changed over time. After this robustness analysis, we examine the hypothesis that marketization has affected marriage, and thus fertility, in Section 3.5. This measures what we refer to as the indirect channel. Finally, in Section 3.6 we perform a decomposition analysis. We find that up to 90% of the effect of marketization on fertility comes from people changing their fertility choices within a given marital status (the direct channel), rather than changing marital status (the indirect channel).

3.1 Theoretical Framework

The cost of marketizing childcare relative to a (potential) mother's wage affects fertility through the direct and indirect channels. The direct channel is that, conditional on marital status, a lower relative cost of marketization leads to more children. The indirect channel is that a lower cost of marketization increases the incentives to get married, and the act of getting married tends to increase fertility. Mathematically speaking, this idea can be expressed as:

$$n = F\left(m\left(\left(\frac{w^{HPS}}{w}\right)\right), \left(\frac{w^{HPS}}{w}\right)\right), \tag{1}$$

where n is the number of children, $(\frac{w^{HPS}}{w})$ is the wage of HPS workers relative to the wage of a (potential) mother. F is a function that takes into account m, the propensity to be married, itself a function of the relative wage, and the relative wage. Our two mechanims can be seen most easily by looking at the derivative of n with respect to $(\frac{w^{HPS}}{w})$:

$$\frac{dn}{d(\frac{w^{HPS}}{w})} = \underbrace{\frac{\partial F}{\partial m} * \frac{dm}{d\frac{w^{HPS}}{w}}}_{\text{Indirect channel}} + \underbrace{\frac{\partial F}{\partial \frac{w^{HPS}}{w}}}_{\text{Direct channel}} \quad . \tag{2}$$

The first term is the indirect channel: it is the derivative of the propensity to be married with respect to the relative marketization costs, $\frac{dm}{d\frac{w^{HPS}}{w}}$, multiplied by the derivative of fertility with respect to the propensity to be married $\frac{\partial F}{\partial m}$. The second term is the direct channel: how much fertility changes, conditional on marital status, when changing the relative cost of marketization $\frac{\partial F}{\partial \frac{w^{HPS}}{w}}$.

In our results, we specify which specifications capture the full effect of changes in the relative costs of marketization, as well as both the direct and indirect effects. We reconcile our estimates in Section 3.6.

3.2 Empirical Approach

We estimate models of the following form:

$$y_{ist} = \alpha + \beta \ln\left(\frac{w_{st}^{HPS}}{w_{ist}}\right) + X'_{ist}\kappa + \delta_a + \delta_m + \delta_t + \delta_s + \epsilon_{ist}. \tag{3}$$

Here, y_{ist} is either whether the woman is married or one of our three measures of fertility, w_{st}^{HPS} is the average of the real hourly wage of workers in the home production substitutes sector in state s, in year t. w_{ist} is the real hourly wage of woman i, in state s, in year t. X'_{ist} are individual controls, including total personal income, its square, and spouse's real hourly wage. Finally, δ_a, δ_m, δ_t, and δ_s are age fixed effects, marital status fixed effects, year fixed effects, and state fixed effects. We cluster the standard errors by state.

We also estimate models of the following form:

$$y_{ist} = \alpha + \beta \ln\left(\frac{w_{st}^{HPS}}{w_{ist}}\right) + \sum_{j=1}^{5} e_{ijst} \ln\left(\frac{w_{st}^{HPS}}{w_{ist}}\right) \theta_j + \sum_{j=1}^{5} e_{ijst}\pi_j + X_{ist}'\kappa + \delta_a + \delta_m + \delta_t + \delta_s + \epsilon_{ist}. \quad (4)$$

Note that (4) allows for a differential effect of the relative cost of childcare on the fertility decision of women who belong to different educational groups, through the vector θ_j, where j indexes the five educational groups. We again cluster the standard errors by state.[19]

3.3 Main Results

We begin by analyzing the effects of marketization on fertility, both in general as well as along the intensive and extensive margins.

Table 2 reports estimates from regressions of the type described in Equation (3), where the dependent variable is the number of children at home. In Column 1 we use the sample of women for whom we observe a wage, and include age fixed effects, year fixed effects, and state fixed effects. The estimate on the childcare relative cost is -0.108, and statistically significant at the 1% level. Since this specification does not include fixed effects for marital status, it measures the total effect of changes in relative childcare costs, including the effect of people changing their marital status as a result of changes in marketization. Column 2 includes marital status fixed effects. The estimate drops substantially to 0.025, but remains significant at the 1% level. This is our preferred specification. Column 3 repeats Column 2, but includes as a control the woman's husband's wage. There is a strong positive and statistically significant correlation between the spouse's wage and fertility. As such, our results are consistent with the notion of children as normal good (Becker, 1960; Black et al., 2013). Column 4 repeats Column 2, but on the sample for Column 3 (that is, where we observe a married woman with her husband's wage). Column 5 repeats Column 2, but restricts the sample to only married women. Column 6 also repeats Column 2, but restricts the sample to single women. Finally, Column 7 repeats Column 2, but uses all women in the dataset, including those for whom we impute a wage. All specifications find negative and statistically significant effects of the relative price of marketization, ranging from -0.052 to -0.103. We conclude that there is an overall negative

[19] Hazan and Zoabi (2015) estimated regressions of the type presented in (3) and (4) when the dependent variable was the probability of giving a birth for the period 1983-2012. We thus not only extend their analysis to 2020, but also expand the outcome variables to include measures of the intensive and extensive margins of fertility. For brevity we do not present the results when the dependent variable is the probability of giving a birth, but the results are almost identical to those reported in Hazan and Zoabi (2015).

correlation between childcare marketzation costs and the number of children a woman has. We next examine this relationship differentially by the mother's education level.

Table 3 repeats Table 2, but allows for a differential effect of childcare cost by the education of women. Notice that the coefficient on the childcare relative cost is positive and statistically significant at the 1% level in all columns (except Column 1, where it is significant at the 10% level). However, this coefficient only measures the effect of the relative cost of childcare on women with less a high school degree. The overall effect of childcare relative costs for other women is the summation of both this coefficient and the coefficient on the interaction term with a woman's education level. These interaction terms are all negative and statistically significant at the 1% level in all specifications.[20] We also note that in each column, higher educational levels are associated with larger coefficients (in absolute terms). The summation of the main effect and interaction effect of childare with maternal education is negative for women with college degrees or advanced degrees in all specifications. For women with some college, this summation is negative in all specifications except when restricting attention to single women (Column 6). For other women, there is no clear pattern in the data. Our preferred specification, Column 2, implies that a 1 log point increase in the relative cost of childcare is associated with a decline of $0.323 - 0.074 = 0.249$ children in the household for women with advanced degrees. Since the relative cost has declined by 0.11 log points over the 1980-2020 period, the change in the relative cost can account for an increase of $0.249 \times 0.11 = 0.027$ children. From Figure 5 we observe that the number of own children in the household for women with advanced degree has increased from 0.87 to 1.1, an increase of 0.23 children. Thus, the decline in the relative cost of childcare can account for 0.027/0.23=11.9% of the increase in the number of own children in the household.[21]

We make two observations. The first is that the estimates in Column 1 imply larger effects of marketization on fertility. The estimates imply that a 1 log point increase in the relative cost of childcare is associated with a decline of $0.409 - 0.025 = 0.384$ children in the household for women with advanced degrees, which is larger than the 0.249 in our preferred specification. As will be discussed in more detail in Section 3.6, these estimates can be thought of as capturing the full effect of marketization on fertility through both the indirect channel (changes in marital status) as well as the direct marketization channel (fertility changes conditional on marital status), while our preferred specification, which

[20] With the exception of Column 6 where the estimate on the relative cost of education interacted with high school graduates is not statistically significant.

[21] Again, we find that higher spousal wages are associated with more children, with the effect statistically significant at the 1% level.

controls for marital status, only captures the direct effect of marketization. The fact that the estimates in Column 1 are larger than in Column 2 suggests an indirect effect, which we attempt to measure directly below in Section 3.5. The second observation is that the effect of marketization costs is much more apparent when broken down by the education of the woman, as in Table 3, rather than in general, as in Table 2. This differential effect by education motivates how marketization can be an underlying source of convergence of fertility by education group over time.

Moving to the intensive margin, Table 4 shows that the coefficients on childcare relative costs are positive in our preferred specification (Column 2), but that this seems to be explained by single women (Column 6), rather than married women (Column 5). We do not conclude any general relationship between the cost of marketization of childcare and the intensive margin of fertility.

However, Table 5 looks at the differential effect of relative marketization costs by educational group. The coefficient on the childcare relative cost is positive and statistically significant at the 1% level in all columns. However, as before, the overall effect of childcare relative costs is the summation of both this coefficient as well as the coefficient on the interaction term with a woman's education level. These interaction terms are all negative and statistically significant at the 1% level.[22] We also note that in each column, higher educational levels are associated with larger coefficients (in absolute terms).[23] The summation of the main effect and interaction effect of childare with maternal education is negative for women with at least a college degree. Our preferred specification suggests that a 1 log point increase in the measure of relative childcare cost is associated with a decline of $-0.167 + 0.089 = -0.078$ children for women with advanced degrees. In the data, the number of own children in the households for mothers with advanced degrees has increased by 0.13 children between the early 1980s and the late 2010s. Hence our estimate can account for an increase of 6.6%.[24]

As before, the estimates in Column 1 imply a larger effect ($-0.182 + 0.068 = -0.116$) than those in our preferred specification (-0.078), indicating the potential for an indirect effect of marketization on fertility. Furthermore, the fact that women with higher education

[22] Again with the exception of Column 6, where the estimates are not significant for high school graduates or women with some college.

[23] Again there is an exception for Column 6, where the estimate is actually lower for women with advanced degrees than with college degrees. However, the difference between these estimates is not significant.

[24] Similar to before, we find that higher spousal wages are associated with more children, with the effect statistically significant at the 1% level. Thus, children can be considered a normal good along the intensive margin.

seem more sensitive to relative childcare costs furthers the notion that this cost can help explain convergence in fertility rates in the intensive margin over time between education groups.

Finally, Tables 6 and 7 look at the extensive margin of fertility, following the same patterns as above. Specifically, the dependent variable is our definition of "currently childless." All specifications, except for Columns 2 and 6, find a positive and statistically significant relationship between relative marketization costs and the probability of being childless. This makes sense: if it is more expensive to marketize childcare costs, it is less likely that women will choose to be mothers.[25]

Table 7 allows for differential effect by educational groups, and follows the same pattern as Table 3. The effect of childcare relative cost on childlessness rates among women with advanced degrees is always positive and statistically significant at the 1% level.[26] The total effect of marketization on childlessness rates (Column 1) suggests that a 1 log point increase in marketization costs increases the probability of being childless for highly educated women by $0.012 + 0.136 = 0.148$. Using our preferred specification, we find that a 1 log point increase in childcare relative cost is associated with an increase in childlessness rates of $-0.014 + 0.102 = 0.088$ with the direct channel for highly educated women. Since the relative cost declined by 0.11 log points over the time period studied, our estimate accounts for a decline in childlessness rates of 0.010. Noting that childlessness rates fell by 6 percentage points, the decline in relative cost can account for 16.1% of the increase in the faction of women with advanced degrees who became mothers.[27] Thus, growing inequality can help account for why the U-shape relationship between a woman's education and the propensity to be childless, documented in Baudin et al. (2015) for 1990, seems to have disappeared over time, as documented in this paper.

Again, we note that the estimates in Column 1 are larger than those in Column 2, implying a role for the indirect channel. We also again point out that the differential effect of childcare costs by education implies that this cost can potentially explain the convergence in childlessness rates by education group over time.

We thus conclude that the relative costs of marketization have a large impact on fertil-

[25]Similarly, both exercises find a strong a statistically significant impact of a spouses' wage on the probability of being childless, furthering the notion discussed above about the income effect on fertility.

[26]We also note that the total effect for women with a college degree is positive and significant at the 1% level in all specifications, and for all specifications except 6 and 7 for women with some college. However, the magnitudes of the effects are much smaller than for women with advanced degrees.

[27]Similar to before, we find that higher spousal wages decreases the probability of being childless, with the effect statistically significant at the 1% level. Thus, children can be considered a normal good along the extensive margin.

ity, both overall and along the intensive and extensive margins. However, this is mostly true for women with advanced degrees, rather than for all women, as can be seen by the importance of the interaction terms with the mother's level of education. Thus, marketization can help explain the convergence in fertility by education group over time. We also find that there is room for both the direct and indirect mechanisms to play a role. We next turn to our robustness analysis measuring how our estimates change over time, and focus on the interaction between the relative costs of marketization and the mother's education level, before examining the role of the direct and indirect mechanisms.

3.4 Estimates over Time

We check the stability of our estimates over time. Superficially, all the estimates we presented in Tables 2 through Table 7 were estimated on data that pools together four decades. To examine the robustness of the coefficients over time, we repeat our preferred specification (Column 2) from Tables 3, 5 and 7, for each decade separately.

Table 8 shows the results when the dependent variable is the number of own children in the household. We find that for women with advanced degrees, the association between childcare relative cost and the number of own children in the household is negative and statistically significant at the 1% level in each decade. The coefficient for the 1980s is about half the size of the coefficients for the 1990s, 2000s, and the 2010s.[28] This suggests an increasing importance of marketization as inequality increased. There is a similar pattern for women with college degrees, but the magnitudes of those estimates are about half as large as for women with advanced degrees (though they are still statistically significant at the 1% level). For women with less than a college degree, there are no consistent patterns over time that can be discerned from the data.

Table 9 examines the intensive margin of fertility over time. We find that the main effect of childcare relative costs is positive and statistically significant in the 1980s and 1990s, though it decreases and loses significance starting in the 2000s. The total effect of the relative cost of childcare on women with advanced degrees is negative and significant starting in the 1990s, with the effect getting stronger over time (as before). For women with a college degree there is a negative and significant net effect only in the 2010s.

Finally, Table 10 switches the dependent variable to the extensive margin of fertility (childlessness). We see that for women with advanced degrees, the association between the childcare relative cost and childlessness is always positive and statistically significant

[28] Keep in mind that the total impact for these women is the summation of the coefficient on childcare relative costs as well as the interaction term between this relative cost and having an advanced degree.

at the 1% level (5% in the 2010s), and that it increases in magnitudes across the decades. For other education levels, there is no clear pattern over time.

Taken together, Tables 8, 9, and 10 show that the coefficients are not driven by a specific decade over our time sample. The total impact of childcare relative costs seems to be growing over time, as inequality grows.[29] This is consistent with the hypothesis that growing inequality allows highly educated women to more easily outsource the time costs of raising children. Another possible explanation for the increasing estimate size over time is that markets adapt to offer marketization services as it is better understood that inequality has increased in a permanently.

3.5 Marketization and Marriage

We next attempt to explicitly measure the indirect channel for marketization to affect fertility, which is that marketization affects the probability of marriage, which in turn affects fertility. To measure this affect, we proceed in two steps. The first is to estimate the impact of marketization on the propensity to marry. The second is to measure the impact of marriage on fertility. In the language of Vogl (2016), one should think of the estimands as equilibrium associations rather than causal effects. However, the magnitudes can help us bound the size of the indirect effects. As such, we ignore issues of causality, taking the estimates at face value, and use the estimates in Section 3.6 to get a general idea of the potential bounds of the indirect effect.

For the first step, we estimate regressions along the lines of Equation (4), where we replace the dependent variable with whether the woman is married. Table 11 reports the results. Column 1 uses the sample of women for whom we observe wages, and includes the relative cost of marketization, age fixed effects, year fixed effects, and state fixed effects.[30] Column 2 repeats Column 1, but includes the interactions between the relative cost of marketization and the woman's education level. Columns 3 and 4 repeat this pattern, but use the full sample of women, including those for whom we impute a wage. Columns 1 and 3 find that higher marketization costs reduce the probability of getting married. Columns 2 and 4 show that this effect is dramatically larger for more highly educated women, of between -0.038 and $-.048$. In what follows, we use the larger value in order to give the indirect channel the best chance to explain our findings. As will be shown,

[29] The total impact of inequality is the change in relative childcare costs multiplied by the effect of childcare costs. As we show in this section, the effect of childcare costs remains roughly constant over time. However, as inequality continues to grow, this relative cost continues to change, yielding a larger impact.

[30] As before, standard errors are clustered by state.

even under this assumption, the indirect channel fails to account for much of our findings. As such, we consider this approach to be conservative.

For the second step, we estimate regressions along the lines of Equation (3), where we replace the independent variable of the relative cost of marketization with an indicator for whether the woman is married. All specifications include controls for a quadratic in personal income, age fixed effects, year fixed effects, and state fixed effects. The results are reported in Table 12. Column 1 has the dependent variable be the total number of children at home. We find that being married is associated with 0.727 more children at home, which is significant at the 1% level. Taken at face value, this means that a 1 log point decrease in the relative cost of marketization increases the marriage rate of highly educated women by 4.8 percentage points, as described above, which in turn yields an increase in fertility of 0.035 children. Column 2 repeats this for the intensive margin (by restricting the sample to include only mothers), and finds that being married is associated with 0.242 more children conditional on having any children, or an increase of about 0.012 children along the intensive margin. Finally, Column 3 repeats this analysis but replaces the dependent variable with whether a woman is childless. We find that being married reduces the probability of childlessness by 33 percentage points. Thus, a one log point increase in marketization costs increases childlessness by 0.016 percentage points.

3.6 Discussion: Breakdown of Results and Consistency of Estimates

As discussed above in Section 3.3, Column 1 of Table 3 suggests that a 1 log point increase in relative marketization costs decreases fertility by 0.384 when including both the direct and indirect channels (Column 1), and 0.249 when only looking at the indirect channel (Column 2). As discussed in Section 3.5, a 1 log point increase in relative marketization costs reduces fertility through the indirect channel by about 0.035. Thus, the direct channel can account for about 65% of the total effect ($\frac{0.249}{0.384}$), while the indirect channel can account for about 9% ($\frac{0.035}{0.384}$). Considering that there is nothing in our framework that forces our estimate of the direct effect (65%) and indirect effect (9%) to sum up to 100%, the fact that they get reasonably close is by itself both interesting and surprising.

A similar analysis on the intensive margin yields similar results. As discussed in Section 3.3, the estimated total effect of a 1 log point increase in relative marketization costs is a reduction of -0.116 children in the intensive margin. We also found that the direct effect can explain a -0.078 change in fertility. The indirect channel suggests a reduction of about 0.012 children with such an increase in marketization costs. Thus, we again find that about 65% of the total effect can be accounted for by the indirect effect, and about

10% by the indirect effect. These numbers are surprisingly consistent with those found for the total number of children at home above.

We next turn to the decomposition of the effect of marketization on childlessness rates. As discussed above, the total effect of a 1 log point increase in marketization costs is an increase in childlessness rates of 0.148, of which the direct channel can account for 0.088, or 60%, while the indirect effect can account for about 11% of the total effect. Again, these numbers are consistent with those discussed above.

There are at least four reasons to think that the direct and indirect channels do not add up to the full effect exactly. The first is that there are standard errors around our estimates, such that the direct effect can easily explain 90% of the total effect if we examine numbers 1 standard error from the point estimates. This approach would assign 90% of the effect to the direct channel, and 10% to the indirect channel. The second reason is that the estimation approaches are not designed to fully capture these two mechanisms separately. For instance, our approach implicitly only looks at two marital statuses, single and married. In reality, and in our data, there are multiple other marital statuses such as divorced. Presumably a more nuanced decomposition framework would help reconcile our numbers. The third reason is perhaps a mispecification of the exercise in general, as noted above, since it is particularly hard to interpret our approach to evaluating the indirect effect as a causal regression. The final reason is that perhaps there is an interaction term that we are not capturing with this analysis. However, given the consistency of our breakdown of results, it seems reasonable to conclude that about 60-90% of the effect comes from the direct channel, while the remaining 10% comes from the indirect channel.

4 Conclusions

In this paper, we documented that the fertility rates of white non-Hispanic women with advanced degrees have converged to those of other women over the last four decades in the US, over both the extensive margin (childlessness) and intensive margin (number of children per mother). We then evaluate the hypothesis proposed by the literature that the opportunity cost of these women's time, along with the ability to outsource (marketize) the cost of childcare, determines their fertility rates.

We examine this hypothesis by exploiting cross-state variation in childcare costs relative to wages of these women to show that this ratio can explain 16.1% of the decline in childlessness, 6.6% of the increase in fertility in the intensive margin, and 11.9% of the overall increase in fertility for women with advanced degrees. Our estimates suggest that the importance of childcare relative costs has grown over time, as inequality has grown. These

facts are consistent with inequality being a good proxy for the relative childcare costs (as highly educated women may hire low paid workers to help with household production). Among our findings is that growing inequality can help account for why the U-shape relationship between a woman's education and the propensity to be childless, documented in Baudin et al. (2015) for 1990, seems to have disappeared over time, as documented in this paper.

Finally, we quantitatively evaluate the possibility that marketization affects fertility not only directly but also through its effect on marriage, given that marital fertility is higher. We find that the vast majority – 60-90% – of this our findings comes from the direct channel (that reductions in marketization costs increase fertility), and about 10% come from the indirect channel of changes in marital status.

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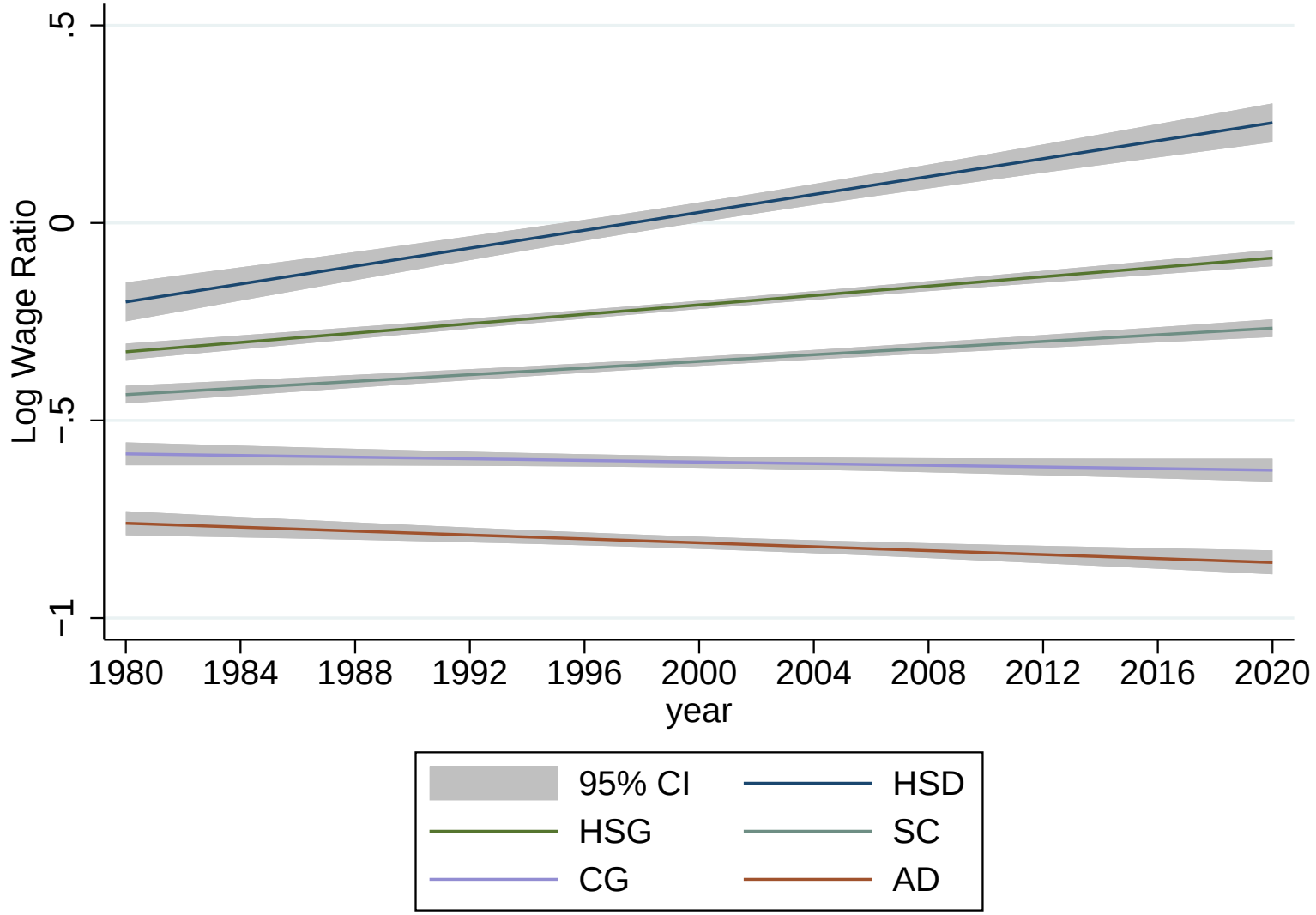

Figure 1: The Ratio between State-Average wages in home production substitutes sectors, relative to a Woman's Wage by Educational Groups.

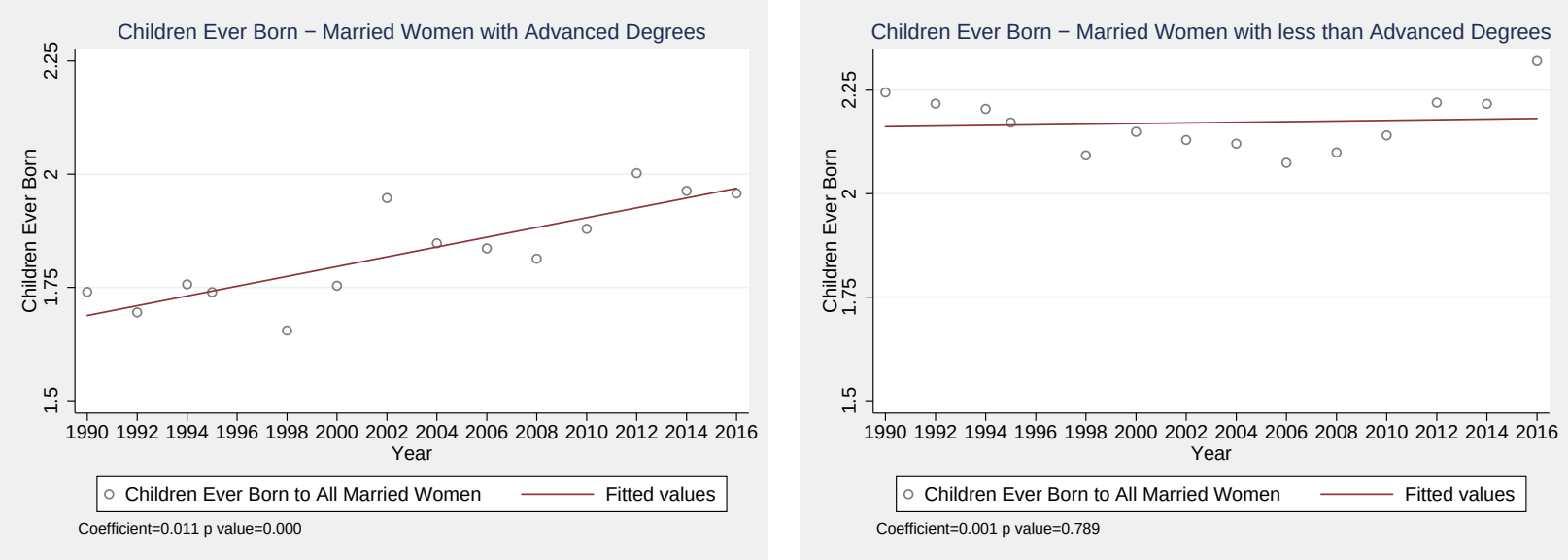

Figure 2: Children Ever Born to all Married Women with Advanced Degrees (left) and Women with less than Advanced Degrees (right).

Notes: Data is from the Fertility and Marriage supplement of the Current Population Survey (CPS). Sample consist of all married women ages 40–44.

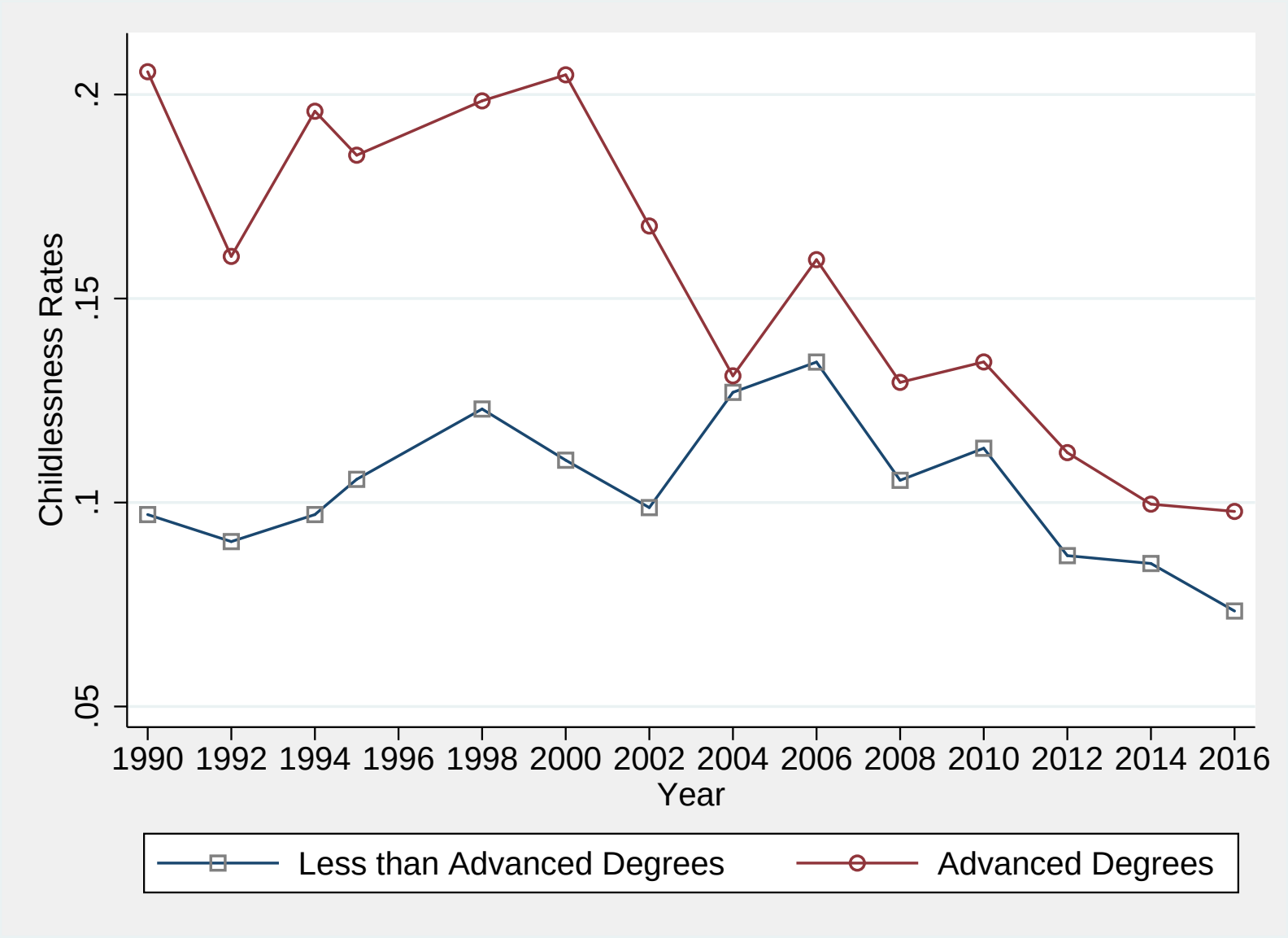

Figure 3: Childlessness Rates among Women with Advanced Degrees and Women with less than Advanced Degrees.
Notes: Childlessness rates of married women with advanced degrees (>16 years of school) labelled "Women with Advanced Degrees" and of women with up to and including a college education labelled "Other Women". Data is from the Fertility and Marriage supplement of the Current Population Survey (CPS) from 1990–2016. The sample consists of married women ages 40–44.

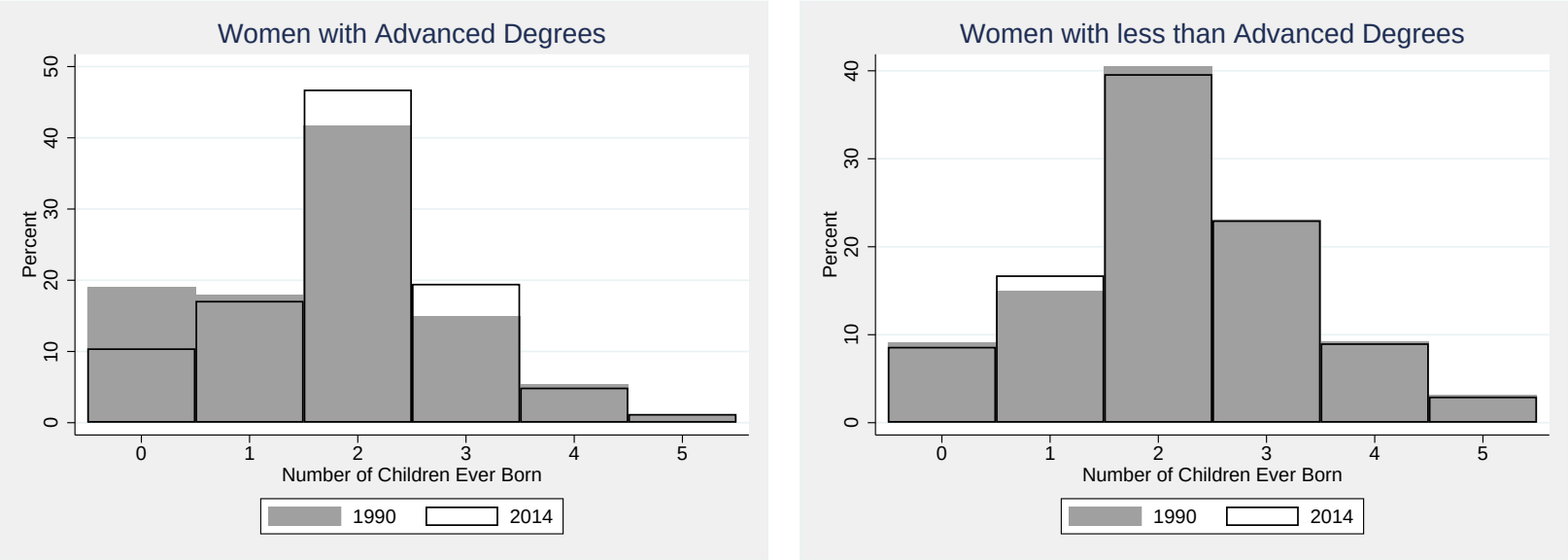

Figure 4: The Number of Children Ever Born to Women with Advanced Degrees (left) and Women with less than Advanced Degrees (right): 1990 and 2014.

Notes: Data is from the Fertility and Marriage supplement of the Current Population Survey (CPS). "1990" combines data from 1988, 1990, and 1992. "2014" combines data from 2012, 2014, and 2016. Samples consist of married women ages 40–44. The left panel is for women with advanced degrees, while the right panel is for women with up to and including a college education

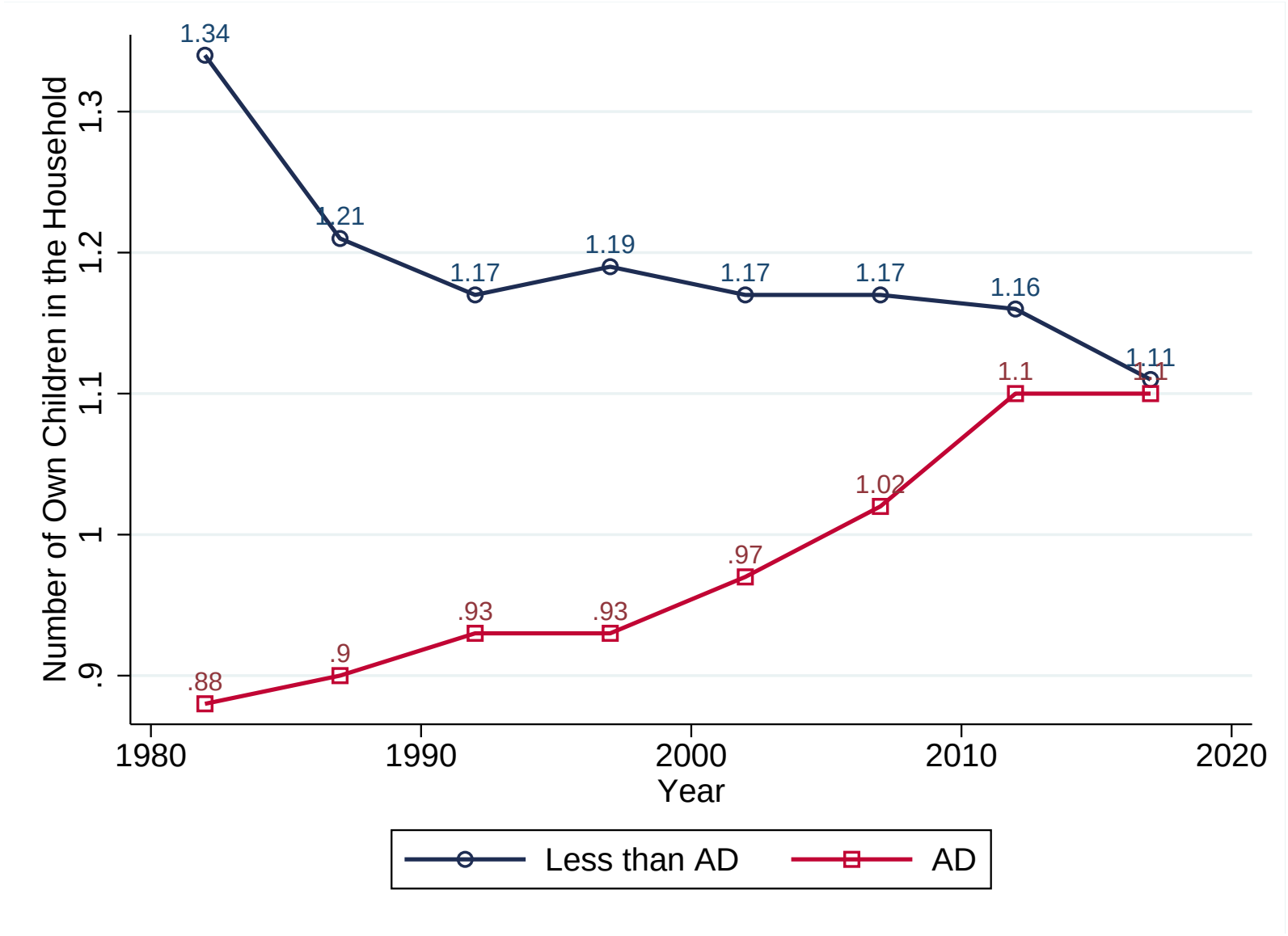

Figure 5: Number of Own Children in the Household among Women with Advanced Degrees and Women with less than Advanced Degrees, 1980-2020.

Notes: Each five years are grouped together and labeled by the mid year. For example, the data for 1982 is the average over the number of own children in the household among women in the relevant educational group for the years 1980-1984, and so on.

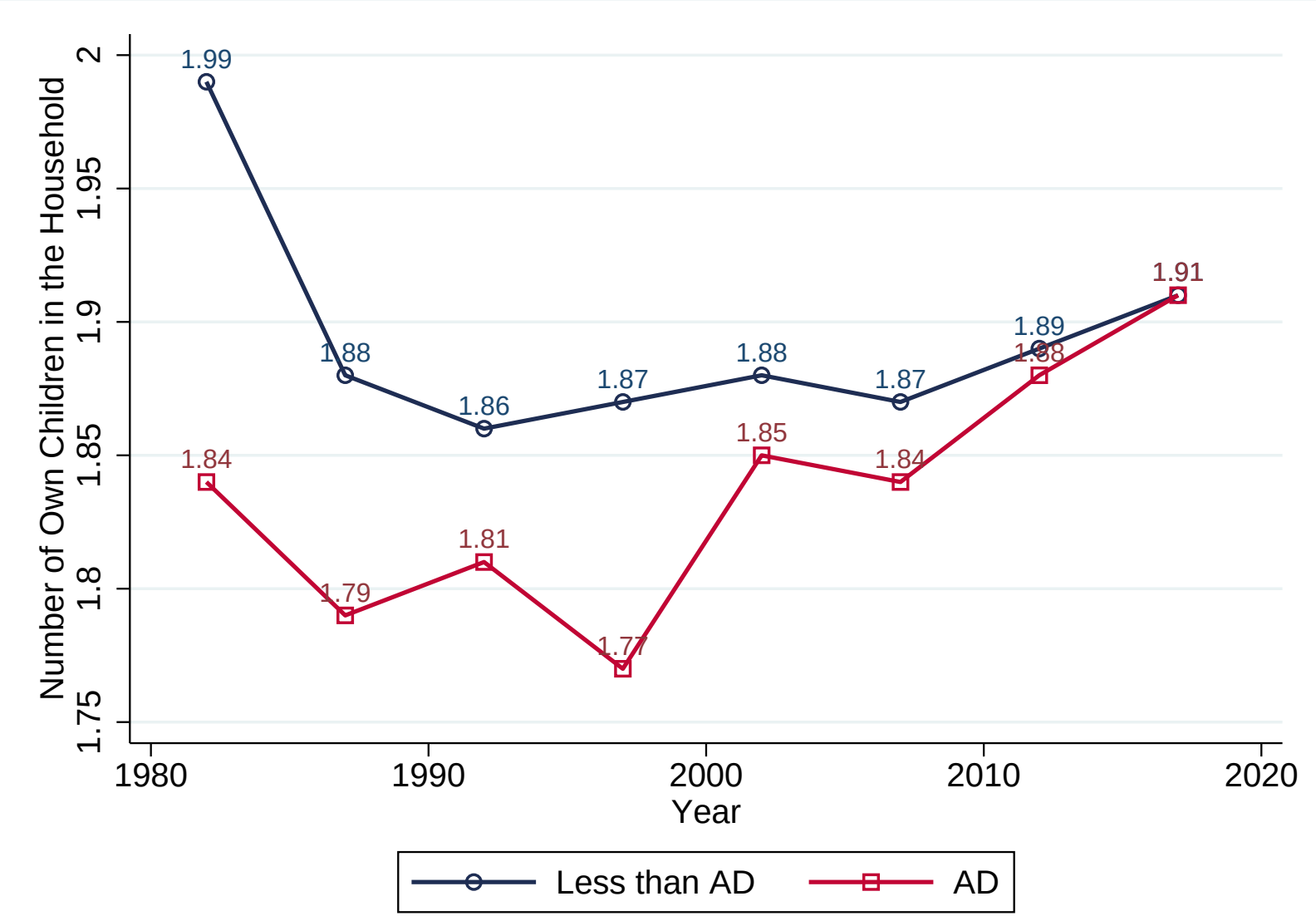

Figure 6: Fertility in the Intensive Margin: Number of Own Children in the Household among Mothers with Advanced Degrees and Mothers with less than Advanced Degrees, 1980-2020.

Notes: Each five years are grouped together and labeled by the mid year. For example, the data for 1982 is the average over the number of own children in the household among women in the relevant educational group for the years 1980-1984, and so on.

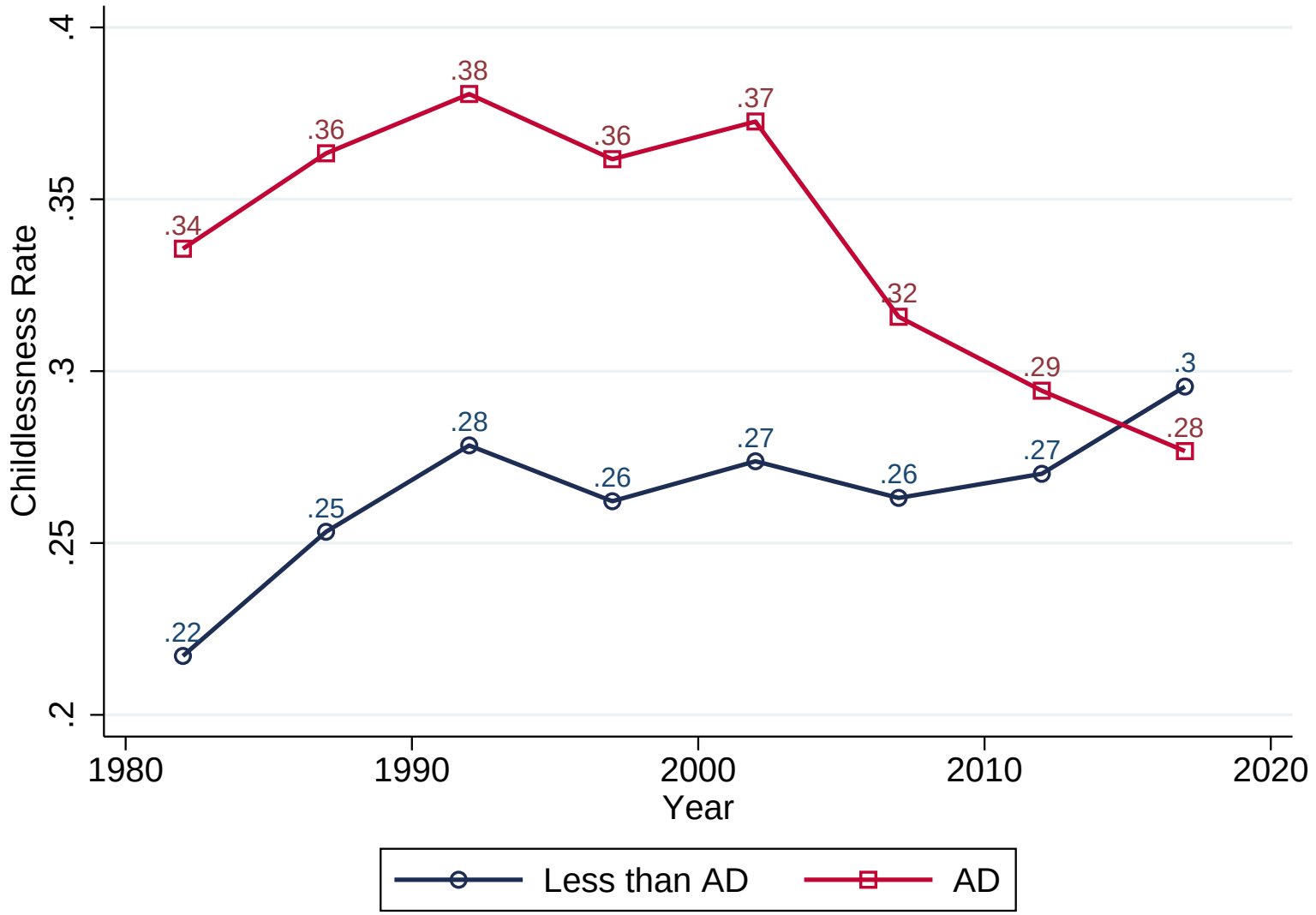

Figure 7: Fertility in the Extensive Margin: Currently Childlessness Rates among Women with Advanced Degrees and Women with less than Advanced Degrees, 1980-2020.

Notes: Each five years are grouped together and labeled by the mid year. For example, the data for 1982 is the average over the number of own children in the household among women in the relevant educational group for the years 1980-1984, and so on. A woman is defined as "currently childless" if she has no own children living in the household. Within each educational group we look for a 10 year window that minimize the fraction of childlessness rates by educational group, and define temporary childlessness within this 10 year window. This procedure implies that we use women age 30-39 for women with up to some college education, and women age 35-44 for women with college and advanced degrees.

Table 1: Summary Statistics

	1980s	1990s	2000s	2010s
	Panel A: Women up to a College Degree			
# of Kids	1.31	1.18	1.40	1.38
	(1.21)	(1.15)	(1.14)	(1.18)
N	141,513	141,417	176,451	137,462
# of Kids if ≥ 1	1.95	1.88	1.91	1.94
	(0.96)	(0.89)	(0.89)	(0.93)
N	94,626	90,436	128,738	97,931
Fraction Childless	0.23	0.26	0.18	0.19
	(0.42)	(0.44)	(0.38)	(0.39)
N	55,979	57,502	65,925	51,880
Age	35.74	37.103	38.38	37.92
	(7.35)	(7.24)	(7.24)	(7.47)
N	141,513	141,417	176,451	137,462
Total Income ($)	24,425	24,026	27,419	28,446
	(14,492)	(16,945)	(20,362)	(21,422)
N	141,513	141,417	176,451	137,462
	Panel B: Women with Advanced Degrees			
# of Kids	0.90	0.94	1.25	1.33
	(1.10)	(1.07)	(1.11)	(1.12)
N	15,336	14,595	21,744	28,889
# of Kids if ≥ 1	1.83	1.81	1.88	1.93
	(0.86)	(0.80)	(0.83)	(0.82)
N	7,573	7,593	14,415	19,969
Fraction Childless	0.35	0.37	0.24	0.20
	(0.48)	(0.48)	(0.42)	(0.40)
N	6,241	6,241	9,200	12,904
Age	35.89	38.71	39.01	38.43
	(6.68)	(7.00)	(7.00)	(6.78)
N	15,336	14,595	21,744	28,889
Total Income ($)	34,096	42,534	46,952	49,428
	(20,007)	(25,507)	(25,507)	(32,529)
N	15,336	14,595	21,744	28,889

Notes: The number of observations for the intensive margin of fertility and measure of childlessness are lower, as described in the text. Total income is reported in 1999 dollars. In the regression analysis, this variable is divided by 100,000 in order to get more readily interpretable coefficients.

Table 2: Childcare Relative Cost and the Number of Own Children in the Household: 1980-2020

Dependent Variable	Number of Own Children in the Household						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Childcare Relative Cost	-0.108***	-0.025**	-0.078***	-0.095***	-0.103***	0.097***	-0.052***
	(0.014)	(0.011)	(0.014)	(0.014)	(0.015)	(0.007)	(0.006)
Total Personal Income	-1.566***	-1.117***	-1.492***	-1.499***	-1.486***	-0.571***	-1.227***
	(0.142)	(0.106)	(0.148)	(0.151)	(0.152)	(0.060)	(0.064)
Total Personal Income^2	0.563***	0.412***	0.490***	0.501***	0.514***	0.244***	0.371***
	(0.102)	(0.077)	(0.119)	(0.122)	(0.121)	(0.037)	(0.045)
Spouse's Wage			4.622***				
			(0.388)				
Age FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Marital Status FE	No	Yes	Yes	Yes	–	–	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	Main	Main	Spouse Wage	Spouse Wage	Main-Married	Main-Single	All
N	677,407	677,407	430,181	430,181	455,922	102,124	909,592
R^2	0.1146	0.2159	0.1369	0.1349	0.1105	0.0831	0.2187

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors, clustered at the state level, are in parentheses. The sample comprises white, non-Hispanic women, aged 25-50, drawn from the Current Population Survey (ASEC samples). The dependent variable is the number of own children in the household. Childcare Relative Cost is the ratio of average wage in the home production substitute sector to the woman's wage. The "Main" sample is the sample including all women with observed wages. "Spouse Wage" is the subset of the "Main" sample that includes observations with a spouse's wage. "Main-Married" is the subset of the "Main" sample comprised only of married women. "Main-Single" is the subset of the "Main" sample comprised only of single women. "All" includes all women, even if their wage was imputed.

Table 3: Childcare Relative Cost by Educational Group and the Number of Own Children in the Household: 1980-2020

Dependent Variable	Number of Own Children in the Household						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Childcare Relative Cost	0.025*	0.074***	0.056***	0.042***	0.035**	0.171***	0.069***
	(0.015)	(0.011)	(0.015)	(0.015)	(0.015)	(0.017)	(0.010)
Childcare Relative Cost×HSG	-0.106***	-0.071***	-0.098***	-0.098***	-0.104***	-0.040	-0.080***
	(0.015)	(0.013)	(0.015)	(0.015)	(0.016)	(0.025)	(0.015)
Childcare Relative Cost×SC	-0.141***	-0.103***	-0.136***	-0.136***	-0.134***	-0.072***	-0.127***
	(0.016)	(0.013)	(0.018)	(0.018)	(0.016)	(0.021)	(0.014)
Childcare Relative Cost×CG	-0.282***	-0.215***	-0.251***	-0.255***	-0.244***	-0.232***	-0.267***
	(0.016)	(0.011)	(0.016)	(0.016)	(0.015)	(0.018)	(0.010)
Childcare Relative Cost×AD	-0.409***	-0.323***	-0.396***	-0.404***	-0.401***	-0.240***	-0.383***
	(0.020)	(0.015)	(0.021)	(0.021)	(0.022)	(0.018)	(0.014)
Total Personal Income	-1.562***	-1.110***	-1.518***	-1.540***	-1.541***	-0.327***	-1.224***
	(0.131)	(0.097)	(0.135)	(0.140)	(0.140)	(0.037)	(0.061)
Total Personal Income^2	0.519***	0.377***	0.460***	0.474***	0.489***	0.120***	0.347***
	(0.093)	(0.070)	(0.108)	(0.112)	(0.112)	(0.019)	(0.041)
Spouse's Wage			5.031***				
			(0.357)				
Age FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Marital Status FE	No	Yes	Yes	Yes	–	–	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	Main	Main	Spouse Wage	Spouse Wage	Main-Married	Main-Single	All
N	677,407	677,407	430,181	430,181	455,922	102,124	909,592
R^2	0.1212	0.2204	0.1420	0.1396	0.1150	0.1325	0.2229

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors, clustered at the state level, are in parentheses. The sample comprises white, non-Hispanic women, aged 25-50, drawn from the Current Population Survey (ASEC samples). The dependent variable is the number of own children in the household. Childcare Relative Cost is the ratio of average wage in the home production substitute sector to the woman's wage, and # of kids in $t-1$ is the number of kids a woman not including a child that was born during the past 12 months. The "Main" sample is the sample including all women with observed wages. "Spouse Wage" is the subset of the "Main" sample that includes observations with a spouse's wage. "Main-Married" is the subset of the "Main" sample comprised only of married women. "Main-Single" is the subset of the "Main" sample comprised only of single women. "All" includes all women, even if their wage was imputed.

Table 4: Childcare Relative Cost and the Number of Own Children in the Household, conditional of Having Children: 1980-2020

Dependent Variable	Number of Own Children in the Household						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Childcare Relative Cost	-0.020***	0.015***	-0.002	-0.014**	-0.016***	0.114***	-0.020***
	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.020)	(0.007)
Total Personal Income	-0.804***	-0.670***	-0.858***	-0.875***	-0.865***	-0.370***	-0.872***
	(0.049)	(0.045)	(0.068)	(0.070)	(0.065)	(0.128)	(0.047)
Total Personal Income^2	0.353***	0.303***	0.383***	0.397***	0.398***	0.152	0.288***
	(0.039)	(0.035)	(0.061)	(0.064)	(0.058)	(0.095)	(0.035)
Spouse's Wage			2.866***				
			(0.330)				
Age FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Marital Status FE	No	Yes	Yes	Yes	–	–	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	Main	Main	Spouse Wage	Spouse Wage	Main-Married	Main-Single	All
N	461,281	461,281	333,107	333,107	359,592	22,054	646,252
R^2	0.0533	0.0659	0.0621	0.0608	0.0601	0.0549	0.0748

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors, clustered at the state level, are in parentheses. The sample comprises white, non-Hispanic women, aged 25-50, with at least one own child at home, drawn from the Current Population Survey (ASEC samples). The dependent variable is the number of own children in the household. Childcare Relative Cost is the ratio of average wage in the home production substitute sector to the woman's wage. The "Main" sample is the sample including all women with observed wages. "Spouse Wage" is the subset of the "Main" sample that includes observations with a spouse's wage. "Main-Married" is the subset of the "Main" sample comprised only of married women. "Main-Single" is the subset of the "Main" sample comprised only of single women. "All" includes all women, even if their wage was imputed.

Table 5: Childcare Relative Cost by Educational Group and the Number of Own Children in the Household, conditional of Having Children: 1980-2020

Dependent Variable	Number of Own Children in the Household						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Childcare Relative Cost	0.068***	0.089***	0.071***	0.063***	0.063***	0.122**	0.092***
	(0.009)	(0.008)	(0.011)	(0.011)	(0.010)	(0.058)	(0.009)
Childcare Relative Cost×HSG	-0.072***	-0.061***	-0.066***	-0.066***	-0.070***	-0.017	-0.095***
	(0.012)	(0.012)	(0.013)	(0.013)	(0.014)	(0.054)	(0.012)
Childcare Relative Cost×SC	-0.098***	-0.085***	-0.082***	-0.082***	-0.083***	-0.031	-0.133***
	(0.011)	(0.011)	(0.012)	(0.012)	(0.012)	(0.059)	(0.012)
Childcare Relative Cost×CG	-0.135***	-0.124***	-0.117***	-0.119***	-0.123***	-0.168***	-0.194***
	(0.009)	(0.009)	(0.010)	(0.010)	(0.010)	(0.057)	(0.009)
Childcare Relative Cost×AD	-0.182***	-0.167***	-0.161***	-0.166***	-0.169***	-0.128*	-0.249***
	(0.014)	(0.014)	(0.016)	(0.016)	(0.016)	(0.072)	(0.014)
Total Personal Income	-0.846***	-0.695***	-0.874***	-0.899***	-0.893***	-0.198*	-0.887***
	(0.046)	(0.041)	(0.062)	(0.064)	(0.060)	(0.108)	(0.047)
Total Personal Income^2	0.343***	0.291***	0.368***	0.383***	0.385***	0.071	0.276***
	(0.036)	(0.032)	(0.057)	(0.059)	(0.054)	(0.069)	(0.033)
Spouse's Wage			2.934***				
			(0.305)				
Age FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Marital Status FE	No	Yes	Yes	Yes	–	–	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	Main	Main	Spouse Wage	Spouse Wage	Main-Married	Main-Single	All
N	461,281	461,281	333,107	333,107	359,592	22,054	646,252
R^2	0.0553	0.0677	0.0640	0.0626	0.0621	0.0731	0.0777

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors, clustered at the state level, are in parentheses. The sample comprises white, non-Hispanic women, aged 25-50, with at least one own child at home, drawn from the Current Population Survey (ASEC samples). The dependent variable is the number of own children in the household. Childcare Relative Cost is the ratio of average wage in the home production substitute sector to the woman's wage, and # of kids in $t-1$ is the number of kids a woman not including a child that was born during the past 12 months. The "Main" sample is the sample including all women with observed wages. "Spouse Wage" is the subset of the "Main" sample that includes observations with a spouse's wage. "Main-Married" is the subset of the "Main" sample comprised only of married women. "Main-Single" is the subset of the "Main" sample comprised only of single women. "All" includes all women, even if their wage was imputed.

Table 6: Childcare Relative Cost and the Probability of being Childless: 1980-2020

Dependent Variable	Probability of being Childless						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Childcare Relative Cost	0.047***	0.007	0.034***	0.037***	0.037***	-0.035***	0.005**
	(0.007)	(0.004)	(0.005)	(0.005)	(0.005)	(0.010)	(0.002)
Total Personal Income	0.522***	0.306***	0.385***	0.387***	0.379***	0.378***	0.278***
	(0.067)	(0.041)	(0.043)	(0.044)	(0.047)	(0.046)	(0.017)
Total Personal Income^2	-0.154***	-0.086***	-0.091***	-0.093***	-0.099**	-0.175***	-0.062***
	(0.050)	(0.030)	(0.032)	(0.033)	(0.037)	(0.027)	(0.010)
Spouse's Wage			-0.795***				
			(0.122)				
Age FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Marital Status FE	No	Yes	Yes	Yes	–	–	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	Main	Main	Spouse Wage	Spouse Wage	Main-Married	Main-Single	All
N	266,052	266,052	175,639	175,639	186,427	31,752	363,713
R^2	0.0354	0.2232	0.0589	0.0583	0.0263	0.1151	0.2298

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors, clustered at the state level, are in parentheses. The sample comprises white, non-Hispanic women, drawn from the Current Population Survey (ASEC samples). Women are aged 30 to 39 for women with less than a college degree and aged 35-44 for women with at least a college degree. The dependent variable is a dummy that is equal to 1 if the woman does not have own child living in the household, and 0 otherwise. The dependent variable is a dummy that is equal to 1 if the woman has given birth during the past 12 months and 0 otherwise. Childcare Relative Cost is the ratio of average wage in the home production substitute sector to the woman's wage. The "Main" sample is the sample including all women with observed wages. "Spouse Wage" is the subset of the "Main" sample that includes observations with a spouse's wage. "Main-Married" is the subset of the "Main" sample comprised only of married women. "Main-Single" is the subset of the "Main" sample comprised only of single women. "All" includes all women, even if their wage was imputed.

Table 7: Childcare Relative Cost by Educational Group and the Probability of being Childless: 1980-2020

Dependent Variable	Probability of being Childless						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Childcare Relative Cost	0.012	-0.014**	-0.003	-0.001	0.001	-0.044**	-0.013**
	(0.009)	(0.006)	(0.007)	(0.007)	(0.006)	(0.018)	(0.005)
Childcare Relative Cost×HSG	0.033***	0.014**	0.031***	0.031***	0.028***	-0.007	0.009
	(0.009)	(0.007)	(0.009)	(0.009)	(0.010)	(0.024)	(0.007)
Childcare Relative Cost×SC	0.036***	0.019***	0.037***	0.038***	0.037***	-0.001	0.013**
	(0.008)	(0.005)	(0.007)	(0.007)	(0.007)	(0.016)	(0.005)
Childcare Relative Cost×CG	0.076***	0.059***	0.065***	0.066***	0.063***	0.076***	0.055***
	(0.009)	(0.006)	(0.008)	(0.008)	(0.007)	(0.015)	(0.006)
Childcare Relative Cost×AD	0.136***	0.102***	0.114***	0.115***	0.114***	0.091***	0.099***
	(0.012)	(0.008)	(0.010)	(0.010)	(0.010)	(0.018)	(0.007)
Total Personal Income	0.528***	0.308***	0.404***	0.408***	0.402***	0.225***	0.282***
	(0.061)	(0.036)	(0.039)	(0.040)	(0.043)	(0.045)	(0.016)
Total Personal Income^2	-0.143***	-0.076***	-0.087***	-0.089***	-0.095***	-0.083***	-0.058***
	(0.045)	(0.026)	(0.029)	(0.030)	(0.034)	(0.025)	(0.009)
Spouse's Wage			-0.881***				
			(0.124)				
Age FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Marital Status FE	No	Yes	Yes	Yes	–	–	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	Main	Main	Spouse Wage	Spouse Wage	Main-Married	Main-Single	All
N	266,052	266,052	175,639	175,639	186,427	31,752	363,713
R^2	0.0408	0.2272	0.0621	0.0614	0.0295	0.1415	0.2326

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors, clustered at the state level, are in parentheses. The sample comprises white, non-Hispanic women, drawn from the Current Population Survey (ASEC samples). Women are aged 30 to 39 for women with less than a college degree and aged 35-44 for women with at least a college degree. The dependent variable is a dummy that is equal to 1 if the woman does not have own child living in the household, and 0 otherwise. The dependent variable is a dummy that is equal to 1 if the woman has given birth during the past 12 months and 0 otherwise. Childcare Relative Cost is the ratio of average wage in the home production substitute sector to the woman's wage. The "Main" sample is the sample including all women with observed wages. "Spouse Wage" is the subset of the "Main" sample that includes observations with a spouse's wage. "Main-Married" is the subset of the "Main" sample comprised only of married women. "Main-Single" is the subset of the "Main" sample comprised only of single women. "All" includes all women, even if their wage was imputed.

Table 8: Childcare Relative Cost by Educational Group and the Number of Own Children in the Household, Each Decade Separately

Dependent Variable	Number of Own Children in the Household			
	(1)	(2)	(3)	(4)
	1980s	1990s	2000s	2010s
Childcare Relative Cost	-0.009	0.004	0.007	-0.049
	(0.009)	(0.017)	(0.022)	(0.041)
Childcare Relative Cost×HSG	0.020	-0.019	0.003	0.107**
	(0.025)	(0.020)	(0.029)	(0.046)
Childcare Relative Cost×SC	0.003	-0.015	-0.027	0.049
	(0.012)	(0.021)	(0.028)	(0.041)
Childcare Relative Cost×CG	-0.016	-0.078***	-0.118***	-0.061
	(0.015)	(0.015)	(0.030)	(0.040)
Childcare Relative Cost×AD	-0.065***	-0.188***	-0.194***	-0.141***
	(0.019)	(0.025)	(0.031)	(0.042)
Total Personal Income	-2.154***	-1.427***	-0.976***	-0.652***
	(0.134)	(0.119)	(0.062)	(0.096)
Total Personal Income^2	1.341***	0.647***	0.333***	0.200***
	(0.119)	(0.102)	(0.038)	(0.064)
N	158,587	157,727	218,574	168,103
R^2	0.2646	0.2314	0.1982	0.2090

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors, clustered at the state level, are in parentheses. The sample comprises white, non-Hispanic women, aged 25-50, drawn from the Current Population Survey (ASEC samples). The dependent variable is the number of own children in the household. Childcare Relative Cost is the ratio of average wage in the home production substitute sector to the woman's wage. All specifications include age fixed effects, marital status fixed effects, year fixed effects and state fixed effects.

Table 9: Childcare Relative Cost by Educational Group and the Number of Own Children in the Household, conditional of Having Children, Each Decade Separately

Dependent Variable	Number of Own Children in the Household			
	(1)	(2)	(3)	(4)
	1980s	1990s	2000s	2010s
Childcare Relative Cost	0.022***	0.065***	0.066**	0.009
	(0.008)	(0.022)	(0.030)	(0.052)
Childcare Relative Cost×HSG	0.007	-0.045*	-0.020	0.019
	(0.028)	(0.026)	(0.037)	(0.055)
Childcare Relative Cost×SC	-0.000	-0.037	-0.039	-0.026
	(0.011)	(0.024)	(0.032)	(0.052)
Childcare Relative Cost×CG	-0.003	-0.056***	-0.072*	-0.065
	(0.014)	(0.021)	(0.038)	(0.052)
Childcare Relative Cost×AD	0.016	-0.121***	-0.125***	-0.079
	(0.016)	(0.030)	(0.039)	(0.052)
Total Personal Income	-1.349***	-0.788***	-0.497***	-0.632***
	(0.085)	(0.082)	(0.048)	(0.114)
Total Personal Income^2	1.036***	0.367***	0.173***	0.280***
	(0.106)	(0.089)	(0.028)	(0.078)
N	103,482	99,198	144,789	119,195
R^2	0.0934	0.0771	0.0592	0.0572

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors, clustered at the state level, are in parentheses. The sample comprises white, non-Hispanic women, aged 25-50, drawn from the Current Population Survey (ASEC samples). The dependent variable is the number of own children in the household. Childcare Relative Cost is the ratio of average wage in the home production substitute sector to the woman's wage. All specifications include age fixed effects, marital status fixed effects, year fixed effects and state fixed effects.

Table 10: Childcare Relative Cost by Educational Group and the Probability of being Childless: Each Decade Separately

Dependent Variable	Probability of being Childless			
	(1)	(2)	(3)	(4)
	1980s	1990s	2000s	2010s
Childcare Relative Cost	0.008***	0.020***	0.006	0.021
	(0.003)	(0.007)	(0.011)	(0.023)
Childcare Relative Cost×HSG	0.003	-0.012	0.004	-0.044
	(0.007)	(0.009)	(0.013)	(0.027)
Childcare Relative Cost×SC	-0.008	-0.010	0.009	-0.017
	(0.005)	(0.008)	(0.013)	(0.024)
Childcare Relative Cost×CG	-0.004	0.020**	0.035***	0.000
	(0.006)	(0.008)	(0.011)	(0.022)
Childcare Relative Cost×AD	0.015*	0.040***	0.065***	0.041
	(0.008)	(0.011)	(0.018)	(0.027)
Total Personal Income	0.526***	0.419***	0.290***	0.124***
	(0.040)	(0.039)	(0.025)	(0.026)
Total Personal Income^2	-0.223***	-0.137***	-0.069***	-0.027
	(0.024)	(0.026)	(0.019)	(0.017)
N	63,014	64,677	76,038	65,468
R^2	0.2904	0.2605	0.2110	0.1839

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors, clustered at the state level, are in parentheses. The sample comprises white, non-Hispanic women, aged 25-50, drawn from the Current Population Survey (ASEC samples). The dependent variable is the number of own children in the household. Childcare Relative Cost is the ratio of average wage in the home production substitute sector to the woman's wage. All specifications include age fixed effects, marital status fixed effects, year fixed effects and state fixed effects.

Table 11: Propensity to Marry

	(1)	(2)	(3)	(4)
Dependent Variable	Married			
Childcare Relative Cost	-0.026***	0.001	-0.038***	-0.021***
	(0.003)	(0.005)	(0.004)	(0.005)
Childcare Relative Cost×HSG		-0.025***		-0.015***
		(0.005)		(0.005)
Childcare Relative Cost×SC		-0.023***		-0.007
		(0.006)		(0.006)
Childcare Relative Cost×CG		-0.023***		-0.009
		(0.005)		(0.006)
Childcare Relative Cost×AD		-0.042***		-0.027***
		(0.006)		(0.006)
N	677,407	677,407	909,592	909,592
R^2	0.0401	0.0410	0.0416	0.0423

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors, clustered at the state level, are in parentheses. The sample comprises white, non-Hispanic women, aged 25-50, drawn from the Current Population Survey (ASEC samples). All specifications include fixed effects for age, year, and state. Columns 2 and 4 also include fixed effects for education, as descried in the text.

Table 12: Fertility and Marriage

Dependent Variable	(1) # Children	(2) # Children if > 0	(3) Childless
Married	0.727***	0.242***	-0.330***
	(0.015)	(0.005)	(0.008)
Total Personal Income	-1.161***	-0.833***	0.274***
	(0.058)	(0.042)	(0.016)
Total Personal Income^2	0.360***	0.281***	-0.061***
	(0.043)	(0.034)	(0.010)
N	909,592	646,252	363,713
R^2	0.1907	0.0723	0.1580

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors, clustered at the state level, are in parentheses. The sample comprises white, non-Hispanic women, aged 25-50, drawn from the Current Population Survey (ASEC samples). All specifications include fixed effects for age, state, and year.