

The Impacts of State Child Tax Credits: Evidence from Oregon and Minnesota

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Written for Professor Gary Krueger • ECON-381 Introduction to Econometrics

Abstract

This paper investigates the impact of state-level child tax credits (CTCs) on reducing financial instability, in the form of food insecurity and difficulty in paying household expenses. Using a difference-in-differences approach, regressions are run for two pairs of states, each pair featuring one state that has recently enacted a CTC, Oregon and Minnesota, and one that has not, Washington and Wisconsin. Utilizing survey data from the Census Bureau's Household Pulse Survey, the two natural experiments are analyzed to gauge the effectiveness of these state-level policies. Results indicate a 45% decline in the likelihood of food insecurity and expense difficulty in Oregon after the beginning of early tax filing in late January. However, the results for Minnesota have no statistical significance, indicating that state-specific conditions can impact the success of CTC policy. Future research into the changing impacts of CTC policy as Oregon and Minnesota move to advance payments of the credit, along with analysis of other state-level CTCs across the U.S., are warranted to further gauge the impacts of this type of policy.

Introduction

In 1997, the U.S. Congress enacted the Taxpayer Relief Act, in which the Federal Child Tax Credit (CTC) was introduced as a new source of financial support for low-income families. This credit offers tax relief to families who meet specific eligibility requirements, such as having dependent children and staying below certain income thresholds, which have changed over time due to various legislation passed by Congress. In addition to eligibility changes, the nominal value of the credit has also fluctuated over time, culminating in a major expansion in March 2021, when Congress passed the American Rescue Plan, raising the Federal CTC from \$2,000 to \$3,600 per qualifying child. Although this expansion only lasted for one tax year, and the Federal CTC returned to being \$2,000, as it had been set in 2017, a variety of state-level initiatives have been introduced in response. Two such responses came during the summer of 2023 when Oregon and Minnesota joined the growing nationwide trend of adopting a state-level CTC. Unlike the Federal version, which has been in existence since 1997, state-level CTCs are a relatively novel concept that are advancing through various legislative stages in states across the country. While these state-level credits vary by size, eligibility requirements, and refundability, the underlying goal remains the same, to provide relief to low-income families with children. Now, with the addition of state-level CTCs to supplement the Federal CTC, families eligible for both credits may receive combined benefits equaling, or in some states exceeding, the 2021 expanded Federal CTC. Yet, despite the significant expansion of the Federal CTC leading to extensive research into its effects, few studies have examined the impacts of state-level credits, largely due to their recent introduction. This study aims to address this gap in the literature on child tax credits by employing a difference-in-differences approach across two pairs of states, each pair featuring one state that has recently enacted a CTC and one that has not, thereby creating a natural experiment to quantify the impact of state-level CTCs.

Literature Review

Theoretical Framework

Child tax credits are a targeted approach by federal and state governments to help alleviate child poverty and improve the economic stability of low and middle-income families. Unlike nonrefundable tax credits, which only offset tax liability, most CTC programs are fully or partially refundable, meaning households with insufficient tax liability receive some or all of the credit as a direct payment (Greenstein, 2024). This structure ensures that every recipient, regardless of income or tax liability, receives the same baseline benefit. Therefore, for some families, the credit merely reduces their annual tax bill, however, for those with very low incomes and little to no tax liability, the credit takes the form of a cash refund. Because this format distributes benefits uniformly,

analyzing the impacts of a CTC becomes substantially more straightforward, as every qualifying household experiences an essentially equivalent level of financial support. Researchers investigate CTCs by applying models, such as difference-in-differences regressions, to isolate the program's direct impact from simultaneous policy shifts or overall economic trends (Curran, 2022). Beyond that, studies have modeled changes in family consumption, children's educational attainment, and long-term poverty rates to gain an overall understanding of how CTCs influence well-being (Curran, 2022).

Previous Empirical Research

The expansion of the Federal CTC in 2021 was particularly significant due to the introduction of the Census Household Pulse Survey during the COVID-19 pandemic, which gave researchers an abundance of information to analyze the CTC's impact. The Pulse Survey was created by the U.S. Census Bureau in April 2020 to rapidly collect data on the social and economic well-being of households across the U.S. during the COVID-19 pandemic. The Census Bureau will randomly select addresses to participate in the survey, and then send either an email or a text message to the contact information associated with the address. The recipient is asked to participate in a 20-minute online survey with questions related to employment, food security, housing, and more. Participants also provide demographic information, allowing for a more detailed and nuanced analysis of the results. The data has been used to track trends in material hardship, changes in employment, and other social and economic indicators since the survey's inception (Bauer et al., 2020). Specifically, empirical studies have measured the expanded credit's effects on quantitative data such as labor supply, along with qualitative changes in the well-being of families, both mentally and financially. These studies primarily sourced their data from the Pulse Survey, with some also using the Current Population Survey (CPS), and applied difference-in-differences models to measure outcomes in a variety of indicators.

Through the use of a difference-in-differences model, Ananat et al. (2022) investigated the CTC's effect on labor supply, examining CPS and Pulse Survey data from April to December 2021. They found that while some adults in CTC-eligible households may have reduced labor force participation, the effects were statistically insignificant. The researchers believe that the short timeframe of expanded Federal CTC benefits likely contributed to the statistically insignificant changes in labor supply, which suggests that a short-term tax credit did not generate a detectable labor disincentive. This aligns with a study done by Enriquez et. al (2023) that analyzed changes in total hours worked and labor force participation following the CTC's expansion. Like Ananat et al. (2022), Enriquez et. al (2023) also utilized a difference-in-differences model, however, they sourced the entirety of their data from the CPS, rather than the Pulse Survey. Nonetheless, Enriquez et. al (2023)'s findings aligned with that of Ananat et al. (2022), noting that there was no statistically significant evidence that the expanded Federal CTC had an impact on labor force participation and total hours worked. Taken together, the studies emphasize that the increase in financial support

through the Federal CTC, at least in its temporarily expanded form, did not appear to diminish the overall labor supply.

Another area of examination for researchers has been the impact of an expanded CTC on social outcomes, primarily through mental well-being and childhood development. In a comprehensive review of empirical work, Gennetian and Gassman-Pines (2024) examined the credit's effects on parents' psychological health. The review analyzed a variety of studies using mental health indicators found from responses to questions on the Pulse Survey, including self-reported measures of anxiety, depression, and stress levels among parents in CTC-eligible households. While Gennetian and Gassman-Pines (2024) found confirmation that the expanded CTC does not appear to harm mental well-being, the evidence is mixed regarding statistically significant improvements. Aizer et al. (2024) expanded on the social impacts of the expanded Federal CTC by investigating child development outcomes linked to the 2021 expansion and comparing them with findings from similar policies in the United States and globally. Their analysis found that the CTC improves child health, especially among lower-income families, though the available evidence on the 2021 expansion remains in its early stages. In addition, the researchers reviewed prior work on income transfers and other tax credits, which demonstrated that higher household income correlates with reduced child maltreatment, improved birth outcomes, and enhanced educational attainment. Collectively, these gains may lead to long-term economic benefits that exceed the costs of an expanded credit. As more state-level CTC policies are created, each carrying significant expenses, these findings are particularly significant in showing that the benefits of CTC policy ultimately outweigh the associated monetary costs.

In contrast to investigations into the CTC's effect on labor markets and social outcomes, studies of material hardship reveal statistically significant results. Using Pulse Survey data, Parolin et al. (2021) observed a 25% decline in food insufficiency among low-income families after the Federal CTC expansion. Notably, their analysis also indicated that a \$100 increase in CTC benefits is linked to a 22% reduction in food insufficiency, which is particularly relevant as overall child tax credit benefits increase in a variety of states due to the new state-level CTCs being enacted. Parolin et al. (2021) also examined broader measures of material hardship, including families' ability to pay their rent and mortgage. Yet despite the statistical significance of the food insufficiency indicator, the researchers found no statistically significant changes in these rent and mortgage indicators. This is attributed to high housing costs relative to the size of the credit, as well as self-reported survey responses indicating most of the benefits from the CTC were spent on food. The findings from Parolin et al. (2021) highlight the role the expanded Federal CTC played in alleviating a specific form of hardship, food insecurity, while also showing its apparent inability to help with larger expenses, especially those related to housing.

One notable limitation across all of the studies of the 2021 expanded CTC was the incomplete coverage of the credit, primarily among low-income families. Cox et al. (2021) reported that around 4 million children in low-income families possibly missed out on the benefit of the

CTC. This incomplete coverage stems from the CTC's tax credit structure, as benefits are only given to those who filed a tax or used the IRS' non-filer portal, both of which lowest-income families may not have done. The assorted literature on the expanded CTC has used a variety of methods to deal with this limitation, with some analyzing simply all eligible families while others using a specific question on some rollouts of the Pulse Survey which asked whether a family had received their credit. Regardless, the nature of this policy leaves room for errors in regression analysis due to the lack of complete coverage.

Research Design

Conceptual Model

Building on Parolin et al. (2021), who found that the 2021 expansion of the Federal CTC significantly reduced at least one indicator of material hardship, this study seeks to determine whether similar outcomes emerge under different policy circumstances. Specifically, through a comparison of changes in household financial instability between states that have enacted supplemental, state-level, CTC policies and those that have not. By isolating the effects of these state-level credits, it can be assessed whether they generate the same kind of measurable reduction in hardship that followed the 2021 Federal CTC expansion. For this analysis, Pulse Survey data will be used starting from the beginning of 2023 to the most recently available data, September 2024. The targeted questions on financial instability in the Pulse Survey, such as difficulty paying bills, meeting basic food needs, and more, allow for a robust analysis of how households' financial situations are evolving. Unlike the expanded Federal CTC in 2021, which took on a new structure of payouts to recipients on specific days, the benefits from state-level CTCs only occur when an eligible recipient files their tax return. Therefore, for an analysis of these credits, the data will be separated into surveys conducted before and after early tax filing opens in late January. Given data from Minnesota suggesting that over half of the estimated cost of their state-level CTC had been claimed by late February, there is clear evidence that many eligible recipients file for tax returns months before the final deadline in April (Hubbard, 2023). This large amount of early filing means a model seeking to isolate the impacts of a state-level CTC must establish its cutoff date around late January to accurately analyze post-CTC impacts. Additionally, by comparing responses in states that have added CTCs against those that have not, it can be evaluated whether the changes in financial instability are due to a state-level CTC or an overall, unrelated, economic trend.

Empirical Model

This study will be applying a difference-in-differences model, similar to the one used by Parolin et al. (2021), to a new set of policy circumstances using the natural experiment of states with and without a state-level child tax credit policy.

The empirical model is as follows:

Equation 1

$$y_i = \beta_0 + \beta_1 \text{afterFeb5} + \beta_2 \text{MN} + \beta_3 (\text{afterFeb5} * \text{MN}) + \sum_k \gamma_k \text{Income}_k + \sum_j \delta_j \text{Education}_j + \eta \text{BirthYear} + \sum_n \theta_n \text{SNAPParticipation}_n + \epsilon$$

The dependent variable (y_i) will change across the variety of regressions performed depending on the specific financial instability indicator being studied from the questions in the Pulse Survey. The main predictors include a binary indicator for whether the survey was conducted after February 5, 2024 (afterFeb5), which is the closest survey period start date to early tax filing opening, along with a binary indicator for whether the household is in a state with a state-level CTC (labeled as either MN and OR in their respective regressions), and the interaction between these two predictors (afterFeb * MN). This interaction will help determine if financial instability outcomes in Oregon and Minnesota have a different trend compared to states without a state-level CTC following the opening of early tax filing. To attain more accurate results, the model controls for several factors: household income (Income), the educational attainment of the household member filling out the Pulse Survey (Education), the birth year of the survey respondent (BirthYear), and participation in Supplemental Nutrition Assistance Program (SNAP) programs (SNAPParticipation). By accounting for these variables, the regressions will attempt to isolate the specific effect of a state's CTC on reducing financial instability. Additionally, the regression is limited to just households eligible for the state-level CTC being analyzed. Because the eligibility requirements are different in Oregon and Minnesota, the specific type of household in each regression is slightly different. In Oregon, households with children five years old and younger, and an income of \$30,000 or less, are eligible for the \$1,000 credit. For Minnesota, eligibility for their \$1,750 credit requires having any children eighteen years old or younger and a household income of less than \$100,000. While Minnesota's household income requirements may appear much higher, the credit begins to decline in amount after an income of over \$30,000.

For this analysis, two different overall experiments will be run, not including the different financial instability indicators, one will compare responses to the Pulse Survey in Oregon and Washington, and the other will compare Minnesota and Wisconsin. For each of these two sets of states, the former state has recently enacted a substantial CTC policy, while the latter has not. As

well, each set contains states that have similarities to one another both economically and regionally. By analyzing eligible households in these pairs of states, the variety of difference-in-differences models will attempt to conclude whether state-level CTCs are having a similar effect on financial instability compared to the Federal CTC expansion of 2021, a larger one, or no effect at all.

Data

This study utilizes pooled cross-sectional data obtained from the Census Pulse Survey between December 9, 2022, and September 16, 2024. Each observation is a unique household's response to the Pulse Survey during a specific collection period. Due to the nature of the Pulse Survey, the responses are linked to a time period rather than a specific date. This collection period was done on a weekly basis for pre-2024 data and moved to a monthly period for 2024. For usage in analysis, the data is encoded as a combination of binary and ordinal categorical variables, with numeric values corresponding to a predefined dictionary that maps each value to the specific multiple-choice selection made in the survey. Table 1 shows the breakdown by state for a household's binary variable regarding food insecurity. This variable is encoded as a 1 if the respondent indicated that their children were not eating enough due to financial reasons. As can be seen in the table, the majority of CTC-eligible households were not food insecure, and within the two pairings, states shared similar levels of food insecurity, at around 14% for Minnesota and Wisconsin and 5% for Oregon and Washington.

Table 1
CTC Eligible Households by Food Insecurity

State	Not Insecure (0)	Insecure (1)	Percent Insecure	Total
Minnesota	2,975	505	14.51%	3,480
Wisconsin	2,710	395	12.72%	3,105
Oregon	5,951	297	4.75%	6,248
Washington	6,421	332	4.92%	6,753
Total	18,057	1,529	7.81%	19,586

Compared to food insecurity, difficulty in paying household expenses is much similar across all four states, as shown in Table 2. Household expenses are defined by the Pulse Survey as food, rent or mortgage, car payments, medical expenses, student loans, and anything else the respondent may define as a usual expense. The binary variable shown in Table 2 was created by encoding a 1 if the respondent indicated they had a somewhat or very difficult ability to pay their usual household expenses in the last seven days, and a 0 if they had little or no difficulty, the same consolidation technique used by Parolin et al. (2021). Consolidating the four category variables, as initially

classified by the Census Bureau, into a binary format simplifies regression analysis while also improving interpretability. Just as with the food insecurity data, both pairings of states share a similar percentage breakdown for households, with Minnesota and Wisconsin being around 48 % and Oregon and Washington being around 53%.

Table 2
CTC Eligible Households by Expense Difficulty

State	No Difficulty (0)	Difficulty (1)	Percent Difficulty	Total
Minnesota	1,812	1,668	47.93%	3,480
Wisconsin	1,621	1,484	47.79%	3,105
Oregon	2,876	3,372	53.97%	6,248
Washington	3,179	3,574	52.92%	6,753
Total	9,488	10,098	51.59%	19,586

Lastly, Table 3 presents a breakdown of key characteristics for CTC-eligible households across the four states. While the SNAP Participation column is interpretable as is, and shows the two pairings share a similar participation rate, with Oregon and Washington’s being noticeably higher than Minnesota and Wisconsin’s, the other two columns require usage of the data dictionary created by the Census Bureau. Using the provided dictionary, the mean income rates in Oregon and Wisconsin, rounded to the nearest whole number of 4, correspond to an income range from \$50,000 to \$74,999. Meanwhile, Oregon and Washington’s rounded value of 1 corresponds to an income range of less than \$25,000, which matches the stricter eligibility requirements for Oregon. Minnesota and Wisconsin’s education column value of 5 is labeled as the average highest educational attainment by respondents being an Associate’s degree. The slight difference in Oregon and Washington’s education column leads to a rounded value of five for Washington, still representing an Associate’s degree, and a four for Oregon, which corresponds to the respondent having completed some college, but either dropping out or still being in progress. Both Table 1 and Table 2, along with Table 3, highlight the similarities in the data for the two pairings of states, which further increase their credibility for use as a natural experiment.

Table 3
CTC Eligible Households by Income, Educational Attainment, and SNAP Participation

State	Mean Income	Mean Education	SNAP Participation (%)
Minnesota	3.5739	4.8402	14.86%
Wisconsin	3.5510	4.7942	18.26%
Oregon	1.4209	4.4536	42.40%
Washington	1.4311	4.5629	31.45%

Results

Minnesota and Wisconsin

As shown in Tables 5 and 6, logistic regressions on the data from Minnesota and Wisconsin do not lead to statistically significant results with food insecurity as the dependent variable nor difficulty with household expenses. For Table 5, the interaction term, $\text{afterFeb5} * \text{MN}$, is negative but not statistically significant, which gives some credence to a decrease in food insecurity after the beginning of early tax filing, however, the lack of statistical significance means no conclusions can be drawn. Further analyzing the regression, as logically expected, income levels exhibit a clear inverse relationship with food insecurity, as higher income levels correspond to a reduced likelihood of food insecurity. The same is true for educational attainment, however, only the highest two levels, Bachelor's and Graduate degrees, have statistical significance. Lastly, both the birth year of the respondent and SNAP participation correspond to increases in the likelihood of food insecurity, with both of the coefficients being statistically significant. This particularly makes sense for SNAP participation, as a household receiving food assistance is likely unable to buy enough food to fully feed their children.

Table 5
Logistic Regression Results for Food Insecurity In Minnesota and Wisconsin

Variable	Coefficient	Std. Err.
afterFeb5	0.0985	0.1181
MN	0.2778***	0.0910
afterFeb5 * MN	-0.2524	0.1594
Income Levels		
Level 2	-0.1446	0.1263
Level 3	-0.2674**	0.1198
Level 4	-0.6118***	0.1189
Level 5	-1.3332***	0.1403
Education Levels		
Level 2	-0.0025	0.3587
Level 3	-0.2552	0.3179
Level 4	-0.3223	0.3154
Level 5	-0.4417	0.3211
Level 6	-0.8913***	0.3255
Level 7	-0.9355***	0.3391
Birth Year	0.0561*	0.0300
SNAP Participation	1.4624***	0.0944
Constant	-12.1472**	5.9505

Number of observations: 6,585

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

As with Table 5, Table 6 shows the same trends in income, educational attainment, birth year, and SNAP participation. However, unlike the food insecurity regression, the coefficient of the interaction term in Table 6 is a positive value. This suggests that in Minnesota, after early tax filing opened, difficulty with household expenses actually increased, however as with Table 5, this interaction coefficient is not statistically significant so there cannot be any formal conclusions drawn from it.

Table 6**Logistic Regression Results for Expenses
Difficulty In Minnesota and Wisconsin**

Variable	Coefficient	Std. Err.
afterFeb5	-0.0239	0.0797
MN	0.0260	0.0627
afterFeb5 * MN	0.0263	0.1092
Income Levels		
Level 2	-0.2026*	0.1106
Level 3	-0.2829***	0.1021
Level 4	-0.4304***	0.0964
Level 5	-0.7625***	0.0992
Education Levels		
Level 2	-0.1090	0.3295
Level 3	-0.1605	0.2886
Level 4	0.0641	0.2867
Level 5	-0.0443	0.2889
Level 6	-0.4976*	0.2877
Level 7	-0.5206*	0.2926
Birth Year	0.0137***	0.0021
SNAP Participation	0.6663***	0.0802
Constant	-26.6929***	4.2268

Number of observations: 6,585

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Oregon and Washington

Turning to the regression results for the data from Oregon and Washington, there are statistically significant results for the interaction between early tax filing opening and being in Oregon as shown in Table 7. This coefficient, -0.1733, is significant at the 0.05 level and means that the probability of food insecurity declines by 45.68% in Oregon for all surveys conducted after February 5, 2024. This is a larger decline in food insecurity than the 25% found by Parolin et al. (2021) when they analyzed the Federal CTC's expansion in 2021, which gives a preliminary result of a state-level CTC having a greater impact than the Federal CTC's expanded version. Additionally, the coefficients for income, educational attainment, and birth year all follow the same trend as highlighted in Tables 5 and 6.

Table 7
Logistic Regression Results for Food Insecurity In Oregon and Washington

Variable	Coefficient	Std. Err.
afterFeb5	0.0761	0.0518
OR	0.0430	0.0475
afterFeb5 * OR	-0.1733**	0.0749
Income Level		
Level 2	-0.1701***	0.0389
Education Levels		
Level 2	-0.0915	0.1754
Level 3	-0.1551	0.1498
Level 4	-0.1226	0.1474
Level 5	-0.1209	0.1519
Level 6	-0.5746***	0.1531
Level 7	-0.6251***	0.1571
Birth Year	0.0204***	0.0011
SNAP Participation	0.6598***	0.0411
Constant	-39.9919***	2.1831

Number of observations: 13,001

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Lastly, the final regression shown in Table 8 uses difficulty paying household expenses as its outcome variable. As with Table 7, the interaction term has statistical significance at the 0.05 level, with a coefficient of -0.1682. This coefficient, given in log odds, corresponds to a 45.81% decrease in the likelihood of having difficulty with household expenses in Oregon after early tax filing opens. Interestingly, the percentage decrease for both food insecurity and difficulty paying household expenses are quite similar, which could point to a potential issue in the models, respondents in Oregon being able to use the CTC for more than solely food, or simply coincidence. Nevertheless, the control variables all follow the same trend from Tables 5, 6, and 7, with income and educational attainment continuing to show a negative association and birth year and SNAP participation remaining positively associated with financial instability.

Table 8
Logistic Regression Results for Expenses
Difficulty In Oregon and Washington

Variable	Coefficient	Std. Err.
afterFeb5	-0.1201**	0.0518
OR	0.0102	0.0478
afterFeb5 * OR	-0.1682**	0.0751
Income Level		
Level 2	-0.2132***	0.0387
Education Levels		
Level 2	0.1631	0.1836
Level 3	-0.0953	0.1551
Level 4	-0.1201	0.1525
Level 5	-0.0563	0.1571
Level 6	-0.5184***	0.1549
Level 7	-0.5018***	0.1608
Birth Year	0.0193***	0.0011
SNAP Participation	0.7914***	0.0411
Constant	-37.7352***	2.1946

Number of observations: 13,001

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Limitations and Extensions

Robustness and Limitations

While the findings in this report provide insight into the relationship between state-level CTCs and financial instability, in terms of food insecurity and difficulty in paying household expenses, there are several limitations. First, the use of self-reported survey data introduces the possibility of response bias and other inaccuracies arising from the nature of this data. However, the Census Bureau attempts to mitigate these risks in its data collection, which gives more validity to the results of this report. However, another possible limitation is unobserved heterogeneity from factors not captured in the data. Specifically, spending habits, debt levels, and local economic factors are not captured in the dataset and could be influencing the results, particularly because of the

pooled cross-sectional structure of the data. Since each survey window surveys a random sample of households, the units of observation differ over time. Therefore, the sample of households after February 5, 2024, may have unobserved heterogeneity that influences the results. Lastly, the inability to know exactly when households would be filing their taxes, and thus receiving the benefit of the CTC, means that there is more possibility of error within the results. To account for this, two more regressions were done for the two financial instability indicators for Oregon using a new cutoff date of January 8, 2024, rather than February 5. This new cutoff includes a month of data before tax filing opens, thus meaning no CTC benefits are being obtained. As shown in Table A.1 and A.2, the interaction terms for both regressions become no longer statistically significant, suggesting that the cutoff date of February 5, which corresponds to early tax filing opening a few days prior, on January 29, is significant.

Another possible issue with the regression could be multicollinearity, particularly given the similarity in the value of the likelihood of a decline in food insecurity and difficulty paying expenses in Oregon. Therefore, as shown in Table A.4, a correlation matrix of the predictors used for these regressions was made. This matrix showed no correlation coefficient exceeding 0.8, which indicates that the model does not have multicollinearity. To test the overall robustness of the models for Oregon, classification tests were performed for each of the regressions. Tables A.5 and A.6 show the results of the two tests, which both have an overall correctly classified rate of around 60%, indicating that the model performs moderately well in predicting outcomes. However, for the food insecurity classification, the sensitivity of only 49.77% suggests that the model struggled to accurately classify households experiencing food insecurity, while the specificity of 71.61% shows improved performance in identifying households not experiencing food insecurity. This imbalance is reflected in the low proportion of food insecure households in the data, around 5% in both Oregon and Washington. For the difficulty paying household expenses model, the sensitivity is considerably higher, 66.77%, while the specificity is somewhat similar at 57.16%. This similarity in sensitivity and specificity reflects the balanced distribution of households reporting difficulty with expenses, with approximately 53% of respondents from Oregon and Washington indicating such challenges.

Future Extensions of Study

Because of the differing economic structures and situations of states across the U.S., future research should look into more natural experiments of states with and without CTCs to gauge their effectiveness. As apparent from the results of this report, the impacts of a state-level CTC may differ across states, thus it is necessary to study state-level CTCs on an individual basis. This means that the conclusions drawn from Oregon's CTC cannot be universally applied across the U.S., as shown by the statistically insignificant impacts in Minnesota, which leaves an opening in the literature for future researchers to explore. Beyond analyzing other states, another important extension will be investigating the impacts of advance CTC payments. Both Oregon and Minnesota are moving to adopt a similar distribution method as the 2021 Federal CTC expansion, delivering advance

payments of a portion of a family's credit amount. Assuming both states adopt a specific date of advance payment, future research will better be able to select a cutoff date for a difference-in-differences regression than the usage of February 5, 2024, in this report. Additionally, comparing the findings from this report, which focus on the period before the switch to advance payments, with future analyses on the impact of advance CTC payments will provide valuable insights into the effectiveness of advance payments relative to the current model.

Conclusion

This report explored the impacts of a state-level CTC on reducing financial instability for households in Oregon and Minnesota. In Oregon, regression analyses showed that households experienced a significant reduction in the likelihood of food insecurity and difficulty paying expenses following the start of early tax filing in late January 2024. However, in contrast, regression results for Minnesota were not statistically significant, indicating CTC benefits being able to be received did not have an impact on Minnesota families. While the regression coefficients still suggested a decline in the likelihood of food insecurity in Minnesota, the results were insignificant, and thus no conclusions can be drawn in regards to this CTC having an impact. Additionally, the regression on the difficulty in paying household expenses actually revealed an increase in the likelihood of difficulty in Minnesota, although this result was also statistically insignificant. This disparity in results between Oregon and Minnesota implies that there may be state-specific factors, like differing economic conditions or other policy variations, that can impact a CTC's effectiveness. As well, the difference in eligibility for Minnesota's CTC is likely playing a role as well. Because many more individuals are able to qualify for the credit in Minnesota, some of which are households making up to \$100,000, there is likely variance for these Minnesota families for the actual impact of a few thousand dollars being given to them particularly if they weren't already food insecure to start, like many of Oregon's households were. Also, beyond the difference in state-specific factors, the lack of statistically significant results for Minnesota highlights that a CTC alone is not sufficient to fully address a family's financial instability. Other elements, such as labor market conditions, local economic policies, and more, all influence a CTC's ability to make an impact. While this report attempted to control for these characteristics, there is still possibly unobserved heterogeneity skewing the results. Nevertheless, the differing results from Minnesota and Oregon make it clear that a tax credit is not a guaranteed solution to the issue of financial insecurity across the U.S., and should not be treated as such.

Turning to focus on the results from Oregon, the similarity in the reduction of the likelihood of both food insecurity and difficulty paying expenses across Oregon and Washington indicates that the CTC's benefits extend beyond addressing immediate food needs. Based on these results, it appears that the CTC in Oregon is helping households manage a range of expenses beyond just food,

thus increasing their overall financial stability. Comparing these initial findings with further analyses into the advanced CTC payments beginning in 2025 for Oregon and Minnesota will allow for deeper and more significant insights into a CTC's effectiveness in improving financial stability for households. Also, given the assumptions necessary for the models in this report, particularly the arbitrary cutoff date of February 5, there is possible bias in the results. Advance CTC payments will allow future researchers to know the specific dates of payouts to eliminate the possible arbitrary nature of results found in this report. However, by testing a movement of the cutoff date back a month, to January 8, 2024, and finding statistically insignificant results, there is evidence that this study's results are not arbitrary. Regardless, comparisons of advance payments against the results of this report will be essential to evaluate the impacts of advance payments and to refine the CTC to maximize its benefits.

In conclusion, state-level child tax credits show potential in reducing financial instability, in regards to both food insecurity and overall difficulty with expenses. However, the varying degrees of impact for Oregon and Minnesota highlight the necessity of state-specific research into the effectiveness of a CTC program. Local economic conditions vary across the U.S., and hence the effectiveness of a tax credit will also vary. Additionally, this disparity in impacts on financial instability indicates that a CTC program is not an absolute solution to a state's economic issues. While a tax credit over \$1,000 is notable, particularly for a low-income family, it will not serve as a lasting fix for a household dealing with low wages, debt, and other difficult financial situations. Future research could attempt to examine the immediate, short-term effects for households receiving advance CTC payments, however, this report suggests that the long-term impacts are not guaranteed to be positive. Regardless, as shown by the 45% decline in the likelihood of food insecurity and difficulty paying expenses in Oregon, the CTC can still play a pivotal role in promoting financial resilience and improving the quality of life for families.

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Appendix A

Tables

Table A.1

Logistic Regression Results for Food Insecurity Showing the Lack of Statistical Significance for the Interaction Term Using a New Cutoff Date Before the Beginning of Early Tax Filing.

Variable	Coefficient	Std. Err.
afterJan8	0.0407	0.0511
OR	0.0253	0.0497
afterJan8 * OR	-0.1144	0.0738
Income Level		
Level 2	-0.1706***	0.0389
Education Levels		
Level 2	-0.0908	0.1754
Level 3	-0.1550	0.1498
Level 4	-0.1228	0.1474
Level 5	-0.1216	0.1513
Level 6	-0.5753***	0.1504
Level 7	-0.6260***	0.1571
Birth Year	0.0202***	0.0011
SNAP Participation	0.6586***	0.0401
Constant	-39.9355***	2.1829

Number of observations: 13,001

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.2

Logistic Regression Results for Expenses Difficulty Showing the Lack of Statistical Significance for the Interaction Term Using a New Cutoff Date Before the Beginning of Early Tax Filing.

Variable	Coefficient	Std. Err.
afterJan8	-0.1621***	0.0511
OR	-0.0054	0.0508
afterJan8 * OR	-0.1176	0.0739
Income Level		
Level 2	-0.2142***	0.0387
Education Levels		
Level 2	0.1623	0.1836
Level 3	-0.0979	0.1550
Level 4	-0.1226	0.1526
Level 5	-0.0592	0.1571
Level 6	-0.5223***	0.1550
Level 7	-0.5066***	0.1608
Birth Year	0.0193***	0.0011
SNAP Participation	0.7908***	0.0411
Constant	-37.6275***	2.1917

Number of observations: 13,001

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.3

A Modified Data Dictionary Showing the Corresponding Values for the Various Levels of the Control Variables Used for Regressions.

Variable	Description	Values
EEDUC	Educational attainment	1) Less than high school 2) Some high school 3) High school graduate or equivalent (e.g., GED) 4) Some college, no degree or in progress 5) Associate's degree 6) Bachelor's degree 7) Graduate degree (e.g., master's, professional, doctorate)
FDBENEFIT1	SNAP Receipt	1) Receives SNAP benefits -99) Question seen but not selected <m> Missing / Did not report
INCOME	Total household income (before taxes)	1) Less than \$25,000 2) \$25,000 - \$34,999 3) \$35,000 - \$49,999 4) \$50,000 - \$74,999 5) \$75,000 - \$99,999 6) \$100,000 - \$149,999 7) \$150,000 - \$199,999 8) \$200,000 and above
TBIRTH_YEAR	Year of birth	Range: 1936 - 2006

Table A.4

A Correlation Matrix for the Predictors Used In The Regressions Shown In Tables 7 and 8.

Variable	income	fdbenefit1	tbirth_year	eeduc	afterFeb5	OR
income	1.0000					
fdbenefit1	-0.3901	1.0000				
tbirth_year	0.1580	0.0120	1.0000			
eeduc	0.4054	-0.2251	0.0198	1.0000		
afterFeb5	-0.0218	0.0140	-0.0277	-0.0257	1.0000	
OR	-0.1300	0.0976	-0.0388	-0.0534	0.0008	1.0000

Table A.5

A Classification Table Made From the Food Insecurity Regression for Oregon and Washington.

Classified	True Positive (D)	True Negative (\sim D)	Total
+ (Predicted Positive)	2,892	2,041	4,933
- (Predicted Negative)	2,919	5,149	8,068
Total	5,811	7,190	13,001

Metric	Value (%)
Sensitivity (Pr(+ — D))	49.77%
Specificity (Pr(- — \sim D))	71.61%
Positive Predictive Value (PPV)	58.63%
Negative Predictive Value (NPV)	63.82%
False Positive Rate (\sim D — +)	41.37%
False Negative Rate (D — -)	50.23%
Correctly Classified	61.85%

Table A.6

A Classification Table Made From The Difficulty With Expenses Regression for Oregon and Washington

Classified	True Positive (D)	True Negative (\sim D)	Total
+ (Predicted Positive)	4,638	2,594	7,232
- (Predicted Negative)	2,308	3,461	5,769
Total	6,946	6,055	13,001

Metric	Value (%)
Sensitivity ($\text{Pr}(+ \mid D)$)	66.77%
Specificity ($\text{Pr}(- \mid \sim D)$)	57.16%
Positive Predictive Value (PPV)	64.13%
Negative Predictive Value (NPV)	59.99%
False Positive Rate ($\sim D \mid +$)	35.87%
False Negative Rate ($D \mid -$)	33.23%
Correctly Classified	62.30%