

**Racial Difference in Child Penalty**

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# Racial Difference in the Child Penalty

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## Abstract

This paper documents substantial racial differences in child penalties in the US. Black women experience only half the child penalties as white women. The racial gap is primarily driven by married women with high wages in the South, returning to the labor market almost immediately after childbirth. Furthermore, the racial gap does not change after I control for the racial difference in the distribution of her prior-childbirth covariates (wage, occupation, industry, government job, job with life insurance), husband covariates (labor income, wage, or gender attitudes), uncertainty (variance in husband income, asset income, or probability of husband being laid-off), and informal help (number of relatives within walking distance, and the number of sisters). In addition, the racial gap in child penalty is uncorrelated with time-varying state-level incarceration. In conclusion, the paper largely rules out economic covariates, gender norms, homeownership, informal family help, and potential incarceration of husbands as the main mechanisms driving the gap, leaving preference and discrimination as potential explanations.

**Keywords:** Race, Child Penalty, Labor Supply, Gender Norms

**JEL classification:** J13, J15, J16, J22

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# 1. Introduction

Mothers experience a substantial reduction in labor market income after childbirth, while fathers remain unaffected. This "child penalty" on women accounts for two-thirds of the overall gender earnings gap in the US (Cortés and Pan, 2020). Kleven et al. (2019 b; 2021 a; 2021 b) find that comparative advantage, biology, or parental leave policies cannot explain the child penalty. Instead, the recent literature considers preferences, gender norms, and labor market discrimination as lead candidates (Andresen and Nix, 2021; Kleven et al., 2021; Cortés and Pan, 2020; Kleven, 2022).

Despite norms and discrimination being potential mechanisms, it is surprising that little is known about the racial difference in the child penalties, except Kleven (2022), with a brief analysis of racial differences. First, racial discrimination is substantial in the labor market in the US (Bertrand and Mullainathan, 2004; Kline et al., 2021). Second, Scarborough et al. (2021) find that Black households have more progressive gender attitudes than white counterparts, potentially due to slavery (Davis, 1981) or discrimination in masculinity identity construction (Bederman, 1993).

Therefore, this paper first documents substantial differences in the child penalties between black and white women in the US. Black women have a significantly smaller child penalty in labor earnings than white women. The racial gap in child penalty is driven by all margins, including employment, annual hours worked, and wage rate. I use the data from the US Panel Study of Income Dynamics (PSID) with the event study decomposition method, which is extensively used by the child penalty literature (Angelov, Johansson, and Lindahl, 2016; Kleven et al., 2019, Kleven et al., 2021; Andresen and Nix, 2021; Cortés and Pan, 2020; Kleven, 2022).

Furthermore, four main findings are presented. First, this paper rules out single parenthood as the main explanation. The racial gap in child penalties is driven by married women, while there is no racial gap in child penalties among single women.

Second, the racial gap only exists among women in the South, while Black and white women have similar child penalties in other regions. Furthermore, the racial gap is driven by women whose wage is higher than the female median wage, whereas there is no significant racial difference among women with lower wages. Moreover, the racial gap is larger among women

in households with lower family non-labor income, and smaller among women with high non-labor income.

Third, this paper rules out homeownership and family composition as the explanation. The racial gap remains substantial when we compare black and white women who own the place they live (homeownership) or live in a household with no other family members except her husband and children (family structure). The results demonstrate that the racial gap in child penalties is not driven by the need for work to pay rent or informal help from other family members in the same household.

Fourth, I use inverse probability weighting (IPW) methods to reweight the sample so that Black and white women have a nearly identical distribution of covariates. Covariates include the wife's prior childbirth characteristics, such as wage, occupation, industry, working as a government worker, having a job paying for life insurance, and her year of schooling. I also control for the racial differences in the distribution of husband characteristics, such as annual labor income (simultaneous control for husband employment status), hourly wage, and husband attitude against wife working.

In addition, to control for the racial gap in financial distress, I control for the racial differences in the uncertainty distribution, such as the standard deviation of husband labor income, and the expected probability of the husband being laid off. In addition, I also control for the racial difference in annual debts or mortgage payments. As a proxy for informal help from family members, I control for the racial difference in the number of relatives living within walking distance and the number of sisters the women have. As a result, I find that the racial difference in the distribution of covariates, discussed above, has a very limited contribution to the racial gap in the child penalties. In addition, the racial gap is not affected by time-varying state-level incarceration rate.

This paper makes three main contributions to the child penalties literature. First, it documents the substantial racial difference in the child penalty, a new finding in the child penalty literature. Second, it is the first paper to systemically investigate what drives the racial gap, and it rules out many previously untested hypotheses proposed in economics and sociology literature, by ruling out single parenthood, homeownership, family structure, gender norms, or the likelihood of husband incarceration as the main explanations for the racial gap.

Furthermore, the paper quantifies the limited contribution of economic variables to the racial gap in child penalties using inverse probability weighting methods. Moreover, this paper

highlights that the racial gap exists primarily among women with high wages in the South. Future research disentangling preference from discrimination within this population may eventually identify the cause of child penalties and the racial gap. This paper leaves racial difference in preference and discrimination as potential candidates for future research.

The third contribution is methodological. The child penalty literature currently does not use individual fixed effects in the estimation which causes the estimates to be mixed with sorting effect. In other words, without individual fixed effects, a sharp reduction in the average wage following childbirth can be driven by lower-wage women entering motherhood earlier than other women. To the best of my knowledge, this paper is the first one to propose having an individual fixed effect in the estimation to isolate sorting effect.

The structure of the paper is as follows. Section 2 documents related literature. Section 3 explains methods and data. Section 4 presents results in event study decomposition. Section 5 presents results with and without inverse probability weighting. Section 6 shows that racial gap in child penalty is uncorrelated with time-varying state-level incarceration. Finally, Section 7 concludes.

## **2. Related Literature**

### **2.1 Child penalty**

Parenthood has long been considered a major cause of gender inequality in the labor market. Influential work by Kleven et al. (2019a; 2019b) uses event-study analysis to show how immediately and substantially the earnings diverge between men and women after first childbirth and how persistent the gender earning gap has remained ever since.

The magnitude of child penalties is similar between biological and adoptive mothers in Denmark (Kleven et al., 2021) and Norway (Andresen and Nix, 2021). Andresen and Nix (2021) further show that the child penalty is no longer significant between birth-mother and co-mother for same-sex couples and rule out comparative advantage as the main explanation. Furthermore, substantial expansions of parental leave policies and child care subsidies have not affected the child penalty in Austria for over 60 years (Kleven et al., 2021)

Gender norms, preferences, and labor market discrimination are key candidates to explain the child penalty (Kleven et al., 2019a; 2019b; 2021; Andresen and Nix, 2021; Cortés and Pan,

2020; Kleven, 2022). However, to the best of my knowledge, economic research has not explored the racial perspective on the child penalty. The exception is Kleven (2022), with a brief analysis on the racial comparison of the child penalties.

## **2.2 Racial difference in female labour supply**

To the best of my knowledge, the racial perspective in the child penalty has not been explored in economic research. The except is Kleven (2022) with a brief analysis of racial comparison in child penalty with hypothesis that single parenthood or gender norms may explain the racial gap.

Similarly, in sociology, Waldfogel (1997) and Glauber (2007) points out that black women do not have a motherhood wage penalty<sup>1</sup> that is substantial for white women. However, there is no explanation provided up to date.

In the female labor supply literature, it is also a puzzle that Black women had a higher labour force participation than white women from 1870 until 1980. The striking racial difference in female labour supply remains after controlling for environmental, economic, and family variables (Goldin, 1977) or other economic and demographic observables (Boustan and Collins, 2013). Once again, gender norms are considered the leading candidate to explain the racial gap in female labor supply (Goldin, 1977).

## **2.3 Racial difference in gender norms**

Scarborough et al. (2021) document that Black men and women have more progressive gender attitudes than their white counterparts, using General Social Survey from 1977 to 2018.

Historians provide two views on why black households have developed less conservative gender norms. First, slavery may have undermined the conservative gender identities in black households, as the slavery system may have changed the ideology of womanhood as black women had to work intensively in manual labor, and the slave system harshly discouraged male supremacy in Black men (Davis, 1981).

On the other hand, less conservative gender norms in Black households may result from racial discrimination in the construction of male supremacy. First, the working-class version of modern manliness is constructed by women's exclusion from paid labor (Melosh, 1993).

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<sup>1</sup> Insignificant coefficient of the interaction term between a dummy of being Black and a dummy of having a child under age 6 in a pooled OLS regression with log hourly wage as the dependent variable, using women-only sample.

Powerful manhood identity is a political language, and such construction deliberately excluded other races, refusing to concede that men of other races were equally manly as white men (Bederman, 1993). As Bederman explains, under gender and racial hierarchy, the gender identity of white men was constructed as self-controlled protectors of women and children, and white women as motherly and dedicated to the home. In contrast, non-white men and women were almost identical.

### 3. Data and methods

#### 3.1 Event study decomposition

I follow the specification of event study decomposition, which is extensively used by the child penalty literature (Angelov et al., 2016; Kleven et al., 2019, Kleven et al., 2021; Andresen and Nix, 2021; Cortés and Pan, 2020; Kleven, 2022).

Furthermore, I add individual fixed effects to account for endogenous timing across women entering motherhood earlier or later. Otherwise, a sharp reduction in the average wage following childbirth can be driven by lower-wage women entering motherhood earlier than other women. Therefore, only within-individual variation is used.

$$Y_{it} = \alpha' D_{it}^{Event} + \beta' D_{it}^{Age} + \gamma' D_{it}^{Year} + v_i + \varepsilon_{it}, \quad (1)$$

where  $Y_{it}$  is the annual labor income (adjusted by inflation index and transformed by inverse hyperbolic sine) or labor supply (participation dummy or annual hours worked if participating) of individual  $i$  at event time  $t$ . The first term includes event time dummies, indexed such that  $t = 0$  denotes the year of the arrival of the first child and omits the dummy for  $t = -1$  so that each  $\alpha'$  measures the impact of children each year relative to the year before the child's arrival. The second and third terms include a full set of age and year dummies to control nonparametrically for life cycle trends and time trends. This specification is run separately for white women, black women, and men<sup>2</sup>.

Similar to Kleven et al. (2019b) and Kleven (2022), the estimated effects are converted into percentage effects by calculating

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<sup>2</sup> Men are not separately run by race as I find that neither black nor white men have their labour market outcomes affected by the childbirth.

$$P_t^g = \frac{\hat{\alpha}_t^g}{E[\tilde{Y}_{it}^g|t]}, \quad (2)$$

Where  $\tilde{Y}_{it}^g$  is the average predicted outcome, excluding the contribution of the event time coefficients, as the counterfactual outcome absent children. Finally, the child penalty is constructed as the average effect of having children on women compared to the effect on men.

$$\text{child penalty} = E[P_t^m - P_t^w | t \geq 0] - E[P_t^m - P_t^w | t < 0], \quad (3)$$

Furthermore, the short-run penalty is defined as the average percentage by which women's labor outcome falls behind men one to five years after the first child's arrival. The long-run penalty is the average penalty from six to ten years after the arrival of the first child.

### 3.2 PSID

Data comes from the Panel Study of Income Dynamics (PSID-CDS) from 1968 to 2019. The study began in 1968 with a nationally representative sample of over 18,000 individuals living in 5,000 families in the United States.

Sample selection criteria follows Kleven et al. (2019a) and Cortés and Pan (2020) to include only individuals with their first child between the ages of 20 and 45. Observations include only between age 18 to 65.

Table 1 shows the summary statistics before and after childbirth, by race, and marital status. On average, black women are more disadvantaged economically. Husbands of white women have higher annual labor income and hourly wage than husbands of black women. For homeownership, married Black women are less likely to own the place where they live. Five years after the first childbirth, black women are less likely to have their husbands being against their wives working, less likely to own the house, and have less non-labor income. Black women are more likely to be a government worker. Homeownership is highest among married white women, followed by married black women, single white women, and single black women. Therefore, annual mortgage payment for housing follows the same pattern. In addition, married black women are most likely to grow up in a larger family size, compared to the rest. After childbirth, the annual hours worked and employment rate of married white women become the lowest, compared to black women or single women.



**Table1. Summary statistics between black and white mothers**

	Married mother		Single mother	
	White	Black	White	Black
<i>3-year average before childbirth</i>				
Age	25.89	25.49	24.82	24.36
Year	1993.18	1991.07	1994.64	1995.71
(Husband) labor income	6380.90	4705.54	-	-
Annual labor income	2982.14	2395.44	5237.31	3041.50
(Husband) hourly wage	2.99	2.38	-	-
Hourly wage	2.05	1.61	2.66	1.73
Employment rate	0.79	0.75	0.85	0.77
Annual hours worked	1243.07	1182.56	1629.29	1410.35
Government worker	0.19	0.31	0.18	0.30
Homeowner	0.31	0.21	0.14	0.07
South	0.31	0.69	0.26	0.63
Household structure*	0.97	0.93	0.63	0.63
Family non-labor income	782.77	474.23	981.69	610.76
Year of schooling	14.24	13.77	14.36	14.18
Total number of sisters	1.18	1.81	-	-
Her mother's number of children	3.51	5.38	3.51	4.81
Annual housing mortgage (\$)	692	252	147	54
Observations	6550	1165	1097	766
n	2981	589	698	400
<i>3-year average after childbirth</i>				
Age	28.23	27.11	27.05	26.45
Year	1996.18	1995.29	1998.02	1998.29
(Husband) labor income	7161.86	4686.98	-	-
Female labor income	2005.23	2184.47	3073.51	2465.00
(Husband) hourly wage	3.29	2.28	-	-
Female hourly wage	1.57	1.40	1.66	1.43
Female employment rate	0.65	0.71	0.73	0.65
Annual hours worked	777.68	1122.85	1043.25	1027.57
Government worker	0.19	0.27	0.13	0.29
Homeowner	0.32	0.21	0.09	0.06
South	0.31	0.70	0.33	0.62
Household structure*	0.97	0.94	0.77	0.78
Family non-labor income	971.93	658.62	1415.42	623.37
Year of schooling	14.11	13.59	12.74	12.58
Total number of sisters	1.27	1.78	-	-
Her mother's number of children	3.50	4.93	3.73	4.88
Annual housing mortgage (\$)	912.23	366.09	176.19	51.28
Observations	7441	1800	592	924
n	3558	883	430	543

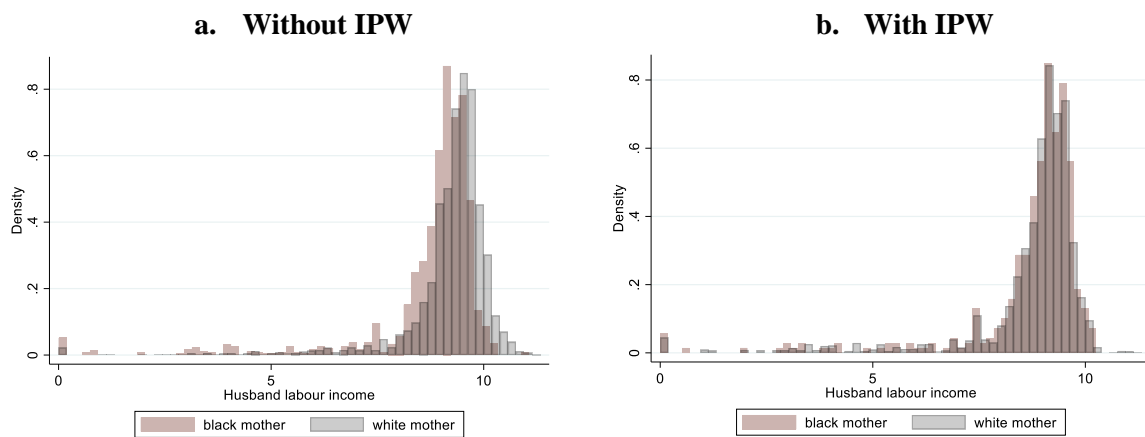
Note: \*Binary indicator if there is no relatives (including grandparents and siblings) or non-relatives living in the households. The sample consists of women having her first child at age between 20 and 45. Only observations between age 18 to 65. Income, wage, and mortgage payment adjusted by inflation index (1960 price). Source: Panel Study of Income Dynamics, 1968 to 2019.

### 3.3 Control for the distribution of covariates between black and white women

As shown in Table 1, Black and white women are in very different economic and demographic situations. Therefore, I use inverse probability weights to ensure that after reweighting, Black women have a nearly identical distribution of these covariates to white women.

For example, black husbands' labor income is lower than white husbands, as shown in Figure 1.a. After reweighting, there is almost no racial difference in the distribution of husband labor income.

**Figure 1. the racial difference in the distribution of covariates**



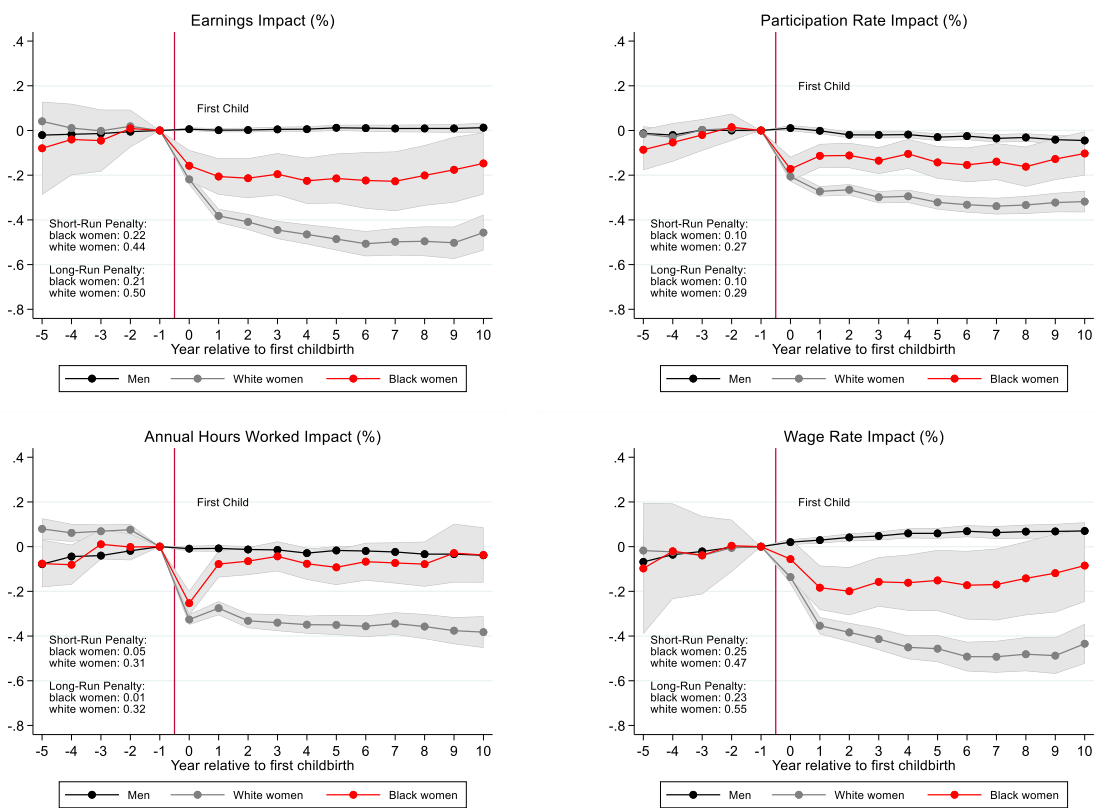
Note: Husband labour income is the 11-year averaged (5 years before and after childbirth) and transformed by inverse hyperbolic sine. The sample consists of women as the head of their households, having her first child at age between 20 and 45. Income and wage adjusted by inflation index (1960 price). Source: Panel Study of Income Dynamics, 1968 to 2019.

## 4. Child penalties by race

### 4.1 Married women

Figure 2 shows the racial differences in the child penalties between black and white married women. The long-run child penalty in labor earnings is around 44% for white women while around 22% for black women. The racial gap is driven by all margins, including participation rate, annual hours worked conditional on being employed, and wage rate.

**Figure 2. Racial differences in the child penalties among married women**



Note: The sample consists of married women in male-headed households having her first child at age between 20 and 45. Income and wage adjusted by inflation index (1960 price). Wage and income are transformed by inverse hyperbolic sine. Annual hours worked are conditional on being employed. Source: Panel Study of Income Dynamics, 1967 to 2017.

## 4.2 Single women

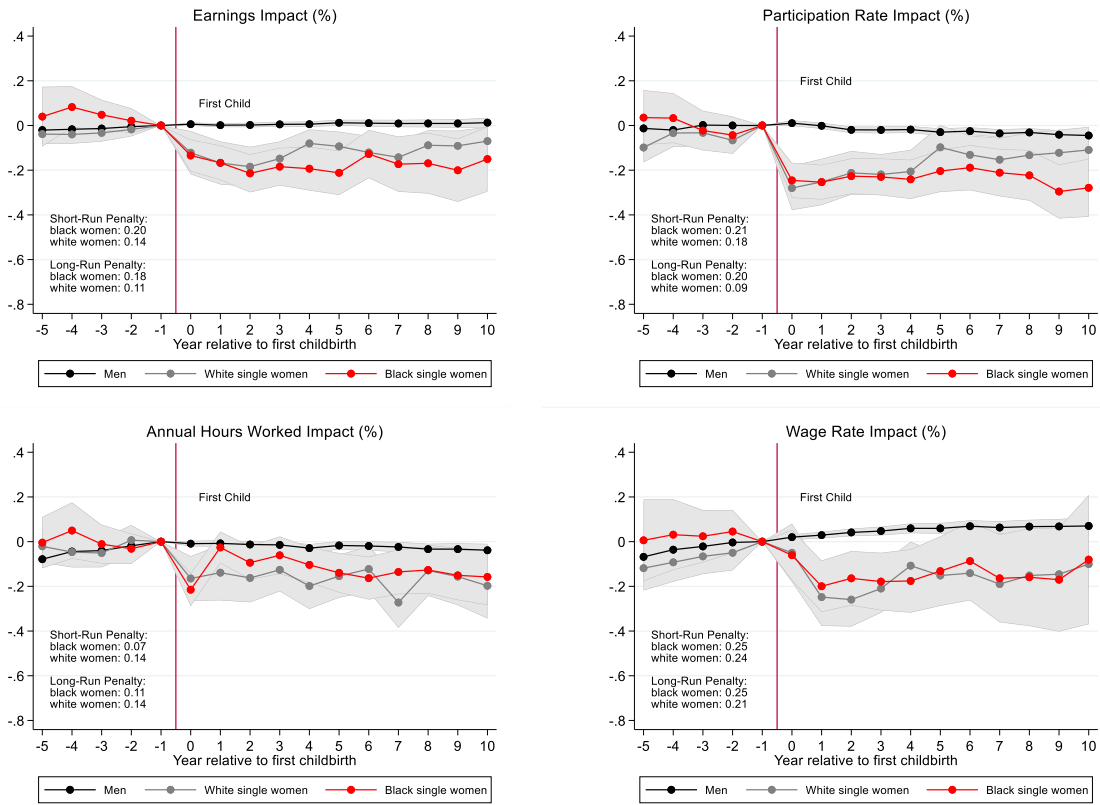
Figure 3 shows the child penalties among single women. The magnitude of child penalties is similar between black women and white women. Furthermore, if we compare Figure 1 and Figure 3, the magnitude of child penalties among black women is similar to single and married women. Therefore, the racial gap is primarily driven by married white women having significantly larger child penalties than the other women.

## 4.3 Other heterogeneity

As married women drive the racial gap in the child penalties, the entire analysis onwards is carried out using the sample of married women in male-headed households.

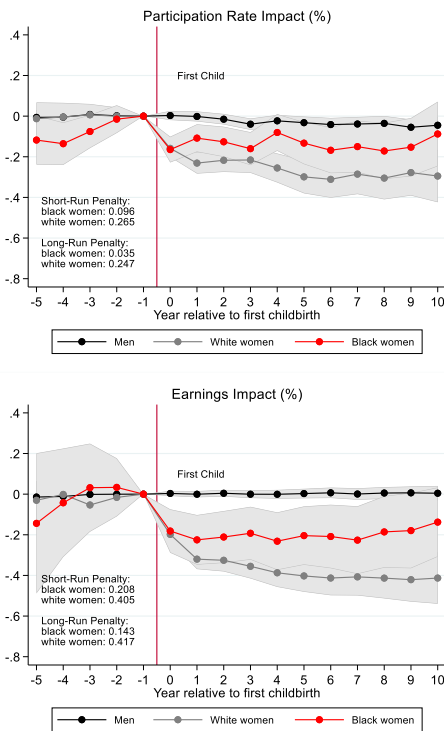
The heterogeneity analysis divides women by region, wage, family non-labor income, homeownership, and family structure. First, Figure 4 shows that women in the South drive the racial gap, while there is no racial difference in the child penalties in the other regions.

**Figure 3. Racial difference in the child penalties (single women)**

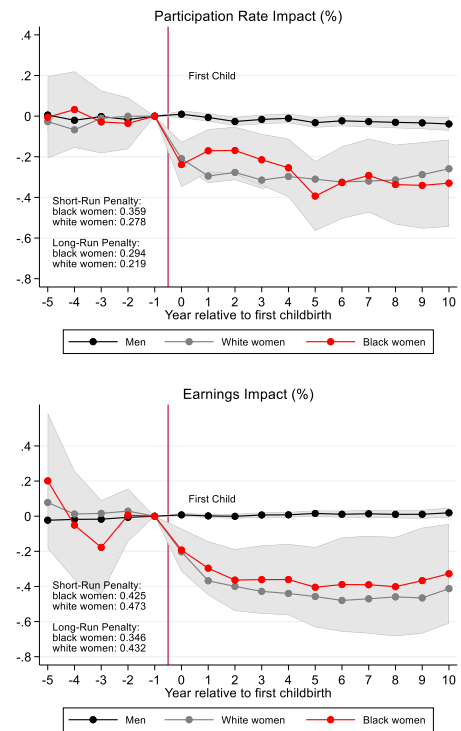


**Figure 4. Racial differences in the child penalties by region**

**a. South**



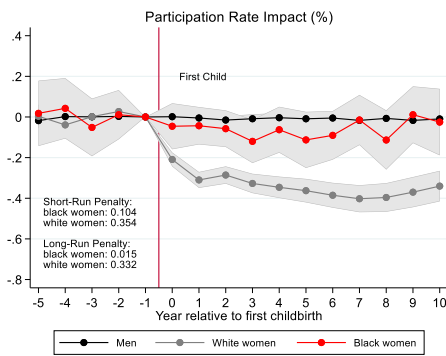
**b. Non-South**



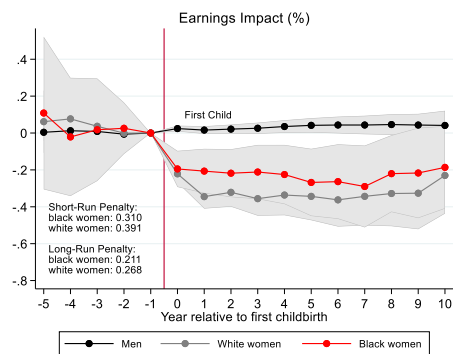
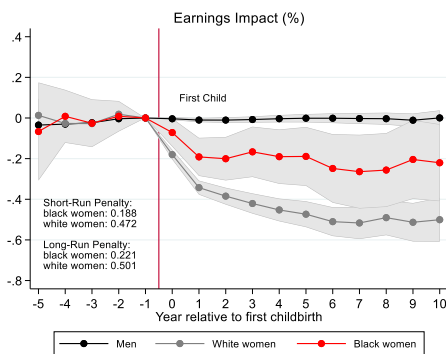
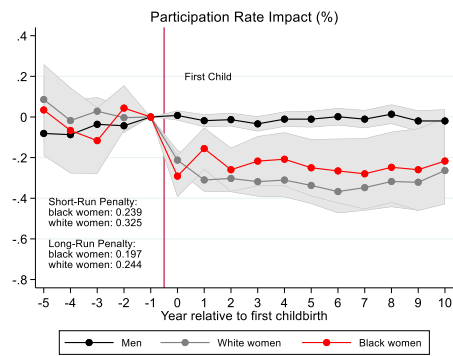
Note: The sample consists of single women as the head of their households, having her first child at age between 20 and 45. Income and wage adjusted by inflation index (1960 price). Source: Panel Study of Income Dynamics, 1967 to 2017.

**Figure 5. Racial difference in the child penalties by prior wage**

**a. Prior wage above the female median**



**b. Prior wage below the female median**



Note: The sample consists of married women in male-headed households having her first child at age between 20 and 45. Income and wage adjusted by inflation index (1960 price). Wage and income are transformed by inverse hyperbolic sine. Annual hours worked are conditional on being employed. Source: Panel Study of Income Dynamics, 1967 to 2017.

Figure 5 shows that high-wage women drive the racial gap in child penalties, while there is no racial gap among women with a wage below the female median. I first measure the median wage per year among childless women in the PSID. Then, I construct a binary indicator if her wage (1 year before childbirth) is above the median female wage of that year.

Finally, the racial gap remains unchanged when I look at different subsamples by other heterogeneity analyses, such as family non-labor income, homeownership, or household composition (women living in a family structure with only a husband, wife, and children).

In addition, I also run the event study analysis with household composition as the outcome variable. I find that parenthood has no effect on other family members moving into the household.

## **5. Control for the racial gap in the distribution of covariates**

I use inverse probability weighting (IPW) to construct the new weights such that Black women have almost identical distribution of covariates compared to white women. This section first explains all covariates controlled for. The second part presents the racial gap in child penalties before and after IPW.

### **Wife characteristics**

First, the racial difference in the distribution of her own characteristics is controlled for. Such prior childbirth covariates include wage, occupation, industry, working as a government worker, having a job paying for life insurance, and her year of schooling.

### **Husband characteristics**

I also control for the racial differences in the distribution of husband characteristics, such as annual labour income (simultaneously control for husband employment status), hourly wage, and husband attitude against wife working (5-item index in a survey question).

### **Volatility, assets, and risks**

To control for the racial gap in financial distress, I control for the racial differences in the distribution of uncertainty, such as the standard deviation of husband labor income (10 years around childbirth), and expected probability of husband laid off (a survey question asking the husband to estimate the probability that he may be laid off in the next 12 months, ranging from 0 percent to 100 percent). I also control for the racial difference in the distribution of family non-labor income and the standard deviation (10 years around childbirth). In addition, I also control for the racial difference in annual debts or mortgage payments.

### **Informal help**

As a proxy for informal help from family members, I control for the racial difference in the number of relatives living within walking distance and the number of sisters the women have.

As shown in Table 3, the child penalty for black women virtually does not change even after we use inverse probability weighting such that Black women have an almost identical distribution of covariates we have discussed above.

This suggests that racial gap in child penalty is not driven by prior childbirth economic covariates (such as wage, industry, occupation, year of schooling, husband labor income,

family non-labor income), or demographic covariate (such as family members living in the household or relatives living within walking distance).

**Table 3. Short-run labor income penalty with and with IPW**

IPW covariates	No IPW	IPW	No IPW	IPW		
	White	Black	Black	racial	racial	Diff.
<b>Wife characteristics</b>	women	women	women	gap	gap	
Female wage	41%	22%	18%	-19%	-22%	-4%
Government worker	38%	20%	22%	-18%	-16%	2%
Female industry	42%	25%	26%	-17%	-16%	1%
Female occupation	41%	25%	23%	-17%	-18%	-1%
Wife's job pays for life insurance	42%	19%	21%	-23%	-21%	2%
Female year of schooling	37%	22%	22%	-15%	-15%	0%
<b><i>Husband characteristics</i></b>						
Husband labor income	40%	21%	19%	-19%	-21%	-2%
Husband hourly wage	40%	21%	21%	-19%	-19%	0%
Husband Attitude	45%	24%	22%	-21%	-23%	-2%
<b><i>Assets and risks</i></b>						
Husband labor income (sd)	41%	22%	21%	-19%	-20%	-1%
Probability husband laid off	38%	15%	16%	-22%	-22%	1%
Family non-labor income	41%	21%	21%	-20%	-20%	0%
Family non-labor income (sd)	42%	19%	16%	-22%	-26%	-4%
Debt	40%	16%	15%	-23%	-24%	-1%
Annual mortgage payment	41%	22%	20%	-19%	-21%	-2%
<b><i>Family structure</i></b>						
Relatives live in working distance	53%	17%	18%	-36%	-35%	2%
Total number of sisters	39%	17%	15%	-23%	-24%	-1%

Note: Short-run (long-run) penalty is the average child penalty between 1-5 (6-10) years after childbirth. Her Prior wage is 1 year before childbirth. Industry is 1 to 5 years before childbirth. Husband labour income is the average of 10 years after childbirth. Family non-labour income is the total of 10 years after childbirth. The husband attitude question asks "How do you feel about your (Wife/friend) working/the possibility of your (Wife/ friend) working? Are you very much in favor of it, somewhat in favor of it, neither for or against it, somewhat against it, or very much against it?" The sample consists of married women in male-headed households, having her first child at the age between 20 and 45. Income and wage adjusted by inflation index (1960 price) and transformed by inverse hyperbolic sine. Source: Panel Study of Income Dynamics, 1967 to 2017.

## 6. Incarceration

I use the yearly incarceration rate by state from the Bureau of Justice Statistics which provides imprisonment rate of sentenced male prisoners under the jurisdiction of state or federal correctional authorities per 100,000 male U.S. residents.

As shown in Table 4, including time-varying state imprisonment rate doesn't affect either the child penalty for white women or the racial gap in child penalty. The result suggests that the

racial gap in child penalties may not be driven by concerns for the risk of incarceration of husbands.

**Table 4. Incarceration and the racial difference in child penalty**

	(1)	(2)	(3)	(4)
	Labor income	Labor income	Being employed	Being employed
After childbirth	-0.982*** (0.066)	-0.978*** (0.066)	-0.142*** (0.006)	-0.142*** (0.006)
Black X After childbirth	0.467*** (0.129)	0.458*** (0.129)	0.072*** (0.012)	0.072*** (0.012)
Imprisonment rate		0.262 (0.161)		-0.009 (0.013)
Constant	8.214*** (0.439)	8.147*** (0.440)	0.405*** (0.015)	0.407*** (0.016)
Observations	67832	67832	120166	120166
Individual Fixed Effect	Yes	Yes	Yes	Yes
Age Fixed Effect	Yes	Yes	Yes	Yes
year fixed effect	Yes	Yes	Yes	Yes

Note: The sample consists of women in male-headed households having her first child at age between 20 and 45. Income and wage adjusted by inflation index (1960 price). Wage and income are transformed by inverse hyperbolic sine. Imprisonment rate of sentenced male prisoners under the jurisdiction of state or federal correctional authorities per 100,000,000 male U.S. residents. Source: Panel Study of Income Dynamics (1978 to 2019) and Bureau of Justice Statistics (1978-2019).

## 7. Conclusion

This study shows striking differences in child penalties between black and white women in the US. This paper largely rules out the main explanation of single parenthood, family structure, and homeownership. Furthermore, most economics, demographic, and work-related gender attitude variables do not explain most of the racial gap in child penalty. In addition, racial gap in child penalty seems to be uncorrelated with time-varying incarceration rate.

Heterogeneity analysis shows that the racial gap is primarily driven by women in the South with high wages and low household non-labor income. Therefore, further distinguishing preference and labor market discrimination for women with high wages is a promising avenue to understand the cause of child penalties and the racial gap.



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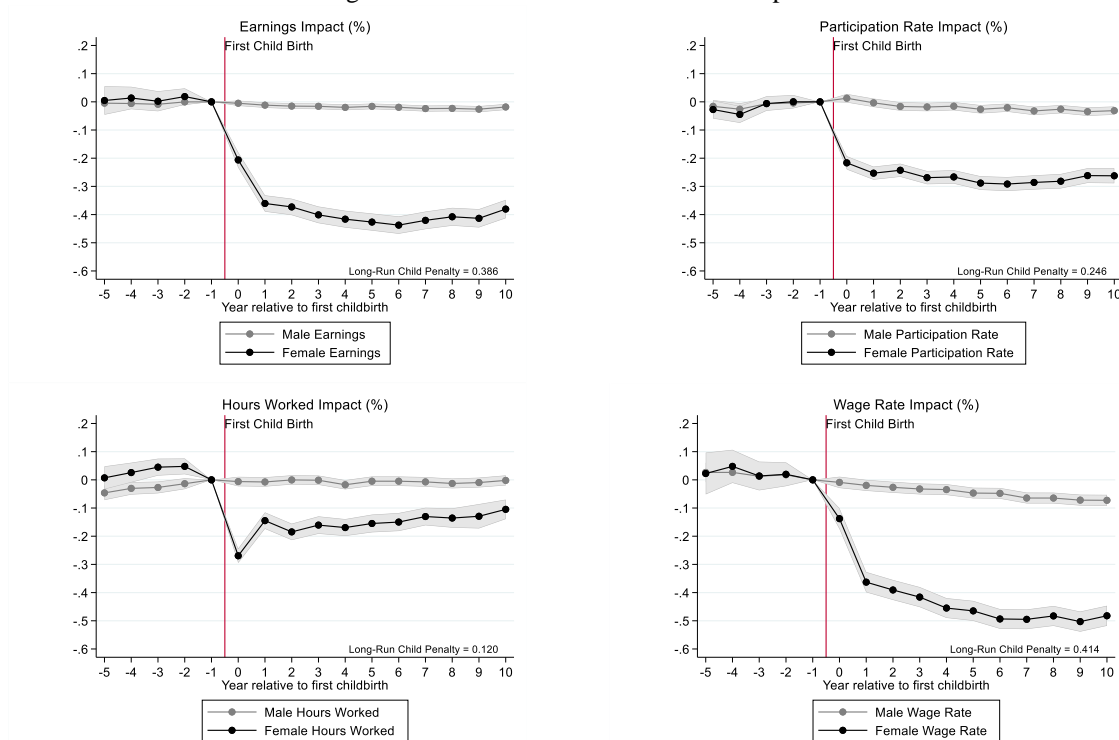
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## Appendix A.

### A1. Child penalties using PSID 1967-2018 without race comparison.

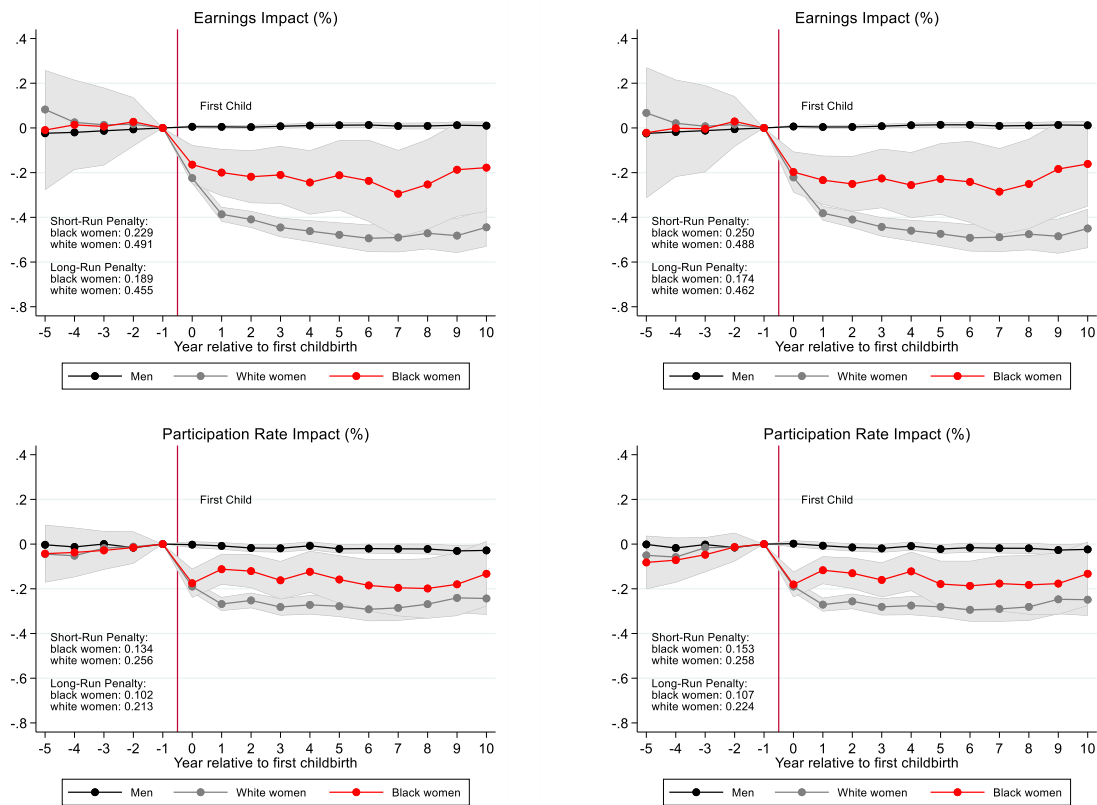
Figure A1. Racial differences in the child penalties



Note: The sample consists of married women in male-headed households having her first child at age between 20 and 45. Income and wage adjusted by inflation index (1960 price). Wage and income are transformed by inverse hyperbolic sine. Annual hours worked are conditional on being employed. Source: Panel Study of Income Dynamics, 1967 to 2017.

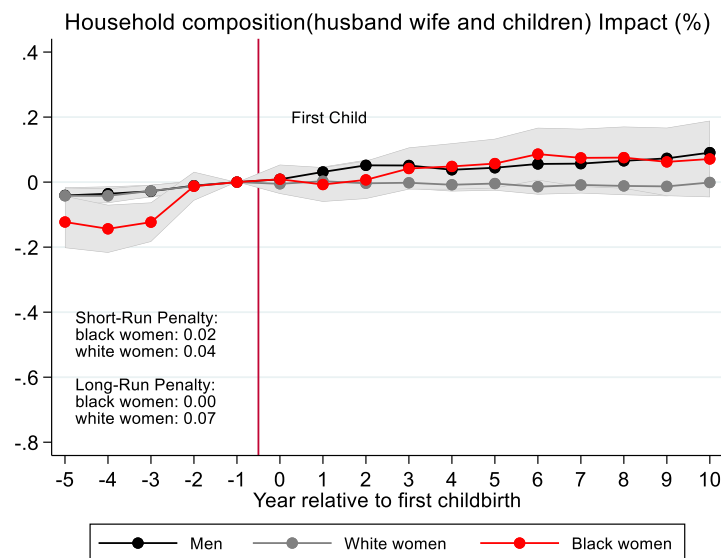
## A2. Child penalties by family composition

**Figure A2. Racial differences in the child penalties by family structure**  
**Husband, wife, child only**      **All types of family structures**



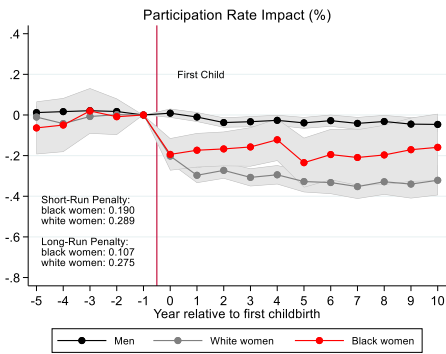
Note: The sample consists of married women in male-headed households having her first child at age between 20 and 45. Income and wage adjusted by inflation index (1960 price). Wage and income are transformed by inverse hyperbolic sine. Annual hours worked are conditional on being employed. Source: Panel Study of Income Dynamics, 1967 to 2017.

**Figure A3. The impact of parenthood on family composition (outcome variable is being the family structure of husband, wife, children family only)**

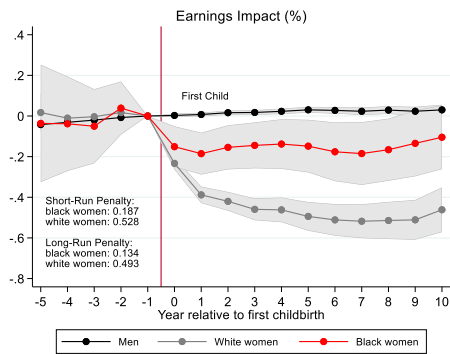
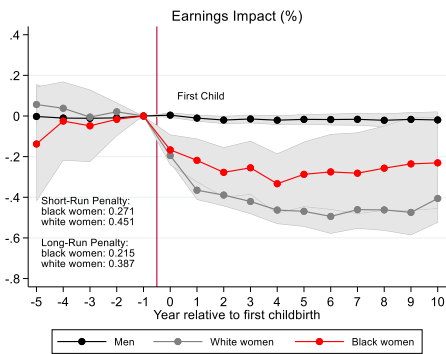
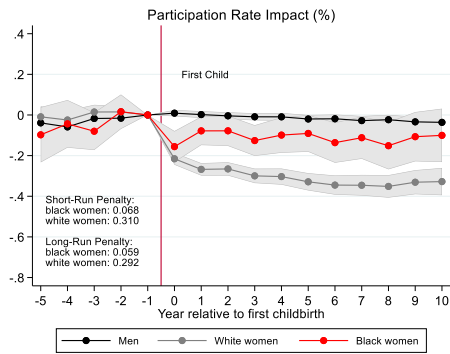


**Figure 5. Racial differences in the child penalties by family non-labor income**

**a. Non-labor income above the median**

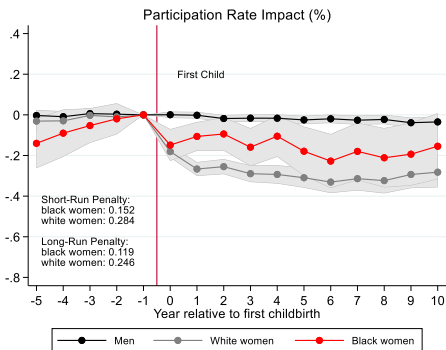


**b. Non-labor income below the median**

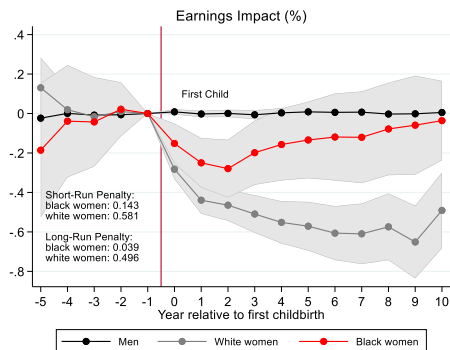
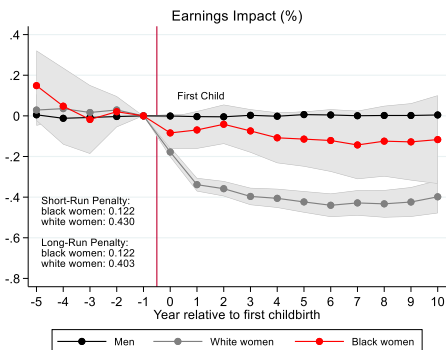
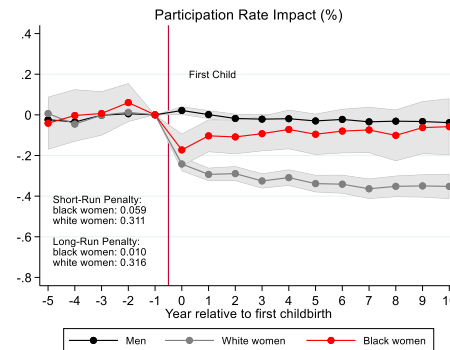


**Figure 6. Racial differences in the child penalties by homeownership**

**a. Owns this home or apartment**



**b. Rent this home or apartment**



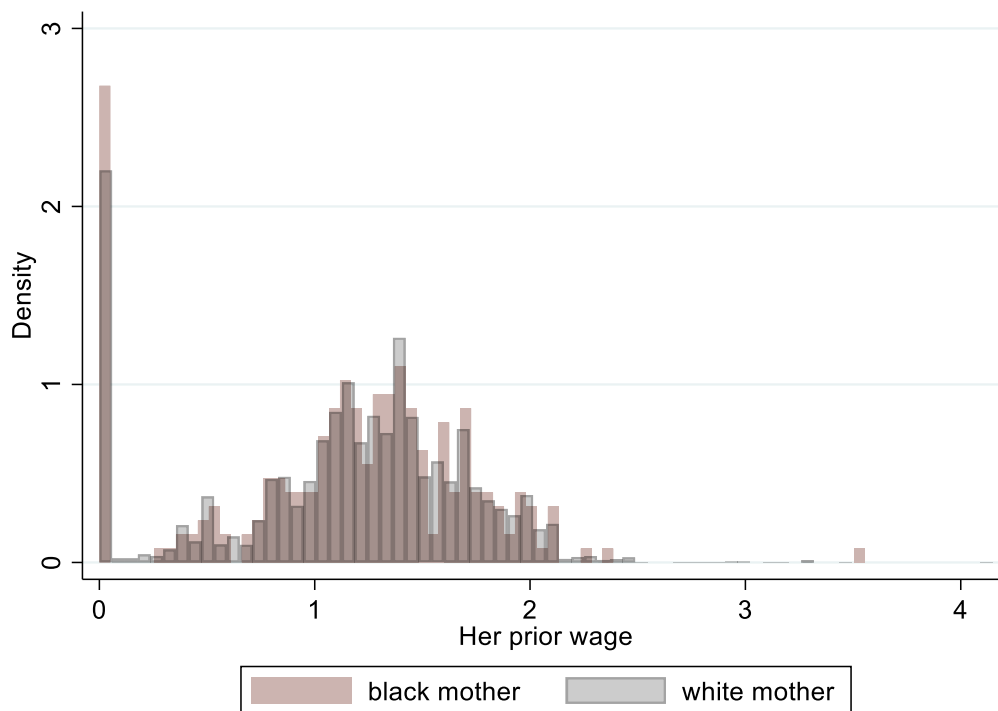
Note: The sample consists of married women in male-headed households having her first child at age between 20 and 45. Income and wage adjusted by inflation index (1960 price). Wage and income are transformed by inverse hyperbolic sine. Annual hours worked are conditional on being employed. Source: Panel Study of Income Dynamics, 1967 to 2017.

## Appendix B. Reweighting the distribution of covariates

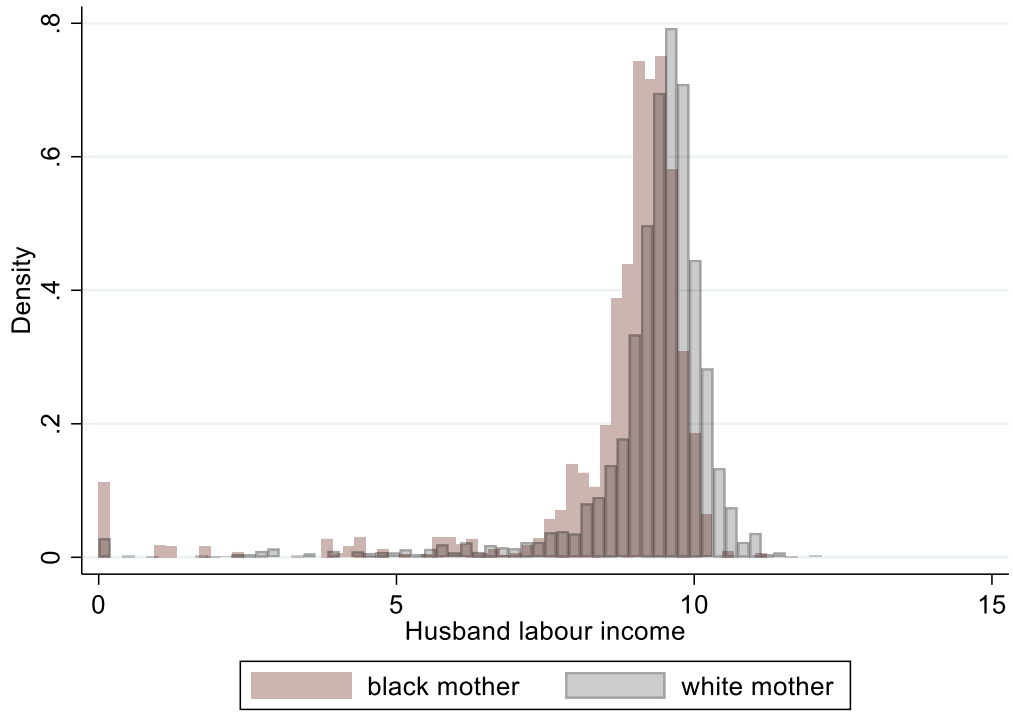
### B1. Prior female wage Without IPW



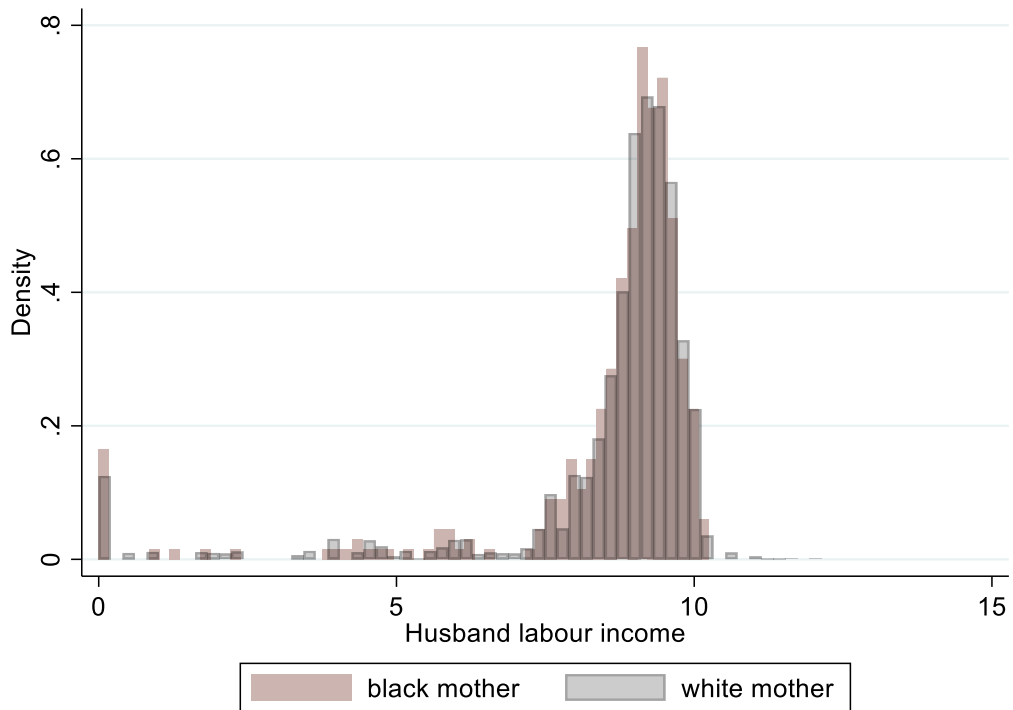
### With IPW



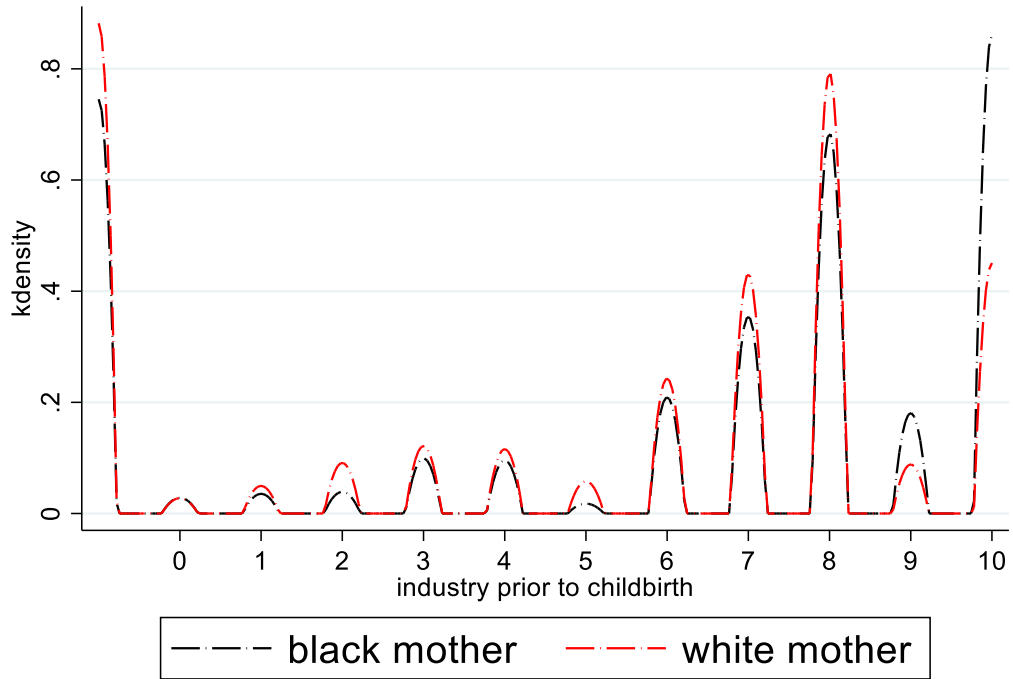
**B2. Husband labor income  
Without IPW**



**With IPW**

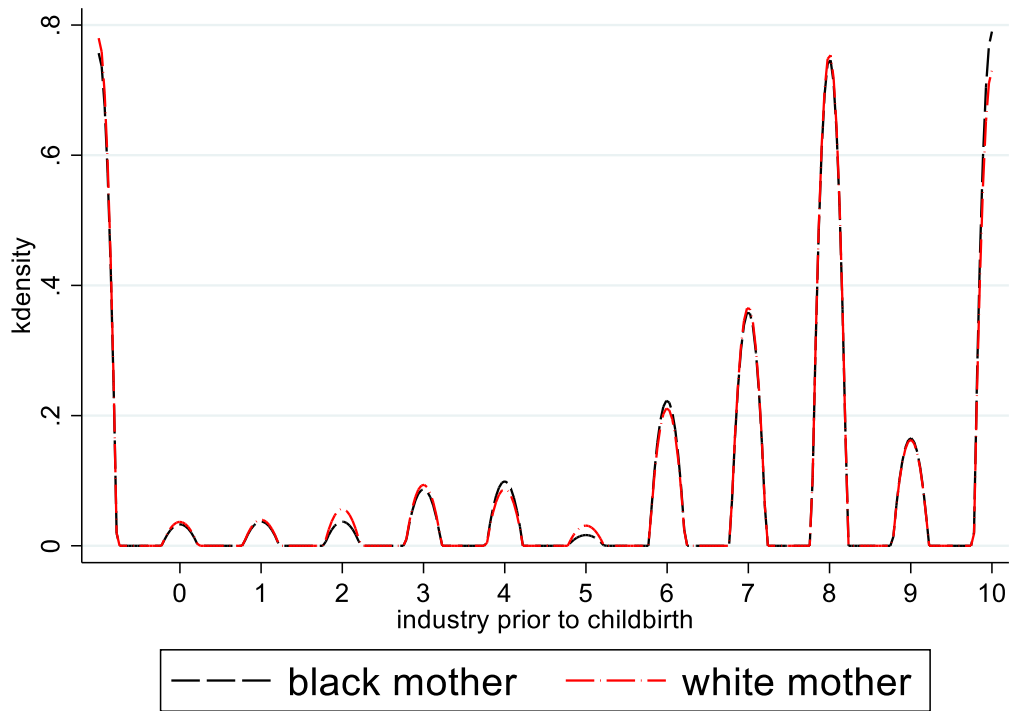


### B3. Prior her industry Without IPW



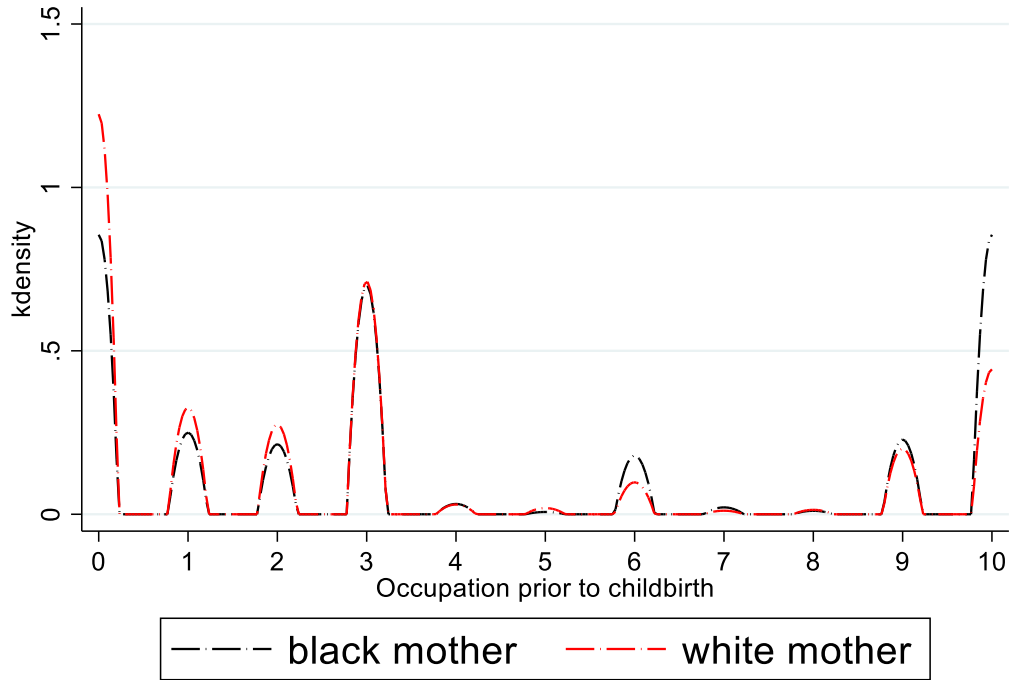
Note: 1-digit industry. 10 is unemployment.

### With IPW



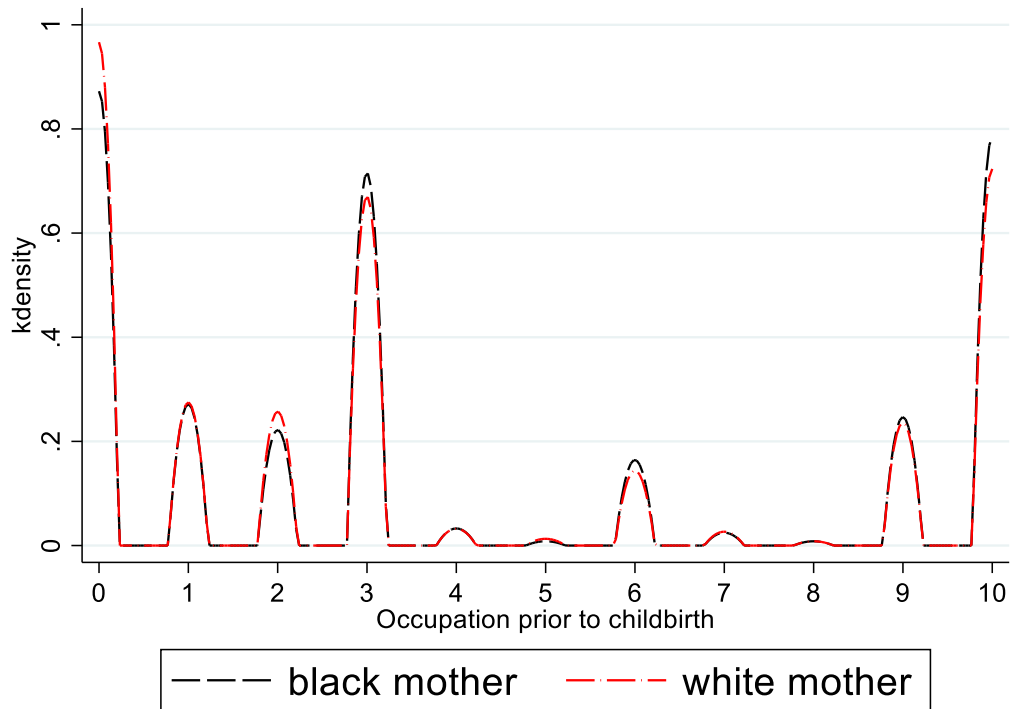


### B4. Prior her occupation Without IPW

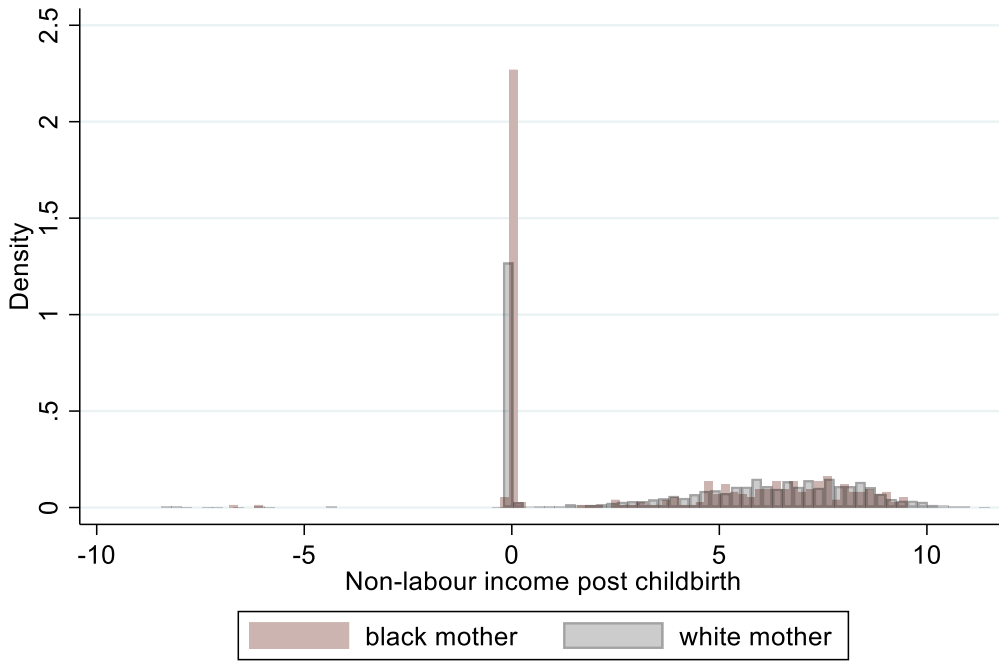


Note: 1-digit occupation. 10 is unemployment.

### With IPW

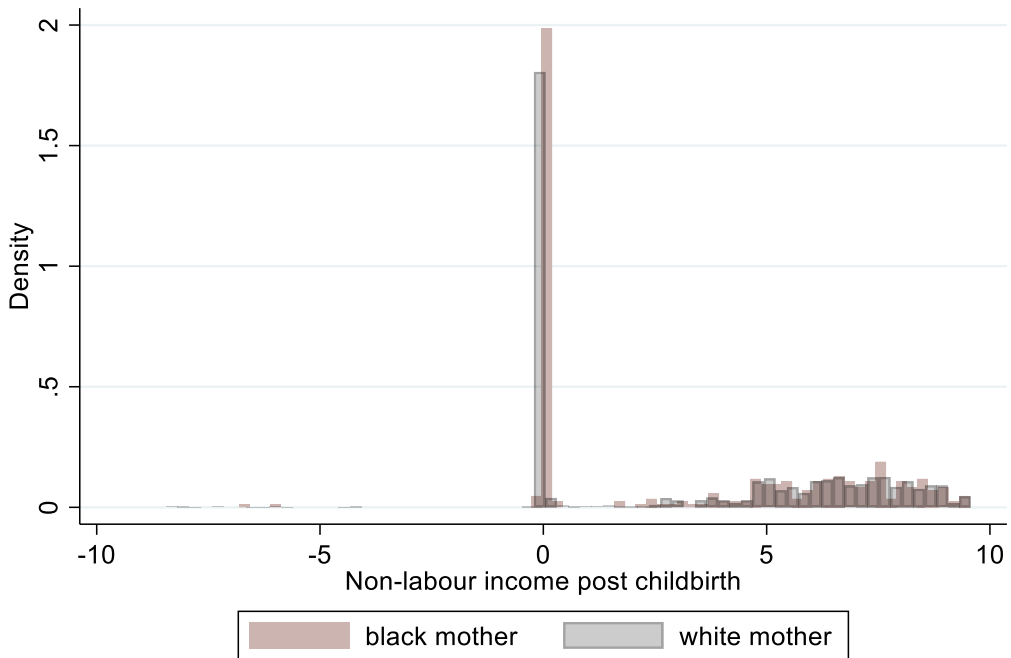


**B5. Prior family non-labor income  
Without IPW**



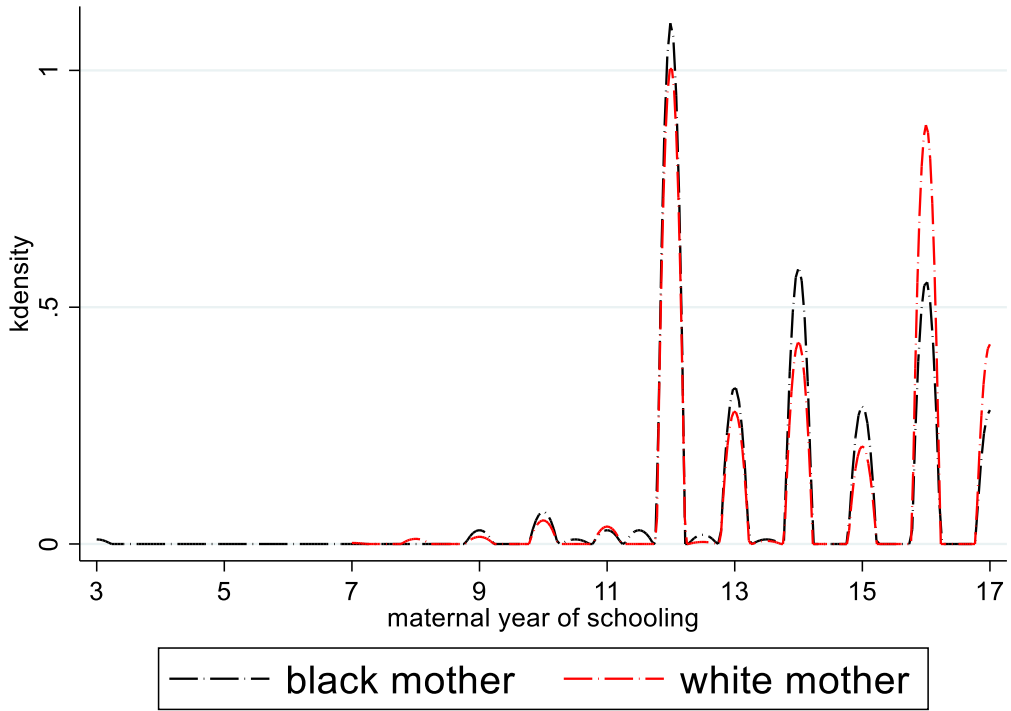
Note: The variable is transformed with inverse hyperbolic sine.  
1 or 2 year after childbirth

**With IPW**

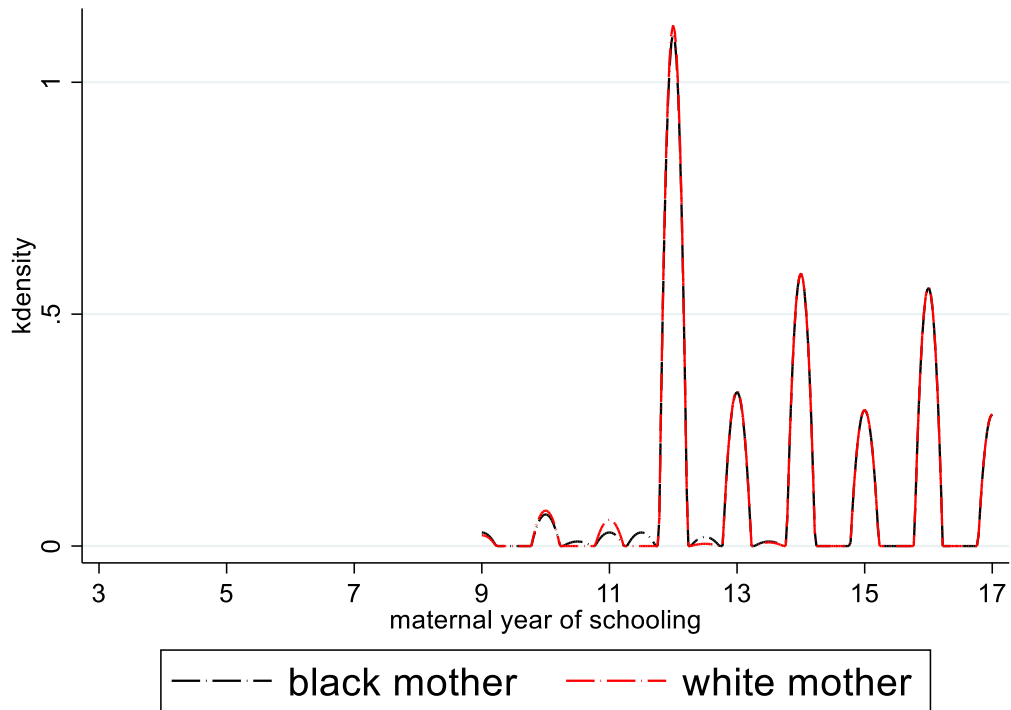


Note: The variable is transformed with inverse hyperbolic sine.  
1 year after childbirth

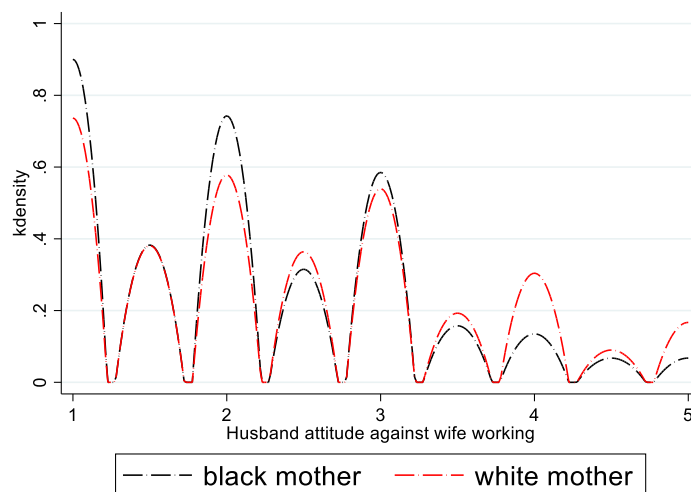
**B6. Her year of schooling**  
**Without IPW**



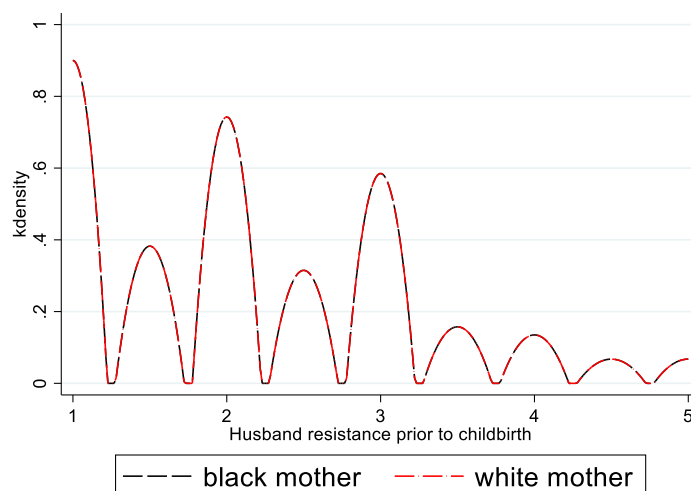
**With IPW**



**B7. Husband attitude about wife working (collected in 1976 and 1977 only)  
Without IPW**



**With IPW**



**Husband attitude (survey question in 1976 and 1977)**

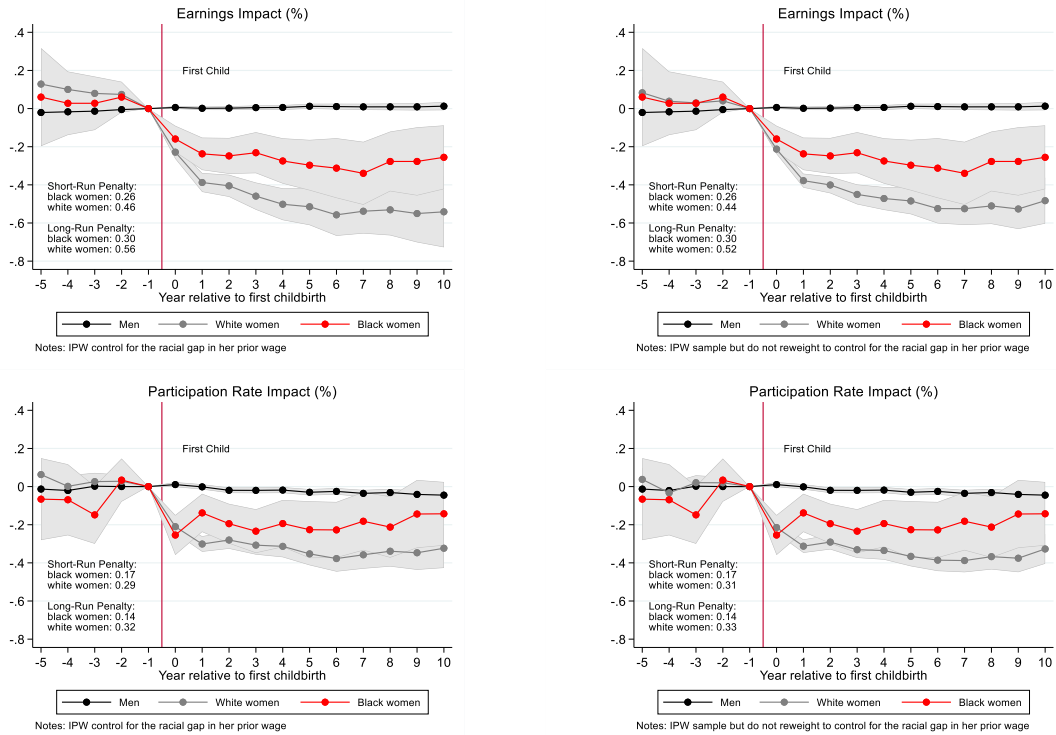
Survey question in 1976, "How does your husband feel about (your working/the possibility of your working)? Is he very much in favor of it, somewhat in favor of it, neither for nor against it, somewhat against it, or very much against it?"

Survey question in 1977, "How do you feel about your (Wife/friend) working/the possibility of your (Wife/ friend) working? Are you very much in favor of it, somewhat in favor of it, neither for or against it, somewhat against it, or very much against it?"

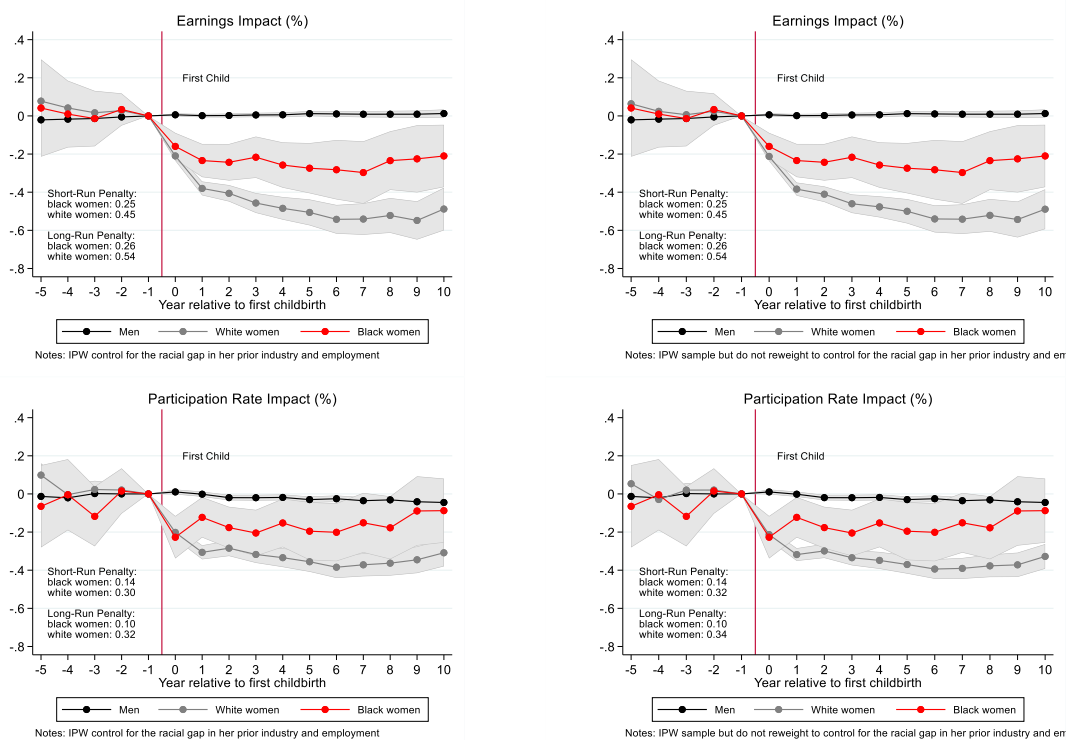
Answer range is (Very much in favor, Somewhat in favor Neither for nor against, Somewhat against, Very much against)

## Appendix C. Event study figure with and without IPW

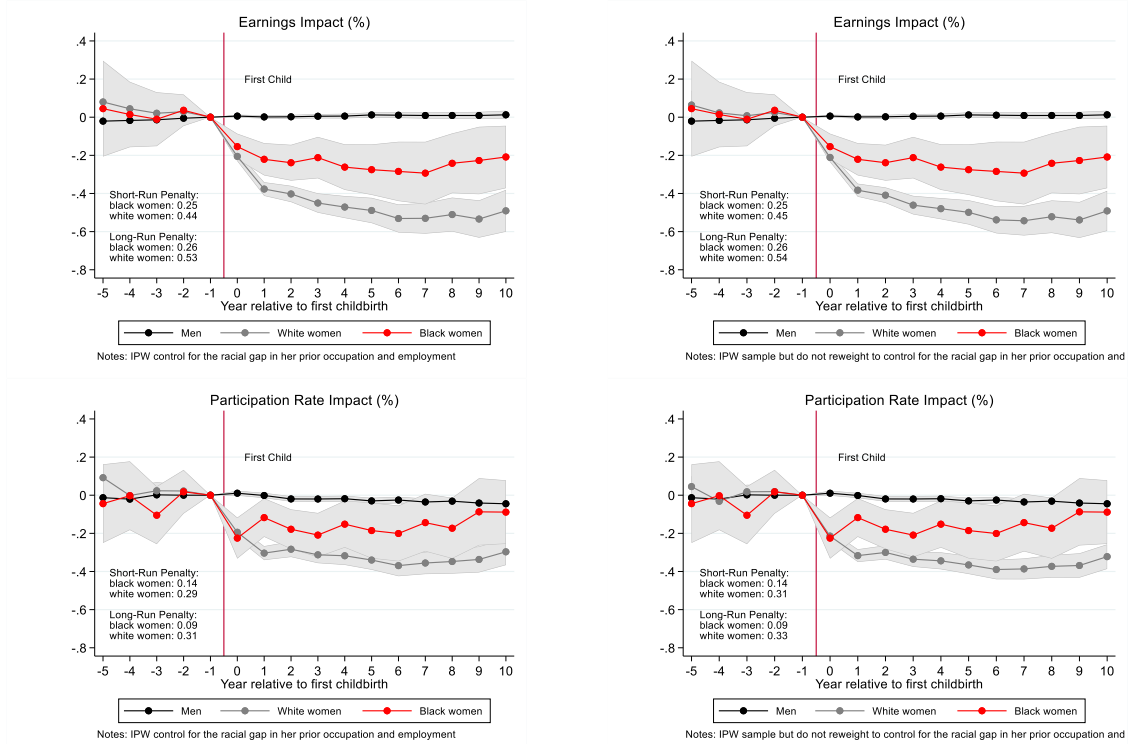
### Figure C1. Child penalty without and with IPW to control for her prior wage



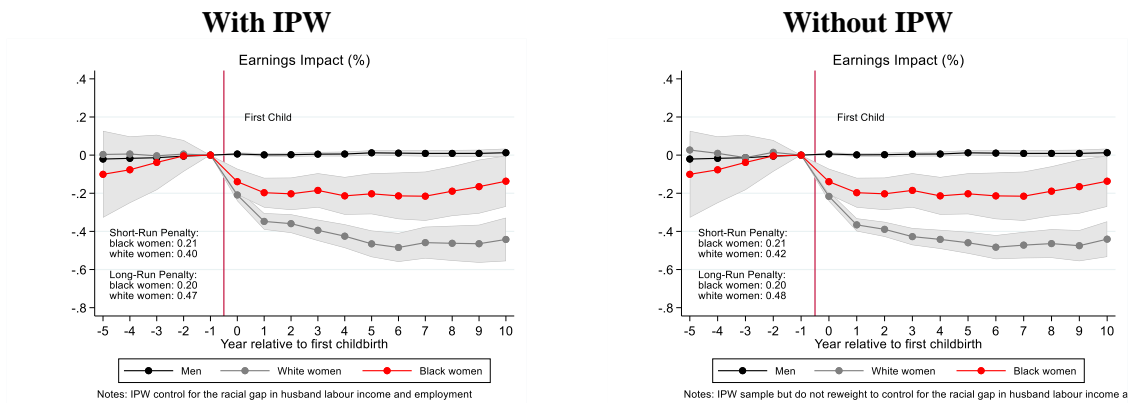
### Figure C2. Child penalty without and with IPW to control for her prior industry

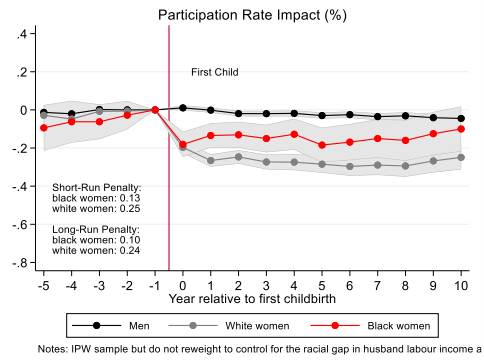
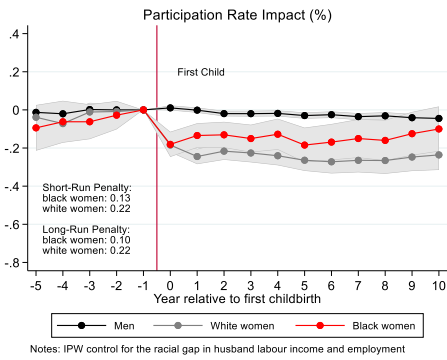


**Figure C3. Child penalty without and with IPW to control for her prior occupation**

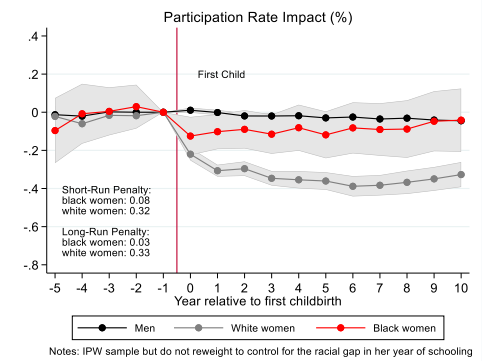
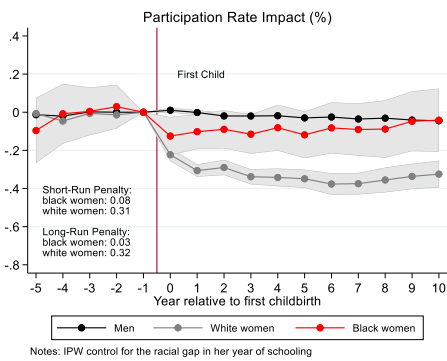
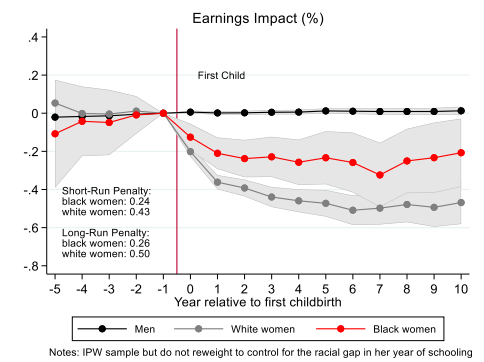
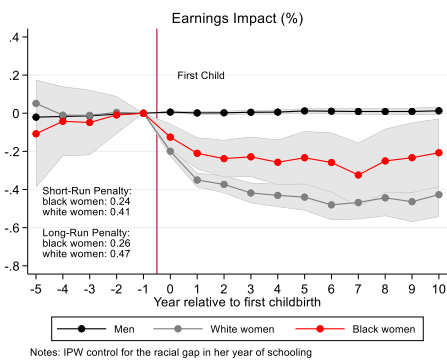


**Figure C4. Child penalty without and with IPW to control for the husband's labor income**

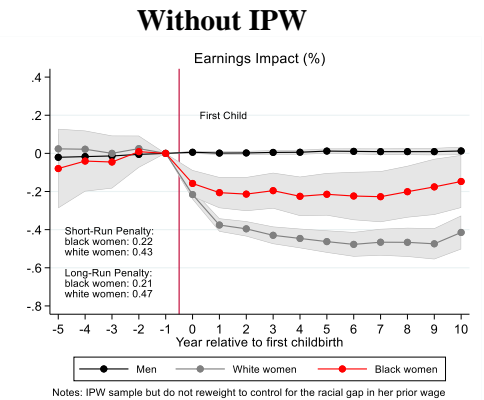
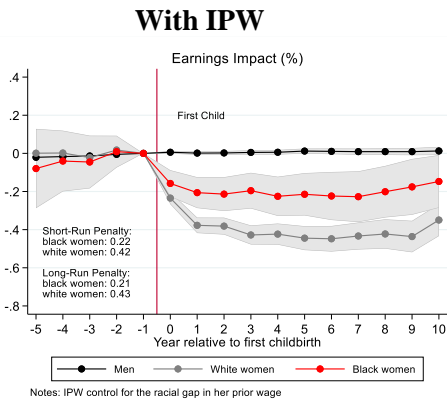


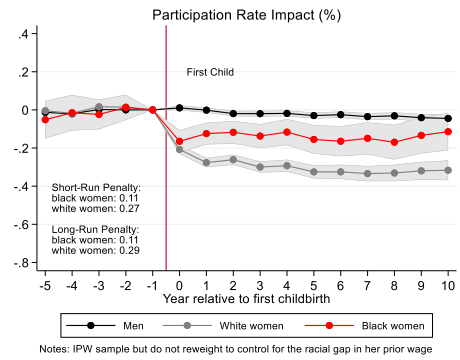
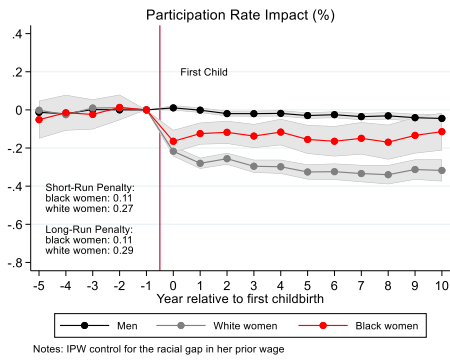


**Figure C5. Child penalty without and with IPW to control for her year of schooling**



**Figure C6. Child penalty without and with IPW to control for family non-labor income**





**Figure C7. Child penalty without and with IPW to control for her husband's attitude about wife working**

