

## STIMULUS CHECKS: TRUE-UP AND SAFE-HARBOR COSTS

David Splinter

*Stimulus checks were sent in response to recent US recessions. These checks grew from about \$40 billion in the 2001 recession to \$800 billion in the COVID era. Prior studies, however, ignored additional stimulus received upon filing tax returns (true-ups) and safe harbors that prevent possible 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, safe harbors, COVID-19, income bunching*

*JEL Codes: H12, H20, H50*

Stimulus checks were major fiscal responses to the last three US 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, 2022b). To quickly distribute payments, stimulus checks are structured as advance tax credits. Although advance tax credits allow for fast payments, they have hidden costs.

These costs arise from individual circumstances changing over time. The Internal Revenue Service (IRS) uses earlier-year information to set stimulus-check amounts for each individual but only observes current-year information after tax returns are filed. This creates gaps between initial stimulus-check amounts and final tax-credit

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Electronically published May 10, 2023

*National Tax Journal*, volume 76, number 2, June 2023.

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amounts. For example, declines in income can cause additional stimulus payments on current-year tax returns, or *true-ups*. Alternatively, increases in income could cause stimulus checks to be clawed back and repaid to the IRS. *Safe harbors*, however, prevent potential check repayments.

Prior research studied how stimulus checks affected consumption but ignored true-ups and safe harbors. Using population-level US tax data, this paper provides estimates of the full costs of stimulus-check policies and the first estimates of safe-harbor costs. The three rounds of COVID-era stimulus cost \$885 billion, of which true-ups and safe harbors cost more than \$130 billion. Safe harbors largely benefit higher-income individuals who had recent income increases, implying they weaken distributional targeting. These findings can inform future policy for stimulus payments and other advance tax credits.

Any advance tax credit may have true-up or safe-harbor costs, although stimulus safe harbors are often more generous than for other tax credits. For example, the advance Earned Income Tax Credit had no safe harbors, which may have contributed to fears of credit repayments and low program take-up (Government Accountability Office, 2007; Jones, 2010). The program ended after 2010. Advance child tax credits, temporarily in effect for 2021, had safe-harbor limitations. Credit repayments could apply to filers with increases in income or fewer children.<sup>1</sup> For health-insurance premium tax credits, partial safe harbors only apply to those with relatively low incomes, which significantly lowers overall credit costs.<sup>2</sup>

True-up and safe-harbor costs can decrease to the degree that early information corresponds with end-of-year information. I estimate that about 85 percent of recent stimulus checks were well predicted (within \$100) by prior-year information. Similarly, Maag et al. (2022) estimated that about 80 percent of tax units had earned income and child tax credits that were well predicted (within 10 percent) by first-quarter information. Therefore, most individuals receive advance tax credits close to final credits. But for some, true-up and safe-harbor costs can be reduced if the IRS receives more up-to-date information throughout the year, such as with online portals.

This paper provides background on how stimulus policy has evolved, including the full costs of stimulus programs since 2001 and a discussion of prior research. I then decompose true-up and safe-harbor costs by causes, such as changes in income or number of children. Changes in income explain much of these costs. Next, I show that stimulus payments are progressive whereas safe harbors are broadly regressive. Finally, I present evidence of a behavioral response to stimulus payments: income bunching at a phaseout threshold.

<sup>1</sup> In contrast, the 2002 advance child tax credit expansions had no repayments due to full safe harbors.

<sup>2</sup> The Premium Tax Credit (PTC) phases out for incomes between 150 and 400 percent of the applicable poverty level, although this limitation was temporarily removed in tax year 2020. Tax year 2019 excess PTC repayments not protected by safe harbors were an estimated \$4.2 billion, about one-tenth of total advance PTC credits (see IRS publication 4801).

## I. 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.<sup>3</sup> This true-up is often based on changes in individual 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 may receive true-up payments on their tax return. In contrast, if the advance portion of a tax credit is more than the current-year credit, then a taxpayer may have to repay some or all of it — although safe harbors prevent repayments for stimulus checks. Conventional tax 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 full true-up payments and had safe harbors preventing the repayment of excess advance credits.<sup>4</sup>

Figure 1 presents an initial view of full stimulus costs. In 2001, stimulus checks (including safe harbors) 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, the first and second rounds of COVID stimulus checks cost \$413 billion, and true-ups cost \$46 billion. In 2021, stimulus checks cost \$408 billion, and true-ups cost \$19 billion.<sup>5</sup> The recent decline in true-up costs is because they result in part from decreases in nominal income, which were more prevalent in the 2020 recession than the 2021 recovery. In contrast, safe harbors mostly result from nominal income increases. Consequently, in the 2021 economic recovery, safe-harbor costs increased from \$22 billion to \$47 billion.

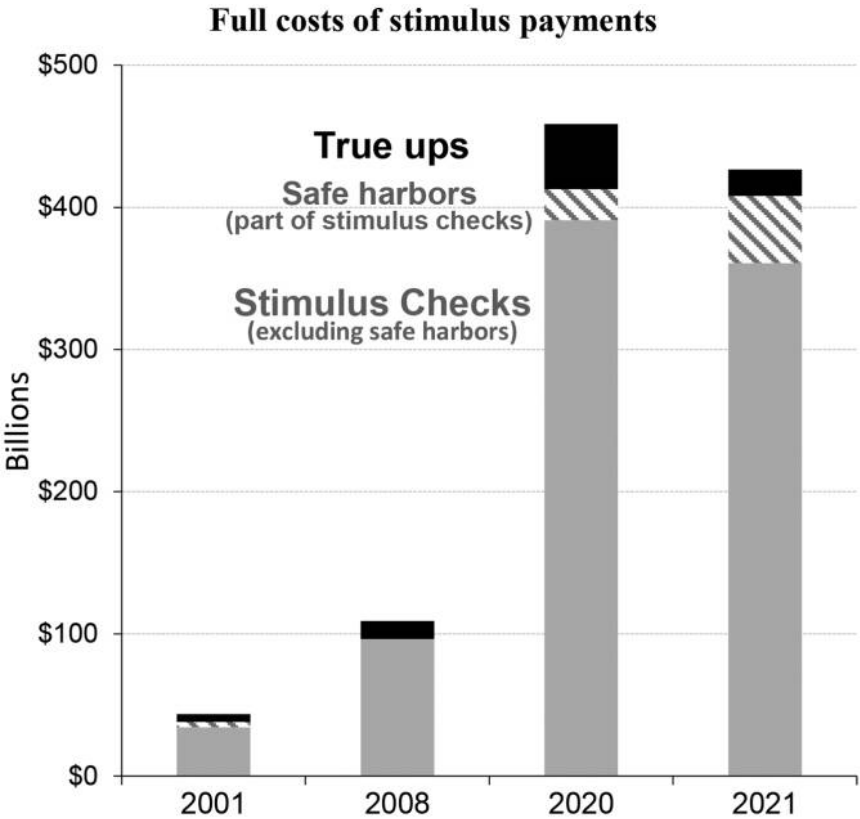
### A. Historical Stimulus Policies

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

<sup>3</sup> 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 true-up amounts only as the RRC, although this excludes stimulus checks (i.e., the advance portion of the full stimulus tax credit).

<sup>4</sup> 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.

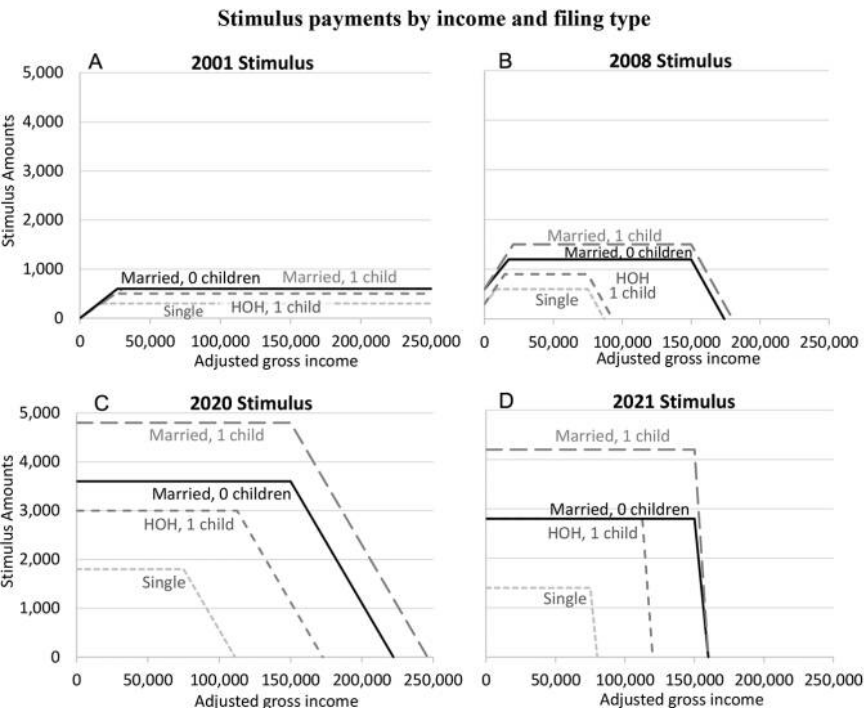
<sup>5</sup> When adjusting for inflation with the Personal Consumption Expenditures index, real stimulus-check amounts for 2001, 2008, 2020, and 2021 were \$55 billion, \$118 billion, \$429 billion, and \$408 billion. Gelman and Stephens (2022) discuss stimulus checks sent in 1975.



**Figure 1.** Full costs of stimulus payments. 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. Data are from Treasury Inspector General for Taxation and author’s calculations using tax data.

stimulus check of \$300 per adult was received by only about two-thirds of tax units.<sup>6</sup> The 2008 stimulus 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 \$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.

<sup>6</sup> 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 2001 (Congressional Research Service, 2008).



**Figure 2.** Stimulus payments by income and filing type. 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. HOH = head of household. Data are author's calculations.

The 2020 stimulus includes both the first and second rounds of COVID 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 stimulus checks were \$1,400 for most filers and dependents. Given the similar average per-person amounts in 2020 and 2021, total stimulus checks were also similar at \$413 billion and \$408 billion.

The population eligible for stimulus checks has expanded over time. In 2001, only those who filed tax returns and had positive tax liabilities were eligible. In 2008, still only filers were eligible, but many previous nonfilers filed tax returns because the credit became partially refundable. By 2020, nonfilers became eligible and the stimulus was fully refundable. The IRS used millions of addresses from other agencies and information from an online portal to distribute stimulus checks to this expanded population. This alleviated the need for low-income individuals to file a tax return just to receive a stimulus payment.

Stimulus checks have been favored in recent economic downturns because the government can immediately issue them to a broad population. In fact, most recent stimulus payments were electronic deposits (Murphy, 2021). Alternatively, policy makers could provide immediate relief through reduced income-tax withholding, which was done with the 2009 and 2010 Making Work Pay tax credit (Boning, 2018).<sup>7</sup> Income-tax withholding changes, however, are less salient than checks and provide no relief to those 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 Phaseouts and Limitations

Stimulus payments resemble transfers issued through the tax system. However, they are not unconditional cash transfers. The per-person dollar amounts described earlier ignore how income phaseouts 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 phaseouts are seen in Figure 2. Although the 2001 stimulus had no income limitation, the 2008, 2020, and 2021 stimulus payments were subject to income phaseouts starting at \$150,000 of adjusted gross income for married individuals filing jointly and starting at \$75,000 otherwise.<sup>8</sup> The phaseout rate above these thresholds was 5 percent for the 2008 and 2020 stimulus. The 2021 stimulus, or third-round COVID 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, and 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 phaseout rate increased to a 42 percent phaseout rate.

In addition to income phaseouts, stimulus payments had other limitations. Stimulus was unavailable to nonresident aliens or dependent filers (although the latter could qualify on 2001 tax returns).<sup>9</sup> Dependent filers are individuals who filed their own tax return but were also claimed as a dependent of another filer who provided

<sup>7</sup> As they usually did not qualify for Making Work Pay tax credits, stimulus checks of \$250 were sent in 2009 to individuals receiving Social Security benefits, Supplemental Security Income, veterans' disability, or survivorship payments (Boning, 2018).

<sup>8</sup> In real terms, between 2008 and 2021 the married threshold fell from \$183,700 to \$150,000. In 2020 and 2021, there was a separate phaseout threshold of \$112,500 for heads of household.

<sup>9</sup> The US Treasury generally provides stimulus funds directly to territorial governments, which disperse the checks. Hence, stimulus information for territorial residents is usually not in IRS data.

more than half of their resources. Ineligibility of dependent filers helps prevent double payments for these individuals (e.g., both to dependents and their parents), but financially prioritizes parents over semi-independent children. Children must have been “qualifying” to count toward 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.

## II. PRIOR STUDIES ON STIMULUS CHECKS

Stimulus checks in the past three recessions have often supported aggregate demand and mitigated 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, 50–90 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 with prior recessions, less of the first COVID stimulus was spent on durables or services in the three months after receipt and more went toward paying off debt (Parker et al., 2021). Given the nature of the pandemic, these stimulus checks were less effective at stimulating aggregate demand than in prior recessions (Baker et al., 2020; Chetty et al., 2022). The third-round 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) discussed international experiences and additional US 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 true-ups, which are received (often with other tax refunds) when tax returns are filed throughout the year.<sup>10</sup>

<sup>10</sup> 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 overwithholding of taxes and marginal propensities to consume from resulting tax refunds.



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 (Larimore, 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).

### III. DATA AND CALCULATIONS

This paper uses the population of IRS tax return records. Tax return data include actual true-up payments and the information used by the IRS to determine stimulus-check eligibility and amounts. As these data are observed for all relevant years, they include panel-based changes over time, such as individual-level income declines that can result in true-up payments. These data are continuously updated by the IRS and were accessed on December 20, 2022. The 2021 tax return data were incomplete due to processing and late filing and are therefore scaled up by 4 percent — the ratio of individuals on 2020 tax returns to those observed on 2021 returns.

With current-year tax return information, I calculate the total stimulus credits for which tax filers were eligible. These “estimated full RRCs” account for both stimulus checks and potential true-up credits and are based on current-year adjusted gross income or tax burdens, filing status, whether one was claimed as a dependent on another return, the number of qualifying children or dependents, mailing address state to proxy for nonresidents, and the SSN status of all individuals. Most tax filers received correct true-up payments. That is, the positive differences between estimated full RRC and stimulus checks equal true-up payments.<sup>11</sup> In some cases, the estimated full RRC is larger than total stimulus received (checks and true-ups), and these excesses are considered unclaimed credits.<sup>12</sup> In other cases, the estimated full RRC is less than the stimulus checks received, which represents repayments that would have been due without hold-harmless provisions and are considered safe-harbor costs.

<sup>11</sup> 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 checks were received after returns were prepared), but do not increase taxpayer-claimed amounts, leaving some with unclaimed true-ups. The Treasury Inspector General for Tax Administration (2022) 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-up payments, where about half were due to receipt by someone potentially the dependent of another taxpayer.

<sup>12</sup> Treasury Inspector General for Tax Administration (2022) estimated there were “approximately 3.1 million individuals eligible for the RRC [i.e., true-up] based on their Tax Year 2020 return who did not claim the credit” (p. 13).



In this study, stimulus payments are estimated at the individual filer level, meaning spouses filing joint returns are two separate observations. This follows IRS guidelines that evenly split stimulus payments (as well as advance child tax credits) between jointly filing spouses to allow for individual-level reconciliation in the case of filing status changes, such as from marriages or divorces. For example, if a couple received stimulus checks based on a prior-year married filing jointly return and then divorced, the low-income spouse could receive a true-up and the high-income spouse could be protected with a safe harbor. Following all filers individually, as compared with following only the primary filer of tax returns, also limits sample attrition.

The analysis of true-ups and safe harbors only considers individuals filing a tax return in the current year. This includes some prior-year nonfilers but excludes all current-year nonfilers, as they receive no true-ups and the characteristics needed to estimate full RRC amounts are unobserved. Since 2020, most nonfilers received stimulus checks and have no need to subsequently file a tax return to receive stimulus.

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 earlier. 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, more than 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 nonfiler or nonresident 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.<sup>13</sup> 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, the reason is listed as not identified.

#### IV. TRUE-UP AND SAFE-HARBOR COSTS

Table 1 shows estimated costs of stimulus checks, true-ups, and safe harbors. The size of stimulus checks increased dramatically, from \$38 billion in 2001 to more than \$400 billion in both 2020 and 2021. Between 2001 and 2020, true-up costs increased from \$5 billion to \$46 billion. Between 2001 and 2021, safe-harbor costs

<sup>13</sup> 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.

**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
<b>Total</b>	<b>24</b>	<b>–</b>	<b>16</b>	<b>16</b>	<b>20</b>
<i>Panel C: True-Up Cost Sources (%)</i>					
Prior nonfiler & 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
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<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
<b>Total</b>	<b>–</b>	<b>–</b>	<b>100</b>	<b>100</b>	<b>100</b>

Note: 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.

increased from \$4 billion to \$47 billion. Total COVID-era stimulus costs were \$885 billion, of which true-up and safe-harbor costs were \$133 billion.<sup>14</sup>

Although 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.

<sup>14</sup> The estimates in this paper are based on data processed more than one year later than in Treasury Inspector General for Tax Administration (2022), 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 and are forecasted estimates, whereas this paper relies on historical data.

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 declines in wages, even in economic expansions (Congressional Budget Office, 2008; Larrimore, Mortenson, and Splinter, 2022a). In addition, an average of 25 percent of true-up costs resulted from individuals not receiving stimulus checks who were nonfilers or nonresidents 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.<sup>15</sup>

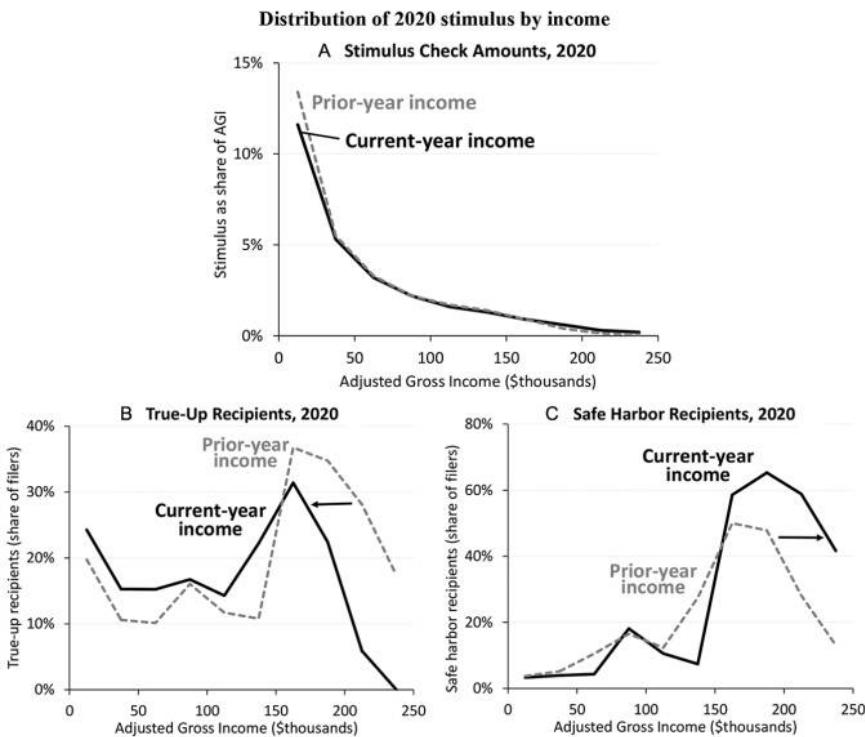
Safe-harbor costs are mostly caused by income increases. Panel D shows that an average of 60 percent of safe-harbor costs were due to higher incomes on current-year tax returns than in earlier years. Remaining safe-harbor costs were mostly due to individuals claiming fewer dependents or children than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

## V. DISTRIBUTIONS OF STIMULUS CHECKS, TRUE-UPS, AND SAFE HARBORS

Stimulus payments are highly progressive. This 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 filer 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 phaseout threshold for married filers).<sup>16</sup>

<sup>15</sup> 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 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.

<sup>16</sup> Note that stimulus may appear more progressive when including nonfilers but less progressive with a broader measure of income including nontaxable transfers, which is more appropriate for distributional analysis (Splinter, 2020).



**Figure 3.** Distribution of 2020 stimulus by income. Estimates are averages within \$25,000 bins of adjusted gross income among resident, nondependent tax return filers (i.e., excluding current-year nonfilers). 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. Data are author’s calculations using tax data.

The progressivity of stimulus payments 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 leftward shift indicated by the arrow when moving from prior-year to current-year incomes. This reflects true-ups benefiting filers with income decreases, which could be seen as improving distributional targeting. In contrast, safe-harbor reciprocity was less progressive with current-year income and overall was regressive (Figure 3c).<sup>17</sup> Here, the arrow indicates that safe harbors benefited filers with income increases — a weakening of distributional targeting. Relative to 2020, stimulus distributions were similar in

<sup>17</sup> Figure 3 Panels (b) and (c) show reciprocity rates of true-ups and safe harbors. Average true-up and safe-harbor amounts are similar across income groups. As a share of income, true-ups are progressive, but safe harbors are broadly regressive.

2021, although the faster income phaseouts limited some higher-income true-ups and safe harbors (see Figure A2).

## VI. INCOME-BUNCHING RESPONSES TO STIMULUS CREDIT PHASEOUTS

When stimulus credits are estimated on tax returns, they phase out by income. Some tax filers may respond to phaseouts by underreporting their income to increase stimulus payments. Mortenson and Whitten (2020) provided the most comprehensive estimates of income bunching on tax returns. 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. They observed limited income bunching at high-income kinks. In comparison, the more recent tax returns considered here suggest high-income bunching in response to stimulus credit phaseouts.<sup>18</sup>

To present simple evidence of income bunching, Figure 4 shows the number of married filing jointly tax returns by income near the phaseout 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 phaseouts of the first and second rounds of payments. This jump in marginal tax rates at the phaseout threshold created a marginal tax rate schedule kink. Bunching effects are clear in Panel (a) of Figure 4. In 2020, the number of returns reporting incomes between \$149,500 and \$150,000 spikes up and then falls dramatically above the phaseout threshold, whereas this is not observed in the prior year without true-ups.<sup>19</sup> This bunching, however, only implies perhaps up to a few million dollars of excess stimulus payments — a small share of total stimulus.

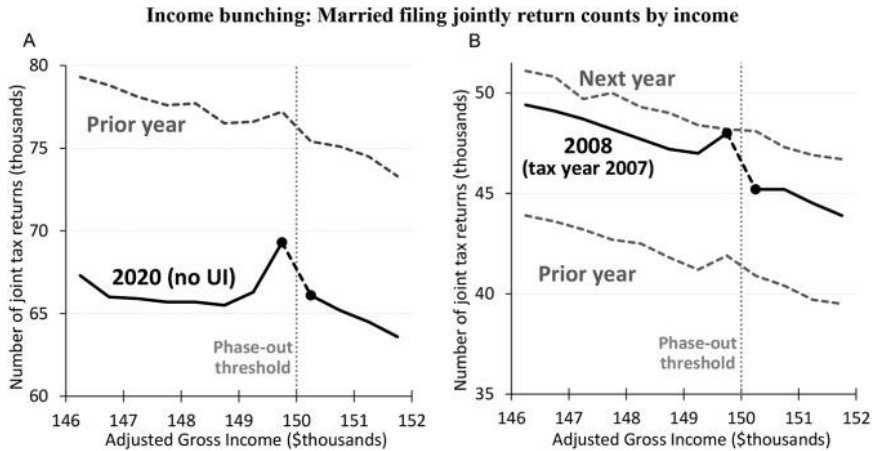
A similar bunching response is observed in the Panel (b) of Figure 4 for tax returns filed in 2008. These incomes were usually reported on returns filed just after the stimulus policy had been announced, providing filers an opportunity to misreport income to maximize stimulus checks (which were based 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 phaseout.

## VII. SUMMARY

Advance tax credits have the renewed interest of policy makers due to a recent advance child tax-credit program. Stimulus checks provide an example of how

<sup>18</sup> As with prior studies, this paper uses preaudit tax returns and therefore cannot determine the degree to which observed bunching is due to noncompliance.

<sup>19</sup> Bunching is not observed at high-income bracket changes 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.



**Figure 4.** Income bunching: Married filing jointly return counts by income. Number of returns are by \$500 bins of adjusted gross income. On the left side, tax year 2020 excludes returns with unemployment insurance (UI). On the right side, 2008 denotes tax year 2007 returns that determined calendar year 2008 stimulus-check amounts. Data are author's calculations using unaudited tax data.

advance tax credits can have ignored costs from true-ups and safe harbors. These costs arise from individual circumstances changing from the earlier-year information used by the IRS to estimate stimulus checks, which are the advance portion of stimulus tax credits. Reconciliations on current-year tax returns result in significant true-up payments. These true-ups mostly benefit individuals who did not receive stimulus checks or had a decline in income. Hence, true-ups can strengthen distributional targeting. In addition, safe harbors protect individuals from repaying stimulus checks back to the IRS, which may encourage spending of those checks. Safe harbors, however, usually benefit higher-income individuals with 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. Therefore, although true-ups promote equity and safe harbors may support aggregate demand, both are costly.

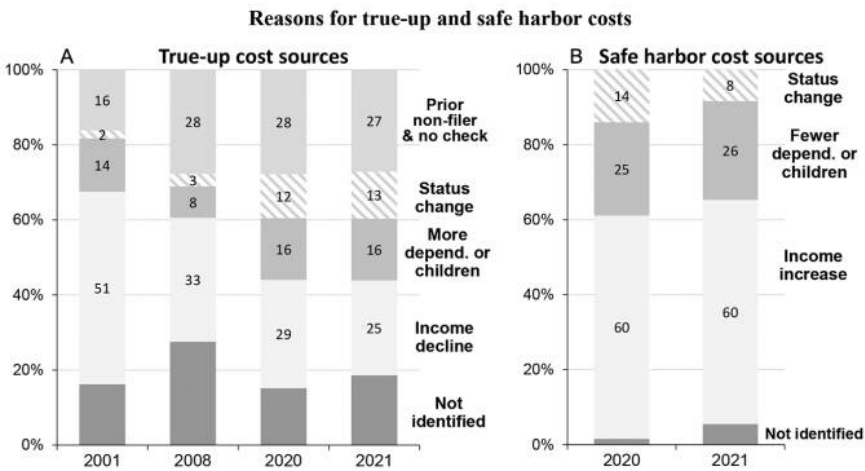
## ACKNOWLEDGMENTS AND DISCLAIMERS

For helpful comments, I thank Tom Barthold, William Boning, Jim Cilke, Tim Dowd, Marina Gindelsky, Lucas Goodman, Laura Kawano, Jeff Larrimore, Paul Landefeld, 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 because members of both parties and both houses of Congress make up the Joint Committee on Taxation, this work should not be construed to represent the position of any member of the committee. Access to the confidential tax data is available through the Statistics of Income Joint Statistical Research Program, and the author will share code with those granted access.

DISCLOSURES

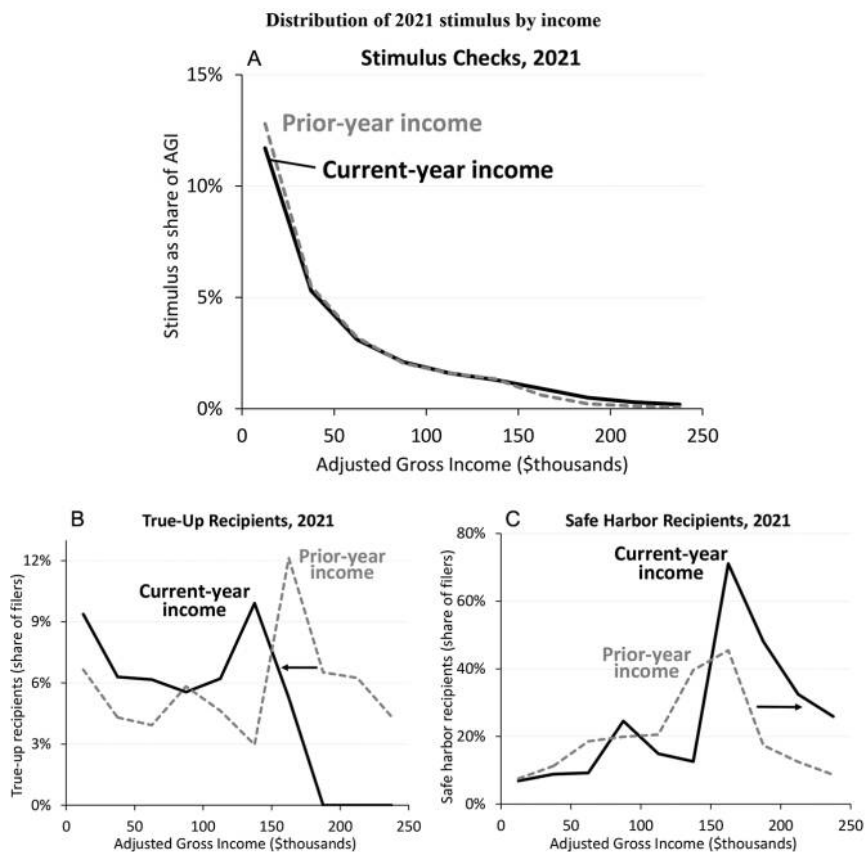
The author has no financial arrangements that might give rise to conflicts of interest with respect to the research reported in this paper. Joint Committee on Taxation management reviewed this research prior to circulation.

APPENDIX



**Figure A1.** Reasons for true-up and safe-harbor costs. 2020 includes all first-round and second-round COVID stimulus. See text for descriptions of reasons. Data are author’s calculations using tax data.





**Figure A2.** Distribution of 2021 stimulus by income. Estimates are averages within \$25,000 bins of adjusted gross income among resident, nondependent tax return filers (i.e., excluding nonfilers). 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. Data are author’s calculations using tax data.

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. National Bureau of Economic Research, Cambridge, MA.
- Boning, William C., 2018. “Paying Taxes Automatically: Behavioral Effects of Withholding Income Tax.” Working paper. <https://willboning.github.io/willboning.com/Withholding.pdf>.
- 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. National Bureau of Economic Research, Cambridge, MA.
- Congressional Budget Office, 2008. “Recent Trends in the Variability of Individual Earnings and Household Income.” CBO Publication No. 2996. Congressional Budget Office, Washington, DC.
- 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. Congressional Research Service, Washington, DC.
- 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.” Current Population Reports P60-275. US Census Bureau, Washington, DC.
- 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), 2959–2991.
- 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. Washington, DC: Brookings Institution.
- Government Accountability Office, 2007. “Advance Earned Income Tax Credit: Low Use and Small Dollars Paid Impede IRS’s Efforts to Reduce High Noncompliance.” Report GAO-07-1110. Government Accountability Office, Washington, DC.
- Greig, Fiona, Erica Deadman, and Tanya Sonthalia, 2022. “Household Pulse: The State of Cash Balances at Year End.” Research Paper. JPMorgan Chase Institute, New York.
- 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.” Report JCX-16-08. Joint Committee on Taxation, Washington, DC.
- Jones, Damon. 2010. “Information, Preferences, and Public Benefit Participation: Experimental Evidence from the Advance EITC and 401(k) Savings.” *American Economic Journal: Applied Economics* 2 (2), 147–163.
- 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, 2022a. "Earnings Business Cycles: The COVID Recession, Recovery, and Policy Response." Working paper. <https://doi.org/10.2139/ssrn.4301437>.
- Larrimore, Jeff, Jacob Mortenson, and David Splinter, 2022b. "Income Declines during COVID-19." *AEA Papers and Proceedings* 112, 340–344.
- Maag, Elaine, and Sam Hammond, 2021. "Issues in Child Benefit Administration in the United States: Imagining the Next Stage of the Child Tax Credit." Research Report. Urban Institute, Washington, DC.
- Maag, Elaine, Elizabeth Peters, Nikhita Airi, and Karen Smith, 2022. "How Well Can Limited Data Predict Annual Tax Credits?" Research Report. Urban Institute, Washington, DC.
- 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: Uses, Payment Methods, and Costs to Recipients." Report. Brookings Institution, Washington, DC.
- 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. Bureau of Labor Statistics, Washington, DC.
- Parker, Jonathan A., 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), 381–396.
- Splinter, David, 2020. "U.S. Tax Progressivity and Redistribution." *National Tax Journal* 73 (4), 1005–1024.
- Treasury Inspector General for Tax Administration, 2022. "Processing of Recovery Rebate Credit Claims during the 2021 Filing Season." TIGTA Report No. 2022-46-032. US Treasury Inspector General for Tax Administration, Washington, DC.