Online Appendix for

"Low-Income Families, Maternal Labor Supply, and Welfare Reform"

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B Taxes, Tax Credits, and Assistance Programs

In this appendix we describe in detail the U.S. federal income tax scheme and the payroll tax, the three tax credits we include in our calculations, and three income transfer programs to support low-income families. All of these taxes and transfers are included in our model as they are being described here, with all their kinks and discontinuities.

INCOME AND PAYROLL TAXES

In our model, all married couples file with the Internal Revenue Service (IRS) using the filing status 'married filing jointly'. Income taxes are calculated based on the gross income of couples, the sum of earnings and capital income, $e + ra$. The formula for income taxes before credits reads

$$T(e, a) \;=\; \sum_{i=1}^{7} \tau_T^i \max\{\min\{e + ra - d_T, b_T^i\} - b_T^{i-1}, 0\},$$

where $b_T^i \geq 0$ denote the break points for the income brackets and τ_T^i the corresponding tax rates. For readability, we have included a seventh upper limit, which is set to an arbitrarily large number never reached by households in our model. The standard deduction d_T reduces gross income by a certain amount, independent of household size.

Payroll taxes for a married couple with earned income $e = e_m + e_f$ are given by

$$T_p(e_f, e_m) \;=\; \tau_{SS}\big(\min\{e_f, \bar{e}\} + \min\{e_m, \bar{e}\}\big) + \tau_{MC} e + \tau_{AMC} \max\{0, e - \tilde{e}\},$$

where τ_{SS} is the employee's social security, τ_{MC} the Medicare and τ_{AMC} the Additional Medicare tax rate. Social security taxes are based on individual earnings while Medicare taxes are derived from joint earnings of the couple. The payroll tax cap is denoted as $\bar{e}$. Any earnings above $\tilde{e}$ are subject to the Additional Medicare Tax. Payroll taxes do not depend on family size.

TAX CREDITS

The Earned Income Tax Credit (EITC). The EITC is a refundable tax credit that targets low-income households with children. Married couples are eligible if: (i) their investment income ra does not exceed a certain level $\overline{ra}$; and (ii) their gross income $e + ra$ is below a certain threshold $\overline{y_E^n}$, which depends on the number of dependents n. The EITC eligibility set of a married couple with $n = 0, 1, 2, 3$ children is defined as

$$\text{EES} = \{ra \leq \overline{ra}\} \cap \{e + ra \leq \overline{y_E^n}\}.$$

A married couple with earned income e, assets a and n children receives a refundable tax credit of the following size

$$EITC(e, a, n) = \begin{cases} \pi_1^n e & \text{if } \; 0 \leq e < \overline{e_{E_1}^n} \text{ and } a \in \text{EES}, \\ \pi_1^n \overline{e_{E_1}^n} & \text{if } \; \overline{e_{E_1}^n} \leq e < \overline{e_{E_2}^n} \text{ and } a \in \text{EES}, \\ \max\{\pi_1^n \overline{e_{E_1}^n} - \pi_2^n (e - \overline{e_{E_2}^n}), 0\} & \text{if } \; \overline{e_{E_2}^n} \leq e \text{ and } a \in \text{EES}, \\ 0 & \text{if } a \notin \text{EES}. \end{cases}$$

The earnings subsidy rates in the phase-in region are denoted by π_1^n, while the phase-out rates are π_2^n. The parameter $e_{E_1}^n$ denotes the end of the phase-in region, and $e_{E_2}^n$ is the beginning of the phase-out region. If income lies between those two parameters, the EITC stays constant at its maximum amount $\pi_1^n e_{E_1}^n$. While the size of the EITC depends on the number of dependent children, the investment income threshold $\overline{ra}$ is independent of household size.

The Child and Dependent Care Tax Credit (CDCTC). The CDCTC is a non-refundable tax credit. Married couples are eligible if: (i) they have at least one child below the age of 13, $n_\Gamma \geq 1$; (ii) they have expenses for child care, $\Gamma > 0$; and (iii) both parents have positive earnings, $e_f > 0, e_m > 0$. The amount of child care expenses accountable for the CDCTC, Γ_a, for a family with n_Γ children below the age of 13 is calculated as

$$\Gamma_a = \min\{\overline{\Gamma} \times \min\{n_\Gamma, 2\}, e_f, e_m, \Gamma\},$$

where $\overline{\Gamma}$ denotes maximum per-child expenses on child care accountable for the CDCTC. If a spouse has lower earnings than the family's child care costs, the lowest individual earnings are used instead of the actual expenses.

The actual tax credit is a fraction of these child care expenses Γ_a. This fraction decreases with household income and then remains constant beyond a certain income limit. The formula for the potential CDCTC, say $CDCTC_p$, reads

$$CDCTC_p(e_f, e_m, a, n_\Gamma, \Gamma) \; = \; \sum_{i=0}^{15} \mathbb{1}_{(e+ra>b_C^i \;\wedge\; e+ra\leq b_C^{i+1})} \Gamma_a u_C^{i+1},$$

where b_C^i denote the break points for the income brackets with the corresponding shares of child care costs, u_C^i, reducing the tax burden. Similar to the income tax brackets, for readability we set the value of the last break point to a large number never reached by households in our model. Since the CDCTC is a non-refundable tax credit, the actual CDCTC cannot exceed the tax liability $T(e, a)$; therefore,

$$CDCTC(e_f, e_m, a, n_\Gamma, \Gamma) = \begin{cases} CDCTC_p(e_f, e_m, a, n_\Gamma, \Gamma) & \text{if } CDCTC_p(e_f, e_m, a, n_\Gamma, \Gamma) \leq T(e, a) \\ T(e, a) & \text{if } CDCTC_p(e_f, e_m, a, n_\Gamma, \Gamma) > T(e, a). \end{cases}$$

The Child Tax Credit (CTC) and the Additional Child Tax Credit (ACTC). The CTC is a non-refundable tax credit. The ACTC is refundable, but its size depends on the CTC. The largest possible CTC for a married couple with n dependent children and gross income $e + ra$ is

$$CTC_p(e, a, n) \; = \; \begin{cases} \theta n & \text{if } e + ra \leq \overline{y_C} \\ \max\left\{\theta n - \rho(e + ra - \overline{y_C}), 0\right\} & \text{if } e + ra > \overline{y_C}, \end{cases}$$

where θ denotes the amount of CTC per child, $\overline{y_C}$ the income threshold marking the beginning of the phase-out region, and ρ is the phase-out rate. However, since this credit is non-refundable just as the CDCTC, the sum of both tax credits cannot exceed the income tax liability. Therefore, the actual CTC is calculated as

$$CTC(e, a, n, CDCTC) = \begin{cases} CTC_p(e, a, n) & \text{if } CTC_p(e, a, n) + CDCTC < T(e, a) \\ T(e, a) - CDCTC & \text{if } T(e, a) \leq CDCTC + CTC_p \wedge CDCTC < T(e, a) \\ 0 & \text{if } CDCTC \geq T(e, a). \end{cases}$$

The ACTC can only be claimed if the taxes due are smaller than the maximum amount of CTC. The ACTC is given by

$$ACTC(e, a, n, CTC, CTC_p) = \min\left\{\min\{n\theta_A, \max(CTC_p - CTC, 0)\}, \max\left\{\phi(e + ra - \overline{y_A}), 0\right\}\right\},$$

with θ_A being the maximum ACTC amount per child, $\overline{y_A}$ the income threshold below which no ACTC is paid, and ϕ the share of the difference between gross income and the income threshold that is considered for the ACTC.

INCOME ASSISTANCE PROGRAMS

Temporary Assistance for Needy Families (TANF). This program is organized at the state level to support families with dependent children. In principle, every state has its own TANF rules with varying degrees of generosity. However, many features of the programs are common across states, and our modeling of the TANF reflects an average version of state-dependent TANF rules. Married couples are eligible if: (i) they have children, $n > 0$; (ii) their assets do not exceed a certain limit $\overline{a_T}$; and (iii) net family income $\iota_T(e, a)$ is not above the payment level $\overline{T^n}$. Net family income for TANF eligibility is calculated as

$$\iota_T(e, a) \; = \; e(1 - \kappa_T) + ra,$$

where $\kappa_T < 1$ is an earned income disregard parameter. These requirements define the TANF eligibility set of a married couple as

$$TES = \{a \leq \overline{a_T}\} \cap \{\iota_T(e, a) \leq \overline{T^n}\} \cap \{n > 0\}.$$

If eligible, the income transfer is determined by the difference between the payment standard $\overline{T^n}$ and net family income $\iota_T(e, a)$. That is, an eligible married couple with dependents is entitled to TANF benefits

$$TANF(e, a, n) = \max \{\overline{T^n} - \iota_T(e, a), 0\}.$$

Note that some states also impose work requirements and time limits (usually 60 months). Work requirements typically include unpaid work experience, job search, community service programs, vocational education and many more alternatives to what we consider work in our model. The extent of enforceability of time limits varies widely across states. Therefore, we do not include any work requirements or time limits in our calculation of TANF.

Supplemental Nutrition Assistance Program (SNAP). Even though this is a federal in-kind transfer program, we follow most of the literature and treat SNAP as near-cash transfers. For a married couple with n dependents, eligibility is determined by: (i) a resource limit $\overline{a_S}$, (ii) a gross income limit $\overline{y^n_{S_1}}$, with TANF also being considered as unearned income; and (iii) a net income limit $\overline{y^n_{S_2}}$. Net income considered for SNAP is

$$\iota_S(e, a, n, \Gamma) \; = \; e(1 - \kappa_S) + ra + TANF(a, e, n) - \Gamma - d^n_S,$$

where κ_S denotes an earned income disregard parameter, and d^n_S is a deduction that depends on household size. Note that child care expenses Γ are also deducted for the calculation of net income. Combining these eligibility criteria, we end up with the following eligibility set for SNAP:

$$SES \; = \; \{a \leq \overline{a_S}\} \cap \{e + ra + TANF(a, e, n) \leq \overline{y^n_{S_1}}\} \cap \{\iota_S(e, a, n, \Gamma) \leq \overline{y^n_{S_2}}\}.$$

If a married couple receives TANF, it is categorically eligible for SNAP and the income tests are disregarded. The size of SNAP benefits is defined as a maximum allotment depending on the household size, $\overline{S^n}$, minus the household's expected contribution towards food as a share ξ of net income,

$$SNAP(e, a, n, \Gamma) \; = \; \max \{\overline{S^n} - \max(\iota_S(e, a, n, \Gamma), 0)\xi, \underline{S^n}\},$$

with $\underline{S^n}$ being the minimum benefit.

Special Supplemental Nutrition Program for Women, Infants and Children (WIC). The WIC is an in-kind transfer program, targeted to pregnant, postpartum and breastfeeding women, as well as children up to their fifth birthday who are at nutritional risk. If there is no pregnant woman or child under the age of five in the household, the household is not eligible for WIC. We will denote the number of children below the age of 5 as ns. If the married couple is eligible for SNAP or TANF, the mother and her children in the household automatically qualify for WIC. Otherwise, the family's gross income needs to be below 185 percent of the federal poverty level $\overline{y^n_W}$, which leads to the WIC eligibility set

$$WES = \{ns > 0\} \cap \left(\{TANF(e, a, n) > 0\} \cup \{SNAP(e, a, n, \Gamma) > 0\} \cup \{e + ra < \overline{y^n_W}\}\right).$$

The size of WIC benefits, in principle, depends on whether it is a pregnant, breastfeeding or postpartum woman, the infant of a postpartum or breastfeeding woman or a child who receives WIC. For simplicity, we calculate the mean value of WIC a family receives per child, assuming that it receives WIC during all the child's first five years of life. Then the amount of WIC received when eligible is simply a lump-sum transfer

$$WIC(e, a, ns, TANF, SNAP) = W^{ns},$$

where the benefit W^{ns} depends on the number of children below 5.

C Tax-Transfer Parameter Values

This appendix presents the parameter values of the 2018 federal income tax schedule, payroll taxes and the six transfer programs in our model (the Earned Income Tax Credit, the Child and Dependent Care Tax Credit, the Child Tax Credit and the Additional Child Tax Credit, Temporary Assistance for Needy Families, the Supplemental Nutrition Assistance Program and the Special Supplemental Nutrition Program for Women, Infants and Children).

Income and Payroll Taxes

Table C1 presents the income tax brackets for filers under the married filing jointly status.

Table C1: Income Tax Brackets

Bracket	Parameter	Married filing jointly
1	b_T^0	0
2	b_T^1	19,050
3	b_T^2	77,400
4	b_T^3	165,000
5	b_T^4	315,000
6	b_T^5	400,000
7	b_T^6	600,000

NOTES: Income tax brackets in 2018, from IRS website.

Table C2 shows the remaining parameter values for income and payroll taxes.

Table C2: Income and Payroll Tax Rates

Description	Comment	Parameter	Value
Standard deduction (in $)	Married filing jointly	d_T	24,000
Marginal tax rate	Bracket 1	τ_T^1	0.10
Marginal tax rate	Bracket 2	τ_T^2	0.12
Marginal tax rate	Bracket 3	τ_T^3	0.22
Marginal tax rate	Bracket 4	τ_T^4	0.24
Marginal tax rate	Bracket 5	τ_T^5	0.32
Marginal tax rate	Bracket 6	τ_T^6	0.35
Marginal tax rate	Bracket 7	τ_T^7	0.37
Social Security tax	Employee's share	τ_{SS}	0.0620
Social Security Cap (in $)	Earnings cap	$\bar{e}$	128,400
Medicare Tax	Employee's share	τ_{MC}	0.0145
Additional Medicare Tax		τ_{AMC}	0.0090
Additional Medicare Cap (in $)	Earnings cap	$\tilde{e}$	250,000

NOTES: Parameter values for 2018, from IRS website.

Earned Income Tax Credit (EITC)

Table C3 presents the limits for investment and total income to be eligible for the EITC for married couples filing jointly with 0 to 3 children.

Table C3: Earned Income Tax Credit: Income Limits

	Max. investment income $\overline{ra}$	Max. total income $\overline{y_E^n}$
Married couple without children	3,500	20,950
Married couple with 1 child	3,500	46,010
Married couple with 2 children	3,500	51,492
Married couple with 3 children	3,500	54,884

NOTES: Parameter values for 2018, from IRS website.

Table C4 reports the phase-in and phase-out rates and the plateau region.

Table C4: Earned Income Tax Credit: Subsidy Rates and Earnings Thresholds

	Phase-in rate π_1^n(%)	Earnings end phase-in $\overline{e_{E_1}^n}$($)	Earnings beginning phase-out $\overline{e_{E_2}^n}$($)	Phase-out rate π_2^n (%)
Married couples				
with n = 0	7.65	6,750	14,200	7.65
with n = 1	34	10,150	24,350	15.98
with n = 2	40	14,250	24,350	21.06
with n = 3	45	14,250	24,350	21.06

NOTES: Parameter values for 2018, from IRS website.

Child and Dependent Care Tax Credit (CDCTC)

Table C5 presents the maximum expenses accountable for the CDCTC, the income brackets, and the corresponding fractions of expenses that can be claimed as tax credit.

Table C5: Child and Dependent Care Tax Credit

Desciption	Parameter	Value
Maximum expenses for child care (in $)	$\bar{\Gamma}$	3,000
Income limits (in thousand $)	$(b_C^0, b_C^1, b_C^2, b_C^3)$	(0,15,17,19)
Income limits (in thousand $)	$(b_C^4, b_C^5, b_C^6, b_C^7)$	(21,23,25,27)
Income limits (in thousand $)	$(b_C^8, b_C^9, b_C^{10}, b_C^{11})$	(29,31,33,35)
Income limits (in thousand $)	$(b_C^{12}, b_C^{13}, b_C^{14}, b_C^{15})$	(37,39,41,43)
Fraction of child care deducted	$(u_C^1, u_C^2, u_C^3, u_C^4)$	(0.35,0.34,0.33,0.32)
Fraction of child care deducted	$(u_C^5, u_C^6, u_C^7, u_C^8)$	(,0.31,0.30,0.29,0.28)
Fraction of child care deducted	$(u_C^9, u_C^{10}, u_C^{11}, u_C^{12})$	(0.27,0.26,0.25,0.24)
Fraction of child care deducted	$(u_C^{13}, u_C^{14}, u_C^{15}, u_C^{16})$	(0.23,0.22,0.21,0.20)

NOTES: Parameter values for 2018, from IRS website.

Child Tax Credit (CTC) and Additional Child Tax Credit (ACTC)

Table C6 shows the parameter values needed to determine the CTC and ACTC.

Table C6: Child Tax Credit and Additional Child Tax Credit

Description	Parameter	Value
Credit per child (in \$)	θ	2,000
Phrase-out income threshold (in \$)	$\overline{y_C}$	400,000
Phase-out rate (in %)	ρ	5
Refundable per child (ACTC) (in \$)	θ_A	1,400
Earnings limit (ACTC) (in \$)	$\overline{y_A}$	2,500
Weight on earnings gap (ACTC)	ϕ	0.15

NOTES: Parameter values for 2018, from IRS website.

Temporary Assistance for Needy Families (TANF)

In Table C7 we present the parameters used to calculate TANF eligibility and size.

Table C7: Temporary Assistance for Needy Families

Description	Parameter	3 Persons	4 Persons	5 Persons
Payment standard	$\overline{T^n}$	432	474	555
Asset test	$\overline{a_T}$	2,250	2,250	2,250
Earned income disregard	κ_T	0.75	0.75	0.75

NOTES: Parameter values reflect a customized TANF, taking representative values from the Welfare Rules Databook: State TANF Policies based on 2018 data.

Supplemental Nutrition Assistance Program (SNAP)

Table C8 shows the parameters needed for determining eligibility and size of SNAP.

Table C8: Supplemental Nutrition Assistance Program

Description	Parameter	2 Pers.	3 Pers.	4 Pers.	5 Pers.
Asset test (in \$)	$\overline{a_S}$	2,250	2,250	2,250	2,250
Gross income test (in \$)	$\overline{y^n_{S_1}}$	1,760	2,213	2,665	3,118
Net income test (\$)	$\overline{y^n_{S_2}}$	1,354	1,702	2,050	2,399
Standard deduction (in \$)	d^n_S	160	160	170	199
Earned income disregard	κ_S	0.2	0.2	0.2	0.2
Maximum allotment (in \$)	$\overline{S^n}$	352	504	640	760
Income share spent on food	ξ	0.3	0.3	0.3	0.3
Minimum benefit	$\underline{S^n}$	15	0	0	0

NOTES: Parameter values from the website of the U.S. Department of Agriculture, Food and Nutrition Service, for the time period October 2017 - September 2018.

Special Supplemental Nutrition Program for Women, Infants and Children (WIC)

Table C9 presents the distribution of participants and the food package costs for each group. Table C10 shows the income thresholds and the benefits calculated from the data in Table C9.

Table C9: Special Suppl. Nutrition Program for Women, Infants and Children

Participant Category	Percent of Participants	Pre-Rebate Food Package Cost ($)	Post-Rebate Food Package Cost ($)
Total Participants	100.0	57.60	35.79
Pregnant women	9.4	37.33	37.33
Breastfeeding women	8.2	37.76	37.76
Postpartum women	7.0	30.72	30.72
Infants	23.3	138.64	44.97
Children	52.1	31.78	31.78

NOTES: Parameter values from the WIC Participant and Program Characteristics 2018 Food Packages and Costs Final Report of the U.S Department of Agriculture, Food and Nutrition Service (monthly values).

Table C10: Special Suppl. Nutrition Program for Women, Infants and Children

Description	Parameter	One child below 5	Two children below 5
Income threshold	$\overline{y_W^n}$	38443	46435
Monthly benefits	W^{ns}	62	124

NOTES: Parameter values from the WIC Participant and Program Characteristics 2018 Food Packages and Costs Final Report of the U.S Department of Agriculture, Food and Nutrition Service (monthly values).

D Benchmark Model: Further Results

In this appendix we present further results on labor supply elasticities from our benchmark model. Moreover, we report additional statistics from our policy experiments, namely changes in gross and net earnings, taxes paid and transfers received across the husbands' income distribution, as well as short-run effects arising at the time of the reform.

D.1 Labor supply elasticities

We complement our presentation of labor supply elasticities in the main text by providing model-generated estimates for total hours elasticities of mothers, and by presenting labor supply elasticities of fathers. The total hours elasticity is defined as the percentage change in total hours worked in response to a one percent change in net wages.

Table D1: Total hours elasticities of mothers

	Positive wage change		Negative wage change	
	Long run	Short run	Long run	Short run
All mothers	0.78	0.88	0.79	0.76
$y^{\dagger}$ children	0.78	0.87	0.78	0.79
$o^{\dagger}$ children	0.77	0.86	0.78	0.71
1 child	0.74	0.87	0.73	0.73
2 children	0.83	0.90	0.86	0.81
3 children	0.85	0.91	0.89	0.78

NOTES: † Here, y refers to married couples with at least one small child (between 0 and 4 years), and o refers to married couples with children who are all at least 5 years old.

Table D1 presents our results for mothers. The long-run total hours elasticities are very close to the extensive-margin elasticities, which suggests that the participation decision is quantitatively more important than the intensive-margin decision. Turning to the labor supply elasticity of fathers, the participation decision is generally much less sensitive to wage changes than for mothers (Table D2). The long-run elasticity after a positive wage change is 0.24 for fathers, compared to 0.78 for mothers.

D.2 Policy Analysis: Further Results

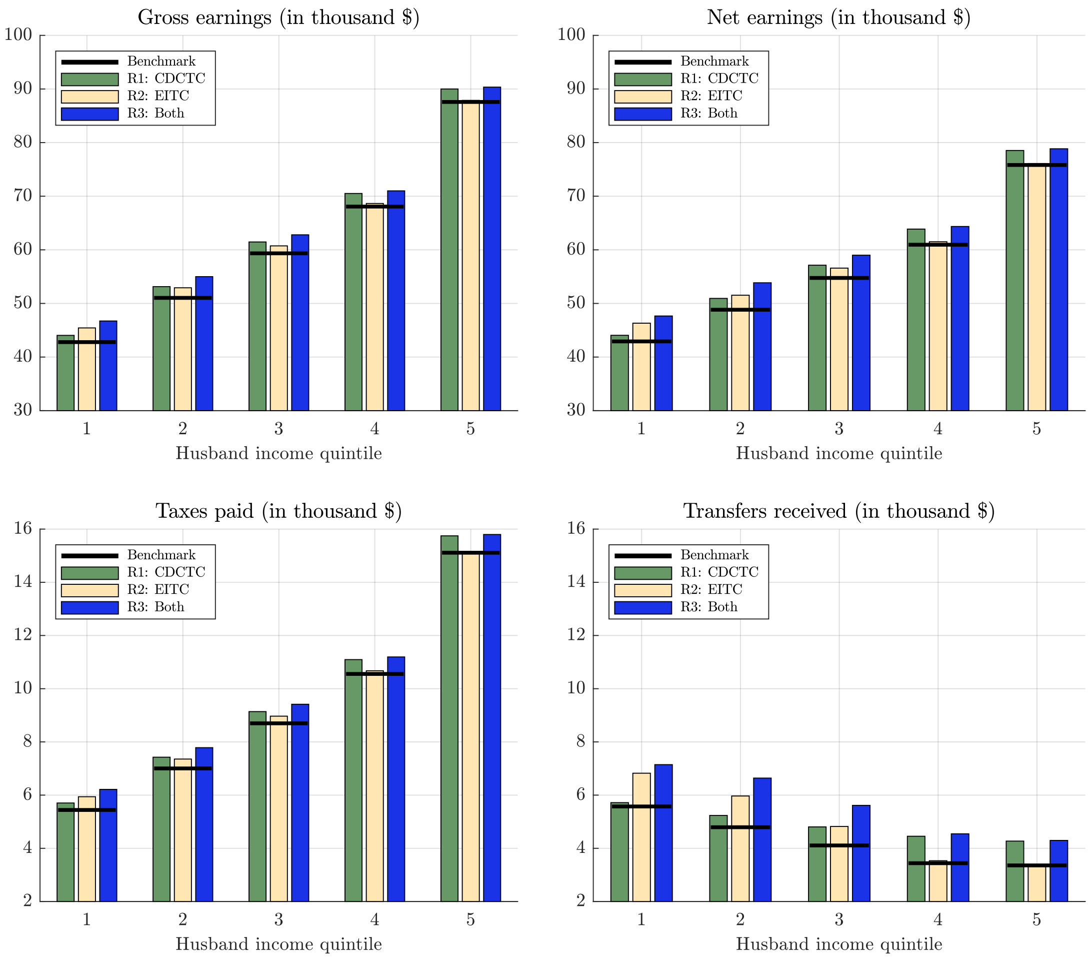
This subsection provides further insights into the effects of the policy reforms. Figure D1 plots changes in gross earnings, net earnings, taxes and transfers in response to each reform. Reform R1 induces larger changes for households at the upper end of the

Table D2: Extensive-margin labor supply elasticities of fathers

	Positive wage change		Negative wage change	
	Long run	Short run	Long run	Short run
All fathers	0.24	0.26	0.26	0.24
$y^{\dagger}$ children	0.39	0.40	0.44	0.38
$o^{\dagger}$ children	0.10	0.13	0.10	0.12
1 child	0.22	0.25	0.24	0.22
2 children	0.27	0.27	0.29	0.27
3 children	0.24	0.22	0.30	0.26

NOTES: † Here, y refers to married couples with at least one small child (between 0 and 4 years), and o refers to married couples with children who are all at least 5 years old.

husbands' income distribution, while R2 affects more those families where husbands' income is low. These results are consistent with the intuition laid out in the main text.



NOTES: Gross earnings includes labor income from from all working members in the household. Net earnings are computed as gross earnings minus taxes plus transfers. The thick black line represents the benchmark value.

Figure D1: Gross earnings, net earnings, taxes and transfers (benchmark vs. reform)

We complement our analysis of the reforms by comparing hours worked and hourly wages between mothers that would work both in the benchmark and under the reform, and those mothers who start working only under the reform. To do this, it is useful to consider the short-run effects in the period when the reform is implemented. That is, we combine the distribution of households across the state space from the benchmark economy and the new policy functions arising at the time of the reform. This allows us to isolate the impact on hours worked and wages within the two subgroups of mothers mentioned above.

Table D3: Short-run effects on mothers' hours and wages

	CDCTC	EITC	Both
Working in B and R			
Avg hours (B)	1,784	1,786	1,786
Avg hours (R)	1,795	1,785	1,799
Avg hourly wage (B, $)	16.69	16.75	16.72
Avg hourly wage (R, $)	16.69	16.75	16.72
Working only in R			
Avg hours (R)	1,849	1,737	1,805
Avg hourly wage (R, $)	12.15	9.74	10.73

NOTES: 'B' refers to the benchmark and 'R' refers to the reform. The first five rows in the table report average annual hours worked and average hourly wages by mothers who work both in the benchmark and under the reform. The next three rows report the same statistics for mothers working only under the reform.

Table D3 presents our findings. We first note that the CDCTC reform induces those mothers who would also work in the benchmark to slightly increase their hours (1,795 vs. 1,784). This effect carries over to the combined reform, while under the EITC reform annual hours remain roughly the same. Note that, for this subgroup, hourly wages at the time of the reform are identical by construction. Among mothers who start working only after the reform, a differential pattern emerges: Wages of mothers joining the labor force in response to the CDCTC reform are distinctly higher ($12.15 on average) than of those joining in response to the EITC reform ($9.74). Once again, these observations dovetail with our finding that the CDCTC reform primarily affects families with high child care needs where both spouses are relatively productive, while the effects of the EITC reform are more concentrated in low-productive couples.

E Sensitivity Analysis: Results

In this appendix we describe in more detail how we alter various assumptions of our benchmark model in order to gauge how they affect our results. We are particularly interested in whether these alternative model specifications lead to notable differences in the model fit, and to what extent they change the effects of our policy reforms. To ensure comparability, we calibrate each model version to the same set of data targets as in our benchmark model. Table E1 below reports the list of internally calibrated parameter values for each model variant. In our presentation of results, rather than reporting the full set of tables and figures for model fit and policy effect for each model variant, we will focus on those with interesting deviations to the benchmark model as well as the employment effects after the policy reforms.

Table E1: Sensitivity analysis– Internally calibrated parameters

Description	**Param.**	**Moment**	**Prod Risk**	**Heter CC**	**Hum Cap**
Discount factor	β	Average wealth	1.004	0.997	0.997
Utility weight	φ	Average hours	0.0670	0.0661	0.104
Participation cost	$\nu_{f,1}$	Empl r. f (kids)	0.0689	0.0379	0.0075
Participation cost	$\nu_{f,0}$	Empl r. f (no k.)	0.0252	0.0136	0.0026
Participation cost	ν_m	Empl rate m	0.0426	0.0595	0.0587
Wage rate	w	Avg hourly wage	58.1	60.7	56.1
Human cap. growth	α	Wage growth	0.0255	0.0100	0.19
Human cap. growth	$\tilde{\alpha}$	Wage growth	–	–	1.8
Initial productivity	$(\sigma^f_{\epsilon,0}, \sigma^m_{\epsilon,0})$	IQR wages 20-22	(0.39,0.45)†	(0.30,0.22)	(0.24,0.23)
Random walk innov.	$(\sigma^f_{\epsilon}, \sigma^m_{\epsilon})$	IQR wages 35-37	–	(0.11,0.09)	(0.08,0.07)
Informal child care	(κ_y, κ_o)	Frac child care	(0.17,0.71)	(0.38,0.75)	(0.16,0.61)
Mean CC distr.	(μ_y, μ_o)	Avg child care†	(9.8,2.7)	(7.1,4.6)	(9.3,2.6)
Std CC distr.	(σ_y, σ_o)	IQR child care†	(9.9,4.0)	–	(8.0,5.0)
Retirement benefit	b	AIME formula	39.2	38.9	37.6

NOTES: † Targeted moment: IQR wages 35-37.

Labor productivity risk. In this model variant, each worker draws a permanent labor productivity level upon entering the economy. This implies that all labor market uncertainty is immediately resolved by age 20, once productivity has been revealed. As in the benchmark model, productivity is drawn from a log-normal distribution $LN(0, \sigma_{\epsilon,0})$, with $\sigma_{\epsilon,0}$ differing by gender. We set $\sigma_{\epsilon,0}$ to match the interquartile range of wages at ages 35-37, thereby striking a balance between matching wage inequality early and later in life (in the benchmark model, consistent with the data, wage dispersion increases over the life cycle). All remaining parameters are calibrated to match the same set of data

Table E2: Sensitivity analysis– Employment effects

	Baseline	Reform CDCTC	EITC	Both
A: Benchmark model				
Mothers' employment rate (%)	59.28	65.88	66.20	72.62
y children	54.82	64.88	61.41	71.74
o children	62.80	66.67	69.97	73.32
1 child	65.62	71.91	70.42	76.71
2 children	54.17	61.01	62.86	69.46
3 children	46.43	53.67	57.40	63.86
Fathers' employment rate (%)	94.85	95.70	95.72	96.57
Share of dual-earner couples (%)	54.13	61.58	61.92	69.19
B: Labor productivity risk				
Mothers' employment rate (%)	59.11	65.60	66.58	72.73
y children	55.52	65.16	63.55	72.83
o children	61.94	65.94	68.98	72.65
1 child	66.44	72.21	71.42	77.01
2 children	53.62	60.77	62.92	69.64
3 children	42.69	50.31	55.93	62.77
Fathers' employment rate (%)	94.93	95.91	96.09	96.92
Share of dual-earner couples (%)	54.04	61.51	62.64	69.65
C: Heterogeneity in child care				
Mothers' employment rate (%)	58.44	63.97	66.93	72.04
y children	58.68	67.92	68.34	77.01
o children	58.25	60.86	65.81	68.12
1 child	65.14	70.47	71.13	76.03
2 children	52.42	58.28	63.27	68.72
3 children	47.16	52.49	59.40	64.37
Fathers' employment rate (%)	94.80	95.84	96.30	97.00
Share of dual-earner couples (%)	53.24	59.81	63.22	69.05
D: Human capital accumulation				
Mothers' employment rate (%)	59.39	66.20	68.63	76.13
y children	49.15	58.24	58.47	68.91
o children	67.48	72.48	76.65	81.83
1 child	65.30	71.63	71.96	79.08
2 children	54.45	61.74	65.84	73.80
3 children	48.08	55.51	62.29	70.00
Fathers' employment rate (%)	94.81	95.65	95.58	96.61
Share of dual-earner couples (%)	54.20	61.85	64.21	72.74

moments as in our benchmark model.

We find that this model variant does comparably well in terms of matching untargeted moments. Focusing on employment rates of mothers, the shares of working mothers by age and number of children closely mirror those from the benchmark model (cf. Table E2, panel B, second column). Some key differences emerge as well, as illustrated in Figure E1 below: At early ages, employment rates are notably higher than in the benchmark model and deviate more from the data (left panel). More strikingly, mothers' participation declines sharply with husbands' income levels (right panel). The intuition is that permanent productivity differences counterfactually induce a much larger degree of specialization within the household than observed in the data.

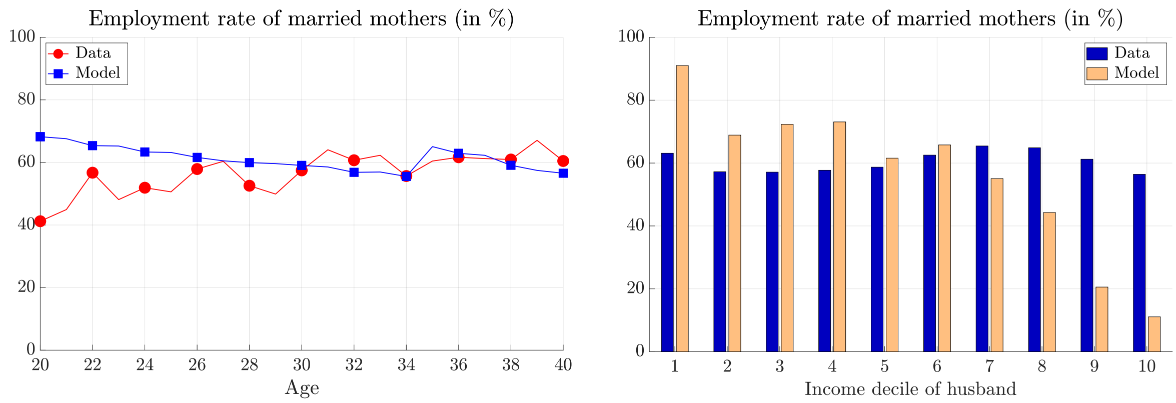


Figure E1: Model fit– No productivity risk

Turning to the policy analysis, all three reforms induce employment increases that are qualitatively and also quantitatively similar to the benchmark model (cf. Table E2, panel B, columns 3-5). This holds true also for fathers' employment rates and the share of dual-earner couples.

Heterogeneity in child care costs. In this model version, we restrict the amount of heterogeneity in child care costs that dual-earner households incur. Specifically, a fraction κ_i, $i = y, o$, of couples has access to informal child care, and all others pay a uniform cost μ_i that only depends on the age of children in the household. Similar to the benchmark, access to informal child care is (re)determined whenever a new child is born or a child in the household turns 5. The four parameters $(\kappa_y, \kappa_o, \mu_y, \mu_o)$ are calibrated to match the empirical shares of dual-earner couples paying for child care as well as average child care costs conditional on paying.

Table E2 (panel C) and Figure E2 report our results. Notably, the model fails to generate a gap in maternal participation between families with young and older children (58.7

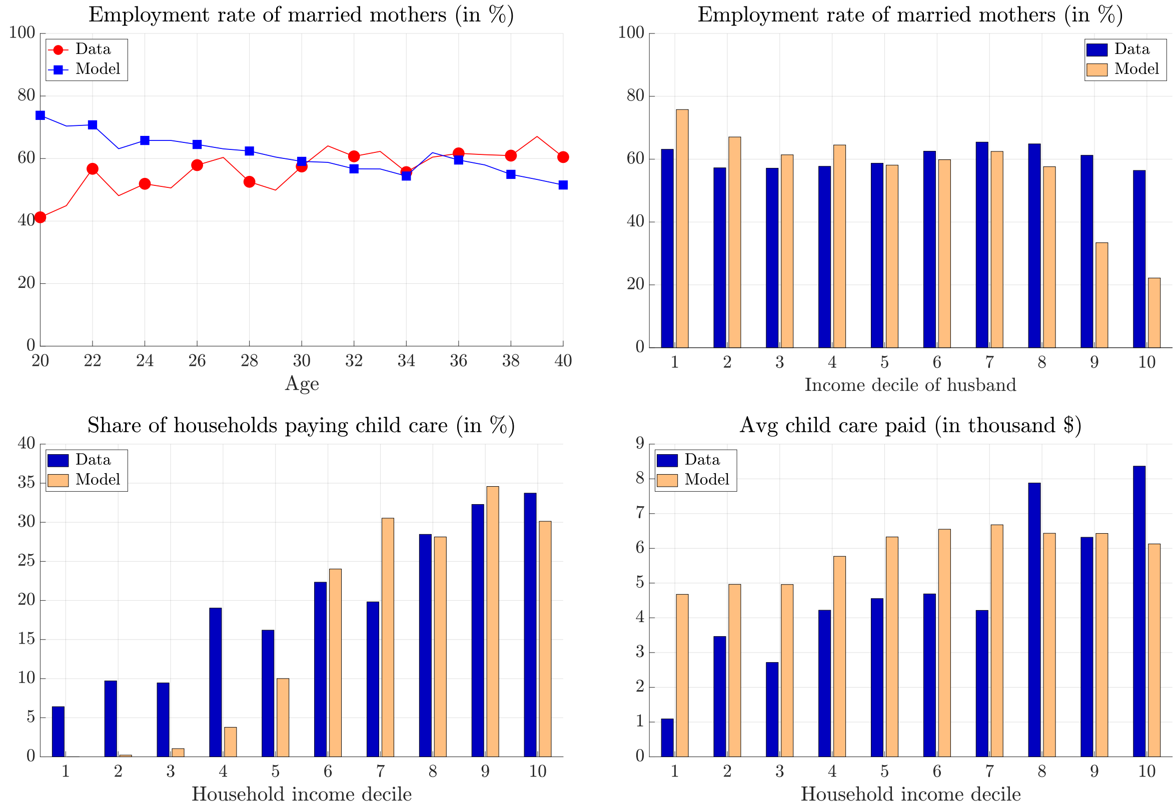


Figure E2: Model fit– No heterogeneity in child care costs

percent vs. 58.3 percent). Put differently, the employment rate of mothers is about 4 percentage points larger with preschool children in the household than in the benchmark model, and about 3.5 percentage points lower in household with older children. One way to interpret this observation is that in the benchmark model some households face large child care costs which induce even mothers with medium-high productivity to stay at home. The model with uniform child care costs does not capture this well enough. Regarding maternal employment rates by age, the model generates a declining gradient that deviates from the data especially for mothers in their twenties. Also, not surprisingly, the model does quite poorly in terms of fitting take-up rates and average child care expenses by household income.

The employment effects in response to policy reforms, on the other hand, are quite similar to our benchmark model. For instance, the combined reform R3 generates an increase in maternal employment by 13.6 percentage points (benchmark model: 12.8 percentage points). On the disaggregated level there are some differences, which can be traced back to the model fit just discussed.

Human capital accumulation. We adopt the following functional for the law of motion of female human capital:

$$h' = \exp\left[\ln(h) + \alpha(l_f)^{\tilde{\alpha}}\mathbb{1}_{l_f>0} - \delta(1-\mathbb{1}_{l_f>0})\right],$$

where $(\alpha, \tilde{\alpha})$ govern the gains in future productivity that come along with working l_f hours. We set these $(\alpha, \tilde{\alpha})$ jointly such that (i) wages of working mothers grow at an annual rate of 2.6 percent; and (ii) the subgroup of mothers working part-time (defined as working less than 30 hours/week) in our model accumulate 50% as much human capital as those working longer hours. All other parameters are recalibrated accordingly.

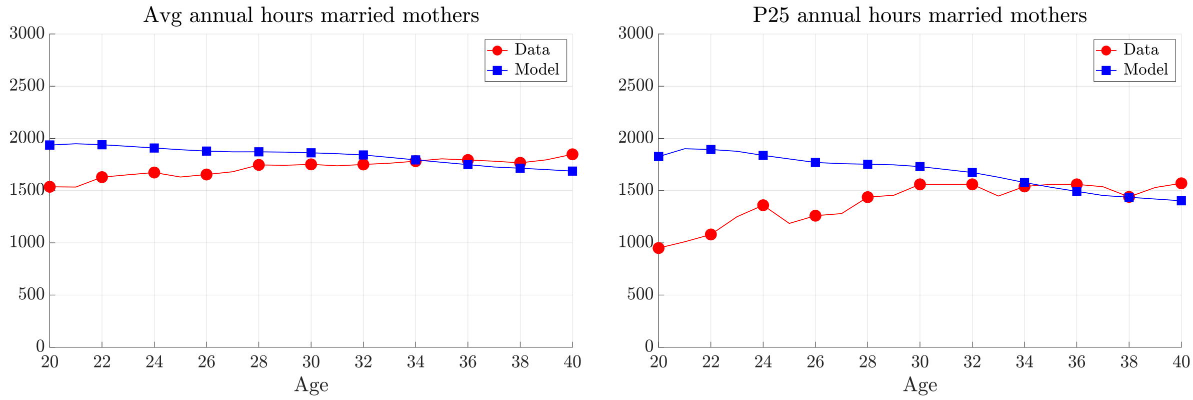


Figure E3: Model fit– Modified law of motion for human capital

Results are reported in Table E2 (panel D) and Figure E3. Compared to the benchmark model, this variant generates a larger gap in maternal participation between families with young (49.2 percent) and older children (67.5 percent), aligning slightly closer with the data. On the other hand, the fit deteriorates considerably along the intensive margin. Over the life cycle, the gap between annual hours worked in the model and the data widens quite a bit, which is decisively driven by an increase in hours worked at the bottom of the hours distribution. With greater gains in productivity when working long hours, women in the model have a large incentive to expand labor supply along the intensive margin, in particular, at the beginning of the life cycle. As a result, the first quartile of the hours distribution overpredicts the corresponding data value quite a bit. This suggests that further refinements of this model variant might be necessary to improve its fit again, for instance, by introducing additional utility cost parameters that depend on the number of hours worked (part-time work), or on age. Then again, the policy experiments under this model variation yield comparable results; employment effects for mothers are slightly more pronounced than in our benchmark model.