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The Effect of the Tax Cuts and Jobs Act of 2017 Expansion of the Child Tax Credit on the Distribution of Household Chores

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**The Effect of the Tax Cuts and Jobs Act of 2017 Expansion of the Child Tax Credit on the
Distribution of Household Chores**

An Honors Thesis

Presented to

The Faculty of the Department of Economics

Colby College

In partial fulfillment of the requirements for the

Degree of Bachelor of Arts

By

Joey Barrett

Waterville, Maine

May 2024

Examined and Approved by

A handwritten signature in black ink, appearing to read "Samara M. Gunter". The signature is fluid and cursive, with the first name being the most prominent.

Advisor: Samara Gunter

A handwritten signature in black ink, appearing to read "Tim Hubbard". The signature is very stylized and minimalist, consisting of a few bold, sweeping strokes.

Second Reader: Tim Hubbard

Abstract

This paper investigates the effect of the Tax Cuts and Jobs Act of 2017 (TCJA) expansion of the Child Tax Credit (CTC) on time spent doing household work in married or cohabiting households with children. Using American Time Use Survey (ATUS) data from before and after the implementation of the TCJA, I conduct a difference-in-differences analysis to determine the effect of the CTC expansion on time spent on all household chores, on historically female household chores, on historically male household chores, and on childcare. Then, using an adapted version of Bargain's (2008) collective utility model, I simulate the TCJA expansion of the CTC and I calibrate the model for the household bargaining power of men and women. While my model predicts that an expansion of the CTC would cause women in the phase-in region of the CTC to slightly decrease their time on household chores and men in the phase-in region of the CTC to slightly increase their time on household chores, my difference-in-differences analysis does not indicate a significant change in time spent on household chores as a result of the TCJA expansion of the CTC and the calibrations of my model do not indicate a significant change in bargaining power as a result of the TCJA expansion of the CTC.

JEL Codes: H24, H31, J16, J22

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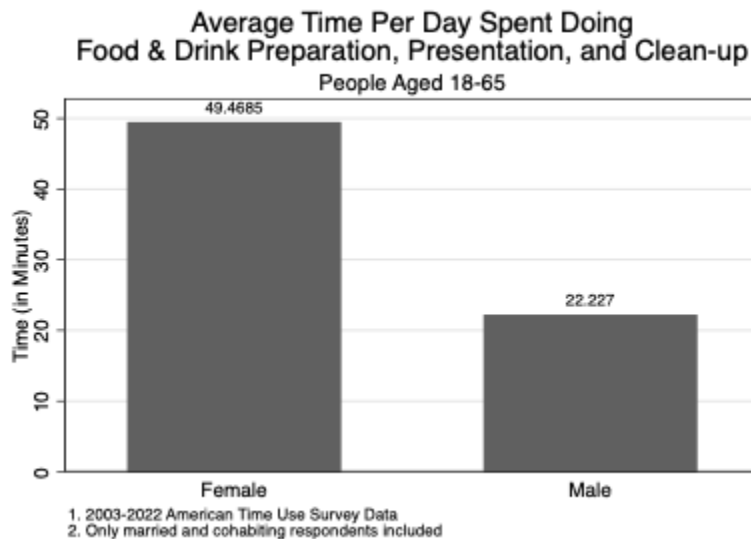
Thank you, Professor Tim Hubbard, for agreeing to read my paper and for providing me with feedback.

Thank you, Professor Kathrin Ellieroth, for teaching me the skills that I needed to run simulations using my model and to calibrate my model.

I. Introduction & Background

American Time Use Survey data indicate that between 2003 and 2007, people 15 years of age and older in the United States spent an average of 21.5 hours each week on household work (Krantz-Kent, 2009). Although unpaid household work is not part of the Bureau of Economic Analysis' calculation of gross domestic product in the United States (U.S. Bureau of Economic Analysis, 2012), Bridgman et al. (2022) value household production in 2019 alone at 4,638.8 billion US dollars. Using Bridgman et al.'s valuation of household production, household production was equal in value to approximately 21 percent of gross domestic product in the United States in 2019 (U.S. Bureau of Economic Analysis, 2020). Household production constitutes a significant source of time use, and in the United States, women have historically done the majority of household chores (as demonstrated by Figure 1).

Figure 1



Because of the unequal manner in which household work has been distributed by households over time, the way in which married and cohabiting households divide household chores is important from a gender equity perspective. As a result, research that identifies factors that affect the way in which married and cohabiting households divide household work is valuable in helping policymakers understand the gender equity implications of policies.

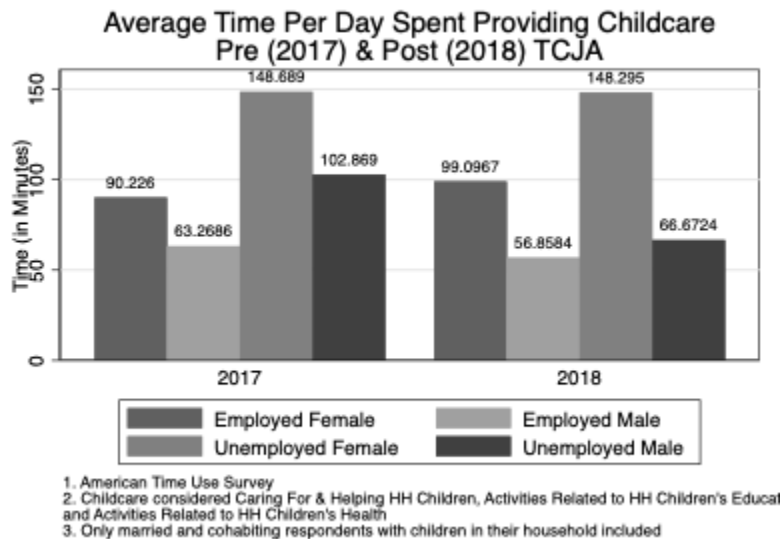
The Child Tax Credit (CTC) provides qualifying households with children with a tax break (Internal Revenue Service, 2024a). In reducing households' tax obligations, the CTC functions as an increase in income for qualifying households. While past research has focused on the labor supply incentives created by CTC policy (e.g., Lippold, 2019; Corinth et al., 2021), past research has not focused on the way in which time spent on household chores is impacted by the CTC. Examining the impact of the Earned Income Tax Credit (EITC), which is similar in design to the CTC, Bastian and Lochner (2022) find that unmarried mothers decrease the time they spend on household chores in response to increases to their EITC benefit. Consequently, further

research investigating the way in which changes in CTC policy affect the distribution of household work between married or cohabiting couples is worthwhile and can enhance policymakers' understanding of the time use implications of tax credits.

The Tax Cuts and Jobs Act of 2017 (TCJA) doubled the maximum Child Tax Credit benefit from \$1,000 to \$2,000 (Tax Policy Center, 2022). I will examine the time use implications of the TCJA, focusing on the following research question: *How did the TCJA expansion of the Child Tax Credit impact the way in which married or cohabiting couples with children divide household chore responsibilities?*

Figure 2 demonstrates the amount of time spent on childcare, which can be considered a type of household work, by American Time Use Survey respondents before and after the TCJA-induced increase in the CTC.

Figure 2



Past research about childcare has overwhelmingly focused on the role of women in childcare (e.g., Waldfogel, 2002). Though the role of men in childcare has been less frequently studied and men have historically spent less time providing childcare than women, Figure 2 indicates that the mean amount of time spent providing childcare by unemployed male American Time Use Survey respondents dropped by approximately 38 percent from 2017 to 2018. This decrease in time spent providing childcare by unemployed males is one indication of the possibility that the TCJA expansion of the CTC, which went into effect in 2018, had wide-ranging effects on time use.

In this paper, I use a difference-in-differences approach, comparing married and cohabiting households with children to married and cohabiting households without children in order to evaluate how the TCJA expansion of the CTC affected time spent on household chores. I then alter Bargain's (2008) collective utility model to simulate how an expansion of the CTC would affect time spent on household chores and I calibrate the model using ATUS data to determine how the TCJA expansion of the CTC affected the household bargaining power of men

and women. While my model predicts that an increase in the CTC benefit received by households would slightly decrease the time spent on chores by women with children and slightly increase the time spent on chores by men with children, my difference-in-differences analysis does not demonstrate a change in time on household chores and the calibrations of my model do not indicate a significant change in the bargaining power of men and women as a result of the TCJA expansion of the CTC.

The rest of this paper is broken up into six sections. Section II reviews relevant literature, placing particular focus on the labor supply incentives of the CTC and the time use implications of tax credit policy. Section III specifies a theoretical model, solves the model, and discusses the intuition behind the model. Section IV describes the data that I use and section V describes the empirical methodology that I use. Section VI explains empirical results. In section VII, I use my model to simulate an increase in the CTC and I calibrate the model for bargaining power. Section VIII discusses both the theoretical and the empirical results in further detail, providing potential explanations for the results and explaining how the theoretical results and the empirical results fit together. Section IX is the conclusion of the paper.

II. Literature Review

Labor Supply Incentives of the Child Tax Credit

Eligibility for the CTC is, in part, based upon household income. The CTC has a phase-in region, so households with income below a certain threshold are not eligible for the CTC. Additionally, because the CTC is only partly refundable, households for which the CTC benefit exceeds their federal tax obligations may only be eligible to receive a portion of the Child Tax Credit (Center on Budget and Policy Priorities, 2022). Similarly, above a certain income threshold, the CTC benefit phases out and households receive a smaller tax break than they would receive if their income were lower. Because eligibility for the CTC is based on income, the CTC creates complicated labor supply incentives. Theory predicts that in the phase-in region, households are faced with two opposing incentives. On the one hand, the substitution effect dictates that households would substitute away from leisure and work more hours in order to increase the size of the CTC benefit they receive and their labor income. On the other hand, the income effect dictates that households would feel wealthier as a result of the CTC and choose to indulge in more leisure than they would absent the CTC. Similarly, in the phase-out region of the CTC, households are faced with opposing incentives. On the one hand, households are incentivized to work fewer hours (and decrease their incomes) in order to maximize the size of the CTC benefit they receive. On the other hand, households are incentivized to work more hours to increase their labor incomes (and consequently, their ability to consume).

Because tax credits (such as the CTC) create complicated labor supply incentives, past research has focused on empirically estimating how tax credits affect labor supply. For example, examining the labor supply implications of the EITC (which is similar in design to the CTC), Eissa and Liebman (1996) find that a 1986 tax reform that increased EITC benefits resulted in an increase in labor force participation among single mothers with children but no change in the hours worked by already employed single mothers with children. While research indicates that

expansions to the EITC increase the labor supply of single mothers (e.g., Bastian and Lochner, 2022; Meyer, 2010; Meyer and Rosenbaum, 2001; Eissa and Liebman, 1996), Eissa and Hoynes (2004) find that expansions to the EITC between 1984 and 1996 reduce the collective labor supply of married couples, with a stronger disincentive to work for married females than for married males. Eissa and Hoynes' findings about the effect of expansions to the EITC suggest that the effect of tax credits on labor supply may differ significantly between married couples and single-parent households.

Additionally, studying the labor supply effects of the CTC using data from 2001 to 2016, Lippold (2019) uses a differences-in-discontinuities empirical analysis to find that, for low-income households who have lost CTC eligibility because their child has reached the age cutoff of 17, parental employment rates drop by 8.4 percent. More recent research on the connection between labor supply and the CTC has focused on the American Rescue Plan, which made the CTC fully refundable and increased the maximum CTC benefit to \$3,000 per child between ages 6 and 17 and to \$3,600 per child under the age of 6 (Internal Revenue Service, 2021). Prior to the implementation of the 2021 American Rescue Plan CTC, Corinth et al. (2021) estimated that the implementation of the American Rescue Plan CTC would lead 2.6 percent of all working parents to exit the labor market. If parents choose to stop working, then they may have additional time to dedicate to other activities such as household chores or leisure. A decrease in labor supply associated with an increase in CTC benefits partially offsets the potential for a CTC expansion to reduce poverty. In the case of the American Rescue Plan expansion of the CTC, Corinth et al. estimated that despite nearly doubling the maximum CTC benefit and reducing the eligibility requirements, deep child poverty would not fall.

Tax Credits and Time Use

Given that household chores constitute a significant time commitment and time is limited (e.g., doing more hours of market work might leave fewer available hours during which a person can do household chores), the labor supply incentives created by the CTC may also impact time spent on household chores. While there exists limited research on the time use implications of the CTC, some research has focused on the time use implications of the EITC, which provides employed, low-income individuals with a federal tax break. In 2017, unmarried individuals with children received 72.9 percent of all EITC dollars (Crandall-Hollick et al., 2023). Studying the effects of the EITC on time use using the ATUS, Bastian and Lochner (2022) use a difference-in-differences approach to find that expansions to the EITC result in increased maternal labor supply and decreased time on home production, leisure, and time spent with children. In particular, Bastian and Lochner find that, for each 1,000 dollar increase in maximum EITC benefit, unmarried mothers reduce time spent on home production by 0.54 hours each week and time spent with children by 1.99 hours each week. While Bastian and Lochner find an increase in labor supply for all women, they only observe a statistically significant increase in labor supply for unmarried women (and not for married women) when they split their analysis by marital status. Much like Bastian and Lochner, I will use ATUS data to conduct a

difference-in-differences analysis of time spent on home production (or household chores). Although I examine the time use implications of the CTC rather than the EITC, because of the similarities between the EITC and the CTC, Bastian and Lochner's findings can be extended to hypothesize that unmarried females with children will reduce the time that they spend on household chores and childcare as a result of the TCJA expansion of the CTC. However, Bastian and Lochner's findings provide a less clear indication about how the TCJA expansion of the CTC will change the time use of married or cohabiting people, the group that my analysis focuses on.

III. Specifying a Model

Because there does not exist a model that clearly and effectively indicates how the bargaining power of married or cohabiting couples affects their time use, I develop a model by modifying Bargain's (2008) collective household utility model.

Bargain's (2008) Model

Bargain (2008) specifies a household utility model in which a household consists of a husband and a wife. Both the husband and the wife get individual utility, and household utility is the weighted sum of the husband's utility and the wife's utility. Bargain specifies that each spouse gets utility from their consumption ($c_{f,m}$) and disutility from their productive effort ($e_{f,m}$). Productive effort equals hours worked ($h_{f,m}$) plus the intensity of work ($v_{f,m}$). Bargain explains that labor supply behavior is more complicated than just hours worked, as certain work might require more or less effort. Bargain extends Bourguignon and Spadaro's (2000) model, determining productivity ($\omega_{f,m}$) by examining wages. Each spouse gets disutility from their productive effort (rather than utility) because productive effort takes time away from leisure, and each spouse is assumed to enjoy leisure. Bargain includes a parameter (μ) for the weight placed on the wife's utility. μ can be interpreted as the wife's bargaining power in the household and $1-\mu$ can be interpreted as the husband's bargaining power in the household.

In Bargain's (2008) model, the husband and the wife are subject to one joint budget constraint where total household consumption ($c_f + c_m$) is determined by each spouse's earnings, household characteristics such as assets or non-labor income, and a function defining tax-benefit rules. Each spouse has Stone-Geary preferences, which are an extension of Cobb-Douglas preferences. Each spouse gets utility from their consumption, utility from leisure (or time not spent working), and utility from their spouse's leisure time (each spouse accounts for the fact that the other dislikes working). Bargain includes a parameter ($\beta_{f,m}^c$) defining each spouse's preference for consumption relative to their preferences for leisure and their spouse's leisure. Similarly, Bargain includes a parameter ($\beta_{f,m}^l$) defining each spouse's preference for leisure relative to their preferences for consumption and their spouse's leisure. Bargain defines a parameter (λ) as the preference that each spouse has for the other's leisure (relative to preferences for consumption and individual leisure). Both spouses share the same preference for the other's leisure.

Bargain's (2008) model specification dictates that the individual consumption of each spouse (which is constrained by the household's budget) is determined by the bargaining power parameter (μ) and each of their preferences for consumption relative to leisure and the consumption of their spouse ($\beta_{f,m}^c$). Because the collective utility model used by Bargain does not define the bargaining power rule, Bargain implements a bargaining power rule such that bargaining power (μ) is determined by log relative productivity. Bargain defines two values for each spouse's relative preference for consumption ($\beta_{f,m}^c$), leisure ($\beta_{f,m}^l$), and the leisure of their spouse (λ) to align with lower and upper bounds for wage-elasticity found in the literature.

Modifying the Model

I use a modified version of Bargain's (2008) model to examine how time on household chores and bargaining power between spouses was affected by the TCJA expansion of the CTC. I first modify Bargain's model in order to clearly incorporate household chores and the CTC into the model. I then further modify the model because, after developing the model, I calibrate the model using ATUS data,¹ so I need to be able to match the model to the ATUS data that I use.

I make three important additions to Bargain's model to clearly incorporate household chores and the CTC. First, I add household chores as a use of time ($y_{f,m}$) in addition to market work and leisure. Like market work, I assume that time spent on household chores negatively affects utility by limiting time on leisure. Second, I assume that time spent on household chores increases the household's ability to consume because in the absence of such household work, households would be forced to pay to outsource some of those chores. While a household could live in an environment where fewer chores are done (e.g., they could do laundry less frequently), I assume that the household would need to outsource some amount of household chores if they were not to devote time to chores. Third, I assume that all households with children receive a CTC benefit from the government. So, with the addition of the CTC benefit, the household's consumption is less constrained than it would otherwise be. I model the CTC benefit received by households in two different ways. First, for households in the phase-in region of the CTC, the CTC acts as a wage-subsidy, meaning that working more increases income both through additional wages and through a larger tax credit. I apply the wage-subsidy to the wife's wage in my model because it is a stylized fact that women are less likely than men to work full-time and the secondary earner is more likely to change their behavior as a result of changes in tax credit incentives. Second, for households in the plateau region of the CTC, the CTC acts as income transfer, simply increasing the household's ability to consume.

In order to match Bargain's (2008) model to my data, I define each spouse's utility as depending on their consumption and their hours worked rather than their consumption and their productive effort. Bargain's use of productive effort rather than hours worked is a reflection that some work is more intense than other work and that simply examining hours worked does not fully demonstrate a household's labor supply decisions. However, my use of hours worked rather than productive effort still captures the importance of labor supply decisions in determining

¹ I discuss my ATUS data sample in detail later in the paper.

utility. Next, in specifying the budget constraint, I eliminate household characteristics, assuming that households only have labor income (i.e., they do not have additional assets). Finally, unlike Bargain, I assume that each spouse only gets utility from their own consumption and leisure (and that they do not get utility from the utility of their spouse). Such an assumption simplifies the model without eliminating the need for spouses to negotiate with one another about how best to distribute their resources and time.

Specifying the Model: Households in the Phase-In Region of the CTC

I define household utility as:

$$(1) U_{\text{household}} = (1-\mu) * u_m(c_m, l_m) + \mu * u_f(c_f, l_f)$$

where μ represents the relative weight placed on each spouse's utility (the bargaining power that each spouse has), the husband's utility (u_m) is determined by his consumption (c_m) and his time spent on leisure (l_m), and the wife's utility (u_f) is determined by her consumption (c_f) and her time spent on leisure (l_f).

$$(2) U_{\text{household}} = (1-\mu) * (\beta_m^c * \ln(c_m) + (1-\beta_m^c) \ln(1-h_m-y_m)) + \mu * (\beta_f^c * \ln(c_f) + (1-\beta_f^c) \ln(1-h_f-y_f))$$

s.to $c_f + c_m = c$

$$c = (1-\tau) * (w_m * h_m + (1+x) * w_f * h_f) + w_f * (y_m + y_f)$$

where β_m^c represents the husband's relative preference for consumption (as compared to leisure), h_m represents the amount of time that the husband works each week, y_m represents the amount of time that the husband spends on household chores each week, β_f^c represents the wife's relative preference for consumption (as compared to leisure), h_f represents the amount of time that the wife works each week, y_f represents the amount of time that the wife spends on household chores each week, w_m represents the husband's wage, w_f represents the wife's wage, and τ represents the tax rate. x , which acts as a wage-subsidy, represents the CTC benefit that the household receives. Household production ($y_m + y_f$) increases the household's ability to consume. While households are typically not compensated for household work, I reflect the fact that household production increases a household's ability to consume by assuming that time spent on household chores (for both the husband and the wife) is compensated at the wife's wage (w_f).

I assume that each person has 100 usable hours of time each week, meaning that hours spent doing market work, hours spent on leisure, and hours spent on household chores must add up to 100 for both the husband and the wife. I then normalize the time that both the husband and the wife are endowed with to one, meaning that:

$$(3) h_{m,f} = (\text{hours worked}) / 100$$

$$(4) y_{m,f} = (\text{hours spent doing chores}) / 100$$

Specifying the Model: Households in the Plateau Region of the CTC

I define household utility in the same way as in my initial model specification, changing only the budget constraint so that the child tax credit acts as an income transfer rather than a wage-subsidy:

$$(5) U_{\text{household}} = (1-\mu) * (\beta_m^c * \ln(c_m) + (1-\beta_m^c) \ln(1-h_m-y_m)) + \mu * (\beta_f^c * \ln(c_f) + (1-\beta_f^c) \ln(1-h_f-y_f))$$

$$\text{s.to } c_f + c_m = c$$

$$c = x + (1-\tau) * (w_m * h_m + w_f * h_f) + w_f * (y_m + y_f)$$

Solving the Model

In order to solve the model, I first derive first-order conditions by setting the partial derivatives of household utility with respect to the husband's consumption and the wife's consumption equal to 0.

$$(6) \partial U / \partial c_m = ((1-\mu) * \beta_m^c) / c_m = 0$$

$$(7) \partial U / \partial c_f = (\mu * \beta_f^c) / c_f = 0$$

I then derive a relationship between c_m and c_f .

$$(8) ((1-\mu) * \beta_m^c) / c_m = (\mu * \beta_f^c) / c_f$$

$$(9) c_m = (((1-\mu) * \beta_m^c) / (\mu * \beta_f^c)) * c_f$$

Combining equations allows me to identify the share of the household's consumption that each spouse gets:

$$(10) c = c_f + (((1-\mu) * \beta_m^c) / (\mu * \beta_f^c)) * c_f$$

$$(11) c_f = ((\mu * \beta_f^c) / (\mu * \beta_f^c + (1-\mu) * \beta_m^c)) * c$$

I next summarize the solution to the model as follows:

$$(12) c_f = p * c$$

$$(13) c_m = (1-p) * c$$

$$(14) p = (\mu * \beta_f^c) / (\mu * \beta_f^c + (1-\mu) * \beta_m^c)$$

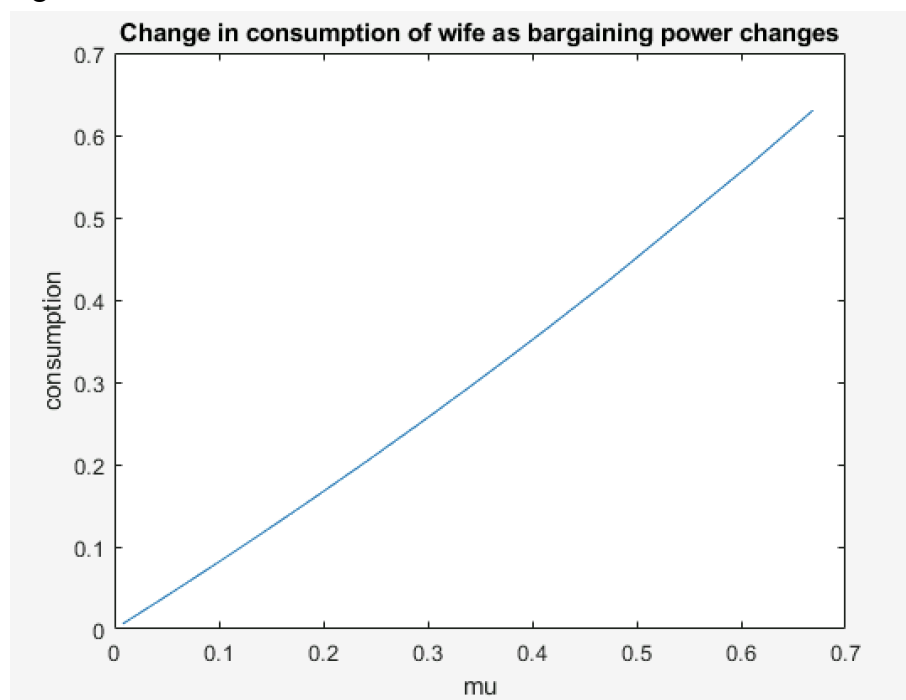
where p dictates how consumption is split between the husband and the wife. Because the husband and the wife share an overall budget, they must decide how to “share” their resources.

Taking Intuition From the Model

Because the husband and the wife in the model both get positive utility from consumption, each spouse would choose to consume more if their bargaining power in the

household were to increase. Figure 3 below plots the change in the wife's consumption as bargaining power changes. I assume that $y_f = .24$ (the mean time spent on chores by all females in the 2015-2017 subset of my ATUS data²) and I use all other variable and parameter values in Appendix Table A1.

Figure 3

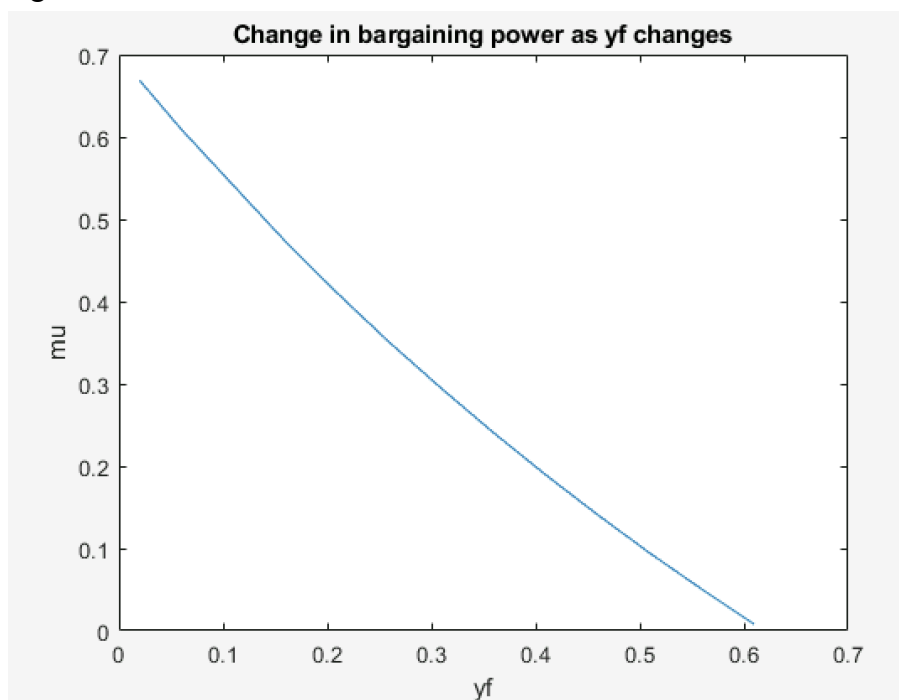


As expected, Figure 3 demonstrates that increased bargaining power results in increased consumption.

Next, given that individuals get disutility from household chores, I would predict that an increase in bargaining power would correspond with a decrease in time spent on household chores. To demonstrate that my model aligns with this prediction, I plot how bargaining power (μ) changes as time spent on household chores by the wife in the model (y_f) changes in Figure 4 below. See Appendix Table A1 for the variable and parameter values that I use. As expected, Figure 4 demonstrates that increased bargaining power corresponds with decreased time on household chores in the model. By confirming that the model matches assumptions about the way in which the husband and the wife negotiate their time use and consumption with one another, I illustrate the model's strong potential to make predictions about how the TCJA expansion of the Child Tax Credit impacted household time use.

² I discuss my ATUS data sample in detail later in the paper.

Figure 4



The primary intuitive difference between the model for households in the phase-in region of the CTC and the model for households in the plateau region of the CTC is that for households in the phase-in region of the CTC, a change in the CTC benefit received by the household changes the relative wages of the husband and the wife, as the CTC effectively increases the wife's wage. Consequently, I would expect that, for households in the phase-in region of the CTC, as the CTC benefit increases, the wife's bargaining power increases (assuming that relative wages impact bargaining power).

To demonstrate this to be the case, I first define bargaining power for households in the phase-in region of the CTC using a simplified version of Bargain's (2008) bargaining power rule. I specify that bargaining power is determined by the relative wages of the husband and the wife. This approach to defining bargaining power is supported by other literature (e.g., Browning et al., 1994; Friedberg and Webb, 2006). Browning et al. (1994) find that in a multi-person household, the relative income of partners is a determinant of expenditures on each partner. Similarly, Friedberg and Webb (2006) find that current and lifetime earnings are a determinant of bargaining power within a household, meaning that higher earnings are correlated with greater decision-making power within a household. I assume that the CTC acts as a wage-subsidy for the wife, meaning that the wife's wage is increased by the CTC.

$$(15) \quad \log(\mu/(1-\mu)) = \log((1+x) \cdot w_f / w_m)$$

$$(16) \quad \mu = ((1+x) \cdot w_f) / ((1+x) \cdot w_f + w_m)$$

I can then substitute Equation 16 into Equation 14 (the share of net consumption that the wife gets) in place of μ .

$$(17) \quad p_{\text{substitution}} = \left(\frac{((1+x)w_f)/((1+x)w_f+w_m) \beta_f^c}{((1+x)w_f)/((1+x)w_f+w_m) \beta_f^c + (1 - ((1+x)w_f)/((1+x)w_f+w_m)) \beta_m^c} \right)$$

I then take the partial derivative of equation 17 with respect to the CTC (x).

$$(18) \quad \frac{\partial p_{\text{substitution}}}{\partial x} = \frac{((1-A)B\beta_m^c + A(C + \beta_f^c))}{(A^2(1-\beta_m^c)^2)}$$

where:

$$A = \frac{(1+x)w_f}{(1+x)w_f + w_m}$$

$$B = \frac{w_f \beta_f^c (w_m - w_f)}{((1+x)w_f + w_m)^2}$$

$$C = \frac{(\beta_m^c w_f^2)}{((1+x)w_f + w_m)^2}$$

Equation 18 demonstrates that, for households in the phase-in region of the CTC, as the CTC benefit increases, the wife's bargaining power increases.

The model demonstrates that for all households, as a spouse's bargaining power rises, their time on household chores decreases and their consumption increases. Importantly, for households in the phase-in region of the CTC, as the size of the CTC increases, the wife's bargaining power increases. While the model makes clear predictions about the effect of the CTC on time spent doing household chores and bargaining power, I next seek to determine whether time-use data matches predictions made using my model.

IV. Data

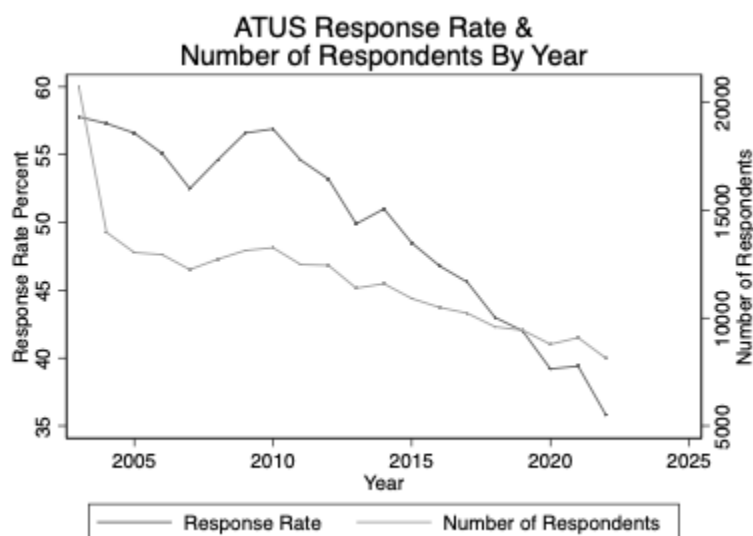
I use data from the American Time Use Survey (ATUS) to empirically and theoretically examine the effect of CTC policy on the division of household chore responsibilities. Because the ATUS tracks survey respondents' use of time throughout an entire day, it effectively allows me to determine the amount of time that each respondent spends doing different types of household chores (U.S. Bureau of Labor Statistics, 2023a). The ATUS is conducted by the US Bureau of Labor Statistics (BLS) throughout each year. Households chosen to participate in the ATUS have completed their final interview for the Current Population Survey (CPS), another survey run by the BLS. Households become eligible to participate in the ATUS two months after their final CPS interview (U.S. Bureau of Labor Statistics, 2023b). Once households are chosen for participation, one household member over the age of 15 is randomly chosen to be the respondent.

The ATUS uses three criteria to select households for participation from the pool of households who have completed the final stage of the CPS. First, the ATUS chooses households to participate such that the number of households from each state is representative of the relative populations of each state. Second, households are grouped based on the race and ethnicity of the head of the household, whether or not there are children in the household, and the number of

adults living in households with only adults. Third, households with a Hispanic or Black head of household and households with children are oversampled to improve the reliability of data by demographic groups and to improve the reliability of data related to childcare (U.S. Bureau of Labor Statistics, 2023b).

Between 2003, when the ATUS was first conducted, and 2022, there are 236,591 respondents. Over time, ATUS' yearly sample size has decreased. In 2003, 3,375 households who had completed their final CPS interview were selected to participate in the ATUS each month. Beginning in December 2003, the monthly ATUS sample decreased by 35 percent because of budget restrictions. In addition to the change in sample size in December 2003, response rates have changed over time. In 2003, 57.8 percent of households chosen for the ATUS responded and in 2022, only 35.8 percent of households chosen for the ATUS responded (U.S. Bureau of Labor Statistics, 2023b). As a result, the number of ATUS respondents per year has decreased over time. If data are not analyzed by year (and observations from different years are grouped together), then the sample is skewed toward earlier years. Figure 5 below demonstrates the number of ATUS respondents each year and the decrease in response rate between 2003 and 2022.

Figure 5



Upon being selected to participate in the ATUS, households receive a letter and a brochure in the mail (in both English and Spanish). For households that choose to participate, ATUS data are collected through a computer-assisted telephone interviewing (CATI) process. 50 percent of interviews report time use on weekdays and 50 percent of interviews report time use on weekend days (U.S. Bureau of Labor Statistics, 2023b).

Because I examine the effect of the TCJA-induced CTC expansion on household chore distribution, I restrict the sample to observations for which the respondent has a married or cohabiting partner and observations from 2015 to 2019. Additionally, I restrict the sample to only

include respondents between the ages of 25 and 54. I only include respondents between the ages of 25 and 54 because that is the population of respondents most likely to have children and to work. The restricted dataset contains 15,927 observations. Despite the intentional oversampling of households with a Hispanic or Black head of household, Table 1 below demonstrates that White respondents are overrepresented in the sample of 15,927 respondents that I use. The overrepresentation of White respondents is likely because marriage rates among Black households are lower than marriage rates among White households (e.g., Raley et al., 2015).

Table 1: Race of Respondents VS. Race of US Population

| Race | Freq. of Respondents | Percent of Respondents | Percent of US Population |
|--------------------------------------|-----------------------------|-------------------------------|---------------------------------|
| White only | 13,319 | 83.63 | 75.50 |
| Black only | 1,089 | 6.84 | 13.60 |
| American Indian, Alaskan Native only | 124 | 0.78 | 1.30 |
| Asian only | 1,137 | 7.14 | 6.30 |
| Hawaiian/Pacific Islander only | 52 | 0.33 | 0.30 |
| Other | 206 | 1.29 | 3.00 |
| Total | 15,927 | 100.00 | 100.00 |

1. Respondent Data From ATUS

2. US Population Data From US Census QuickFacts, which can be accessed at:
<https://www.census.gov/quickfacts/fact/table/US/RHI225222#qf-headnote-a>

While the ATUS has a target number of Hispanic, Black, and Non-Hispanic/Non-Black households selected for participation each year (U.S. Bureau of Labor Statistics, 2023b), the overrepresentation of White participants and the underrepresentation of all other participants may also be due to differences in response rate between different populations of prospective participants. The lack of a racially representative sample may limit the generalizability of my results.

Additionally, as can be seen below in Table 2, ATUS respondents in the restricted sample are not equally distributed throughout the United States. Table 2 illustrates that the percentage of respondents in the sample who live in each geographic region of the United States roughly matches the percentage of the US population that lives in each geographic region of the United States.

Table 2: Geographic Distribution of Respondents

| Region | Freq. of Respondents | Percent of Respondents | Percent of US Population |
|---------------|-----------------------------|-------------------------------|---------------------------------|
| Northeast | 2,510 | 15.76 | 17.3 |
| Midwest | 3,826 | 24.02 | 20.8 |
| South | 5,790 | 36.35 | 38.1 |
| West | 3,801 | 23.87 | 23.7 |
| Total | 15,927 | 100 | 100 |

1. Respondent Data From ATUS

2. US Population Data From 2020 US Census, which can be accessed at:
https://www.census.gov/popclock/data_tables.php?component=growth

Appendix Table A2 lists the outcome variables that I use to quantify the effect of the TCJA-induced CTC expansion on household chore distribution.

V. Empirical Methodology

I compare the time spent on household work before and after the TCJA-induced expansion of the CTC in married or cohabiting households using a difference-in-differences regression analysis. The TCJA affected earnings after December 31, 2017 (Internal Revenue Service, 2023). I define 2017 as the period prior to the implementation of the TCJA. I define 2019 as the period after the implementation of the TCJA. I do not include 2018 in the analysis because it is likely that many respondents were unaware of the TCJA-induced change in CTC policy until they filed their 2018 taxes at the beginning of 2019. If households were unaware of the increase in the CTC, then they could not have changed their behavior in response to the change in CTC policy. Once households filed their 2018 taxes at the start of 2019, they may have become aware of the TCJA-induced change in CTC policy (if they were not already aware of it). By using 2019 as the period after the implementation of the TCJA, I ensure that households were aware of the change in CTC policy.

Because a change in CTC policy does not impact the earnings of households without children, I do not expect the TCJA-induced expansion of the CTC to affect households without children and I use respondents without children as my control group. I use married or cohabiting respondents with children in their household under the age of 18 as my treatment group. These treatment and control groups allow for the change in time spent on household work as a result of the expansion of the CTC to be examined, but they do not allow for the change in time spent on household work to be examined by sex. In order to examine whether the TCJA expansion of the CTC affected the time spent on household work by males and females differently, I then perform the same analysis using two additional treatment and control groups. My second treatment group is females with children under the age of 18 and the corresponding control group is females without children. My third treatment group is males with children under the age of 18 and the corresponding control group is males without children. I then perform the same analysis with the same three treatment and control groups, but I only include respondents in the treatment group if they have a child younger than 6 years old in their household. Because younger children require more caretaking, it is possible that the TCJA expansion of the CTC differently affected households with children under the age of 6 and households with older children. Table 3 below provides a summary of the six treatment groups (and their corresponding control groups) that I use. Because the effects of the CTC may differ for households in the phase-in region of the CTC (who only receive part of the maximum CTC amount because of their income level) and for households in the plateau region of the CTC (who qualify for the maximum CTC amount because of their income), I conduct the analysis first for all households before splitting the sample by income. When I split the sample by income, I assume that households with household income below \$25,000 per year are in the phase-in region of the CTC and households with household income above \$29,999 are in the plateau region of the CTC.

Table 3: Treatment and Control Groups

| | Treatment Group | Control Group |
|-----------|--|--|
| A. | Respondents with a child/children under 18 in the household | Respondents without a child/children in the household |
| B. | Female respondents with a child/children under 18 in the household | Female respondents without a child/children in the household |
| C. | Male respondents with a child/children under 18 in the household | Male respondents without a child/children in the household |
| D. | Respondents with a child/children under 6 in the household | Respondents without a child/children in the household |
| E. | Female respondents with a child/children under 6 in the household | Female respondents without a child/children in the household |
| F. | Male respondents with a child/children under 6 in the household | Male respondents without a child/children in the household |

I estimate the effect of the TCJA-induced expansion of the CTC on time spent doing household chores using Equation 19 below for treatment/control groups A, B, and C and Equation 20 below for treatment/control groups D, E, and F.

$$(19) \quad y_{it} = a + \beta_1(PostTCJA)_t + \beta_2(HasChildUnder18)_i + \beta_3(PostTCJA*HasChildUnder18)_t + \beta_4X_{it} + e_{it}$$

where y_{it} is the amount of time spent on doing household work by person i at time t (before or after the implementation of the TCJA), $(PostTCJA)_t$ indicates whether a respondent was surveyed before or after the implementation of the TCJA, $(HasChildUnder18)_i$ indicates whether a respondent has a child under the age of 18 in their household, $(PostTCJA*HasChildUnder18)_t$ indicates whether a respondent has a child under the age of 18 in their household and was surveyed after the implementation of the TCJA, X_{it} is a series of control variables, and e_{it} is an error term.

$$(20) \quad y_{it} = a + \beta_1(PostTCJA)_t + \beta_2(HasChildUnder6)_i + \beta_3(PostTCJA*HasChildUnder6)_t + \beta_4X_{it} + e_{it}$$

where y_{it} is the amount of time spent on doing household work by person i at time t (before or after the implementation of the TCJA), $(PostTCJA)_t$ indicates whether a respondent was

surveyed before or after the implementation of the TCJA, $(HasChildUnder6)_i$ indicates whether a respondent has a child under the age of 6 in their household, $(PostTCJA*HasChildUnder6)_i$ indicates whether a respondent has a child under the age of 6 in their household and was surveyed after the implementation of the TCJA, X_{it} is a series of control variables, and e_{it} is an error term.

Because age, race, ethnicity, employment status, education, and geographic region may impact time spent on household work, I include X_{it} as a series of control variables in both Equation 19 and Equation 20. X_{it} includes a variable for age of the respondent and binary variables indicating whether or not the respondent is White, Hispanic, has a spouse who is employed, is employed, has completed some amount of college (but does not have a college degree), has a high school diploma (but no further schooling), has less than a high school diploma, lives in the Midwest, lives in the South, and lives in the West. Table 4 below provides summary statistics for all control variables used in the analysis.

Table 4: Control Variable Summary Statistics, 2015-2019

| Variable | All Respondents <i>15,927 obs</i> | | Female Respondents <i>8,488 obs</i> | | Male Respondents <i>7,439 obs</i> | |
|-----------------------|--------------------------------------|-----------|--|-----------|--------------------------------------|-----------|
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| Age | 39.99 | 7.82 | 39.59 | 7.92 | 40.46 | 7.69 |
| White | 0.84 | 0.37 | 0.83 | 0.37 | 0.84 | 0.37 |
| Hispanic | 0.16 | 0.37 | 0.16 | 0.37 | 0.16 | 0.37 |
| Spouse Employed | 0.81 | 0.39 | 0.91 | 0.29 | 0.71 | 0.45 |
| Employed | 0.82 | 0.38 | 0.72 | 0.45 | 0.93 | 0.25 |
| Some College | 0.25 | 0.43 | 0.25 | 0.43 | 0.24 | 0.43 |
| High School | 0.18 | 0.38 | 0.17 | 0.37 | 0.19 | 0.39 |
| Less Than High School | 0.07 | 0.25 | 0.06 | 0.24 | 0.08 | 0.26 |
| Midwest | 0.24 | 0.43 | 0.24 | 0.42 | 0.24 | 0.43 |
| South | 0.36 | 0.48 | 0.37 | 0.48 | 0.36 | 0.48 |
| West | 0.24 | 0.43 | 0.24 | 0.43 | 0.24 | 0.43 |

As can be seen in Table 4, both dummy variables for employment status (Employed and Spouse Employed) differ by the sex of the respondent. Aside from the employment status dummy variables, the mean value of each control variable is very similar between female respondents and male respondents.

I perform the regression analysis four times using different types of household work as the outcome variable (y_{it}). First, I perform the regression analysis using all household work, which is the combination of historically female chores, historically male chores, and childcare, as the outcome variable. Second, I perform the regression analysis using historically female chores as the outcome variable. Third, I perform the regression analysis using historically male chores as the outcome variable. Fourth, I perform the regression analysis using time spent on childcare as the outcome variable.

In order to define household chores as historically male or historically female, I compare the mean time spent on each activity that constitutes household work by all male and female ATUS respondents between 2003 (when ATUS data is first available) and 2017 (the year prior to the implementation of the TCJA). If the mean time spent on a particular household activity is greater for females than for males, then I define the activity as a historically female chore. If the mean time spent on a particular housework activity is greater for males than for females, then I define the activity as a historically male chore. I then run hypothesis tests to determine whether or not the difference in time spent by males and by females on each chore is statistically significant. If the difference between the time spent by males and by females on a chore is not statistically significant at the 95 percent confidence level, I exclude that chore from the analysis. Additionally, if the chore is not intuitively a historically female chore or a historically male chore (e.g., care for animals and pets), I exclude that chore from the analysis. All activities related to caring for household children are categorized as childcare regardless of whether female respondents or male respondents have historically spent more time doing that activity. I exclude secondary childcare activities from the analysis (i.e., passive activities where parents are providing childcare, but childcare is not their primary focus). Appendix Table A2 lists all chores included in the analysis and demonstrates the way in which activities were coded as historically male, historically female, or childcare using 2003-2017 ATUS respondent data.

By performing the regression analysis for all household work before separating historically female chores, historically male chores, and childcare, the impact of the TCJA-induced expansion of the CTC on different types of household chores can be understood. Table 5 below provides summary statistics for outcome variables included in the regression analysis.

Table 5: Outcome Variable Summary Statistics, 2015-2019

| Variable | Mean Time Spent Per Day (in minutes) | | |
|----------------------------|--------------------------------------|--------------------|------------------|
| | All Respondents | Female Respondents | Male Respondents |
| <i># of observations</i> | 15,927 | 8,488 | 7,439 |
| All Chores | 164.84 | 205.73 | 118.19 |
| Historically Female Chores | 87.24 | 123.26 | 46.14 |
| Historically Male Chores | 17.52 | 8.56 | 27.73 |
| Childcare | 60.09 | 73.90 | 44.32 |

To help demonstrate that any change in time spent doing household work resulting from my difference-in-differences regression analysis is not the result of a change in time period, but rather the result of the TCJA-induced expansion of the CTC, I perform placebo tests using the same difference-in-differences methodology with 2015 as the pre-policy period and 2016 as the post-policy time period. I do not find a statistically significant difference between the control

group and the treatment group for any of the 72 regressions run as part of the analysis. By finding no statistically significant effects of a non-existent policy on time spent doing household work using my difference-in-differences methodology, I make clear that a change in time period alone (without a policy change) is not a feasible explanation for changes in time spent doing household work. This finding supports the use of a difference-in-differences methodology to identify changes in time spent doing household work as a result of the TCJA expansion of the CTC.

VI. Empirical Results

Using the difference-in-differences approach outlined in my methodology, I first find that for all respondents, the TCJA expansion of the CTC did not lead respondents with children under 18 to change the amount of time that they spend on household chores. Table 6 below shows my regression results, which are statistically insignificant and small in magnitude.

Table 6: All Respondents

| VARIABLES | (1) All Chores | (2) Historically Female Chores | (3) Historically Male Chores | (4) Childcare |
|------------------------------|---------------------|-----------------------------------|---------------------------------|---------------------|
| Post TCJA | -5.327 (8.158) | -1.361 (5.525) | -2.487 (3.276) | -1.479 (4.809) |
| Has Child Under 18 | 90.36*** (6.588) | 23.56*** (4.462) | -2.202 (2.646) | 69.00*** (3.883) |
| Post TCJA*Has Child Under 18 | -0.0176 (9.329) | 0.844 (6.318) | 1.567 (3.747) | -2.429 (5.499) |
| Observations | 6,169 | 6,169 | 6,169 | 6,169 |
| R-squared | 0.155 | 0.096 | 0.014 | 0.198 |

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

All control variables included in analysis

I next find that the TCJA expansion of the CTC led female respondents with household income in the phase-in region of the CTC and a child under 18 to decrease their daily time spent on historically female chores by 58.5 minutes. Table 7 below shows my regression results for females in the phase-in region of the CTC. In order to determine how to interpret the decrease in time spent on historically female chores by females in the phase-in region of the CTC with a child, I both increase and decrease my initial definition of the maximum income that a household in the phase-in region of the CTC can have (\$24,999) in increments of \$5,000. When I limit the sample by income differently, I no longer find a statistically significant result and both the magnitude and the sign of the coefficient of interest vary. Consequently, my evidence of a

TCJA-induced change in time spent on chores by females with children in the phase-in region of the CTC is weak.

Table 7: Female Respondents With HH Income Below \$25,000

| VARIABLES | (1) All Chores | (2) Historically Female Chores | (3) Historically Male Chores | (4) Childcare |
|---------------------------------|---------------------|--------------------------------------|------------------------------------|---------------------|
| Post TCJA | 39.23 (42.46) | 37.18 (29.59) | 6.667 (8.354) | -4.615 (27.90) |
| Has Child Under 18 | 145.9*** (32.84) | 56.24** (22.88) | 0.577 (6.461) | 89.04*** (21.57) |
| Post TCJA*Has Child Under 18 | -68.35 (50.82) | -58.50* (35.42) | -9.669 (9.999) | -0.172 (33.39) |
| Observations | 269 | 269 | 269 | 269 |
| R-squared | 0.278 | 0.222 | 0.040 | 0.192 |

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

All control variables included in analysis

In contrast to my weak evidence that the TCJA expansion of the CTC led female respondents with household income in the phase-in region of the CTC and a child under 18 to decrease their daily time spent on historically female chores, I find no evidence that the TCJA expansion of the CTC affected time on household chores for female respondents with children in the plateau region of the CTC. Table 8 below shows my regression results, which are statistically insignificant and inconsistent in sign.

Table 8: Female Respondents With HH Income Over \$29,999

| VARIABLES | (1) All Chores | (2) Historically Female Chores | (3) Historically Male Chores | (4) Childcare |
|---------------------------------|---------------------|-----------------------------------|---------------------------------|---------------------|
| Post TCJA | -6.313 (12.49) | -9.302 (9.180) | 4.450 (2.890) | -1.461 (7.559) |
| Has Child Under 18 | 103.4*** (10.12) | 30.33*** (7.440) | -0.874 (2.342) | 73.99*** (6.126) |
| Post TCJA*Has Child Under 18 | 4.146 (14.22) | 10.51 (10.45) | -3.838 (3.289) | -2.530 (8.603) |
| Observations | 2,911 | 2,911 | 2,911 | 2,911 |
| R-squared | 0.172 | 0.071 | 0.014 | 0.241 |

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

All control variables included in analysis

For all other regressions I run as part of my difference-in-differences analysis, I do not find statistically significant results, meaning that by and large, my difference-in-differences analysis does not indicate a change in time spent on chores as a result of the TCJA expansion of the CTC.

VII. Simulating the CTC Expansion and Calibrating the Model for Bargaining Power

Using the Model to Simulate the TCJA CTC Expansion: Households in the Phase-In Region of the CTC

I simulate the TCJA CTC expansion to observe how the model predicts that time spent on household chores changes when the maximum CTC amount increases for households in the phase-in region of the CTC. To assign values to h_m , h_f , w_m , w_f , and τ , I use my ATUS data sample for all households from 2015-2019. When calculating h_m , h_f , w_m , and w_f using ATUS data, I exclude observations for people who do not work. I assume that households only face one type of tax (federal income tax) and I assign the tax rate to be 0.12 using 2023 married filing jointly federal income tax brackets (Internal Revenue Service, 2024b). I assume household income to be \$10,000, as a household income of \$10,000 would mean that a household falls in the phase-in region of the CTC. The CTC phases-in at a rate of 15 percent of income above \$2,500 (Crandall-Hollick, 2021). Using this information, I assign the post-TCJA value of x to be .1275 and I set the pre-TCJA value of x to equal .1.

I assign a value to μ using Equation 16. Appendix Table A3 provides a complete list of values for variables and parameters in my simulations. After defining parameters, I run four different simulations. Before running each simulation, I calibrate the model using β_m^c and β_f^c such that the baseline level of $y_{m,f}$ equals my ATUS data targets. In simulations 1 and 2, only y_f (time spent by the wife on household chores) is allowed to change. Table 9 below lists the results of simulations 1 and 2.

Table 9

| <i>Simulation #</i> | Pre-TCJA Female Household Member's Weekly Time on Chores Based on 2015-2017 ATUS Data (in hours) | Male Household Member's Weekly Time on Chores Assigned Using 2015-2017 ATUS Data (in hours) | Post-TCJA Female Household Member's Weekly Time on Chores (in hours) | <i>Change in Female Household Member's Weekly Time on Chores (in hours)</i> |
|---------------------------------------|--|---|--|---|
| 1 (Respondents With a Child Under 18) | 29.61 | 16.4 | 29.05 | -0.56 |
| 2 (Respondents With a Child Under 6) | 35.70 | 18.8 | 35.23 | -0.47 |

In simulations 3 and 4, only y_m (time spent by the husband on household chores) is allowed to change. Table 10 below lists the results of simulations 3 and 4.

Table 10

| <i>Simulation #</i> | Pre-TCJA Male Household Member's Weekly Time on Chores Based on 2015-2017 ATUS Data (in hours) | Female Household Member's Weekly Time on Chores Assigned Using 2015-2017 ATUS Data (in hours) | Post-TCJA Male Household Member's Weekly Time on Chores (in hours) | <i>Change in Male Household Member's Weekly Time on Chores (in hours)</i> |
|---------------------------------------|--|---|--|---|
| 3 (Respondents With a Child Under 18) | 16.31 | 29.7 | 16.50 | +0.19 |
| 4 (Respondents With a Child Under 6) | 18.70 | 35.8 | 19.53 | +0.83 |

My simulations indicate that my model predicts a small decrease in time spent on household chores by women in the phase-in region of the CTC and a small increase in time spent on household chores by men in the phase-in region of the CTC as a result of the TCJA expansion of the CTC.

Calibrating For Bargaining Power

One explanation for a TCJA-induced change in time spent on household chores by the husband and the wife in a household is that the TCJA changed the relative bargaining power of spouses. I assume that both males and females get disutility from chores, meaning that if one spouse's bargaining power were to increase, they would likely negotiate with their partner such that they spend less time than they previously did on chores. While I previously set bargaining power based on the bargaining power rule in Equation 16, I now instead calibrate the model such that the model determines bargaining power (μ). In doing so, I can evaluate how bargaining power changed in the aftermath of the TCJA. To assign values to β_m^c and β_f^c , I use a modified version of one of the preference regimes outlined in Bargain (2008). Using Bargain's values, I assign β_m^c to equal .65 and β_f^c to equal .5. Bargain writes that it is a stylized fact that married women have a higher wage-elasticity than married men. To assign values to all other variables and parameters, I use my ATUS data sample. Appendix Tables A4-A7 provide the variable and parameter values that I use in each calibration. I calibrate the model four times. First, I calibrate the model for bargaining power using pre-TCJA values of each variable and parameter for households with a child under 18. Second, I calibrate the model for bargaining power using post-TCJA values of each variable and parameter for households with a child under 18. Third, I calibrate the model for bargaining power using pre-TCJA values of each variable and parameter for households with a child under 6. Fourth, I calibrate the model for bargaining power using

post-TCJA values of each variable and parameter for households with a child under 6. Table 11 provides the results of the calibration process.

Table 11

| | Pre-TCJA Bargaining Power Parameter Value (μ) | Post-TCJA Bargaining Power Parameter Value (μ) | <i>Change in Bargaining Power</i> |
|-----------------------------------|---|--|---|
| Respondents With a Child Under 18 | .3275 | .3319 | <i>+.0044 (1.3% increase in bargaining power for wife in the household)</i> |
| Respondents With a Child Under 6 | .2634 | .2612 | <i>-.0022 (0.8% decrease in bargaining power for wife in the household)</i> |

My results indicate that women with a child under 18 experience a 1.3 percent increase in their household bargaining power as a result of the TCJA expansion of the CTC. However, women with a child under 6, a subset of women with a child under 18, experience a 0.8 percent decrease in their household bargaining power. Both the small magnitude of the changes in bargaining power and the inconsistency in the sign of the changes in bargaining power are indicative that my calibrations do not demonstrate a change in the household bargaining power of men and women as a result of the TCJA expansion of the CTC.

VIII. Discussion

While my model predicts that the TCJA expansion of the CTC would slightly decrease time spent on chores by women with children and slightly increase time spent on chores by men with children for households in the phase-in region of the CTC, my difference-in-differences analysis does not indicate that the TCJA expansion of the CTC had an effect on time spent on household chores and the calibrations of my model do not yield a significant change in bargaining power as a result of the TCJA expansion of the CTC. My empirical results and the calibrations of my model align; an increase in bargaining power for one spouse would correspond with a decrease in time on household chores for that spouse, so absent a change in bargaining power, I would not expect to find a change in time spent on household chores.

There are three potential explanations for the lack of statistically significant results that I find. First, it may be that the Child Tax Credit does not affect the distribution of household chores. People can spend their time in three ways: on work, on leisure, and on household production. While theory and some past research indicate that tax credits affect labor supply decisions (e.g., Corinth et al., 2021; Lippold, 2019; Eissa and Liebman, 1996), it is possible that a change in the CTC only results in a substitution between paid labor and true leisure and that household production is unaffected. In other words, it is plausible that in response to a change in the CTC, people do not adjust time use on the labor/home production margin or on the leisure/home production margin, instead only adjusting time use on the labor/leisure margin.

Alternatively, Kleven (2019) calls into question whether changes to EITC policy have labor supply effects, finding that all but one EITC reform since 1975 have yielded small, statistically insignificant changes in labor supply and that the one statistically significant labor supply effect is confounded by other simultaneous welfare system reforms. Given the similarities between the EITC and the CTC, Kleven's findings are relevant to the CTC, too. If the CTC does not affect labor supply, then I would not expect the CTC to affect household chore distribution.

Second, and more likely, it may be that the CTC is a low-salience tax credit, meaning that households who are eligible for the CTC do not possess a strong understanding of how the tax credit works. Goldin (2012) finds that low-salience commodity taxes have a welfare cost because when taxes are low-salience, consumers do not change their behavior in response to the tax as much as they would change their behavior in response to a more salient tax of equal magnitude. Using similar logic, the less salient the CTC is, the less likely it is that decisions about household chore distribution would change in response to changes to the CTC.

Studying the salience of the EITC, Chetty and Saez (2013) conducted a randomized experiment where tax professionals at H&R Block, a company that offers tax preparation services, provided some of their clients with information about the EITC. While the authors do not find a significant effect of the information intervention on earnings when looking at the full sample, they find that individuals given the information intervention who worked with an H&R employee who properly complied with the experiment were more likely than others to report earnings near a kink point in the EITC. In other words, Chetty and Saez find some evidence that tax professionals who complied with the experiment did increase the EITC amount received by their clients. Because of the way in which the EITC is structured, reporting income around a kink point is advantageous for taxpayers. As a result, reporting income near the kink point is indicative of an understanding of the structure of the EITC. If taxpayers fully understood the EITC prior to working with the tax professional, then taxpayers who worked with compliant tax preparers would have been equally likely to report income around the kink point regardless of whether they were in the treatment group or the control group of the experiment. While Chetty and Saez provide inconclusive evidence of the effects of information interventions about the EITC, their research suggests that taxpayers do not fully understand the EITC. Given the similarities between the EITC and the CTC, Chetty and Saez's results can be extended to suggest that taxpayers do not fully understand the CTC.

Moreover, Saez (2010) uses tax return data to examine whether or not there is "bunching" at the kink points of the EITC (i.e., whether or not a disproportionate number of people report income that lands them at one of the two convex kink points in the EITC schedule). While Saez finds bunching at the first kink point of the EITC (where the tax credit is fully phased-in), he does not find evidence of bunching at the second kink point (where the tax credit begins to phase-out). One potential explanation for the inconsistent findings of Saez is that tax filers do not fully understand the complexities of the EITC. While the EITC and the CTC are different tax credits, they are structured similarly. Therefore, the evidence suggesting that the EITC is not salient is indicative of the likely possibility that the CTC is not salient.

Salience (or lack thereof) has significant implications for policies unrelated to tax credits, too. Much like the tax code is complicated, the process by which financial aid is awarded to college students is complicated. Studying the effects of information interventions in the college application process (i.e., providing information to prospective college students to decrease information barriers about financial aid), Burland et al. (2015) find that students who were provided with information about the financial aid that they are eligible for by the University of Michigan were more likely to apply to the University of Michigan than students who, despite being eligible for the same amount of financial aid, were not provided with explicit information informing them of their eligibility. Had prospective college students understood the amount of financial aid that they were eligible for prior to the information intervention, then the information intervention should not have affected their likelihood to apply to college. Similar to the way in which Burland et al. demonstrate that prospective college students do not understand the financial aid that they are eligible for, it is likely that households eligible for the CTC do not fully understand how the CTC works.

Third, it is possible that changes to the CTC do affect the distribution of household chores, but that limitations of my analysis prevent me from discerning those time use changes. Given that the CTC changes the net income of qualifying households and income affects the amount of time that household members spend working (e.g., Bick et al., 2018), it is likely that the CTC affects other sources of time use like time spent on household chores, too. If individuals change their hours worked as their incomes change, they are left with more or less time for other activities. For example, if an individual were to double their hours worked, they would need to cut back on another source of time use such as leisure time or time on household chores. Gelber and Mitchell's (2012) findings corroborate this intuition; Gelber and Mitchell find that when the incentive to do market work increases, time spent on household production decreases. Consequently, it seems unlikely that individuals possessing full information about the CTC would not alter their time spent on household chores in response to a change in the CTC. If that is the case, then limitations of my analysis are responsible for my inability to discern changes in time spent on household chores.

To investigate possible limitations of my analysis, I compare my methodology to Bastian and Lochner (2022), who find that unmarried women significantly decrease their time on household chores in response to increases in their EITC benefit. While Bastian and Lochner look at the time use implications of the EITC rather than the CTC, the EITC and CTC are similar in design, so it is plausible that the EITC and the CTC have similar effects on time use. Bastian and Lochner account for the number of children in a household in their analysis by calculating the maximum EITC benefit that each household can receive while I do not. Households with more children are eligible for bigger EITC and CTC benefits, and it is possible that households with different numbers of children would respond differently to changes in tax credit policy. Furthermore, Bastian and Lochner's ATUS sample includes data for all mothers aged 18-49 between 2003 and 2018 (43,685 observations). Meanwhile, my ATUS data sample only includes data from 2015 to 2019 (15,927 observations). It is possible that differences in sample size

between Bastian and Lochner's analysis and my analysis lead to differences in results. Finally, and most importantly, Bastian and Lochner include unmarried mothers while I restrict my analysis to only include married or cohabiting people. While Bastian and Lochner find a statistically significant decrease in the time spent on household chores by unmarried mothers in response to an increase in their EITC benefit, they do not find a statistically significant result for married mothers. Consequently, my results are actually very similar to Bastian and Lochner's results: neither my analysis nor Bastian and Lochner's analysis yield a statistically significant change in the time that married or cohabiting mothers spend on household chores in response to changes in tax credit benefits.

IX. Conclusion

The Tax Cuts and Jobs Act of 2017 increased the maximum Child Tax Credit benefit from \$1,000 to \$2,000. I investigate the effect of the CTC expansion on time spent on household chores by members of married and cohabiting households with children, finding no significant change in time spent on household chores and no significant change in bargaining power between spouses in the aftermath of the implementation of the TCJA. My research fills a gap in the literature by exploring the time use implications of the CTC. While previous research has examined the labor supply effects of the CTC, previous research has not examined how the CTC affects household production. Additionally, much of the previous research about the effect of tax credits focuses on single women (e.g., Bastian and Lochner, 2022; Meyer, 2010; Meyer and Rosenbaum, 2001; Eissa and Liebman, 1996) rather than married or cohabiting households. Consequently, this paper contributes to the literature by considering time use incentives for married and cohabiting couples.

Research focused on time spent doing household production is particularly important because of the way in which the distribution of household production affects gender equity. Given that women have historically done the majority of household work, increased gender equity would mean a more balanced distribution of household production responsibilities between men and women. If the TCJA expansion of the CTC were gender equity-enhancing, it would result in a redistribution of household chores such that women would decrease the percentage of household chores that they are responsible for. While my analysis does not suggest that the CTC has implications for time spent on household chores by members of married and cohabiting households, my analysis calls attention to the need for policymakers to consider gender equity when implementing policies. Even if a policy is not specifically intended to tackle gender equity, policies have the potential to create complicated sets of time use incentives. As a result, it is reasonable to imagine that a wide variety of policies may impact time use incentives surrounding household production and that households with different structures may differently respond to time use incentives. Future research should carefully examine how policies (both similar to the CTC and different from the CTC) affect time spent on household production.

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Appendix

Table A1: Parameter and Variable Values for Figure 3 and Figure 4

**Data Counterparts (excluding τ and x) are from the 2015-2017 subset of my ATUS data sample; τ and x are based on all respondents from my full 2015-2019 ATUS sample.*

| Parameter/Variable | Parameter/Variable Meaning | Value | Value Source |
|--------------------|--|-------|------------------|
| β_m^c | Man's preference for consumption relative to leisure | .65 | Bargain (2008) |
| β_f^c | Woman's preference for consumption relative to leisure | .5 | Bargain (2008) |
| w_m | Man's wage | 1 | Data Counterpart |
| w_f | Woman's wage | .86 | Data Counterpart |
| τ | Tax rate | .12 | Data counterpart |
| x (pre-TCJA) | Child tax credit value | .017 | Data counterpart |
| x (post-TCJA) | Child tax credit value | .033 | Data counterpart |
| h_m | Hours worked by man | .46 | Data counterpart |
| h_f | Hours worked by woman | .38 | Data counterpart |
| y_m | Time spent on chores by man | .14 | Data counterpart |

Table A2: Outcome Variables and Variable Coding Using 2003-2017 Data

| Variable | Type of HH Work | ATUS Activity Code | Male Respondents (7,439 obs) | Female Respondents (8,488 obs) |
|--|-----------------|--------------------|------------------------------|--------------------------------|
| | | | Mean (minutes per day) | Mean (minutes per day) |
| Interior cleaning | Female | t020101 | 13.56849 | 36.11228 |
| Laundry | Female | t020102 | 5.079177 | 20.63478 |
| Sewing, repairing, & maintaining textiles | Female | t020103 | 0.0514854 | 1.40139 |
| Storing interior hh items, inc. food | Female | t020104 | 0.7995698 | 1.844722 |
| Housework (not elsewhere categorized) | Female | t020199 | 0.0564592 | 0.2428134 |
| Food and drink preparation | Female | t020201 | 21.80374 | 47.2652 |
| Food presentation | Female | t020202 | 0.2882108 | 1.021678 |
| Kitchen and food clean-up | Female | t020203 | 4.489716 | 14.74093 |
| Exterior cleaning | Male | t020401 | 3.148945 | 1.008247 |
| Exterior repair, improvements, & decoration | Male | t020402 | 2.743245 | 0.8562677 |
| Lawn, garden, and houseplant care | Male | t020501 | 15.37182 | 5.679901 |
| Ponds, pools, and hot tubs | Male | t020502 | 0.3723619 | 0.1452639 |
| Vehicle repair and maintenance (by self) | Male | t020701 | 4.359591 | 0.5810556 |
| Vehicles (not elsewhere categorized) | Male | t020799 | 0.0021508 | 0.0011781 |
| Appliance, tool, and toy set-up, repair, & maintenance (by self) | Male | t020801 | 1.731684 | 0.2921772 |
| Physical care for hh children | Childcare | t030101 | 15.77833 | 33.44274 |
| Reading to/with hh children | Childcare | t030102 | 1.950531 | 3.300306 |
| Playing with hh children, not sports | Childcare | t030103 | 16.98226 | 19.51932 |
| Arts and crafts with hh children | Childcare | t030104 | 0.1307972 | 0.3762959 |
| Playing sports with hh children | Childcare | t030105 | 0.9713671 | 0.5166117 |
| Looking after hh children (as a primary activity) | Childcare | t030109 | 3.703455 | 6.327757 |
| Talking with/listening to hh children | Childcare | t030186 | 1.503025 | 3.003299 |
| Caring for & helping hh children (not elsewhere categorized) | Childcare | t030199 | 0.4514048 | 0.260721 |
| Homework (hh children) | Childcare | t030201 | 2.54752 | 4.781338 |
| Home schooling of hh children | Childcare | t030203 | 0.062374 | 1.144204 |
| Providing medical care to hh children | Childcare | t030301 | 0.2380696 | 1.231739 |

A3: Parameter/Variable Values for Simulation of CTC Expansion

| Parameter/Variable | Parameter Meaning | Value | Value Source |
|--------------------|--|-------|--|
| β_m^c | Man's preference for consumption relative to leisure | | Calibrated in the model before each simulation |
| β_f^c | Woman's preference for consumption relative to leisure | | Calibrated in the model before each simulation |
| μ (pre-TCJA) | Pareto weight/bargaining power parameter | .483 | Bargain (2008) and data counterpart |
| μ (post-TCJA) | Pareto weight/bargaining power parameter | .49 | Bargain (2008) and data counterpart |
| w_m | Man's wage | 1 | Data Counterpart |
| w_f | Woman's wage | .85 | Data Counterpart |
| τ | Tax rate | .12 | Data counterpart |
| x (pre-TCJA) | Child tax credit value | .10 | Data counterpart |
| x (post-TCJA) | Child tax credit value | .1275 | Data counterpart |
| h_m | Hours worked by man | .46 | Data counterpart |
| h_f | Hours worked by woman | .38 | Data counterpart |

A4: Pre-TCJA Values for Households with a Child Under 18

**Data Counterparts (excluding τ and x) are from the 2015-2017 subset of my ATUS data sample; τ and x are based on all respondents from my full 2015-2019 ATUS sample.*

| Parameter/Variable | Parameter Meaning | Value | Value Source |
|--------------------|--|-------|------------------|
| β_m^c | Man's preference for consumption relative to leisure | .65 | Bargain (2008) |
| β_f^c | Woman's preference for consumption relative to leisure | .5 | Bargain (2008) |
| w_m | Man's wage | 1 | Data Counterpart |
| w_f | Woman's wage | .8611 | Data Counterpart |
| τ | Tax rate | .12 | Data counterpart |
| x (pre-TCJA) | Child tax credit value | .017 | Data counterpart |
| x (post-TCJA) | Child tax credit value | .033 | Data counterpart |
| h_m | Hours worked by man | .4584 | Data counterpart |
| h_f | Hours worked by woman | .3689 | Data counterpart |
| y_m | Time spent on chores by man | .1535 | Data counterpart |
| y_f | Time spent on chores by woman | .2785 | Data counterpart |

A5: Post-TCJA Values for Households with a Child Under 18

**Data Counterparts (excluding τ and x) are from the 2015-2017 subset of my ATUS data sample; τ and x are based on all respondents from my full 2015-2019 ATUS sample.*

| Parameter/Variable | Parameter/Variable Meaning | Value | Value Source |
|--------------------|--|-------|------------------|
| β_m^c | Man's preference for consumption relative to leisure | .65 | Bargain (2008) |
| β_f^c | Woman's preference for consumption relative to leisure | .5 | Bargain (2008) |
| w_m | Man's wage | 1 | Data Counterpart |
| w_f | Woman's wage | .8636 | Data Counterpart |
| τ | Tax rate | .12 | Data counterpart |
| x (pre-TCJA) | Child tax credit value | .017 | Data counterpart |
| x (post-TCJA) | Child tax credit value | .033 | Data counterpart |
| h_m | Hours worked by man | .4514 | Data counterpart |
| h_f | Hours worked by woman | .3784 | Data counterpart |
| y_m | Time spent on chores by man | .1575 | Data counterpart |
| y_f | Time spent on chores by woman | .2624 | Data counterpart |

A6: Pre-TCJA Values for Households with a Child Under 6

**Data Counterparts (excluding τ and x) are from the 2015-2017 subset of my ATUS data sample; τ and x are based on all respondents from my full 2015-2019 ATUS sample.*

| Parameter/Variable | Parameter/Variable Meaning | Value | Value Source |
|--------------------|--|-------|------------------|
| β_m^c | Man's preference for consumption relative to leisure | .65 | Bargain (2008) |
| β_f^c | Woman's preference for consumption relative to leisure | .5 | Bargain (2008) |
| w_m | Man's wage | 1 | Data Counterpart |
| w_f | Woman's wage | .8987 | Data Counterpart |
| τ | Tax rate | .12 | Data counterpart |
| x (pre-TCJA) | Child tax credit value | .017 | Data counterpart |
| x (post-TCJA) | Child tax credit value | .033 | Data counterpart |
| h_m | Hours worked by man | .4561 | Data counterpart |
| h_f | Hours worked by woman | .3620 | Data counterpart |
| y_m | Time spent on chores by man | .1806 | Data counterpart |
| y_f | Time spent on chores by woman | .3430 | Data counterpart |

A7: Post-TCJA Values for Households with a Child Under 6

**Data Counterparts (excluding τ and x) are from the 2015-2017 subset of my ATUS data sample; τ and x are based on all respondents from my full 2015-2019 ATUS sample.*

| Parameter/Variable | Parameter/Variable Meaning | Value | Value Source |
|--------------------|--|-------|------------------|
| β_m^c | Man's preference for consumption relative to leisure | .65 | Bargain (2008) |
| β_f^c | Woman's preference for consumption relative to leisure | .5 | Bargain (2008) |
| w_m | Man's wage | 1 | Data Counterpart |
| w_f | Woman's wage | .8798 | Data Counterpart |
| τ | Tax rate | .12 | Data counterpart |
| x (pre-TCJA) | Child tax credit value | .017 | Data counterpart |
| x (post-TCJA) | Child tax credit value | .033 | Data counterpart |
| h_m | Hours worked by man | .4402 | Data counterpart |
| h_f | Hours worked by woman | .3734 | Data counterpart |
| y_m | Time spent on chores by man | .1965 | Data counterpart |
| y_f | Time spent on chores by woman | .3290 | Data counterpart |