When Policy Shapes Perception: The 2021 Child Tax Credit and Consumer Sentiment

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Abstract

Consumer sentiment influences household behavior in important ways, yet we lack causal evidence on whether government policies themselves shape these perceptions. We help fill this gap by studying the expiration of the expanded 2021 Child Tax Credit (CTC), which abruptly reduced household income for millions of families. Using monthly microdata from the University of Michigan's Consumer Sentiment Survey and plausibly exogenous variation in benefit losses across households, we implement continuous difference-in-differences and instrumental variables strategies. We find that each $1,000 in lost CTC benefits reduces sentiment by 1.7 points (or about 2.4%), with the largest effects among lower-income families with multiple children. These effects persist nearly two years after expiration and remain robust to controls for inflation, interest rates, and macroeconomic conditions. The results suggest that fiscal policy impacts perceived economic well-being beyond contemporaneous income effects, with potential implications for household economic activity, political attitudes, and voting behavior.

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Consumer sentiment measures how households assess their financial situation, broader business conditions, and the economic outlook. Recent evidence shows that survey- and social-media-based sentiment predicts household behavior—such as consumption, saving, and labor supply decisions—and improves forecasts of unemployment and economic conditions even conditional on standard metrics (Barbaglia et al., 2023; Blanchflower and Bryson, 2021, 2022; Barbaglia et al., 2025). For example, consumer confidence forecasts future consumption growth (Ludvigson, 2004), and sentiment shocks can amplify business cycles (Barsky and Sims, 2012). Economic models typically treat sentiment as an endogenous response to fundamentals such as income, employment, and prices (Carroll et al., 1994). Under this view, sentiment should respond to a policy-driven income change just as it would to any other income change: in proportion to the loss, only for as long as it lasts, and symmetrically for gains and losses. Whether policy affects sentiment beyond this income channel—because households attribute the change to government action, or because it shifts how they assess the broader economy and government policy itself—remains an open question.

This paper provides the first causal evidence on this question. We show that the expiration of the 2021 expanded Child Tax Credit (CTC) significantly reduced household sentiment—particularly among lower-income families with children—with effects that persist well beyond the period of direct income loss and extend to households' assessments of the overall economy and government policy. The response is thus not simply another instance of sentiment tracking income: its persistence and scope point to a distinct policy channel.

The expanded CTC benefits were delivered as six monthly payments from July to December 2021, and also as a large lump-sum tax refund around February/March 2022. These payments significantly reduced material hardship and helped drive child poverty to a record low of 5.2%, while also reducing food insecurity and parental stress (Schanzenbach and Hoynes, 2023; Ziliak, 2023; Parolin et al., 2023). In 2022, the monthly payments ceased—the final payment arrived in December 2021—and the credit reverted to its lower, pre-pandemic levels, leading to higher poverty and financial strain (Bovell-Ammon et al., 2022; Burnside et al., 2023; Center on Budget and Policy Priorities, 2024).[1]

[1]For an alternative view, see Han et al. (2022), who argue that estimates of the CTC's poverty impact based on imputed monthly income are overstated.

The CTC's expiration offers an unusually clean setting for this question. Beyond fundamentals, economic perceptions also respond to media coverage (Doms and Morin, 2004; Soroka et al., 2015; Fronzetti Colladon et al., 2023) and policy communication (Coibion et al., 2022; D'Acunto et al., 2024), making it difficult to isolate the effect of policy itself. The expiration, by contrast, was a large, sharply timed income change that households could clearly attribute to government action. Sentiment responses may therefore reflect both the direct loss of income and broader reactions to the policy change, such as reduced confidence in economic management. If such perceptions respond to policy-driven resource changes—as we test here—the implications may extend to behavioral modeling, political attitudes, and voting behavior.

We analyze microdata from the University of Michigan's Consumer Sentiment Survey, which asks respondents about their personal finances, the broader economy, and their views of government economic policy. We leverage plausibly exogenous variation in benefit losses across households, using continuous difference-in-differences and instrumental-variables approaches. Each \$1,000 in lost benefits reduces sentiment by 1.7 points (or about 2.4%). These effects are concentrated among lower-income families with multiple children and remain persistent through early 2024, well beyond the period of direct income support. The results are robust to controls for inflation, interest rates, and broader macroeconomic conditions, all interacted with number of children. There is no evidence of differential pre-trends by number of children, and our main estimate is a clear outlier compared to placebo estimates using four decades of alternative cutoffs. We also find suggestive evidence that the introduction of monthly payments increased sentiment, though by less than the expiration reduced it—an asymmetry consistent with loss aversion, but estimated imprecisely.

We find that the loss of transfer income not only reduces sentiment, but also leads households to view the overall economy—and government policy—more negatively. We reach this conclusion by decomposing the composite sentiment index into its subcomponents and analyzing related survey questions on personal finances, economic outlook, buying conditions, and whether the government is doing a good job managing economic policy. These findings suggest that government policy can shape subjective economic assessments in ways that persist beyond the immediate financial impact. These results may generalize to other transfer

programs—particularly those serving lower-income families—where benefit reductions can have lasting psychological consequences.

These results contribute to two key gaps in the literature. First, while prior work has documented the co-movement of sentiment with income, employment, or political news shocks (e.g., Carroll et al., 1994; Soroka et al., 2015), no study has identified the causal effect of a policy-driven income loss on household sentiment. Second, we show that the removal of targeted fiscal support helps explain the post-COVID disconnect between predicted sentiment—the level implied by economic fundamentals such as inflation, unemployment, and income growth—and the persistently weak sentiment actually reported by households (Burn-Murdoch, 2023). In late 2023, actual sentiment was about 10 points below predicted levels, a shortfall equal to roughly 13% of predicted sentiment. We estimate that the expiration of the CTC accounts for about 15% of this 10-point gap. Our findings complement Bolhuis et al. (2024), who show that elevated borrowing costs explain roughly 70% of this sentiment gap (i.e., the "vibecession"). By controlling for inflation and borrowing costs interacted with number of children, we show that while higher borrowing costs dampened sentiment, they do not explain our results.

Taken together, these findings show that sentiment responds to policy-driven income changes that standard macroeconomic indicators may miss—and that the response persists well beyond the direct financial impact, consistent with sentiment reflecting more than contemporaneous income alone. Given prior evidence that sentiment predicts consumption, saving, and labor supply, these shifts may carry downstream behavioral consequences, though we do not test them here.

Contrary to claims that families were largely indifferent to the policy's expiration, we find meaningful declines in economic sentiment. While one survey found that less than 30% of respondents supported making the CTC expansion permanent (American Compass, 2022), our estimates suggest that its expiration had a substantial impact on household sentiment and wellbeing.

A related literature examines how transfer programs shape political support and voting, primarily in developing countries. Manacorda et al. (2011) and Zucco (2013) find that recipients of anti-poverty cash transfers were more likely to support incumbent governments,

with effects persisting after programs ended. Galiani et al. (2019) show that the size and recency of transfers—not just their cumulative value—independently increased incumbent vote share. Our results complement this literature by documenting a sentiment channel through which policy changes may shape political attitudes—one that operates alongside, and potentially amplifies, the direct material effects these studies identify—and extend it to the context of a high-income country with a large, temporary transfer program.

1. The Temporary Expansion of the CTC in 2021

The temporary CTC expansion in 2021 was one of the largest investments ever in low- and middle-income families. The policy increased the maximum CTC benefit to $3,600 per child under age 6 and $3,000 for children aged 6–17, up from $2,000. A key change was full refundability, eliminating the income-based phase-in and making the full credit accessible to previously ineligible low earners. Another major shift was the move from annual to monthly payments. Half of the expanded CTC benefits were delivered as six monthly payments from July to December 2021, with the remaining half distributed as a large lump-sum tax refund in early 2022.

Just as the 2021 CTC brought a substantial income boost, its expiration in early 2022 marked a sharp reduction in household resources. Figure 1b shows the drop in annual income—by earnings, number of children, and marital status—when the expanded credit expired and the smaller 2022 CTC resumed. Figure 1a illustrates the 2021 CTC structure. The largest declines occurred among the lowest-income households. For example, the poorest families with two children lost $6,000 in annual income—or $7,200 if both children were under age six. Families with two children and incomes between $10,000 and $35,000 saw losses ranging from $4,500 to $2,000, while those earning above $35,000 experienced declines of about $2,000. In contrast, many higher-income households were unaffected by the change.

Over 35 million families received more than $15 billion in monthly CTC payments, reaching 61 million children. Most used the funds for essentials like food, housing, and child-related expenses (Michelmore and Pilkauskas, 2023; Schild et al., 2023). Studies show the monthly payments led to large reductions in food insecurity and financial hardship (Parolin et al.,

2021; Perez-Lopez, 2021; Lourie et al., 2022; Pilkauskas et al., 2022; Aizer et al., 2024), with especially strong gains among Black, Hispanic, and lower-income families. The policy also improved mental health: parents earning under $35,000 reported fewer symptoms of anxiety and depression, with financial stress playing a central role (Kovski et al., 2023). Studies of the 2021 CTC find either null or small negative effects on labor supply (Han et al., 2022; Enriquez et al., 2023; Schanzenbach and Strain, 2023; Pac and Berger, 2024; Ananat et al., 2024), although there is debate about what the employment effects may have been if the program had been made permanent (Corinth et al., 2021; Goldin et al., 2022; Bastian, 2024).

The expanded CTC lifted 3.7 million children out of poverty and helped reduce child poverty—along with help from the Economic Impact Payments (EIPs)—to a record low of 5.2% (Creamer et al., 2022; Collyer et al., 2022). However, when the expanded CTC expired in 2022, child poverty more than doubled, rising from 5.2% to 12.4% (Council of Economic Advisers, 2023).[2] While the credit improved household outlooks during implementation, its abrupt end removed a stabilizing force for families with children.

2. University of Michigan Sentiment Data

Several national surveys track consumer sentiment, including the University of Michigan's Survey of Consumers (University of Michigan, 2024), the Conference Board's Consumer Confidence Index (The Conference Board, 2024), and the New York Fed's Survey of Consumer Expectations (Federal Reserve Bank of New York, 2024). We use the Michigan microdata since it has rich demographic data and goes back to the late 1970s.

The Michigan data samples 420–800 U.S. households monthly (University of Michigan, Survey Research Center, 2024). We focus on April 2020 to March 2024, covering the expansion and expiration of the policy, yielding a sample of 27,136 nationally representative respondents.

The main measure of sentiment in the Michigan data is the Index of Consumer Sentiment (ICS), which aggregates five core questions on personal finances and expectations about the economy. The ICS is composed of two subindices that capture different aspects of consumer

[2]The 2020 and 2021 EIPs also played an important role in these poverty trends.

attitudes: the Index of Current Economic Conditions (ICC) and the Index of Consumer Expectations (ICE). The ICC isolates consumers' assessments of their present financial situation and prevailing business conditions.[3] The ICE focuses on forward-looking expectations about their future financial situation and future business conditions.[4] We provide more technical details in Table 1 notes.

Table 1 shows that the mean ICS during our study period is 69.99 for the full sample of all adults. The mean ICS before the CTC expiration was 75.5 whereas after the CTC expiration it was 64.4. This represents a 15% decline in consumer sentiment during our study period.

Figure 2a shows average ICS over time, beginning in 1953 when the data was first collected (microdata was not collected until 1978). This figure shows that sentiment moves with the business cycle and is generally over 90 when the economy is good and below 70 during a recession. Figure 2b zooms in on 2014–2024 and illustrates the steady rise in ICS after the Great Recession, the steep fall in early 2020 during the pandemic, and another fall starting in the summer of 2021 when inflation began to rise. ICS bottomed out below 60 in the summer of 2022, after which it slowly rose through early 2024. Figures 2a–2b denote recessions with grey vertical bars as defined by NBER (2025).

Additional Measures of Sentiment: In addition to the ICS, ICE, and ICC indexes, the Michigan data includes 19 additional monthly questions on personal finances, general economic conditions, and buying conditions or retirement expectations.[5] Six questions capture personal financial expectations, including retrospective and prospective assessments of household finances, expected income growth, and income changes relative to inflation over 1–5 years. Another six questions assess views on general economic conditions, including past and expected business conditions, unemployment expectations, job loss probability, and evaluations of government economic policy. The remaining seven questions cover buy-

[3]The ICC is constructed from two questions: "Would you say you (and your family) are better off or worse off financially than you were a year ago?" and "Generally speaking, do you think now is a good or bad time for people to buy major household items?"

[4]ICE is constructed from three questions: "Do you think that a year from now, you (and your family) will be better off financially, worse off, or just about the same?"; "Do you think that during the next 12 months, business conditions will be better, worse, or about the same as now?"; and "Looking ahead, do you think that business conditions in the country as a whole will be good, bad, or neither in the next five years?"

[5]The survey also asks a number of questions less regularly, which we do not consider.

ing conditions and retirement expectations, asking whether it is a good time to buy or sell a house or car, expected investment returns and interest rate changes, and perceived likelihood of receiving Social Security and enjoying a financially secure retirement. See Appendix A for exact wording of each question.

Summary Statistics: Table 1 summarizes key characteristics of the full sample of all 27,136 adults surveyed between April 2020 and March 2024.[6] The survey is nationally representative at the household level, as weights are designed for one respondent per household rather than for individuals. The average respondent is 50.8 years old. About 45% are female, 58% are married, and 52% have a college degree, while 21% have a high school degree or less. Roughly 29% report having children in the household, with an average of 0.56 children. Unfortunately, the survey does not capture race or ethnicity. Average total household income is $109,200. Average CTC benefits under the 2021 ARP CTC were about $1,850, while they were $970 under the (non-2021) TCJA CTC—we calculate CTC benefits using NBER's TAXSIM (Feenberg and Coutts, 1993). Most respondents (69%) own their home. Regionally, 23% reside in the West, 23% in the Midwest, 16% in the Northeast, and 38% in the South. Politically, 45% identify as Democrats, 40% as Republicans, and 14% as Independents. The mean Index of Consumer Sentiment (ICS) is 70.0, with lower values for households earning below $100,000 (68.2) compared to those earning above $100,000 (72.8).

Table 1 also shows how ICS varies across demographic and political traits with estimates from bivariate regressions. Democrats report significantly higher sentiment (+20 points), while Republicans report substantially lower sentiment (–19 points), consistent with partisan alignment with the incumbent administration (Cummings and Mahoney, 2023). Higher household income and education are linked to more positive sentiment, with college graduates reporting values 9 points higher—and those with a high school education or less reporting values 8 points lower—than those with some college. Homeowners, women, older respondents, married respondents, and those with children tend to report slightly lower sentiment. Higher CTC benefits are associated with lower sentiment, which mechanically reflects that

[6] In April 2024, the Michigan survey switched from phone to online interviews, causing a structural break: online respondents reported significantly lower sentiment, especially about current conditions, leading to an 8.9-point (11%) drop in the index (Cummings and Tedeschi, 2024). This shift occurred after the period we analyze, cannot explain any of our findings, and motivates us to end our sample in March 2024.

households with more children both receive higher CTC benefits and report lower sentiment. Regional differences are modest, with higher sentiment in the Northeast and Midwest and lower sentiment in the South. Overall, individual and household characteristics—especially political affiliation, living in a larger household, and educational attainment—are strongly correlated with reported economic sentiment.

3. Sentiment Trends by Number of Children

To isolate the impact of the CTC, we compare sentiment trends between households with and without children. This helps control for broader factors affecting all households, such as the pandemic, inflation, and labor market shifts. Notably, sentiment fell substantially for all households during this period—childless households saw a decline of roughly 10 points—so the key variation we exploit is the differential decline among families with children relative to this common trend. Figure 3 shows that before 2022, households with children reported slightly higher sentiment. Starting in the second quarter of 2022—shortly after the second part of the 2021 CTC was received as a tax refund in early 2022—sentiment for households with children fell relative to those without children—especially those with two or more children—and remained lower through early 2024. The sentiment peak visible in early 2021 likely reflects, at least in part, the March 2021 EIP, which provided a large income boost to families—particularly those with children. However, this effect on sentiment appears short-lived, and our estimates are robust to excluding months with EIP payments (see Section 5.2).

Figure 4a plots these sentiment trends relative to households without children: trends were parallel before 2022. Starting in the second quarter of 2022, sentiment fell for families with at least one child and fell even more for those with two or more children, corresponding to binary difference-in-differences (DD) estimates of -3.9 and -5.0 points.

Figures 4b and 4c repeat the analysis by income group. Because the 2021 CTC expansion was largest for lower-income households (see Figure 1b), we expect and find stronger effects in that group. Among households earning less than $100,000, sentiment declined by about 7.6 points for families with at least one child and 9.2 points for those with two or more. Among

higher-income households, sentiment fell an insignificant 0.5 and 0.1 points, respectively.

Figure 5a summarizes these changes in sentiment by comparing April 2020–March 2022 with April 2022–March 2024. Among childless households ineligible for the CTC, sentiment fell by 10.0 points, reflecting high inflation and broader macroeconomic factors. But families with one, two, three, and four-or-more children saw declines of 12.4, 14.8, 14.5, and 17.5 points, respectively. On average, each $1,000 reduction in CTC benefits is associated with a 1.19-point drop in sentiment.

Figures 5b and 5c show results separately by income. Among households earning less than $100,000, sentiment declined by 8.8 points for families with no children, 13.6 points for one child, 17.5 points for two children, and 18.6 points for three or more. On average, each $1,000 reduction in CTC is linked to a 1.69-point drop in sentiment. Among higher-income households, there is no clear pattern between sentiment and number of children, and the effect of CTC losses is statistically insignificant.

Overall, the sharp decline in sentiment beginning in 2022 appears concentrated among lower-income families with children—consistent with the CTC's expiration having a substantial impact—while higher-income households were largely unaffected.

4. Empirical Strategy and Results Using OLS and IV

4.1. Average Effects

While Figures 3–5c show unadjusted trends, we now turn to regression analysis to account for demographic characteristics and broader economic and policy factors.

To estimate the causal effect of the 2022 expiration of the expanded CTC on household sentiment, we exploit variation in benefit loss driven by income and the number of children. Our empirical strategy uses a continuous DD design, comparing changes in sentiment across households with different exposure to CTC losses. The effective control group consists of households with little or no exposure—primarily childless households and higher-income households with children—while treatment intensity varies continuously with predicted benefit loss. Conditional on baseline controls, identification relies on two assumptions: (i) CTC benefit loss is exogenous to other determinants of sentiment, and (ii) in the absence of the

expiration, sentiment trends would have evolved similarly across households with different exposure to CTC losses (i.e., parallel trends). In complementary analysis, we examine the introduction of monthly CTC payments in 2021 (Section 6), though this setting is less suited for clean identification due to the proximity of other pandemic-era transfers.

We begin by estimating the following equation:

$$Sentiment_{it} = \alpha + \beta_1 Post_{it} + \beta_2 (Post_{it} \times LostCTC_i) + \gamma X_{it} + \epsilon_{it}. \tag{1}$$

The "pre" period includes months through March 2022, and the "post" period begins in April 2022. A note on timing: the monthly CTC payments ceased after December 2021, but families had received only half of the expanded credit through these payments; the remaining half arrived as a lump-sum tax refund in early 2022. Most families receiving refundable tax credits file in February or March (LaLumia, 2013), so April 2022 marks the first month in which the full income loss from the expiration had materialized for most households. We therefore use March 2022 as the cutoff, though we show that results are robust to alternate cutoffs, including ones aligned with the December 2021 end of monthly payments (Section 5.2).

This timing raises two potential concerns, which we address before presenting results. First, because households may have learned of the expiration when monthly payments stopped—or even earlier, as legislative efforts to extend the credit failed—sentiment among affected families may have declined before our cutoff. Such anticipation would attenuate our estimates by lowering pre-period sentiment among treated households, making our approach conservative; the monthly event-study estimates in Section 5.2 trace out the timing of the response directly. Second, sentiment among credit-receiving families might decline every spring simply because the post-refund period follows a temporary income boost. To probe this possibility, we conduct a placebo analysis applying our specification to the same calendar cutoff in each year from 1980 to 2019: if post-refund declines were a regular seasonal pattern, placebo estimates would be similar to our main estimate. As we show below, our 2022 estimate is a clear outlier relative to this placebo distribution, and results are robust to a battery of additional checks, including controls for inflation and borrowing costs interacted with number of children (Section 5.5).

The variable *LostCTC* represents the dollar loss (in $1,000s) due to the expiration of the 2021 American Rescue Plan (ARP) CTC and the reversion to the smaller Tax Cuts and Jobs Act (TCJA) credit in 2022. We calculate *LostCTC* as the difference in each household's estimated CTC under the ARP and TCJA rules, using NBER's TAXSIM and information on number of children, marital status, and household income.[7] The control vector X_i includes age, birth year, and fixed effects for the number of children, number of adults, region, sex, marital status, six education categories, and year-by-quarter. The key treatment variable is the interaction $Post \times LostCTC$, which captures the change in sentiment per $1,000 of lost CTC income following the policy expiration.

The first estimate in Figure 6 shows that each $1,000 of lost CTC income decreases sentiment by 1.69 (0.26) points (or about 2.4% from a baseline of 70).[8] Since the average value of *LostCTC* in the sample is $900, this means that the overall impact of the expanded CTC expiring on national sentiment is about -1.6 points. This estimate helps explain the widely discussed gap between actual sentiment and "predicted" sentiment—the level implied by models based on economic fundamentals such as inflation, unemployment, and income growth (Burn-Murdoch, 2023; Bolhuis et al., 2024). In late 2023, actual sentiment was about 10 points below predicted levels (around 65 vs 75), suggesting our results can explain about 15% of this gap.[9] Among households with children, the average value of *LostCTC* is $3,000, which implies an average impact on the sentiment of families of about -5 points (a decrease of 8%).

An alternative to estimating *LostCTC* is to examine effects by number of children and time, independent of income. A binary DD version of equation (1) yields an estimate of -4.26 (1.10) points for households with any children after March 2022. A version of equation (1) that separately estimates binary DD effects for households with one child, two-to-three children, and four-to-five children yields estimates of -2.51 (1.57), -5.11 (1.41), and -8.15

[7] Unfortunately, we do not observe children's ages and therefore cannot exploit the variation in CTC benefits between children under and over age 6.

[8] The control group consists of households that did not experience a change in CTC, including childless families and higher-income families with children. Restricting the control group to each subgroup separately yields estimates of -1.34 (0.27) and -2.16 (0.39), respectively. Including a control for *LostCTC* not interacted with *Post* yields a slightly smaller estimate of -1.30 (0.28).

[9] The Michigan survey was about one standard deviation (SD) below predicted levels in late 2023 (Bolhuis et al., 2024), with one SD corresponding to roughly 10 points over the last several decades.

(3.46) points, respectively. Additionally, a binary triple difference (DDD) specification that further compares lower vs higher incomes yields an estimate of -5.23 (2.2).[10]

4.2. Average Effects Over Time

Next, we estimate effects over time using a single regression where we divide the "post" period into four time periods: 4/2022–9/2022, 10/2022–4/2023, 5/2023–9/2023, and 10/2023–3/2024, which we label in the following equation as $Post_1$, $Post_2$, $Post_3$, and $Post_4$:

$$Sentiment_{it} = \alpha + \sum_{k=1}^{4} \left(\beta_{1k} Post_{it}^{k} + \beta_{2k}(Post_{it}^{k} \times LostCTC_i)\right) + \gamma X_{it} + \epsilon_{it}. \quad (2)$$

Four estimates in Figure 6 are labeled according to these four time periods. In the months immediately after expiration, sentiment decreased by 1.5 points per $1,000 in lost CTC income; the estimated effect remained similar over the next year and a half (estimates of -1.3, -1.7, and -2.3). We cannot reject equal estimates across the four periods (p-value = 0.33).

4.3. Subgroup Effects

Figure 6 shows estimates where the sample is restricted to several subgroups we identified in Table 1 with baseline differences in consumer sentiment. These subgroups are defined by gender, marital status, age, education, home ownership, partisanship, and geographic region. When examining subgroup effects by age, we dichotomize age at a cut-off of age 50 because presence of minor children in the household drastically declines at this age: 64% of parents aged 45-49 still have minor children in the home versus 39% of parents aged 50-54 (Hemez et al., 2024). Using the same controls across 17 regressions, and showing the estimate on $Post \times LostCTC$ from equation (1), we find that effects are (1) similar by gender, though slightly larger for men; (2) a bit larger among married versus unmarried parents; (3) larger for parents under age 50; (4) larger for parents with a college degree; (5) similar for those who own versus rent their home; (6) similar across regions of the country, except in the West where effects are smaller; and (7) smaller among Republicans, and similar for Democrats and

[10] All regressions use the full set of controls. The DDD uses an income cutoff of $100,000 as in Figures 5b–5c, and interacts each control with having lower and higher income.

Independents. Across all 22 estimates, 20 are statistically significant and all fall between -0.6 and -2.3 points.

Overall, subgroup effects show that the loss of CTC income affected nearly all parents. Although effects appear slightly larger among married and more-educated parents, these differences are generally not statistically significant, and we cannot reject the null of similar effects across groups. Still, the suggestive pattern is informative. While lower-income families gained the most from the 2021 CTC (Figure 1b) and sentiment changes are driven by families with income below $100,000 (Figures 4a–5c), economic sentiment may also be shaped by expectations and perceived loss. Married and more-educated parents may have been more likely to notice the end of monthly payments, view it as a meaningful policy change, and adjust their outlook accordingly—even if their income loss was modest. This suggests that sentiment responds not only to income losses but also to policy salience and awareness, consistent with Chetty et al. (2009), who show that the salience of a tax change, not just its size, significantly affects how individuals perceive and respond to policy.

4.4. Impact on Sentiment Subcomponents and Other Factors

While it is intuitive that a loss of income would worsen views about personal finances, an important question is whether the effects extend beyond personal financial assessments to broader perceptions of the economy and government policy—which would be more consistent with a confidence channel than a mechanical income response. To explore this, we examine how the expiration of the expanded CTC affected the subcomponents of the ICS, along with several related survey questions discussed in Section 2. Importantly, these additional questions include not only assessments of personal finances and general economic conditions, but also specific questions about views of government economic policy, allowing us to test directly whether the CTC's expiration affected attitudes toward public policy itself; we present these results separately below. Because the questions vary in format (binary, categorical, continuous), we standardize each to be mean zero and standard deviation one, coding higher values to indicate more optimistic views.

The first three estimates in Figure 7 show the effect of a $1,000 increase in $Post \times LostCTC$ from equation (1), with estimated impacts on ICS, ICC, and ICE of -0.04, -0.03,

and -0.04 standard deviations (SDs), respectively. ICS is constructed from five underlying survey questions, with ICC based on two of the five and ICE based on the remaining three (details in Section 2). Of these five components, the largest estimate is a -0.04 SD decline in assessments of current personal finances. We also find significant negative effects of -0.03 SDs on expectations for personal finances next year, the economy next year, and the economy over the next five years. The effect on attitudes toward buying durable goods is statistically insignificant at -0.01 SDs.

Beyond the five ICS components, Figure 7 presents results for 19 additional survey questions, grouped into personal finances, general economic conditions, and buying/retirement expectations. Among the six general economic conditions questions, we find significant declines in views of the economy compared to last year, perceived job loss risk in the next year, and opinions on government policy. These results indicate that losing CTC income not only shaped perceptions of personal finances but also eroded confidence in the broader economy and public institutions. The average effect in this category is a significant -0.015 SDs, with individual estimates ranging from -0.03 to 0.01 SDs.[11]

For the six personal finance questions, the average effect is -0.03 SDs, with individual estimates ranging from -0.050 to -0.015 SDs. The largest effects appear for views on personal finances compared to last year and expected income increases over the next 1–2 and 5 years. For the seven buying and retirement questions, the average effect is a significant -0.014 SDs, with point estimates ranging from -0.04 to 0.01 SDs. The largest effects are for expectations that interest rates will decline in the next year and that retirement will be comfortable.[12]

Overall, losing CTC income makes individuals more pessimistic about their current personal finances, future financial wellbeing, view of the overall economy, and views of government policy.

[11] We find small and statistically insignificant effects for expectations for the economy next year, economic news being heard, and expected unemployment rates.

[12] Smaller and largely significant effects (-0.02 to -0.01 SDs) are found for vehicle-buying attitudes, the investment environment, and expectations about future Social Security. Views on whether it is a good time to buy or sell a home are close to zero and statistically insignificant.

4.5. IV Approach

We implement an IV strategy to estimate the effect of income on sentiment, using a group-level average of predicted CTC losses (*LostCTC*) as an instrument for each household's income.[13] To construct the instrument, we partition households into demographic cells defined by marital status, number of children, college versus non-college education, and pre-expiration income tercile based on the 2021 income distribution. For each cell, we compute the average predicted CTC loss implied by the expiration of the 2021 expansion using only exogenous characteristics and statutory CTC parameters; by assigning households the group-level predicted loss rather than an amount computed from their own contemporaneous income, the instrument avoids the mechanical correlation between the IV and the endogenous income measure. Because the expiration generated differential income losses across demographic groups, this design provides plausibly exogenous variation that helps address reverse causality and omitted-variable bias. The first stage relates group-level predicted CTC losses to declines in household income, and the second stage estimates how this income change affects sentiment. The exclusion restriction requires *LostCTC* to affect sentiment only through income, a stronger assumption than in our reduced-form analysis because it rules out direct policy effects on sentiment.

While the group-level instrument addresses individual-level endogeneity concerns such as reverse causality between sentiment and reported income, one could worry that group-level policies correlated with having children—such as school or childcare policies—affected sentiment independently of CTC losses, which would violate the exclusion restriction. We address this concern in Section 5.3, where we show that the most disruptive such policies occurred in 2020–2021, before our post period begins.

Lower-income households face tighter budget constraints and have less ability to smooth consumption in response to income shocks, so a given dollar loss in CTC benefits represents a larger disruption to their financial situation and—we expect—a larger blow to their economic outlook. Table 2 presents IV estimates for samples with income below $100,000, below

[13] Total income equals self-reported pre-tax income plus imputed CTC benefits from NBER's TAXSIM. We impute expanded CTC benefits for households observed between July 2021 and March 2022, and smaller TCJA-era CTC benefits for households observed in all other months.

$300,000, and for the full sample. We expect each $1,000 loss in CTC income to have a larger impact on the sentiment of lower-income households, so we anticipate that estimated effects will shrink as the sample expands to include higher-income households. The log income specification captures this idea directly, since a fixed dollar loss represents a larger proportional decline for lower-income households. We report results using six progressively richer sets of controls: (1) *post* and number-of-children fixed effects (FE); (2) household adults and marital status; (3) sex, age, and birth year; (4) education; (5) region and year-quarter FE; and (6) interactions of year-quarter FE with region, sex, marital status, and education. First-stage F-statistics are strong for the broader samples, though weaker for the below-$100,000 sample with richer controls (Table 2).

Each $1,000 increase in income raises sentiment, with effects diminishing at higher income levels. Estimates are 1.65–3.45 for households below $100,000, 0.19–0.23 for those below $300,000, and 0.13–0.16 for the full sample.[14] These results confirm that additional income has a much larger effect on sentiment among lower-income households.

5. Robustness Checks and Potential Confounders

5.1. Placebo Treatment Years

To test whether our findings could arise by chance, we conduct a placebo analysis using 40 alternative cutoffs, shifting the policy break to April of each year from 1980 to 2019 while holding the pre- and post-period lengths constant (9 and 24 months). In Figure 8, we standardize the 41 estimates and show that the true 2022 estimate (-2.95 SDs) stands out as the most negative estimate. Across placebo years, the 5th, 10th, 50th, and 90th percentile estimates equal -1.12, -0.72, 0.01, and 1.64 SDs.

5.2. Monthly Sentiment Around CTC Introduction and Expiration

Figures 9a and 9b zoom in on December 2020 to December 2022 and show monthly (instead of quarterly) trends to examine the onset of CTC monthly payments. While trends are noisy, they may suggest (1) an increase in sentiment in March 2021, aligning with a large

[14] Using log income shows estimates of 10.6–13.0, reflecting the implied impact of doubling household income.

EIP,[15] and (2) a small increase in sentiment after July 2021 when monthly CTC payments were delivered. We defer formal estimates of these introduction effects to Section 6. The relevance here is for our expiration estimates: if sentiment rose when payments began, our baseline estimate could partly reflect a return from an elevated 2021 level rather than a decline from a stable pre-period. This is not the case: removing July–December 2021 from the sample (with or without dropping other months with an EIP, including March 2021) yields expiration estimates very similar to our baseline, ranging from -1.7 to -1.8.

Since the last monthly payment was received in December 2021 and the second half of the expanded CTC was received as a tax refund in early 2022, it is not obvious when declines in household sentiment should have begun. The timing was further shaped by anticipation: there was substantial public discussion throughout late 2021 about whether Congress would extend the expanded CTC, and negotiations over the Build Back Better Act, which would have done so, collapsed in December 2021. The abrupt end of monthly payments and the failed renewal effort likely signaled to families that the higher benefit level would not continue, potentially accelerating the sentiment response ahead of the final tax refund. Figures 9a and 9b show that sentiment for households with two or more children may start falling after January 2022, reaching a lower level in April 2022 that remains through December 2022. Results are robust to alternate definitions of "post": using January, February, or March 2022 yields estimates of -1.52, -1.68, and -1.70.

5.3. COVID-Era Factors and Policies

Several factors beyond the CTC may have affected household sentiment, particularly among parents—a concern for both our difference-in-differences estimates and the IV exclusion restriction (Section 4.5). However, most of these occurred prior to the CTC expiration in 2022. School closures and remote learning during 2020–2021 were associated with worse parental well-being, including greater emotional distress among parents of children receiving virtual instruction (Verlenden et al., 2021). Supply chain disruptions led to food and goods shortages and inflation (Packer, 2021; Hobbs, 2020). Three rounds of federal stimulus checks

[15] A simple comparison of sentiment before and after March 2021 EIPs, using December 2020 through June 2021 sentiment data, shows a 6.7-point increase in consumer sentiment among all households.

in 2020–2021 temporarily boosted household income (Internal Revenue Service, 2021; Pandemic Oversight, 2021). Additionally, major COVID-19 case and death surges—in spring 2020, winter 2020–2021, and late 2021—created broad stress across all households, not just those with children (Centers for Disease Control and Prevention, 2023). These earlier shocks occurred before 2022 and are unlikely to explain the post-CTC decline in sentiment among families with children. More generally, a confound would require differential post-2022 shocks systematically correlated with family size and demographic composition, for which we find little evidence.

Concerns also extend to state-level policy responses during and after the pandemic—such as additional financial support for families or school district meal programs—which may have varied in ways correlated with treatment status. We cannot fully address this because the Michigan survey identifies only four Census regions rather than states, precluding state or finer geographic controls. However, our region-by-year-quarter fixed effects absorb broad geographic variation over time.

5.4. Sentiment and Partisanship

Partisan identity strongly influences consumer sentiment, with Republicans reacting more sharply to presidential election outcomes than Democrats (Cummings and Mahoney, 2023; Cummings et al., 2024). This partisan filtering helps explain the disconnect between sentiment and economic fundamentals. Despite these divides, the loss of CTC benefits reduced sentiment across all political affiliations (Figure 6). The decline was slightly larger for Democrats and Independents, likely because Republican sentiment was already low under a Democratic administration.

5.5. Inflation, Borrowing Costs, and Cost of Living

Sentiment fell by about 10 points in the post period among CTC-ineligible households with no children (see Figure 5a), suggesting that broader macroeconomic forces were also at play. As interest rates rose to multi-decade highs in 2023, rising borrowing costs—often excluded from conventional CPI—contributed to declining sentiment. Bolhuis et al. (2024) attribute nearly 70% of the sentiment gap to these factors, and others link higher mortgage

rates to weaker economic outlooks (Kliesen, 2022; Fannie Mae, 2023). These effects are broad-based, not limited to families with children.

To test whether these inflationary and borrowing-cost pressures had larger effects on families with more children—and help explain the pattern in this paper—we re-estimate the main specification across 11 sets of controls. Table 3 columns 1–6 use the same progressive control sets as Table 2, then columns 7–11 add four price measures separately and jointly: (1) the 12-month percent change in CPI inflation (Bureau of Labor Statistics, 2026), (2) the 30-year fixed mortgage rate (Freddie Mac, 2026), (3) the 48-month auto loan rate (Board of Governors of the Federal Reserve System, 2026b), and (4) the federal funds rate (Board of Governors of the Federal Reserve System, 2026a). We interact these measures with number of children to allow them to have differential impacts by family size. Point estimates are remarkably stable across all 11 specifications, ranging from -1.48 to -2.24, and adding inflation and borrowing-cost controls individually or jointly does not attenuate the results. While inflation and borrowing costs dampened sentiment broadly, they do not explain the disproportionate decline among families with children.

6. The Impact of the CTC Introduction on Sentiment

While our main analysis focuses on the expiration of the expanded CTC, we also examine whether the introduction of monthly CTC payments in July 2021 affected consumer sentiment. Identifying the effects of the introduction is challenging for two reasons: there are only a few months between the March 2021 EIP and the July start of monthly CTC payments, making it difficult to separate the effects of these policies, and the policy was actively debated for renewal throughout late 2021, complicating the counterfactual. We restrict the sample to April 2021–February 2022 to capture the introduction while excluding the March 2021 EIP and the spring 2022 expiration, and to increase statistical power we estimate a simple DD specification that pools all parents together.

Table 4 shows that the estimated effects are positive but imprecisely estimated. Pooling all parents, we estimate a 2.3-point (s.e. 2.6) increase in sentiment following the introduction of monthly payments. Effects are larger for lower-income households, with an estimate of

4.9 (2.9), and close to zero for higher-income households at 0.1 (2.8). Estimates are also somewhat larger for women (5.0) than men (0.3), for those with lower education (3.6 vs. 1.1), and for unmarried households (4.1 vs. 1.8). Overall, the point estimates align with the expansion improving household sentiment, but are smaller and statistically weaker than the expiration effects—a pattern that may partly reflect the identification challenges described above, and is also loosely consistent with prior work showing asymmetric responses to gains versus losses (Kahneman and Tversky, 1979; Thaler, 1980) and stronger political backlash from cutting benefits than credit for expanding them (Weaver, 1986; Soroka and Wlezien, 2010), though we view this comparison as suggestive rather than conclusive.

7. Conclusion

This study shows that the expiration of the expanded CTC in early 2022 led to a sustained decline in consumer sentiment among families with children. The drop in sentiment was larger for families with more children and those with lower incomes, while higher-income households experienced minimal change. Our estimates imply that the expanded CTC's expiration can account for the roughly 4-point larger decline in sentiment among households with children relative to those without. Consistent with this, we also find suggestive evidence that the introduction of monthly CTC payments increased sentiment, though these effects are smaller and less precisely estimated.

Our results help explain the post-COVID disconnect between standard economic indicators and how the economy is perceived by many households—a phenomenon often called a "vibecession" (Picchi, 2023). While Bolhuis et al. (2024) attribute most of the gap to high borrowing costs, we identify the loss of CTC income as another key driver, explaining about 15% of the overall gap.

The persistence of these effects for nearly two years is consistent with a confidence channel beyond contemporaneous income. Households that experienced the loss may have revised downward their assessments of government economic management and their own long-run financial prospects—updates that do not automatically reverse when the immediate income shock fades. Consistent with asymmetric responses to gains versus losses, benefit with-

drawal appears to generate larger and more persistent shifts in perceptions than comparable increases. These findings suggest that even temporary income supports can have lasting psychological effects, and that their withdrawal may generate economic headwinds not captured by conventional metrics—with potential implications for political attitudes and voting behavior more broadly (Bastian, 2026).

Our analysis here focuses on the withdrawal of benefits, a setting with few modern precedents. Future work should use the Michigan survey's rich microdata back to 1978 to examine how a broader range of policy changes affect economic sentiment. However, the survey's small sample sizes for very low-income households may limit the precision with which highly targeted policy changes—such as EITC expansions or welfare reform—can be evaluated.

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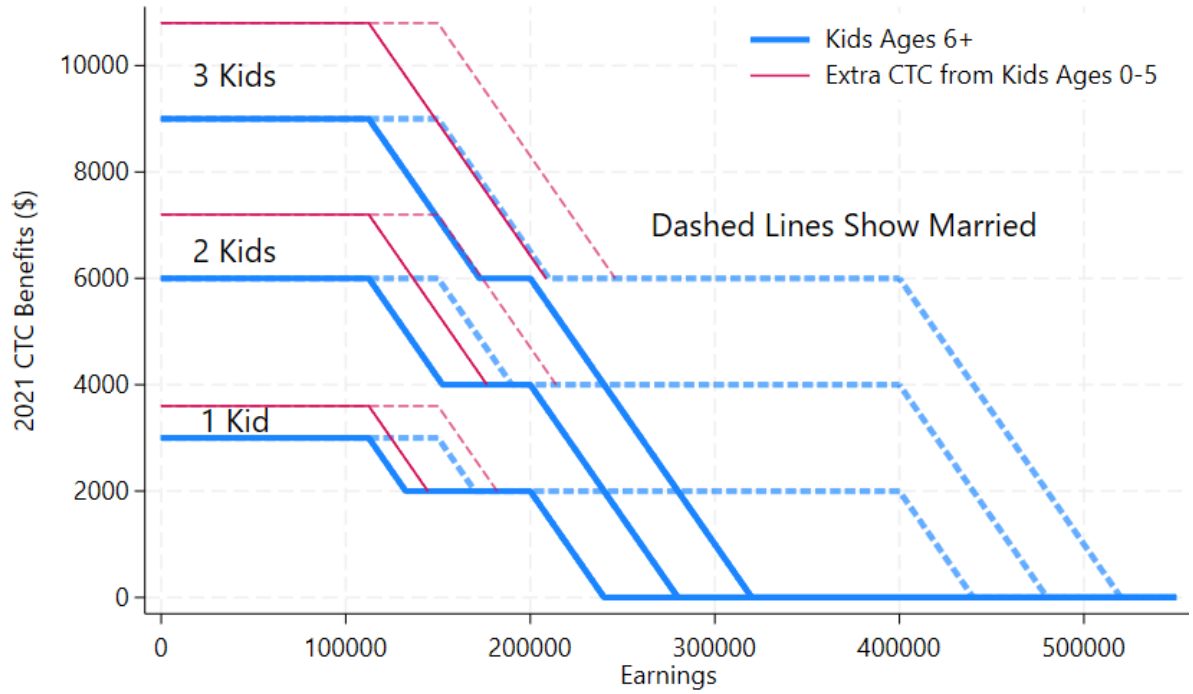
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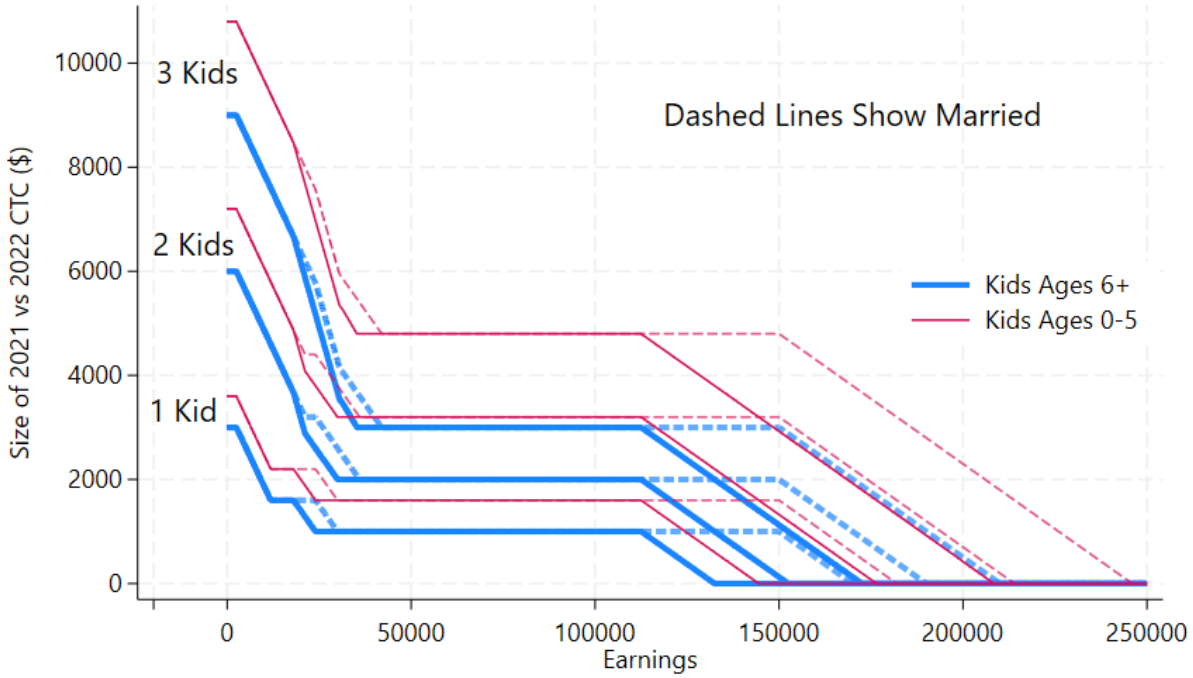
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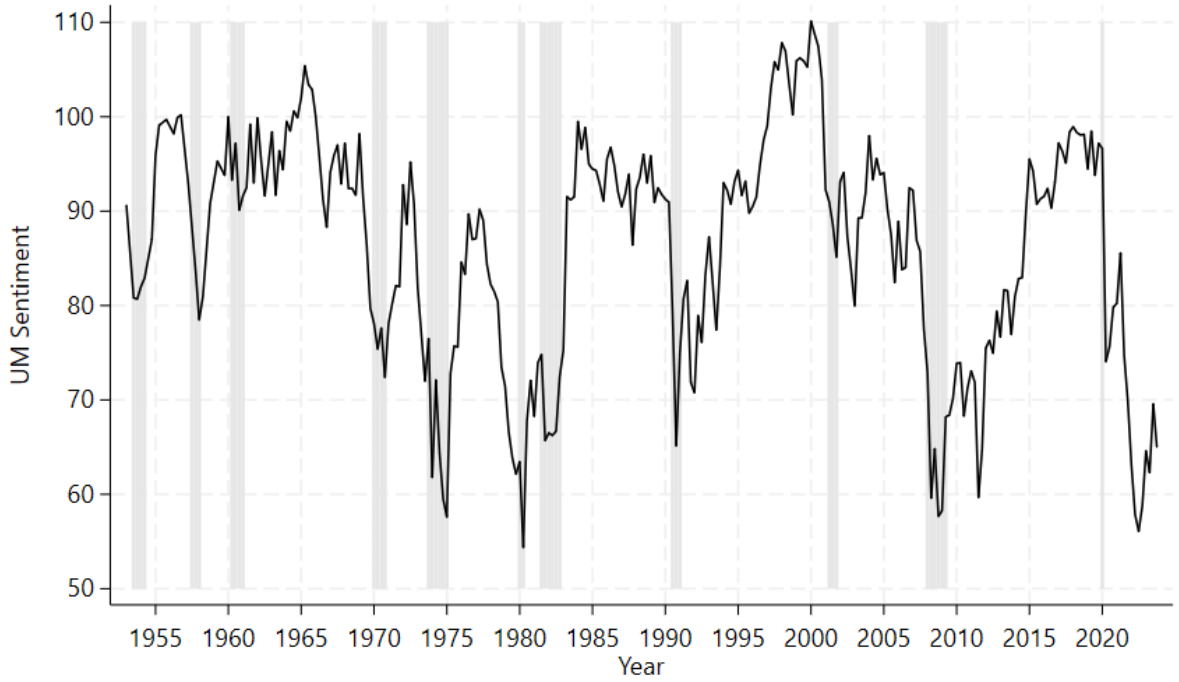
(a) **2021 CTC Structure by Number of Children and Marital Status**



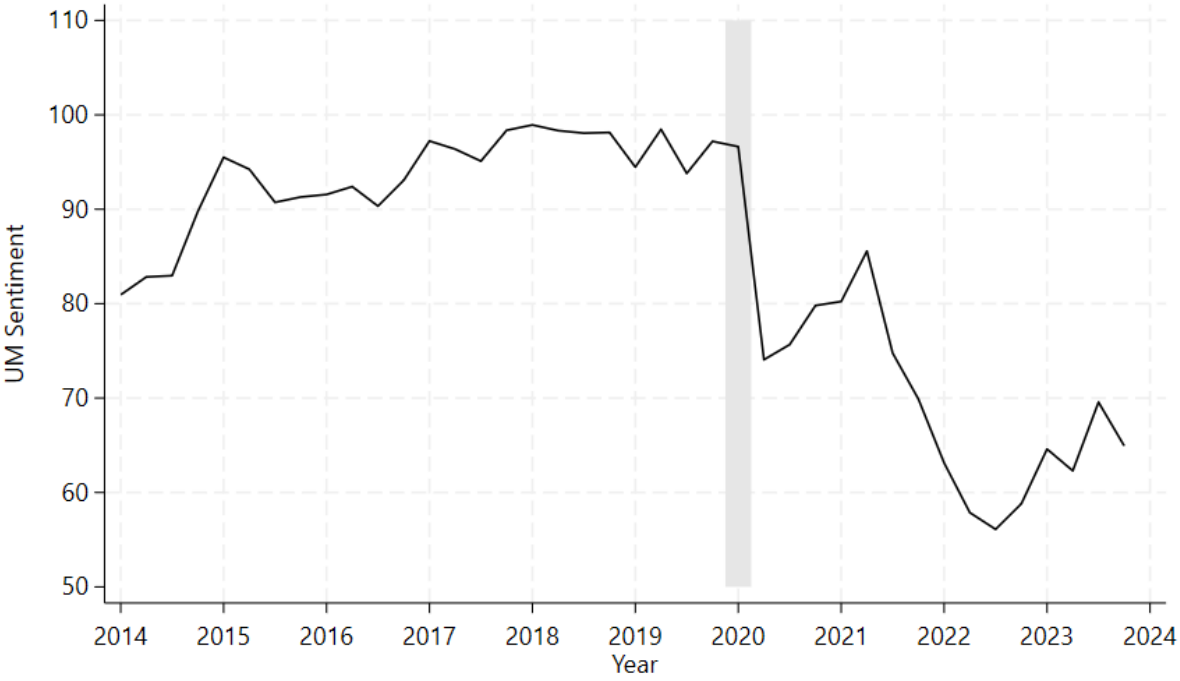
(b) **Income Lost When the Expanded 2021 CTC Expired, by Family Type**

Fig. 1. **Structure and Expiration of the 2021 Child Tax Credit**

Source: Authors' calculations from NBER's TAXSIM. Income loss in panel (b) equals CTC benefits under expanded ARP CTC vs smaller TCJA CTC.



(a) **Average Sentiment: 1953–2024**



(b) **Average Sentiment: 2014–2024**

Fig. 2. **Aggregate Sentiment Trends**

Source: 1953–2024 University of Michigan's Consumer Sentiment Survey.

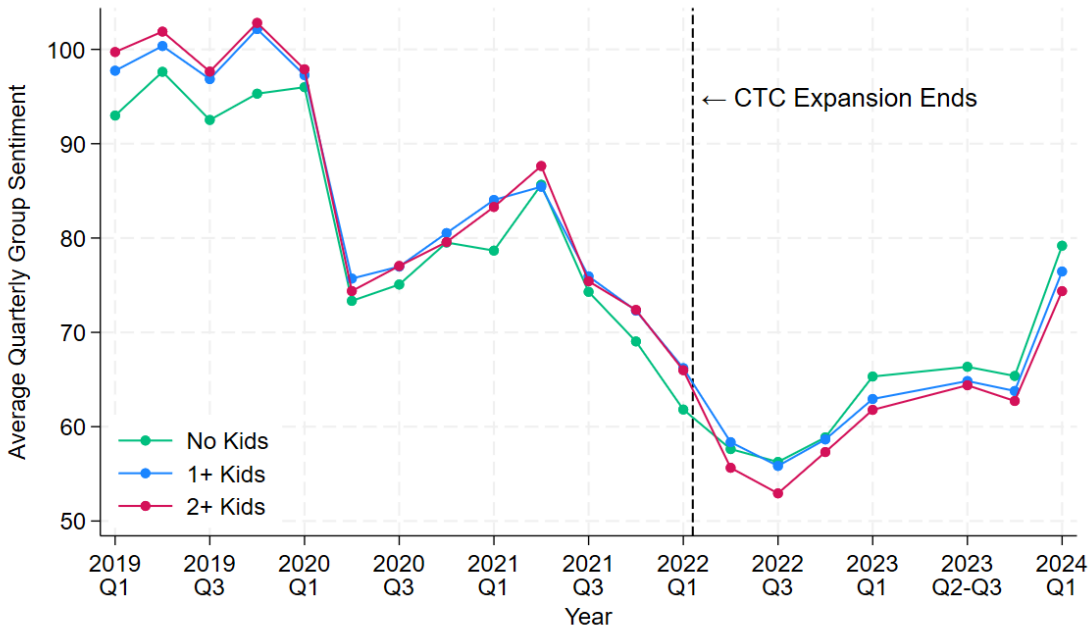
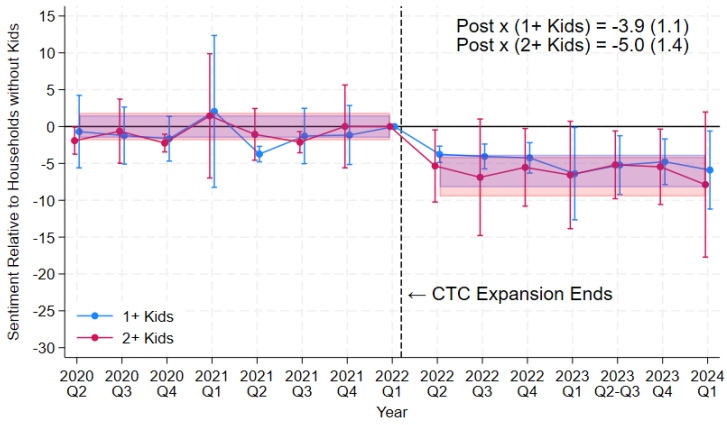
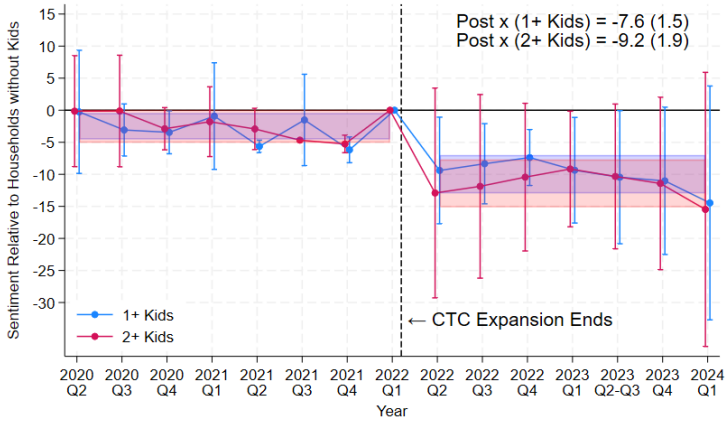


Fig. 3. **Quarterly 2019–2024 Sentiment by Number of Children**

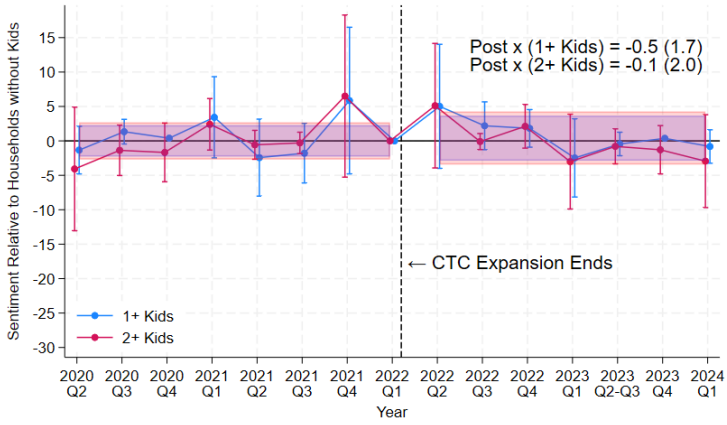
Source: Authors' calculations from January 2019 to March 2024 University of Michigan's Consumer Sentiment Survey. Sentiment in quarters 2 and 3 combined in 2023 because of smaller sample sizes.



(a) **Sentiment Relative to No-Child Households**



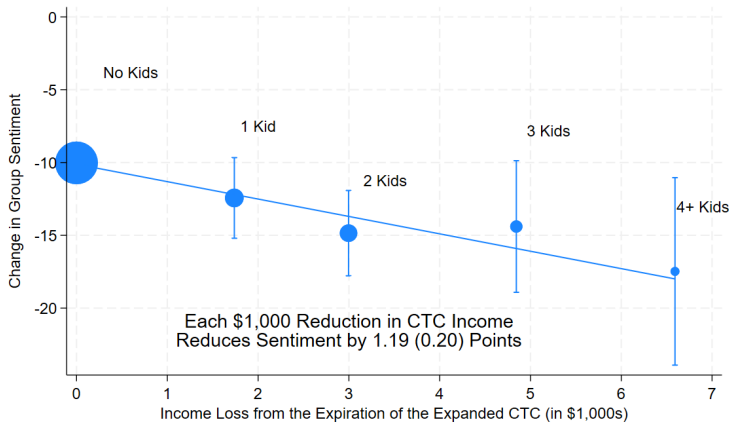
(b) **Sentiment vs No-Child HH (Lower Income)**



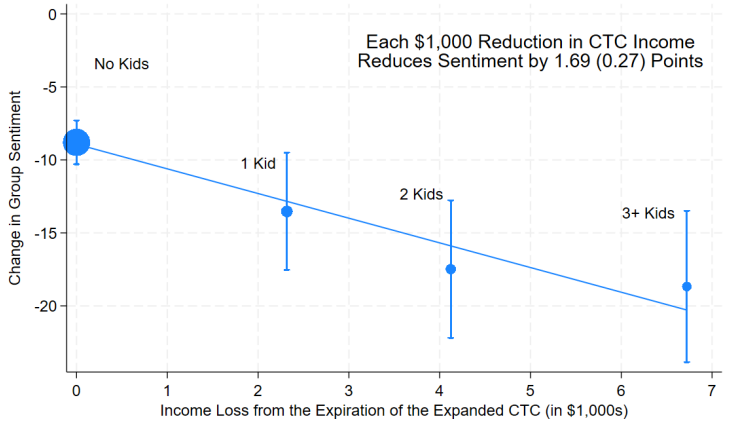
(c) **Sentiment vs No-Child HH (Higher Income)**

Fig. 4. **Sentiment Trends Relative to No-Child Households**

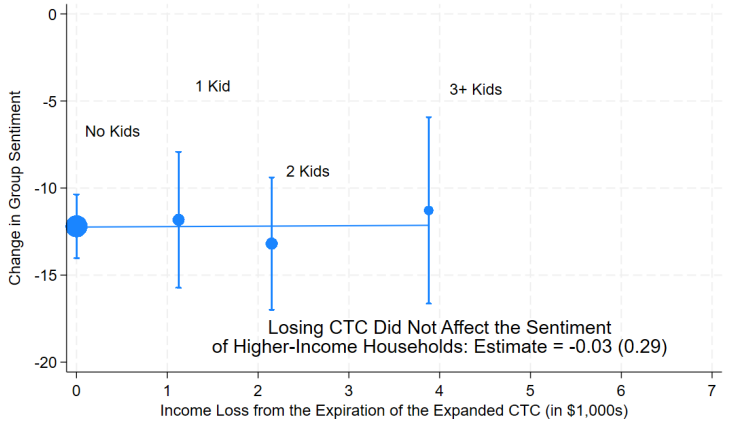
Source: Authors' calculations from April 2020 to March 2024 University of Michigan's Consumer Sentiment Survey. Each estimate comes from a separate regression that compares households with one or more children (or two or more children) with households without children, one year at a time. No additional controls are used. The pooled difference-in-differences estimate is shown in each panel for parents with at least one child vs those without children, and for those with at least two children vs those without children. The shaded bars capture the average "pre" and "post" effect for those with at least one or two children.



(a) **CTC Loss and Sentiment (Full Sample)**



(b) **CTC Loss and Sentiment (Lower Income)**



(c) **CTC Loss and Sentiment (Higher Income)**

Fig. 5. **CTC Loss and Sentiment by Income Group**

Source: Authors' calculations from April 2020 to March 2024 University of Michigan's Consumer Sentiment Survey. Income loss defined for each household based on income, marital status, and number of children. Change in group sentiment averages April 2020 to March 2022 and compares to the average from April 2022 to March 2024.

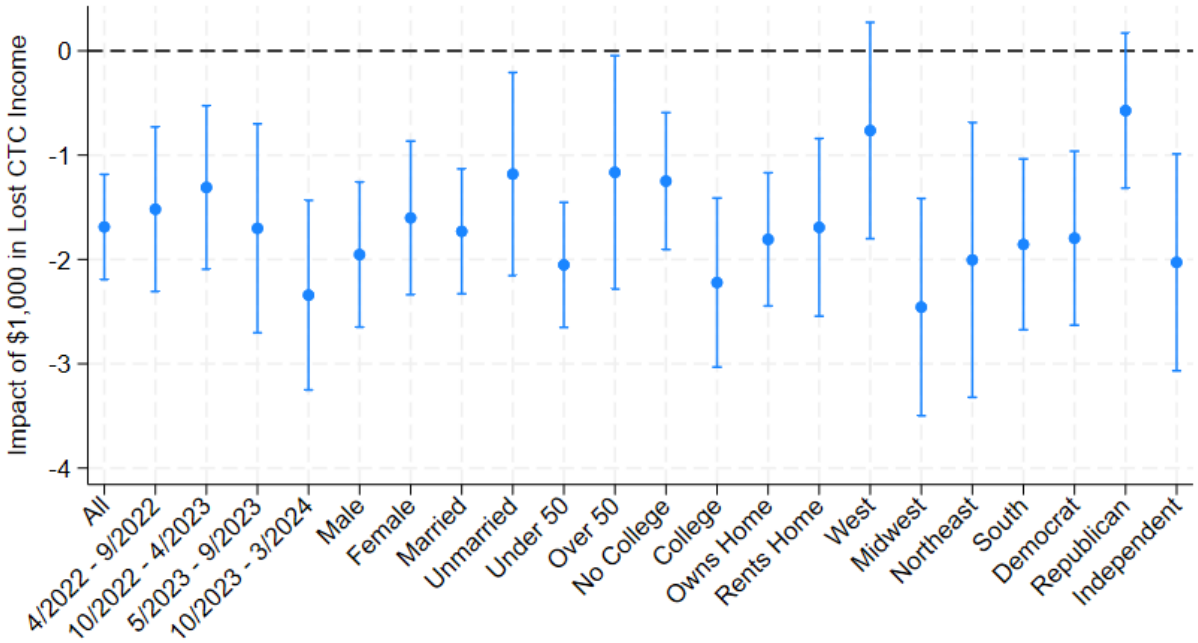


Fig. 6. **Impact of $1,000 CTC Loss on Various Subgroups**

Source: University of Michigan's Consumer Sentiment Survey April 2020 to March 2024. **Notes:** Each estimate comes from a separate regression, except for the four that split the post period. Sample size for the full sample is 27,136, and sample sizes (starting with male and moving right) are 17,186, 9,950, 17,375, 9,761, 7,640, 19,496, 12,698, 14,438, 19,491, 7,551, 6,475, 6,626, 4,221, 9,814, 11,978, 11,414, and 3,744. All regressions use robust standard errors and the full set of controls (i.e., age, birth year, year-by-quarter fixed effects (FE), region, gender, married, education, number of children FE, and household number of adults FE).

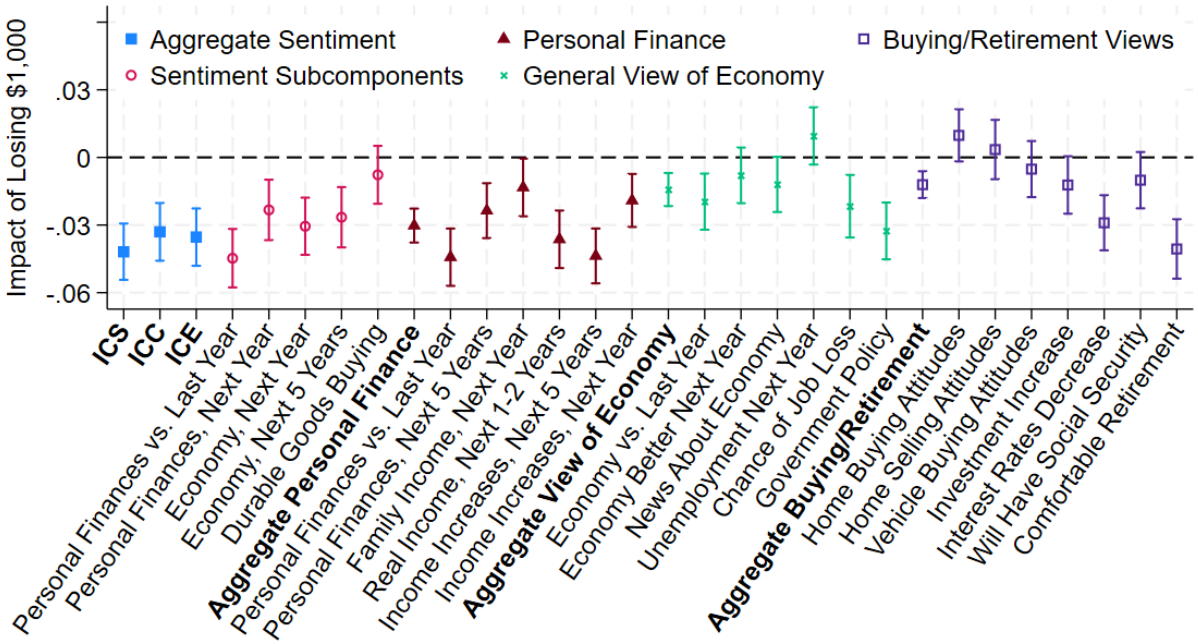


Fig. 7. **Impact of $1,000 CTC Loss on Various Indexes, Subcomponents, Individual Questions**

Source: University of Michigan's Consumer Sentiment Survey April 2020 to March 2024. **Notes:** Sample sizes are 27,136, 27,136, 27,136, 27,118, 26,252, 25,569, 26,327, 26,641, 27,136, 26,980, 25,994, 27,013, 26,841, 26,914, 26,849, 27,136, 26,923, 26,563, 27,136, 26,866, 27,020, 26,684, 27,136, 26,950, 26,794, 26,611, 26,208, 26,808, 26,845, and 26,969. All regressions use robust standard errors and the full set of controls (i.e., age, birth year, year-by-quarter fixed effects (FE), region, gender, married, education, number of children FE, and household number of adults FE).

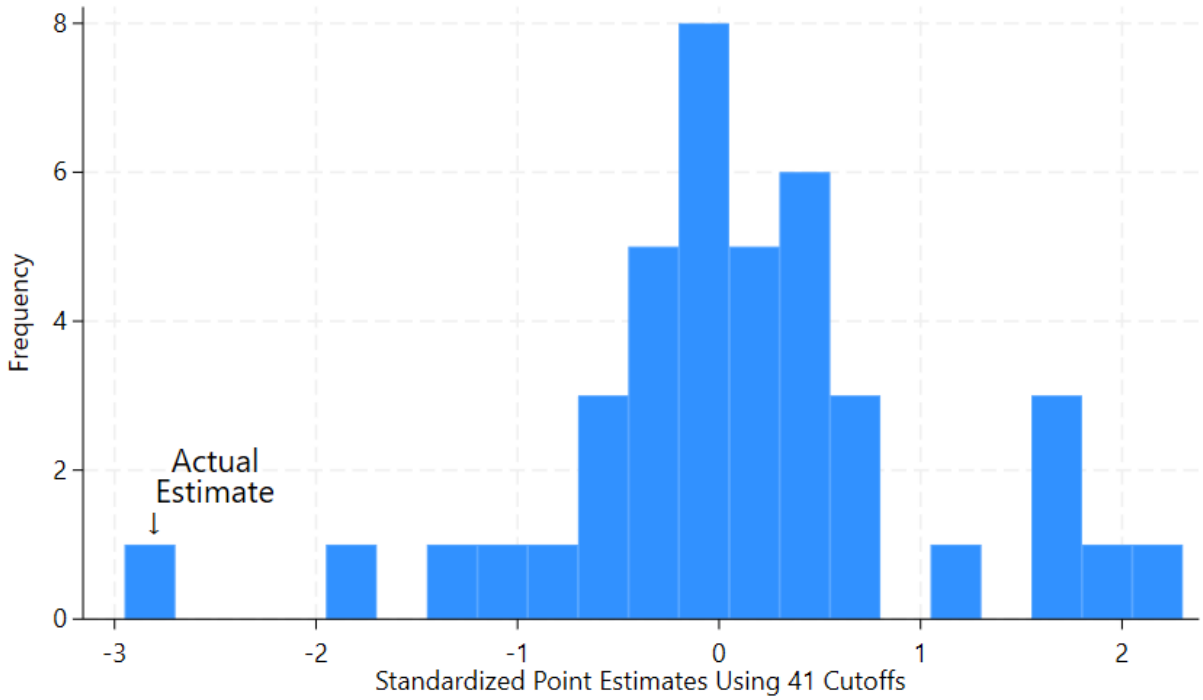
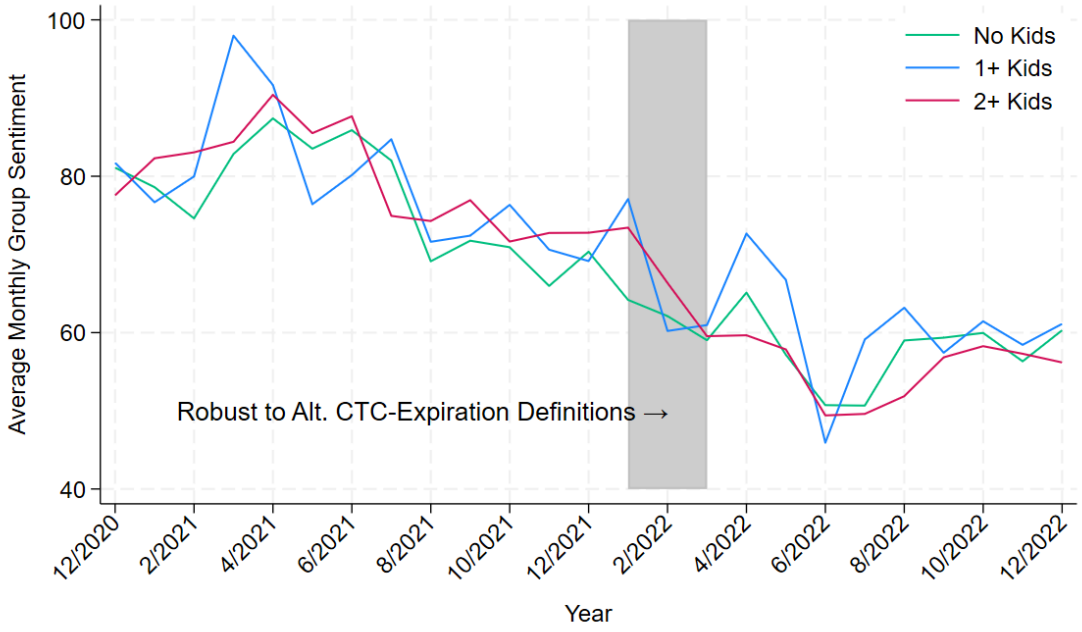
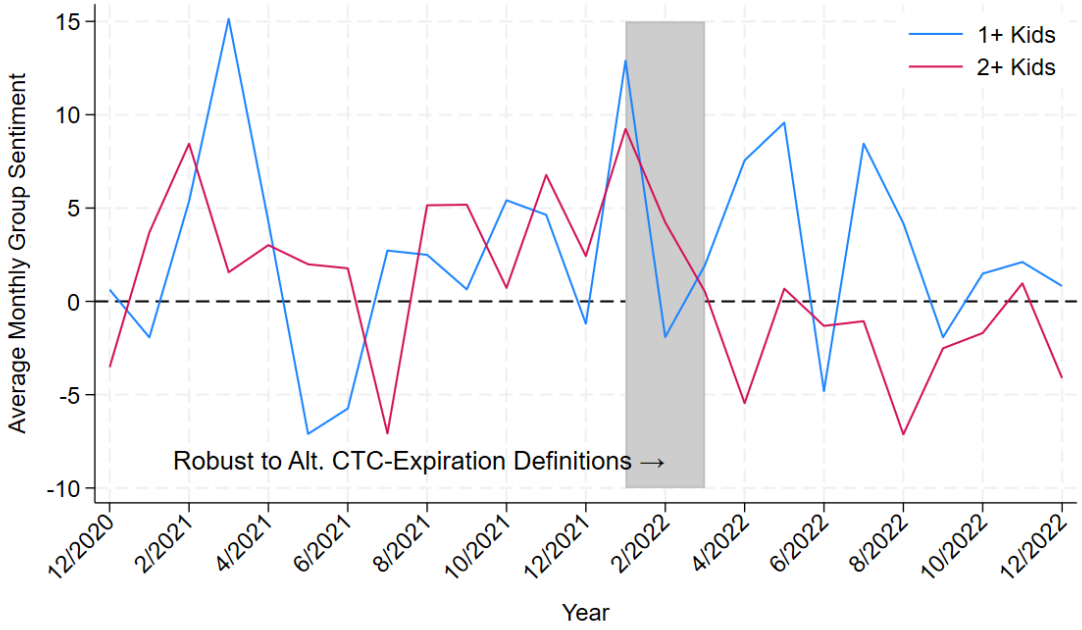


Fig. 8. **2022 Cutoff vs 1980–2019 Placebo Cutoffs**

Source: 1979–2024 University of Michigan's Consumer Sentiment Survey. **Notes:** Placebo cutoffs use April of each year from 1980–2019, with 9- and 24-month pre/post windows. All 41 estimates are standardized; the actual 2022 estimate (–2.95) is the most extreme. Regressions use robust standard errors and the full set of controls.



(a) **12/2020–12/2022 Monthly Trends by Children**



(b) **12/2020–12/2022 Trends vs No-Child HH**

Fig. 9. **Monthly Sentiment Trends**

Source: 2020–2022 University of Michigan's Consumer Sentiment Survey. **Notes:** Both panels use December 2020 to December 2022 sentiment data.

Table 1: Summary Statistics and Correlation of Various Traits with ICS

Variable	Mean	Std. Dev.	Min	Max	Bivariate Regression of ICS on Each Trait
Age	50.77	17.43	18	97	-0.2
Year of Birth	1970.5	17.44	1923	2006	0.2
Survey Year	2021.7	1.20	2020	2024	-3.0
Female	0.446	0.497	0	1	-5.0
Married	0.582	0.493	0	1	-1.6
High School or Less	0.209	0.406	0	1	-7.9
College Degree	0.522	0.500	0	1	9.2
Has Children	0.290	0.454	0	1	0.0
Number of Children	0.556	1.020	0	5	-0.3
Number of Adults	1.992	0.864	1	9	-0.8
Income ($10,000s)	10.92	9.66	0.2	50.2	0.3
2021 ARP CTC ($1,000s)	1.85	3.40	0	13.6	-0.3
2022 TCJA CTC ($1,000s)	0.97	1.76	0	6	-0.2
Owns Home	0.694	0.461	0	1	-3.3
West Region	0.233	0.422	0	1	-0.8
Midwest Region	0.230	0.421	0	1	1.2
Northeast Region	0.162	0.369	0	1	1.3
South Region	0.375	0.484	0	1	-1.0
Democrat	0.454	0.498	0	1	20.3
Republican	0.402	0.490	0	1	-18.6
Independent	0.144	0.351	0	1	-4.6
ICS	69.99	40.37	2	150.02	1.0
ICC	75.66	52.48	2	153.38	0.6
ICE	66.34	46.92	2	147.86	0.8
ICS (for Income $\leq$ $100,000)	68.23	39.89	2	150.02	1.0
ICC (for Income $\leq$ $100,000)	73.79	52.64	2	153.38	0.6
ICE (for Income $\leq$ $100,000)	64.67	46.47	2	147.86	0.7
ICS (for Income $>$ $100,000)	72.75	40.97	2	150.02	1.0
ICC (for Income $>$ $100,000)	78.61	52.08	2	153.38	0.6
ICE (for Income $>$ $100,000)	68.98	47.50	2	147.86	0.8
Observations = 27,136					

Notes: 2020–2024 University of Michigan's Consumer Sentiment Survey. Table reports weighted summary statistics. The final column shows the estimate from a bivariate regression of ICS on the trait. ICS, ICC, and ICE refer to indexes of consumer sentiment, current conditions, and expectations, respectively. Having some college is the omitted education group. Each respondent's ICS is calculated as $\left(\frac{Q_1+Q_2+Q_3+Q_4+Q_5}{6.7558}\right) + 2.0$, where each Q_i is a relative score equal to 100 plus the net favorable response. ICC is calculated as $\left(\frac{Q_1+Q_5}{2.6424}\right) + 2.0$ and ICE as $\left(\frac{Q_2+Q_3+Q_4}{4.1134}\right) + 2.0$. The denominators reflect 1966 base-period values, and the 2.0 adjustment accounts for a sample design change (University of Michigan, Surveys of Consumers, 2025).

Table 2: Using CTC Expiration as an Instrument for Household Income

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Income Below $100,000						
$1,000 in Income	1.65	2.11	2.19	3.45	3.28	2.60
	(0.52)	(0.73)	(0.80)	(1.69)	(1.59)	(1.15)
Observations	14,204	14,204	14,204	14,204	14,204	14,204
First-Stage F-Statistic	19.1	13.5	11.9	5.4	5.6	7.4
Panel B: Income Below $300,000						
$1,000 in Income	0.19	0.22	0.22	0.23	0.23	0.19
	(0.03)	(0.03)	(0.03)	(0.05)	(0.05)	(0.04)
Observations	25,345	25,345	25,345	25,345	25,345	25,345
First-Stage F-Statistic	611.3	541.8	524.2	358.2	365.1	375.4
Panel C: All Households (No Income Upper Bound)						
$1,000 in Income	0.14	0.15	0.15	0.16	0.15	0.13
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)
Observations	27,136	27,136	27,136	27,136	27,136	27,136
First-Stage F-Statistic	716.8	629.1	602.2	387.7	393.2	399.4
Controls						
Post, Household Children FE	X	X	X	X	X	X
Household Adults FE		X	X	X	X	X
Marital Status		X	X	X	X	X
Sex, Age, Birth Year			X	X	X	X
Education				X	X	X
Year × Quarter FE					X	X
Region FE					X	X
Interactions with Year × Quarter FE						X

Notes: 2020–2024 University of Michigan's Consumer Sentiment Survey. Panels A and B restrict the sample by household income; Panel C includes all households. Controls for each model: (1) *post* and number-of-children fixed effects (FE); (2) adds household adults and marital status; (3) adds sex, age, and birth year; (4) adds education; (5) adds region and year-quarter FE; and (6) adds interactions of year-quarter FE with region, sex, marital status, and education. Estimates report the effect of a $1,000 increase in income on economic sentiment, instrumented using variation in exposure to the expiration of the expanded Child Tax Credit.

Table 3: OLS Estimates: Robustness to Alternative Controls, Including Inflation and Borrowing Costs

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Post × LostCTC	-2.20	-2.24	-2.19	-1.77	-1.69	-1.54	-1.71	-1.88	-1.48	-1.62	-2.10
	(0.26)	(0.26)	(0.26)	(0.26)	(0.26)	(0.26)	(0.28)	(0.38)	(0.32)	(0.34)	(0.39)
R^2	0.023	0.029	0.035	0.049	0.076	0.095	0.095	0.095	0.095	0.095	0.095
Observations = 27,136											
Controls											
Post, #Children FE	X	X	X	X	X	X	X	X	X	X	X
Household Adults FE		X	X	X	X	X	X	X	X	X	X
Marital Status		X	X	X	X	X	X	X	X	X	X
Sex, Age, Birth Year			X	X	X	X	X	X	X	X	X
Education				X	X	X	X	X	X	X	X
Year × Quarter FE					X	X	X	X	X	X	X
Region FE					X	X	X	X	X	X	X
Interactions with Year-Quarter FE						X	X	X	X	X	X
CPI Inflation × #Children FE							X				X
Mortgage Rate × #Children FE								X			X
Auto Loan Rate × #Children FE									X		X
Federal Funds Rate × #Children FE										X	X

Notes: 2020–2024 University of Michigan's Consumer Sentiment Survey. *Post* × *LostCTC* measured in $1,000s and come from estimating equation (1). Controls for each model: (1) *post* and number-of-children fixed effects (FE); (2) adds household adults and marital status; (3) adds sex, age, and birth year; (4) adds education; (5) adds region and year-quarter FE; (6) adds interactions of year-quarter FE with region, sex, marital status, and education; (7)–(10) each add a separate inflation or borrowing-cost measure to the column (6) specification; (11) includes all four measures simultaneously. The four measures of inflation and borrowing costs are: the 12-month percent change in the Consumer Price Index for All Urban Consumers (Bureau of Labor Statistics, 2026), the 30-year fixed mortgage rate (Freddie Mac, 2026), the finance rate on new auto loans with a 48-month term (Board of Governors of the Federal Reserve System, 2026b), and the federal funds effective rate (Board of Governors of the Federal Reserve System, 2026a); all series are from FRED. Robust standard errors in parentheses. Estimate in column 5 uses the full set of controls and is identical to the first estimate in Figure 6.

Table 4: Impact of 2021 CTC Introduction on Household Sentiment

	(1)	(2)	(3)	(4)	(5)
CTC Payment Period × Any Children	2.34				
	(2.59)				
CTC Payment Period × Lower Income		4.88			
		(2.94)			
CTC Payment Period × Higher Income		0.11			
		(2.77)			
CTC Payment Period × Female			4.95		
			(3.01)		
CTC Payment Period × Male			0.32		
			(2.80)		
CTC Payment Period × Higher Educ.				1.09	
				(2.88)	
CTC Payment Period × Lower Educ.				3.55	
				(2.91)	
CTC Payment Period × Unmarried					4.13
					(3.65)
CTC Payment Period × Married					1.78
					(2.65)
Observations	6,171	6,171	6,171	6,171	6,171
Eq. Effects P-Value	–	0.047	0.077	0.343	0.460
Full Controls	X	X	X	X	X

Notes: University of Michigan's Consumer Sentiment Survey restricted to April 2021–February 2022 to capture the introduction of the expanded CTC payments, but also to exclude the March EIP and the spring 2022 expiration of the credit. CTC Payment Period starts in July 2021 and runs through February 2022 when most households received the second half of the expanded CTC as a large tax refund. Capturing the introduction of the CTC is noisy because there are only a few months between the March EIP and the July start of the CTC payments, so to increase statistical power we run a simple binary DD and pool all parents together. Point estimates are positive and consistent with the expansion boosting sentiment, but statistically weaker than the expiration effects—consistent with asymmetric responses to gains versus losses.

Appendix A. Michigan Survey Question Wording

The following is the exact wording of all 19 questions in the University of Michigan's Consumer Sentiment Survey that we consider.

Six questions are about personal finances: (1) "Now thinking back 5 years, would you say you (and your family living there) are better off or worse off financially now than you were 5 years ago?" (2) "Looking ahead, do you think that five years from now you (and your family living there) will be better off financially, or worse off, or just about the same as now?" (3) "During the next 12 months, do you expect your total (family) income to be higher or lower than during the past year?" (4) "During the next year or two, do you expect that your (family) income will go up more than prices will go up, about the same, or less than prices will go up?" (5) "What do you think the chances are that your (family) income will increase by more than the rate of inflation during the next five years or so?" and (6) "What do you think is the percent chance that your income in the next twelve months will be higher than your income in the past twelve months?"

Six more questions are about general economic conditions: (7) "Would you say that business conditions in the country as a whole are better now than they were a year ago, worse, or about the same?" (8) "Looking ahead, do you think that a year from now business conditions in the country as a whole will be better, worse, or about the same as now?" (9) "Have you heard of any recent changes in business conditions?" (10) "During the next 12 months, do you expect that unemployment in the country as a whole will increase, decrease, or stay about the same?" (11) "What do you think is the percent chance that you will lose your job during the next five years?" and (12) "Would you say the government's economic policies are good, bad, or have you not heard enough about them to say?"

Seven more questions are about buying conditions and future retirement expectations: (13) "Generally speaking, do you think now is a good time or a bad time to buy a house?" (14) "Generally speaking, do you think now is a good time or a bad time to sell a house?" (15) "Generally speaking, do you think now is a good time or a bad time to buy a car?" (16) "What do you think is the percent chance that the value of your investments

will increase during the next year?" (17) "During the next 12 months, do you expect that interest rates for borrowing money will go up, go down, or stay about the same?" (18) "What do you think is the percent chance that you will receive Social Security benefits when you retire?" and (19) "What do you think is the percent chance that you will have a financially comfortable retirement?"