

Stimulus Checks: True-Up and Safe Harbor Costs

David Splinter
Joint Committee on Taxation

January 5, 2023

Abstract

Stimulus checks were sent in response to recent U.S. recessions. These checks grew from about \$40 billion in the 2001 recession to \$800 billion in the Covid era. Prior studies, however, only account for advance payments and ignore subsequent true-up payments, as well as safe harbors that prevent stimulus repayment. Using population-level tax data, I estimate true-up and safe harbor costs and decompose them by reasons, such as changes in income or the number of children. True ups and safe harbors are costly. For the three rounds of Covid-era stimulus, true ups and safe harbors cost more than \$130 billion.

Keywords: stimulus checks, advance tax credits, tax credits, true ups, safe harbors, Covid-19, income bunching

JEL: H12, H20, H50, J68

For helpful comments, I thank Tom Barthold, William Boning, Jim Cilke, Tim Dowd, Lucas Goodman, Laura Kawano, Jeff Larrimore, Bert Lue, Elaine Maag, Andrew Whitten, Derek Wu, and Lin Xu. This paper embodies work undertaken for the staff of the Joint Committee on Taxation, but as members of both parties and both houses of Congress comprise the Joint Committee on Taxation, this work should not be construed to represent the position of any member of the Committee.

Stimulus checks were major fiscal responses to the last three U.S. recessions. These payments increased aggregate demand and mitigated household income losses. In 2001 and 2008, households spent about two-thirds of stimulus checks within three months (Johnson, Parker, and Souleles 2006; Parker et al. 2013). During the Covid recession, stimulus was less effective at stimulating demand (Baker et al. 2020; Chetty et al. 2022; Parker et al. forthcoming), though it lowered poverty rates and stabilized incomes (Fox and Burns 2021; Larrimore, Mortenson, and Splinter 2022a). To quickly distribute payments, these checks are structured as advance tax credits. While advance tax credits allow for fast payments, they have hidden costs from true ups and safe harbors.

These costs arise from changing circumstances creating gaps between initial check amounts based on prior-year information and final tax credit amounts based on current-year information. For example, declines in income can cause additional *true-up payments* on current-year tax returns. Alternatively, increases in income can cause stimulus checks to be clawed back and repaid. *Safe harbors*, however, prevent these potential check repayments. These safe harbors largely benefit higher-income individuals, implying they weaken distributional targeting and are an expensive way to stimulate demand.

Prior stimulus research studied how stimulus checks affected consumption but neglected true-up and safe harbor payments. Using population-level U.S. tax data, this paper provides estimates of the full costs of historical stimulus check policies since 2001 and the first estimates of safe harbor costs. Together, true-up and safe harbor costs are nearly one fifth of stimulus check amounts. For the three rounds of Covid-era stimulus checks, true ups and safe harbors cost more than \$130 billion. Therefore, while true ups promote equity and safe harbors may support aggregate demand, both are costly. These findings can inform future stimulus policy, as well as other proposed advance tax credits.

Advance tax credits have captured the interest of U.S. policymakers, especially with the introduction of advance child tax credits. While this paper focuses on stimulus checks, true-up and safe harbor costs can result from other advance tax credits, such as the health insurance premium tax credit (PTC). Whereas stimulus safe harbors usually benefit those with higher incomes, PTC safe harbors only apply to those with relatively low incomes, which significantly lowers overall credit costs.¹

Previously, advance tax credits were also available for earned income and child tax credits. Congress repealed the advance earned income tax credit in 2010 due to high noncompliance and low take-up rates of only 3 percent of eligible recipients. Low take-up rates resulted from high turnover among the eligible population and fears about possible repayments upon tax filing, as there were no safe harbors (Government Accountability Office 2007; Dowd and Horowitz 2011).

¹ The PTC phases out for incomes between 150 and 400 percent of poverty, although this income limitation was temporarily removed in tax year 2020. In tax processing year 2020 (mostly tax year 2019), excess PTC repayments not protected by safe harbors totaled \$4.2 billion, or 15 percent of the advance PTC credits reported on Form 8962 (www.irs.gov/pub/irs-pdf/p4801.pdf).

Child tax credits were temporarily advanced in 2021. Collyer et al. (2022) presented preliminary evidence of increased spending on children’s clothing and childcare from these advance child tax credits. Like the PTC, safe harbors of advance child tax credits had limitations—credit repayments could apply to current-year filers with more income or fewer qualifying children than in prior years. Safe harbors for advance child tax credits were therefore more restrictive than for stimulus checks, which had neither of these limitations.

True-up and safe harbor costs are muted to the degree that early information corresponds to end-of-year information. Maag et al. (2022) estimated that about 80 percent of tax units had earned income and child tax credits that were well-predicted with first-quarter information, i.e., within 10 percent of credit amounts based on end-of-year information. This is consistent with this paper’s findings that about 85 percent of recent stimulus checks were well-predicted (within \$100) with prior-year information, although a much smaller share among those with incomes just above phase-out thresholds.

This paper provides background on how stimulus policy has evolved, including the full costs of stimulus programs, and a discussion of prior research. I then decompose true-up and safe harbor costs by causes, such changes in income or number of children. Changes in income explain much of these costs. Next, I show stimulus payments are progressive while safe harbors are regressive. Finally, I present evidence of a behavioral response to stimulus payments—bunching of reported incomes at a phase-out threshold.

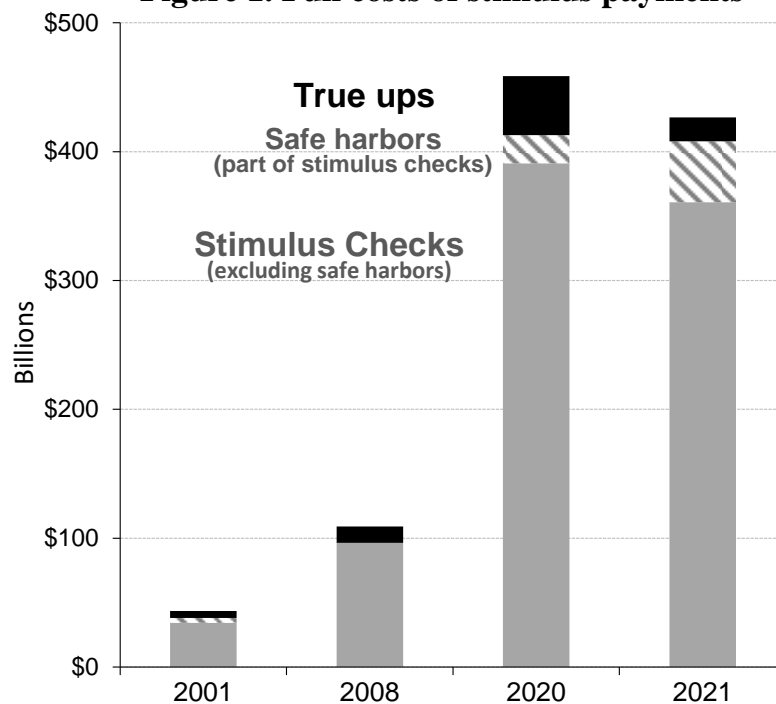
1. Stimulus Policy Background

Stimulus checks in 2001, 2008, 2020, and 2021 were all advance tax credits—early payments of rate reduction credits and recovery rebate credits (RRCs). Whereas stimulus check amounts are determined by the IRS using earlier-year information, RRCs are calculated by tax return filers using current-year information. If the advance portion of the tax credit (i.e., stimulus check) is less than the RRC, then an additional true up is paid.² This true up is often based on changes in circumstances. For example, when tax filers have additional children or less income than in the earlier-year information used to determine stimulus check amounts, they can sometimes receive true-up payments on their tax return. In contrast, if the advance tax credit is more than the RRC, then a taxpayer may have to repay some or all of it—although safe harbors prevent repayments for stimulus checks. Conventional credits are based only on current-year information and have no need for the true ups or safe harbors associated with advance tax credits. All stimulus policies, however, allowed for true-up payments and had safe harbors preventing the repayment of any excess advance credits.³

² This paper refers to the full stimulus tax credit (stimulus checks and potential true ups) as the RRC, following Internal Revenue Code section 6428B. In contrast, recent tax forms refer to only true-up amounts as the RRC, although this excludes stimulus checks (i.e., the advance portion of the full stimulus tax credit).

³ With true ups and safe harbors, the full cost of an advance tax credit is the *greater* of the advance credit based on prior-year information and the current-year credit. Without true ups or safe harbors, it is the *lesser* of these two.

Figure 1. Full costs of stimulus payments



Notes: Safe harbor costs are included in stimulus check amounts but increase total costs by preventing the repayment of any excess payments relative to current-year circumstances. 2020 includes all first-round and second-round Covid-era stimulus checks and true ups. 2008 safe harbors are not shown due to data limitations. *Source:* Author’s calculations using tax data.

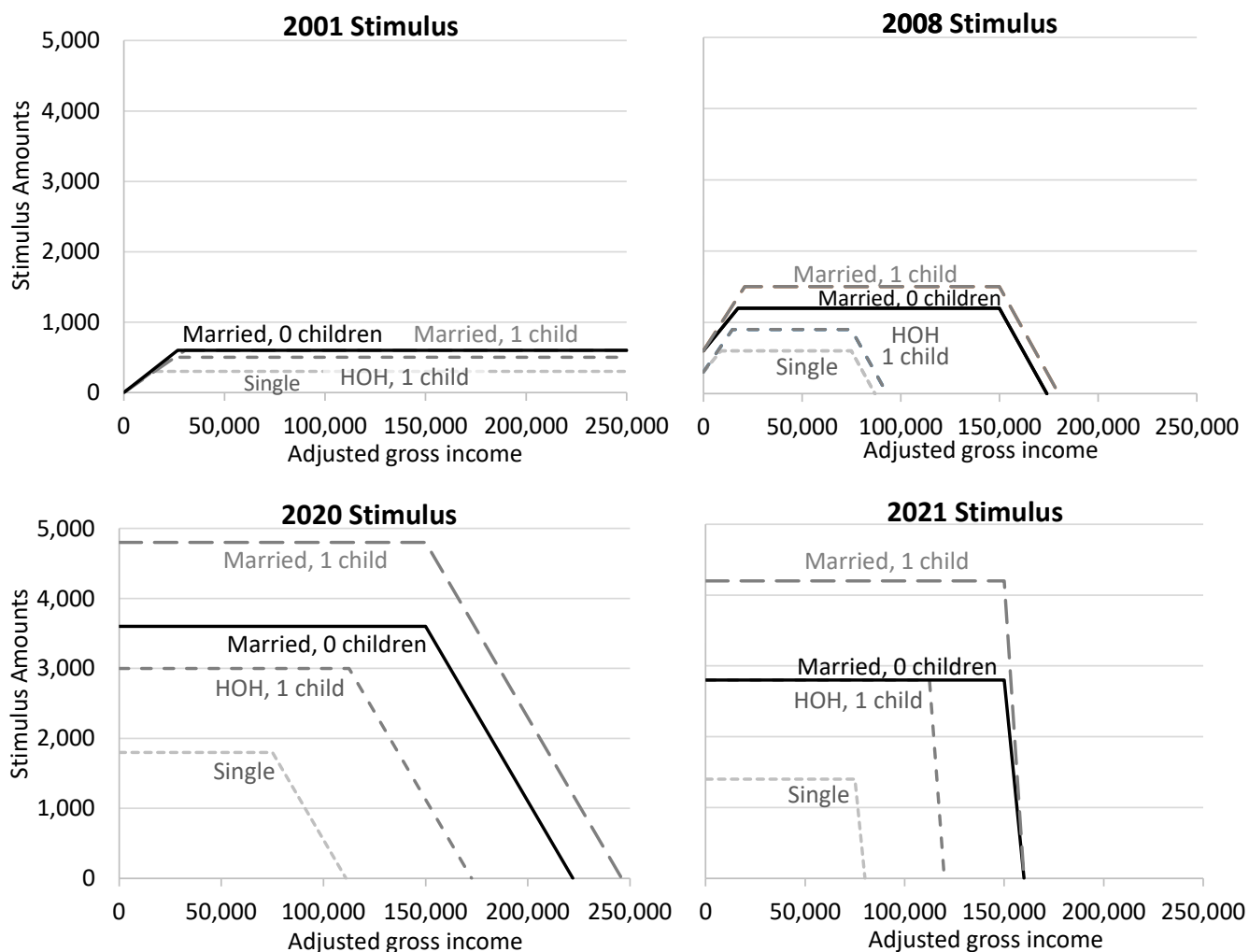
Figure 1 presents an initial view of full stimulus costs. In 2001, stimulus checks cost \$38 billion and true ups cost an additional \$5 billion. In 2008, stimulus checks cost \$96 billion and true ups cost \$13 billion. In 2020, stimulus checks (including the first and second rounds) cost \$413 billion and true ups cost \$46 billion. In 2021, stimulus checks cost \$408 billion and true ups cost \$19 billion. The recent decline in true-up costs is because they result from decreases in nominal income, which were more prevalent in the 2020 recession than the 2021 recovery. In contrast, safe harbor costs were more than twice as large in the 2021 recovery, as they mostly result from income increases.

A. Historical Stimulus Policies

Over the past three recessions, stimulus payments per tax filing unit have grown substantially, as seen in Figure 2. The 2001 stimulus checks were advance reductions in tax liabilities. Many tax filing units have no tax liability and therefore a stimulus check of \$300 per adult was received by only about two-thirds of tax units.⁴ The 2008 payments maximum amounts were usually \$600 per adult and \$300 per child, although only up to \$300 per adult was refundable (i.e., payments in excess of tax liabilities) and a taxpayer needed to have at least

⁴ Heads of household (unmarried filers with dependents) often received a stimulus check of \$500. The 2001 rate reduction tax credit lowered the tax rate from 10 to 15 percent for the bottom tax bracket: the first \$6,000 of taxable income for single filers, \$10,000 for heads of household, and \$12,000 for joint filers. Most advance stimulus checks were sent between July and October of 2001 (Congressional Research Service 2008).

Figure 2. Stimulus payments by income and filing type



Notes: 2020 includes all first-round and second-round stimulus. Estimates assume all individuals have Social Security numbers and that the tax unit claims the standard deduction for 2001 and 2008 stimulus.
Source: Author's calculations.

\$3,000 of earned income plus retirement income or a positive tax liability (Joint Committee on Taxation 2008; Parker et al. 2013). Relative to 2001, these 2008 expansions nearly tripled total stimulus checks from \$38 billion to \$96 billion.

The 2020 payments include both the first and second rounds of stimulus checks, or Economic Impact Payments, even if paid in early 2021. Most individuals received first-round checks of \$1,200 per filer and \$500 per child and second-round checks of \$600 per filer or child, for a total of \$1,800 per filer and \$1,100 per child. The 2021 third-round checks were \$1,400 for most filers and children. Given the similar average per-person amounts in 2020 and 2021, total stimulus checks were also similar at \$413 billion and \$408 billion (Treasury Inspector General for Tax Administration 2022a, 2022b).⁵

⁵ When adjusting for inflation with the PCE index, real stimulus check amounts for 2001, 2008, 2020, and 2021 were: \$55, \$118, \$429, and \$408 billion. Gelman and Stephens (2022) discuss stimulus checks sent in 1975.

The population eligible for stimulus checks has also expanded over time. In 2001, only those who filed tax returns and had positive tax liabilities were eligible. In 2008, eligibility was extended by making the stimulus partially refundable, although still only to filers. By 2020, stimulus was fully refundable. Additionally, non-filers became eligible and the IRS relied on millions of addresses from other agencies and information from an online portal to distribute stimulus checks to this expanded population. This mitigated the need for many low-income individuals to file a tax return just to receive a stimulus payment.

Stimulus checks have been favored in recent economic downturns because they can be issued immediately to a broad population.⁶ Alternatively, policymakers could provide immediate relief through reduced income tax withholding, as done with the 2009 and 2010 making work pay tax credit (Boning 2018).⁷ Income tax withholding changes, however, are less salient than checks and provide no relief to the large share of adults without withholding (Maag and Hammond 2021). Perhaps due to the latter limitation, the making work pay tax credit was effectively replaced with a temporary payroll tax rate reduction that provided immediate relief to all workers regardless of income tax burdens.

B. Stimulus Phase Outs and Limitations

Stimulus payments resemble transfers issued through the tax system. However, they are not unconditional cash transfers. The per-person dollar amounts described above ignore how income phase outs and other limitations reduce stimulus payments. These limitations are based on income and other characteristics that change over time and therefore are a major source of true-up and safe harbor costs.

Income phase outs are seen in Figure 2. While the 2001 stimulus had no income limitation, the 2008, 2020, and 2021 stimulus payments were subject to income phase outs starting at \$150,000 of adjusted gross income for married individuals filing jointly and at \$75,000 otherwise (\$112,500 for heads of household in 2020 and 2021). In real terms, between 2008 and 2021 the married threshold fell from \$183,700 to \$150,000. The phase-out rate above these thresholds was 5 percent for the 2008 and both 2020 stimulus payments. The 2021 stimulus, or third-round checks, phased out proportionally for incomes between \$75,000 and \$80,000 for single filers, between \$112,500 and \$120,000 for heads of household, and between \$150,000 and \$160,000 for married filers. Consequently, the 2021 credits phased out at much higher rates than earlier credits. For example, a married couple with one child had a second-round 2020 credit of \$1,800 (\$600 for three people) fully phased out at an income of \$186,000, while a 2021 credit of \$4,200 (\$1,400 for three people) fully phased out at an income of only \$160,000. In this example, the earlier 5 percent phase-out rate

⁶ Most Covid-era stimulus payments were electronic deposits. See IRS 2021 Data Book: www.irs.gov/pub/irs-pdf/p55b.pdf. For the timing of first-round payments by tax filing status, see Murphy (2020).

⁷ In 2009, stimulus checks of \$250 were sent to individuals receiving Social Security benefits, SSI, veterans' disability, or survivorship payments as they usually did not qualify for making work pay tax credits (Boning 2018).

increased to a 42 percent phase-out rate. Even for single filers, phase-out rates increased from 5 percent to 28 percent.

In addition to income phase outs, stimulus payments had other limitations. Stimulus was unavailable to non-resident aliens or dependent filers (although the latter could qualify on 2001 tax returns).⁸ Dependent filers are individuals who filed their own tax return but were claimed as a dependent of another filer who provided over half of their resources. Making dependent filers ineligible for stimulus helps prevent double payments for these individuals (e.g., to both dependents and their parents), but financially prioritizes parents over semi-independent children. Children must have been “qualifying” to count towards the 2008 and 2020 stimulus—they needed to be younger than 17 years old, have a valid Social Security Number (SSN) or adoption identification number, and meet the other requirements to be eligible for the child tax credit. The 2021 stimulus was available to nearly all dependents with SSNs or adoption numbers, regardless of age. With some exceptions for members of the Armed Forces, adults also needed to provide SSNs to be eligible for stimulus.

2. Prior Studies on Stimulus Checks

Stimulus checks in the last three recessions have often supported aggregate demand and offset household income losses. Research on the 2001 and 2008 stimulus checks focused on demand effects. In the short term, the 2001 stimulus checks were mostly saved or used to pay down debt (Shapiro and Slemrod 2003). After at least three months, about two-thirds of these checks were spent (Johnson, Parker, and Souleles 2006). For the 2008 stimulus checks, 50 to 90 percent were spent within three months of receipt (Parker et al. 2013), and responses were largest among low-income and low-wealth households (Broda and Parker 2014). Using a quantitative model to control for differences in the recessions and policies, Kaplan and Violante (2014) estimated that the 2008 consumption response was about two-thirds the 2001 response.

Research on Covid-era stimulus checks also considered effects on spending and saving. Compared to prior recessions, less of the first Covid stimulus was spent on durables or services in the three months after receipt and more went towards paying off debt (Parker et al. 2021). Given the nature of the pandemic, these stimulus checks were less effective at stimulating aggregate demand during Covid than in prior recessions (Baker et al. 2020; Chetty et al. 2022). The third Covid stimulus payments had almost no effect on short-term spending—likely because they were distributed during an economic recovery with high household liquidity (Parker et al. forthcoming). Feldman and Heffetz (2022) discuss international experiences and additional U.S. studies are reviewed in Gelman and Stephens (2022) and Amato and Yannelis (forthcoming). Note that these studies often identified spending responses based on stimulus checks being received on specific dates. This identification approach has not been applied to

⁸ The U.S. Treasury generally provides funds stimulus checks directly to territorial governments, who disperse the checks. Hence, stimulus information for territorial residents is usually not in IRS data.

true ups, which are received (often with other tax refunds) when tax returns are filed throughout the year.⁹

The Covid recession stimulus checks also lowered poverty rates, stabilized incomes, and increased bank account balances. The 2020 stimulus checks moved 11.7 million individuals out of poverty based on the supplemental poverty measure (Fox and Burns 2021). Stimulus lowered the share of bottom-quintile adults with large declines in income by one third in 2020 and similarly offset large earnings declines in 2021 (Larrimore, Mortenson, and Splinter 2022a, 2022b). By the end of 2021, low-income bank account balances were about 65 percent higher than before the recession (Greig, Deadman, and Sonthalia 2022).

3. Data and Calculations

This paper uses population-level IRS tax data. These data include the universe of stimulus check payments and tax returns. Tax return data include the information used by the IRS to determine stimulus check eligibility and amounts (adjusted gross income, number of children and dependents, SSN statuses, etc.) as well as actual true-up payments. As these data are observed for all relevant years, panel-based changes over time can be observed, such as individual-level income declines that can result in true-up payments.

In this study, stimulus payment estimates are at the individual filer level, meaning spouses filing joint returns are two separate observations. This follows IRS guidelines that evenly split stimulus payments between jointly filing spouses to allow for individual-level reconciliation in the case of filing status changes, such as from marriages or divorces. These data are continuously updated by the IRS. Data were accessed on December 20, 2022, when the 2021 tax return data were still incomplete due to processing and late filing. Therefore, 2021 estimates are scaled up by 4 percent based on the ratio of individuals on 2020 tax returns to those currently available on 2021 returns.¹⁰

With current-year tax return information, I calculate the total stimulus credits for which tax filers are eligible. These *estimated full RRCs* account for both stimulus checks and potential true-up credits and are based on current-year income (adjusted gross income) or tax burdens, filing status, if one was claimed as a dependent on another return, the number of qualifying children or dependents, mailing address state to proxy for non-residents, and the SSN status of all individuals. Most tax filers receive correct true-up payments. That is, the difference between their estimated full RRC and stimulus checks equals their true-up payment.¹¹ In some cases, the estimated full RRC is larger than total stimulus received

⁹ Aladangady et al. (forthcoming) used a change in tax refund timing to estimate that about a quarter of earned income tax credits (received after filing tax returns) were spent within two weeks. Gelman et al. (2022) discussed rational models of over-withholding of taxes and marginal propensities to consume from resulting tax refunds.

¹⁰ Alternatively, scaling by the number of tax returns in 2020 would result in a scaling up of 5 percent.

¹¹ True ups are the computer-generated amounts in IRS data, which correctly deduct stimulus check amounts that are often not accounted for by tax filers (e.g., because second-round payments were received after returns were prepared), but do not increase taxpayer-claimed amounts, leaving some with unclaimed true ups. The Treasury Inspector General

(checks and true ups) and these are considered unclaimed credits.¹² In other cases, the estimated full RRC is less than stimulus checks received, which represents repayments that would have been due without hold harmless provisions and are considered safe harbor costs.

To explain the reasons for true-up and safe harbor costs, filers are linked to their tax returns for two prior years (one prior year for 2008). Information for earlier years generally includes the variables listed above. Comparing earlier-year and current-year characteristics indicates the causes of true-up or safe harbor costs. To simplify the decomposition, and due to these costs often resulting from a single change, each filer's entire true-up or safe harbor cost is assigned to a single explanation based on a sequential order. For example, over 90 percent of 2020 true-up costs were due to a single identified reason. For true-up reasons, the first of these that apply is selected: (1) receiving no stimulus checks (either 2020 check) and being an earlier-year non-filer or non-resident filer; (2) changing filing status (and usually no increase in the number of effective children or dependents) to account for marriages and divorces as well as ineligible prior-year dependent filers becoming eligible current-year filers; (3) claiming more effective children or dependents; and (4) reporting lower income or a tax burden that became positive for 2001 and 2008 credits.¹³ Safe harbor reasons are: (1) changing filing status and no decrease in the number of effective children or dependents; (2) claiming fewer effective children or dependents; and (3) reporting higher income. If none of these apply then the reason is listed as not identified.

Note that by following all filers individually, as compared to only following the primary filer of tax returns, changes in filing status can be more accurately captured.¹⁴ For example, if a couple received stimulus checks based on a prior-year married filing jointly return and then divorced, the low-earning spouse could receive a true up and the high-earning spouse be protected with a safe harbor. The analysis of true ups and safe harbors only considers individuals filing a tax return in the current year. This includes some prior-year non-filers but excludes all current-year non-filers, as they receive no true ups and the characteristics needed to estimate full RRC amounts are unobserved. Since 2020, most non-filers received stimulus checks and have no need to subsequently file a tax return to receive stimulus.

of Tax Administration (2022b) estimated that 2020 true-up payments were correctly calculated by the IRS for 99.3 percent of tax returns and potentially improper payments represented about 2 percent of true ups, where about half were due to receipt by someone potentially the dependent of another taxpayer.

¹² Treasury Inspector General of Tax Administration (2022b) estimated that “approximately 3.1 million individuals eligible for the RRC [i.e., true up] based on their Tax Year 2020 return...did not claim the credit.” (p. 13)

¹³ The effective number of children or dependents is the number claimed but divided by two for joint filers. This controls for filing status changes, such as divorces.

¹⁴ In effect, following individuals implements the corrections in Larrimore, Mortenson, and Splinter (2016) to the standard tax return panel selection based only on following primary filers (the first filer listed on a tax return), which has a gender bias (Dowd and Horowitz, 2011).

4. True-Up and Safe Harbor Costs

Table 1 shows estimated costs of stimulus checks, true ups, and safe harbors. Panel A shows that the size of stimulus checks increased dramatically, from \$38 billion in 2001 to more than \$400 billion in both 2020 and 2021. True-up costs increased from about \$5 billion in 2001 to \$46 billion in 2020. Safe harbor costs increased from about \$4 billion in 2001 to \$47 billion in 2021. Total Covid-era stimulus costs were \$885 billion, of which true-up and safe harbor costs were \$133 billion.¹⁵

While total stimulus checks were similar in the two years of Covid stimulus, true-up costs were more than twice as large in 2020. This is because true ups result from income declines, making them larger in economic recessions. Conversely, safe harbor costs were more than twice as large in 2021. This is because safe harbors result from nominal income increases, making safe harbor costs larger in economic expansions and inflationary periods.

Panel B shows true-up and safe harbor costs as a share of stimulus checks. Across the four years of stimulus checks, true-up costs averaged 11 percent and safe harbor costs averaged 9 percent. The dollar-weighted averages were 9 and 8 percent. Hence, the total cost of true ups and safe harbors for stimulus checks has been nearly one fifth the cost of stimulus checks.

Many reasons caused true-up payments on tax returns, but more than half of true ups went to individuals with income declines or not receiving stimulus checks. Panel C shows that an average of 35 percent of true-up costs resulted from income declines. This is not surprising, given that stimulus payments are usually made during downturns and the consistently high share of adults with large wage and income declines, even in economic expansions (Congressional Budget Office 2008; Larrimore, Mortenson, and Splinter 2016). In addition, an average of 25 percent of true-up costs resulted from individuals not receiving stimulus checks who were non-filers or non-residents in prior years. The IRS may have not issued stimulus checks to these individuals for various reasons, including lacking the information needed to send payments. True ups were also paid to individuals changing tax filing status, including those who were dependent filers the prior year (7 percent), or claiming more children or dependents than in earlier years (14 percent). The latter results in part from newborns being unobserved in earlier-year information and only first observed by the IRS when claimed on the tax returns claiming true ups.¹⁶

¹⁵ The estimates in this paper are based on data processed more than one year later than in Treasury Inspector General for Tax Administration (2022b), which explains the larger true-up costs. Note that Stimulus estimates by the staff of the Joint Committee on Taxation include both true-up and safe harbor costs (although neither are broken out) and are forecasted estimates, whereas this paper relies on historical data.

¹⁶ The two 2020 stimulus checks likely had different reasons for true ups. Most second-round 2020 checks were sent in late December and therefore were sometimes based on more up-to-date information (i.e., 2019 tax returns), than the first-round 2020 stimulus checks. However, 2020 true ups combine both checks, complicating a separate analysis of first-round and second-round checks. The 2020 true ups can also include the effects from a change in policy that allowed joint returns with only one valid SSN to newly qualify for first-round credits.

Table 1. Stimulus checks: Decomposition of true-up and safe harbor costs

	2001	2008	2020	2021	Average
<i>Panel A: Amounts (\$billions)</i>					
Stimulus checks	38.0	96.3	412.9	408.0	---
True-up cost (additional)	5.5	12.7	45.7	18.6	---
Safe harbor (in stim. checks)	3.6	---	21.9	47.3	---
<i>Panel B: Cost as share of stimulus checks (%)</i>					
True-up cost	14	13	11	5	11
Safe harbor cost	9	---	5	12	9
Total	24	---	16	16	20
<i>Panel C: True-up cost sources (%)</i>					
Prior non-filer & no check	16	28	28	27	25
Status change	2	3	12	13	7
More dependents/children	14	8	16	16	14
Income decline (tax incr.)	51	33	29	25	35
Not identified	16	28	15	19	19
Total	100	100	100	100	100
<i>Panel D: Safe harbor cost sources (%)</i>					
Status change	---	---	14	8	11
Fewer dependents/children	---	---	25	26	26
Income increase	---	---	60	60	60
Not identified	---	---	2	6	4
Total	---	---	100	100	100

Notes: 2020 includes all first-round and second-round Covid stimulus checks and recovery rebate credits. For 2001 and 2008, income changes also account for tax burden changes and safe harbors are not shown due to data limitations. See text for description of cost sources.

Source: Treasury Inspector General for Taxation and author's calculations using tax data.

Safe harbor costs are mostly caused by income increases. Panel D shows that an average of 60 percent of safe harbor costs were due to higher incomes on current-year tax returns than in earlier years. Remaining safe harbor costs were mostly due to individuals claiming fewer dependents or children than in earlier years. Appendix Figure A1 shows visually how the reasons for true-up and safe harbor costs varied across years.

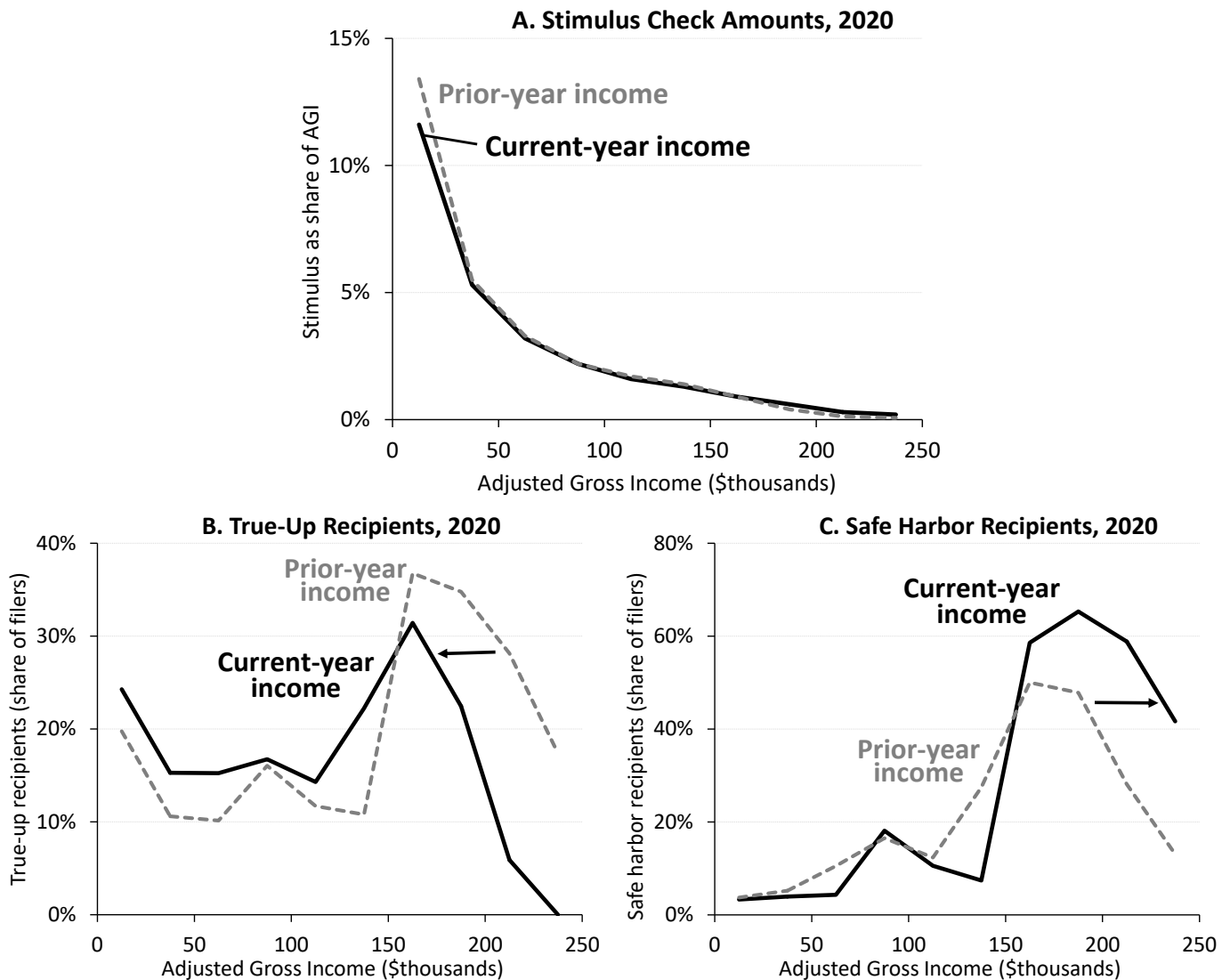
5. Distribution of True-Up and Safe Harbor Costs

Stimulus payments are highly progressive. This mostly results from the flat benefit structure. Figure 3A shows that 2020 stimulus checks, as a share of adjusted gross income, declined as income increased among filers. Stimulus checks averaged 12 percent of income for current-year positive incomes below \$25,000; 6 percent for incomes between \$25,000 and \$50,000; and less than 1 percent for incomes above \$150,000 (the phase-out threshold for married filers).

The progressivity of stimulus payments, however, differs when ranking tax filers by prior-year or current-year income. Stimulus checks were slightly more progressive with the prior-year income on which they were based (Figure 3A). Meanwhile, the distribution of true-up recipients was more progressive with the current-year income on which they were

based (Figure 3B). For true ups, note the shift indicated by the arrow from above to below the married phase-out threshold when moving from prior-year to current-year incomes. This reflects true ups benefitting filers with income decreases, which can be seen as improving distributional targeting. In contrast, safe harbor reciprocity was less progressive with current-year income and overall was regressive (Figure 3C).¹⁷ Here, the arrow indicates that safe harbors benefitted filers with income increases—a weakening of distributional targeting. Relative to 2020, the 2021 stimulus distributions were similar, although the faster income phase outs limited some higher-income true ups and safe harbors (see appendix Figure A2).

Figure 3. Distribution of 2020 stimulus by income



Notes: Estimates are averages within \$25,000 bins of adjusted gross income among resident, non-dependent tax return filers (i.e., excluding non-filers). All panels effectively weight by the number of filers, where Panel A accounts for the tax-unit level checks (two rounds) and the income of both married joint filers.

Source: Author's calculations using tax data.

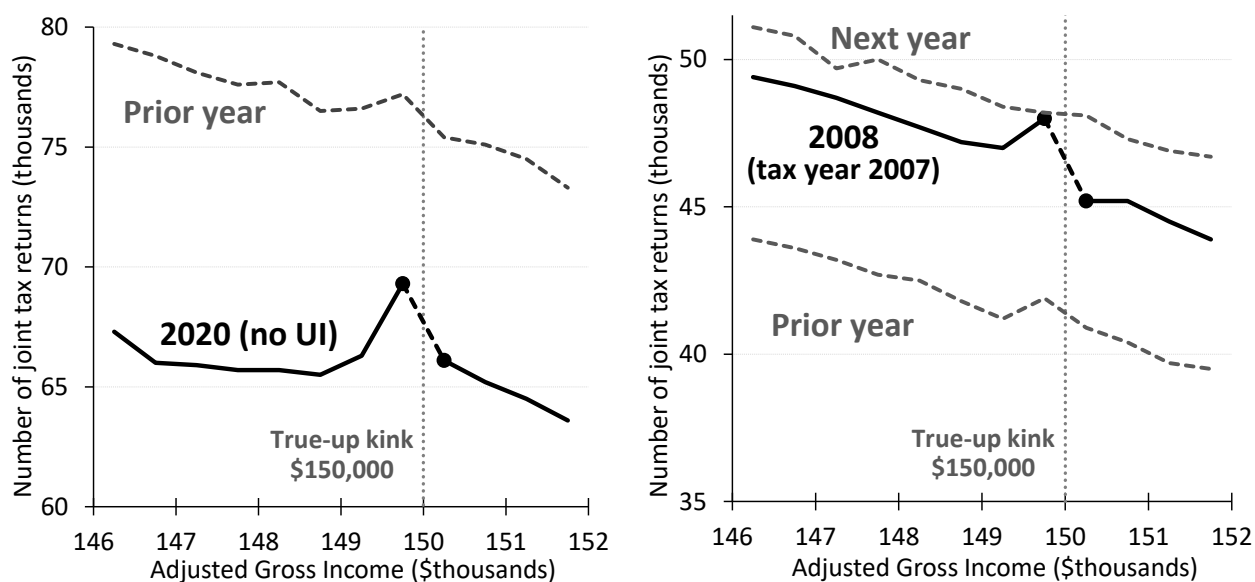
¹⁷ Figures 3B and 3C show reciprocity rates of true ups and safe harbors. As average true-up and safe harbor amounts are similar across income groups, true ups as a share of income are progressive but safe harbors are still regressive.

6. Income Bunching Responses to Stimulus Credit Phase Outs

When stimulus credits are estimated on tax returns, they phase out by income. These phase outs may become salient for some tax filers who respond by underreporting their income to increase stimulus payments. Mortenson and Whitten (2020) provided the most comprehensive estimates of more general “income bunching” effects using population-level tax data. They found that most bunching occurred at the bottom of the income distribution due to kinks in marginal tax rate schedules from earned income and child tax credits. While they observed limited income bunching at high-income kinks. The more recent tax returns considered here suggest high-income bunching in response to stimulus credit phase outs.¹⁸

To present simple evidence of income bunching, Figure 4 shows the number of married filing jointly tax returns by income near the phase-out threshold of \$150,000 in years that determined credit amounts and neighboring years. In 2020, returns with unemployment insurance benefits are dropped because the exclusion of those benefits was based on the same income threshold. The 2020 true ups started phasing out at a 10 percent rate from the combined phase outs of the first and second rounds of payments. This jump in marginal tax rates at the phase-out threshold created a marginal tax rate schedule kink. Bunching effects are clear in the left side of Figure 4. In 2020, the number of returns reporting incomes between \$149,500 and \$150,000 spikes up and then falls dramatically, whereas this is not observed in the prior year without true ups.¹⁹ This bunching, however, implies less than \$2 million of excess stimulus payments—a small share of total stimulus.

Figure 4. Income bunching: Married filing jointly return counts by income



Notes: Number of returns are by \$500 bins of adjusted gross income. In the left side, tax year 2020 excludes returns with unemployment insurance. In the right side, 2008 denotes tax year 2007 because these returns determined stimulus check amounts. Source: Author’s calculations using unaudited tax data.

¹⁸ As with prior studies, this paper uses pre-audit tax returns and therefore cannot determine the degree to which observed bunching is due to noncompliance.

¹⁹ Bunching is not observed at the 10 to 22 percent bracket change for joint returns, suggesting stimulus check policy was more salient or that taxpayers incorrectly believed true ups to completely phase out at the threshold with a notch.

A similar bunching response is observed in the right side of Figure 4 for tax returns filed in 2008. These incomes were usually reported on returns filed just after the stimulus policy had been announced, providing filers an opportunity to misreport income to maximize stimulus checks (which were based on tax year 2007 returns filed in 2008). In addition, an online calculator allowed filers to see how stimulus amounts would change based on reported income, probably increasing the salience of the stimulus phase out.

7. Summary

Advance tax credits have the renewed interest of U.S. policymakers. Stimulus checks provide an example of how advance tax credits can have ignored costs from true ups and safe harbors. These costs arise from taxpayer circumstances changing from the prior-year information used by the IRS to estimate stimulus checks, the advance portion of stimulus tax credits. Reconciliations on current-year tax returns result in significant true-up costs, often due to declines in income that are prevalent during recessions. In addition, safe harbors protect individuals from repaying stimulus checks—usually due to increases in income—and can be more costly in economic expansions. Together, true-up and safe harbor costs are nearly one fifth of stimulus check amounts.

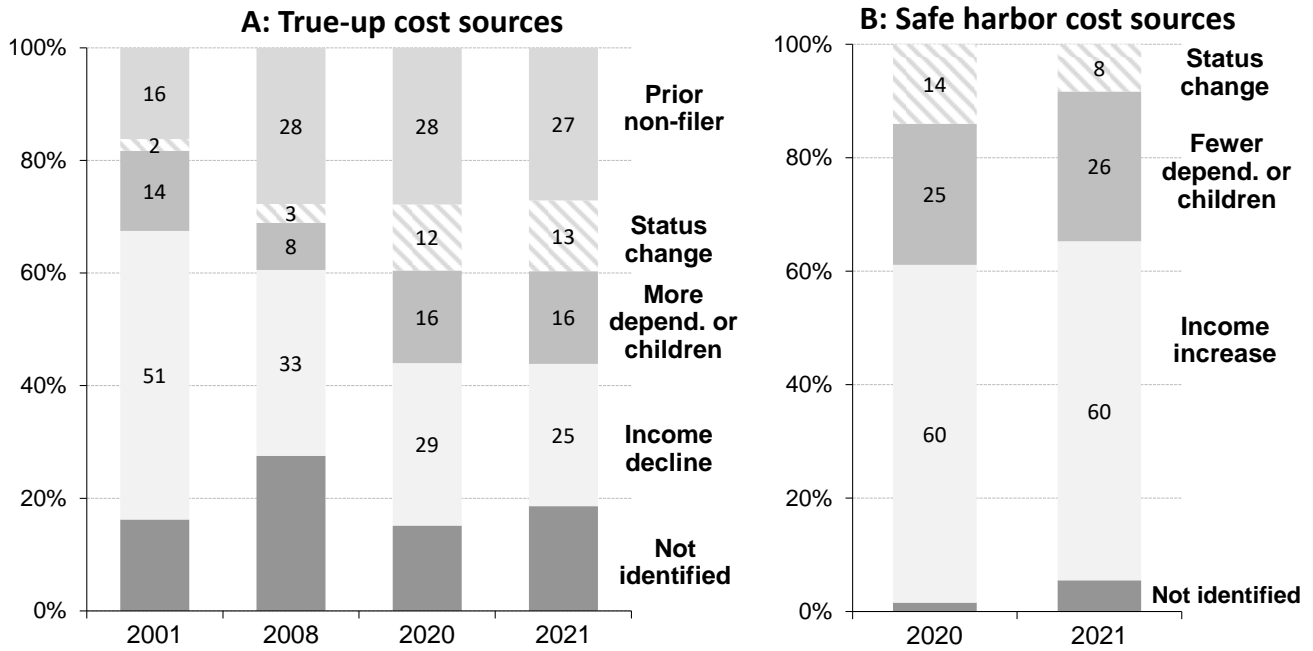
References

- Aladangady, Aditya, Shifrah Aron-Dine, David Cashin, Wendy Dunn, Laura Feiveson, Paul Lengermann, Katherine Richard, and Claudia Sahm. Forthcoming. “[Spending Responses to High-Frequency Shifts in payment Timing: Evidence from the Earned Income Tax Credit.](#)” *American Economic Journal: Economic Policy*.
- Amato, Livia, and Constantine Yannelis. Forthcoming. “[Household Behavior \(Consumption, Credit and Investments\) During the COVID-19 Pandemic.](#)” *Annual Review of Financial Economics*.
- Baker, Scott R, R. A. Farrokhnia, Steffen Meyer, Michaela Pagel, and Constantine Yannelis. 2020. “[Income, Liquidity, and the Consumption Response to the 2020 Economic Stimulus Payments.](#)” NBER Working Paper no. 27097.
- Boning, William C. 2018. “[Paying Taxes Automatically: Behavioral Effects of Withholding Income Tax.](#)” Working paper.
- Broda, Christian, and Jonathan A. Parker. 2014. “[The Economic Stimulus Payments of 2008 and the Aggregate Demand for Consumption.](#)” *Journal of Monetary Economics* 68: S20-S36.
- Chetty, Raj, John N. Friedman, Nathaniel Hendren, Michael Stepner, and the Opportunity Insights Team. 2022. “[The Economic Impacts of COVID-19: Evidence from a New Public Database Built Using Private Sector Data.](#)” NBER Working Paper no. 27431.
- Collyer, Sophie M., Thesia Garner, Neeraj Kaushai, Jiwan Lee, Jake Schild, Jane Waldfogel, Christopher T. Wimer. 2022. “[Effects of the Expanded Child Tax Credit on Household Expenditures during the Interview Survey Reference Period: Preliminary Evidence from the Consumer Expenditure Survey.](#)” BLS Working Paper no. 549.
- Congressional Budget Office, 2008. “[Recent Trends in the Variability of Individual Earnings and Household Income.](#)” CBO Publication no. 2996.
- Congressional Research Service, 2008. “[The Rate Reduction Tax Credit—“The Tax Rebate”—in the Economic Growth and Tax Relief Reconciliation Act of 2001: A Brief Explanation.](#)” CRS Report RS21171.
- Dowd, Tim, and John B. Horowitz. 2011. “Income Mobility and the Earned Income Tax Credit: Short-Term Safety Net or Long-Term Income Support.” *Public Finance Review* 39(5): 619–52.
- Feldman, Naomi, and Ori Heffetz. 2022. “[A Grant to Every Citizen: Survey evidence of the Impact of a Direct Government Payment in Israel.](#)” *National Tax Journal* 75(2): 229–263.
- Fox, Liana E., and Kalee Burns. 2021. “[The Supplemental Poverty Measure: 2020.](#)” U.S. Census Bureau, Current Population Reports P60-275.
- Gelman, Michael, Shachar Kariv, Matthew D. Shapiro, and Dan Silverman. 2022. “[Rational Illiquidity and Consumption: Theory and Evidence from Income Tax Withholding and Refunds.](#)” *American Economic Review* 112(9): 2959–91.
- Gelman, Michael, and Melvin Stephens Jr. 2022. “[Lessons Learned from Economic Impact Payments during COVID-19.](#)” In Edelberg, Wendy, Louise Sheiner, and David Wessel (Eds.), *Recession Remedies*, 91–122.
- Government Accountability Office. 2007. “[Advance Earned Income Tax Credit: Low Use and Small Dollars Paid Impede IRS’s Efforts to Reduce High Noncompliance.](#)” GAO Report GAO-07-1110.
- Greig, Fiona, Erica Deadman, and Tanya Sonthalia. 2022. “Household Pulse: The State of Cash Balances at Year End.” www.jpmmorganchase.com/institute/research/household-income-spending/household-pulse-cash-balances-at-year-end#finding-1

- Johnson, David S., Jonathan A. Parker, and Nicholas S. Souleles. 2006. “[Household Expenditure and the Income Tax Rebates of 2001.](#)” *American Economic Review* 96(5): 1589–1610.
- Joint Committee on Taxation, 2008. “[Technical Explanation of the Revenue Provisions of H.R. 5140, The ‘Economic Stimulus Act Of 2008’ as passed by the House of Representatives and the Senate on February 7, 2008.](#)” Joint Committee on Taxation Report JCX-16-08.
- Kaplan Greg, and Giovanni L. Violante. 2014. “[A Tale of Two Stimulus Payments: 2001 versus 2008.](#)” *American Economic Review* 104(5): 116–121.
- Larrimore, Jeff, Jacob Mortenson, and David Splinter. 2016. “[Income and Earnings Mobility in U.S. Tax Data.](#)” In Federal Reserve Bank of St. Louis and the Board of Governors of the Federal Reserve System (Eds.), *Economic Mobility: Research and Ideas on Strengthening Families, Communities and the Economy*, 481–516.
- Larrimore, Jeff, Jacob Mortenson, and David Splinter. 2022a. “[Income Declines During COVID-19.](#)” *AEA Papers & Proceedings* 112: 340–344.
- Larrimore, Jeff, Jacob Mortenson, and David Splinter. 2022b. “[Earnings Business Cycles: The Covid Recession, Recovery, and Policy Response.](#)” Working paper. <http://dx.doi.org/10.2139/ssrn.4301437>
- Maag, Elaine, and Sam Hammond. 2021. “[Issues in Child Benefit Administration in the United States: Imagining the Next Stage of the Child Tax Credit.](#)” Urban Institute Research Report.
- Maag, Elaine, Elizabeth Peters, Nikhita Airi, and Karen Smith. 2022. “[How Well can Limited Data Predict Annual Tax Credits.](#)” Urban Institute Research Report.
- Mortenson, Jacob A., and Andrew Whitten. 2020. “[Bunching to Maximize Tax Credits: Evidence from Kinks in the US Tax Schedule.](#)” *American Economic Journal: Economic Policy* 12(3): 402–432.
- Murphy, Dan. 2021. “[Economic Impact Payments.](#)” Brookings Institution, Washington, D.C.
- Parker, Jonathan A., Jake Schild, Laura Erhard, and David S. Johnson. 2021. “[Household Spending Responses to the Economic Impact Payments of 2020: Evidence from the Consumer Expenditure Survey.](#)” BLS Working Paper no. 544.
- Parker, Jonathan, Jake Schild, Laura Erhard, and David Johnson. Forthcoming. “[Economic Impact Payments and Household Spending During the Pandemic.](#)” *Brookings Papers on Economic Activity*.
- Parker, Jonathan A., Nicholas S. Souleles, David S. Johnson, and Robert McClelland. 2013. “[Consumer Spending and the Economic Stimulus Payments of 2008.](#)” *American Economic Review* 103(6): 2530–2553.
- Shapiro, Mathew D., and Joel Slemrod. 2003 “[Consumer Response to Tax Rebates.](#)” *American Economic Review* 93(1): 381.
- Treasury Inspector General for Tax Administration. 2022a. “[American Rescue Plan Act: Implementation of Advance Recovery Rebate Credit Payments.](#)” TIGTA Report Number 2022-47-030.
- Treasury Inspector General for Tax Administration. 2022b. “[Processing of Recovery Rebate Credit Claims During the 2021 Filing Season.](#)” TIGTA Report Number 2022-46-032.

APPENDIX

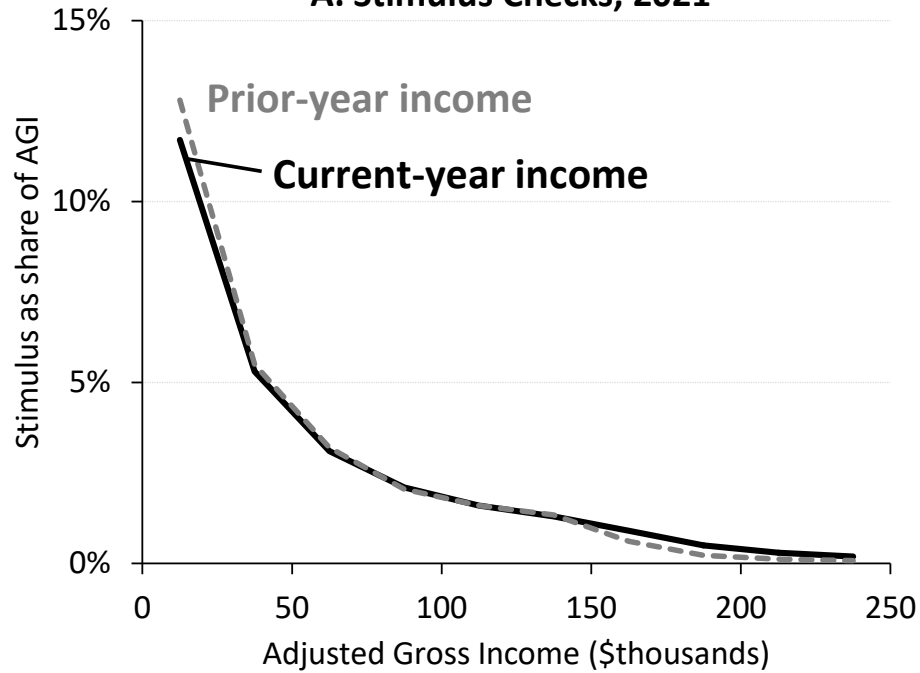
Figure A1. Reasons for true-up and safe harbor costs



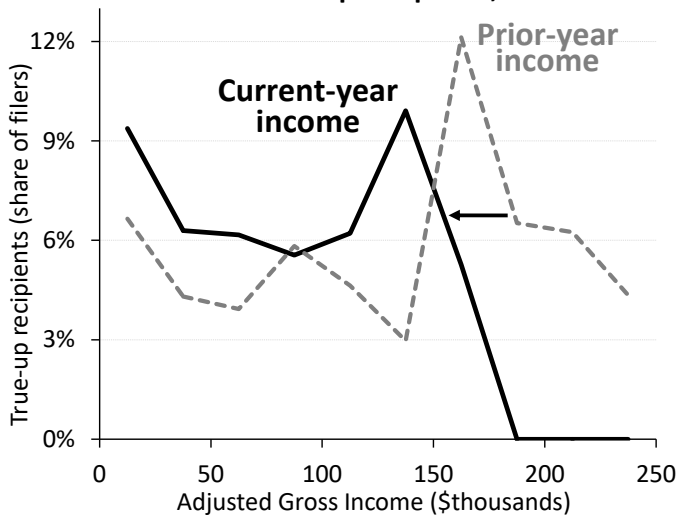
Notes: 2020 includes all first-round and second-round Covid stimulus checks and recovery rebate credits. See text for descriptions of reasons. *Source:* Author's calculations using tax data.

Figure 2A. Distribution of 2021 stimulus by income

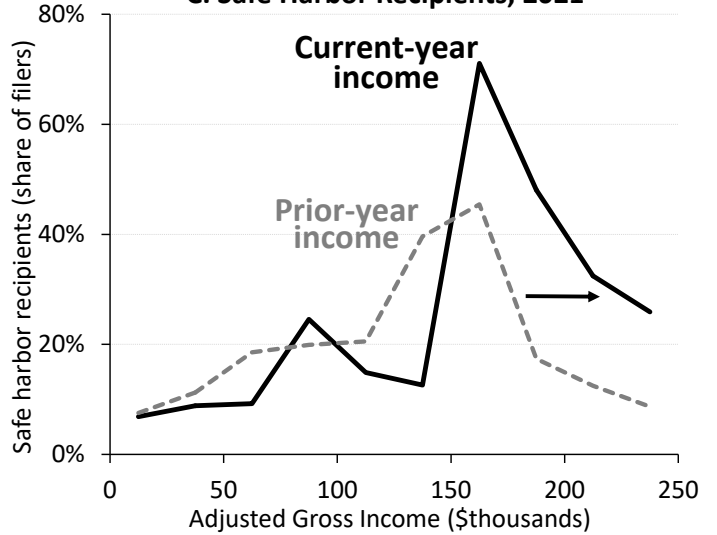
A. Stimulus Checks, 2021



B. True-Up Recipients, 2021



C. Safe Harbor Recipients, 2021



Notes: Estimates are averages within \$25,000 bins of adjusted gross income among resident, non-dependent tax return filers (i.e., excluding non-filers). All panels effectively weight by the number of filers, where Panel A includes the tax-unit level checks and income of both married joint filers. Source: Author's calculations using tax data.