Comment: Tax Evasion at the Top of the Income Distribution: Theory and Evidence

May 5, 2021

Gerald Auten
Office of Tax Analysis, U.S. Treasury Department

David Splinter
Joint Committee on Taxation, U.S. Congress

Abstract

Evaded income is difficult to account for when measuring the distribution of income. Prior research has relied on special comprehensive IRS National Reporting Program (NRP) audit studies. Guyton, Langetieg, Reck, Risch, and Zucman (2021) provide an important contribution by bringing attention to limitations of NRP audits in discovering evasion from passthrough businesses and income from offshore assets. While such evasion is a serious issue, there are problems with the specific assumptions used in allocating evaded income, such as uniformly scaling up detected evasion to account for undetected evasion. In this comment, we explain the methodological problems creating an inherent bias in their results and suggest improved approaches that are distributionally consistent. While uncertainty necessarily remains, these improved approaches suggest that including evasion has less impact on top income shares and that high-income underreporting rates are lower.

I. Background on Evaded Income

Guyton, Langetieg, Reck, Risch, and Zucman (2021, hereafter GLRRZ) argue there is substantially more evaded income than previously estimated and that it is found almost exclusively in the top 1% of their "benchmark" income distribution. In this comment, we explain the inherent upward bias in their allocation methods and propose alternative methods for allocating evaded income that conform with official estimates and are distributionally consistent when using micro data. These more consistent methods suggest that including evasion has much less impact on top income shares.

Despite tax data providing information regarding income inequality—especially for high incomes—tax data suffer from the incentive to underreport income to avoid taxes. Fortunately, special IRS audit studies in the National Research Program (NRP) shed light on the types of income where evasion is more prevalent and the extent of such evasion. These are not

---

This paper comments on Guyton, Langetieg, Reck, Risch, and Zucman (March 2021, ungated link here). We recognize that GLRRZ is a work in progress and the authors plan to address some of our concerns, but given the attention this version has received, we are sharing our concerns on the current publicly available version. For helpful comments and discussions, we thank Tom Barthold, Brian Erard, John Guyton, Janet Holtzblatt, Patrick Langetieg, Emily Lin, Jamie McGuire, Jacob Mortenson, Daniel Reck, Matthew Smith, Alexander Yuskavage, and Eric Zwick. Auten: Views and opinions expressed are those of the authors and do not necessarily represent official Treasury positions or policy. Splinter: 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.

operational audits that typically focus on only a few identified issues, but comprehensive stratified random audits that theoretically examine all items on tax returns and oversample returns with high incomes or low-visibility business income. These special audit studies in the NRP have been the main source of estimates of evasion and are the basis for the amounts included in national accounts. GLRRZ use the 2006–2013 NRP studies to estimate the distribution of the tax gap and evasion-inclusive income inequality.[1]

GLRRZ's analysis has four steps. First, it uses audit study micro data to add *detected* evasion. Second, GLRRZ imputes *undetected* evasion using a set of multipliers developed from earlier audit data. These multipliers are from detection-controlled estimation (DCE) and can nearly *quadruple* the amount of evasion in audit studies.[2] Third, it adds imputations of additional evasion from passthrough entities (including partnerships, S corporations, and certain other sources). The amounts already in the NRP audits are removed and then this assumed total passthrough evasion is allocated by reported income, such that essentially all goes to the top of the distribution. Fourth, GLRRZ estimates how income from offshore wealth affects income distributions. These extend Langetieg, Reck, and Risch's prior work in Johannesen et al. (2020), as well as studies by Zucman.

Combining the four components of estimated evasion, GLRRZ argue that top 1% fiscal income shares increase by 1.5 percentage points (pp). This includes a 0.5 pp *decrease* from detected evasion, 1.1 pp increase from undetected evasion using DCE multipliers, 0.6 pp increase from additional business evasion, and 0.3 pp increase from income of offshore wealth.[3,4] Two-thirds of the estimated increase in top income shares results from applying DCE multipliers. This approach causes exaggerated upward re-ranking of returns with large amounts of detected evasion, shifting estimated evasion from the bottom and middle to the top of the income distribution. The second largest increase in top shares results from allocating additional passthrough evasion by reported income. However, returns with business losses appear to be allocated little additional evasion despite accounting for over one third of evaded income (Auten and Langetieg, 2020). While offshore evasion has received considerable attention, it accounts for only a small portion of the total effect on top income shares. This is not to say that evasion is low or that evasion is not greater than that discovered in the special audit

[1] The first NRP study included a much larger sample, but only covered tax year 2001. Previous comprehensive audit studies were under the Taxpayer Compliance Measurement Program (TCMP), which was last conducted in 1988. The tax gap is the differences between estimated tax liabilities and the amount of taxes paid voluntarily and on time.

[2] For 2012, GLRRZ Table A6 shows an overall ratio of 3.95: detected net evasion of $330 billion increases to detected plus undetected evasion of $1,304 billion ($330 plus $974 billion). When starting with the larger amount of gross evasion (not offset by detected *over*reporting) the overall ratio should be near the historical average of 3.3.

[3] GLRRZ's top 1% income share of 20 percent for 2006–2013 exceeds other estimates of top 1% shares because it excludes non-filers, sets groups by tax units, and excludes about 40 percent of national income. When including non-filers, setting groups by individuals, and including all of national income, the top 1% pre-tax income share is about 15 percent and the after-tax/after-transfer income share about 10 percent (Auten and Splinter, 2019a). This implies that when comparing the percentage point changes in GLRRZ to national income estimates, they should be reduced.

[4] GLRRZ do not break out passthrough and offshore effects in their Table 1 results, but explain on page 39: "In the case where there is zero offshore evasion (only passthrough business income evasion), the top 1% income share rises by more than 0.6 points." And on pg. 29: "the pass-through adjustment…is about twice as large as the offshore adjustment."

studies. Instead, the concern is that the analysis in GLRRZ uses assumptions that likely overstate the top one percent's share of evasion.

Section II discusses the largest single methodological issue in GLRRZ: the use of simple DCE multipliers. These multipliers were designed to obtain reasonable estimates of total evaded income and tax, but they are inappropriate for application at the micro level. When used to estimate income distributions, the multipliers cause an upward bias in top shares. DCE assumes that undetected evasion can be estimated by the gap between auditors finding the least and most evasion, controlling for the types of returns audited. These gaps are then used to compute average multipliers that scale up detected evasion to estimate total undetected evasion. GLRRZ, however, apply the same multipliers to returns where large amounts of evaded income were discovered by the best auditors as to the small amounts found by less-skilled auditors.

Other researchers have noted that application of the simple DCE multipliers to micro data is not distributionally consistent, including Johns and Slemrod (2010), Bloomquist et al. (2012), and DeBacker et al. (2020). A simple example is shown in Section II, along with alternative approaches that are distributionally consistent. Relative to estimates using DCE multipliers, these show that high-income underreporting rates are lower.[5] As with detected evasion, these approaches also result in *decreases* in estimated top income shares.

The second largest issue is the estimation and allocation of additional passthrough evasion. Section III shows that the GLRRZ "benchmark" approach allocates nearly all additional passthrough evasion to the top 1%, presents evidence suggesting less total additional passthrough evasion than assumed, and discusses issues with their comparison of operational audits and audit studies that motivates the argument for additional passthrough evasion. Rather than relying on assumed amounts and distributions of evaded income, to the extent possible, the paper's analysis should be based on (or supported by) IRS data from other audits and special studies. Section IV discusses additional concerns. Most importantly, estimates of the amount of evaded income from offshore wealth fail to account for recent offshore enforcement efforts that increased disclosure rates. Section V discusses some of the policy implications.

While the NRP audits are theoretically comprehensive, GLRRZ discusses types of evasion that are likely missing. Unfortunately, GLRRZ makes clear that they are only trying to estimate evasion among high-income returns. This narrow focus disregards additional evasion outside the top of the distribution. First, GLRRZ excludes non-filers from their analysis.[6] Second, GLRRZ choose to add nearly all business-level passthrough evasion to the top of the distribution. They suggest that only high-income individuals can engage in "sophisticated" evasion. But undetected evasion does not require sophisticated behavior—one can be paid in cash or in-kind for services provided, leaving no paper trail. GLRRZ argues that

[5] These approaches lower top one percent underreporting rates by one third to two thirds. This follows the method described in Table 2 to allocate detected evasion but with a maximum evasion to reported income ratio of 700%. Also accounting for passthrough and offshore evasion not in the NRP audits as estimated by GLRRZ's benchmark approach, top one percent underreporting rates in 2010 are estimated to be about 12%. This is half the GLRRZ estimate and close to the average underreporting rate across all income groups.

[6] Erard and Ho (2003) provide estimates that fill several gaps when only considering evasion in the tax return audit studies. They augment the base data with special studies of non-filers, tip income, and informal supplier. For a discussion of the tax gap and the informal economy, see Joint Committee on Taxation (2019).

third-party reporting of income (e.g., Forms W-2 and 1099-MISC) should attenuate evasion outside the top of the distribution. But third-party reporting cannot prevent all evasion. For example, additional amounts of third-party reported income can be offset by claiming additional expenses or shifting them across time (Slemrod et al., 2017). Therefore, a note of caution seems appropriate: Looking for evasion only in the top of the distribution, one will find it there. But looking for evasion in the bottom and middle, one will probably also find it there.

II. DCE Multipliers: Inconsistent Allocation to Specific Returns & Exceed National Accounts

The DCE method was originally developed from audit studies data by Feinstein (1990, 1991). While the underlying analysis uses a sophisticated procedure to assign total detection rates (detected and undetected) to each auditor based on detection rates of the best auditors, GLRRZ use a simplified method with only four DCE multipliers that are applied regardless of auditor. The multipliers differ for each low/high reported income group and low/high visibility source of income. For example, wages are high visibility due to reporting on Form W-2 and sole proprietor income is low visibility.[7] The multipliers are:

For returns with Total Positive Income < $100,000 and no Schedule C or F income:
Low-visibility income: 4.158 High-visibility income: 2.009
For returns with Total Positive Income >=$100,000 or with Schedule C or F income
Low-visibility income: 3.358 High-visibility income: 2.340

These simplified DCE multipliers were developed to estimate aggregate amounts of evasion and are inappropriate for imputing evasion at the tax-return level because the effect of varying auditor skill has been lost. Using these simplified DCE multipliers at the return level provides distributionally inconsistent results because it uniformly scales up detected evasion.[8] A second issue is that DCE multipliers can result in more total evasion than in national accounts. This section discusses these issues and presents estimates using alternative approaches.

A. DCE multipliers applied at the micro level are not consistent with underlying method

The main concern with GLRRZ estimates is that DCE multipliers are not distributionally consistent. Applying uniform DCE multipliers to all income (within each income level/visibility type) treats all detected evasion the same even though the basis of DCE aggregate multipliers is the gap between auditor rates of detection (Feinstein, 1990, 1991; Erard and Feinstein, 2011). This exaggerates the amount of evasion allocated to specific returns, which re-ranks them up the distribution and causes overstated top 1% evasion-inclusive income shares.

Table 1 presents a simple three-return example of how uniform DCE multipliers can exaggerate top income shares. For reported income, return *a* is at the top of the distribution and

[7] See the appendix for a detailed discussion of the DCE approach used by Johns and Slemrod (2010) and GLRRZ.

[8] The IRS economists who use the NRP to estimate the official tax gap express the same concern, saying the simple multiplier method "was still primarily an aggregate approach." Therefore, official tax gap estimates no longer rely on simple DCE multipliers (Bloomquist et al., 2012, pg. 71). Instead, the tax gap now uses the parameters based on differences in auditor characteristics to estimate return-level undetected evasion.

has 40 percent of income. Adding detected evasion ($1 for *a* and *b* and $4 for *c*) lowers *a*'s share to 36 percent. Hence, detected evasion decreases the top share, as observed in the NRP. Finally, adding DCE adjustments by multiplying detected amounts by four (total evasion of $4 for *a* and *b* and $16 for *c*) re-ranks taxpayer *c* to the top of the distribution with 44 percent of income. It also increases *c*'s detected underreporting from 33% to a DCE underreporting rate of 67%. Applying simple DCE multipliers to the NRP microdata also results in higher top income shares and underreporting rates. However, these increases result from incorrectly applying the same multiplier to *a* and *b*'s $1 of detected evasion and *c*'s $4 of detected evasion. Instead, these multipliers should differ based on auditor rates of detection.[9]

Table 1: Example of adding detected evasion and applying DCE multipliers

	Reported			**Reported + Detected**			**Reported + DCE**		
ID	Rank	Income	Share	Rank	Income	Share	Rank	Income	Share
a	1	$12	40%	1	$13	36%	3	$16	30%
b	2	$10	33%	3	$11	31%	2	$14	26%
c	3	$8	27%	2	$12	33%	1	$24	44%
Total		$30	100%		$36	100%		$54	100%

Other researchers have recognized the problem of applying the simple multipliers to micro data for distributional analysis. DeBacker et al. (pg. 1106) write: "Because the published multipliers are applied to all auditors regardless of skill level, the biggest amounts of undetected misreporting will be attributed to the audits with the largest amounts of detected misreporting. This runs counter to the intended application of the adjustments and can exaggerate the true variation in misreporting." Johns and Slemrod (2010, pg. 400) write: "The use of the DCE multipliers will understate estimates of undetected income for some taxpayers, and almost certainly will do so for…audited returns where no income underreporting was detected, because no adjustment is made in these cases. Conversely, it may overstate estimates of undetected income for other taxpayers."

Top 1% underreporting rates are also overstated by using the same multipliers for the most and least effective auditors. Returns with significant detected evasion are allocated excess undetected evasion. Some of these returns move from below to above the top 1% threshold. For example, a return with reported income of $100K and an equal amount of detected evasion of $100K is still below the top 1% threshold. A low-visibility multiplier of about 4, increases this total evasion to $400K and pushes the return over this threshold. This implies that DCE increases this return's underreporting rate to 80 percent and re-ranks it into the top 1%, likely pushing out a return with little or no evasion. This example likely corresponds to a significant share of returns in the post-DCE top 1%. In recent audit studies, Auten and Langetieg (2020) find that about one percent of returns have reported income in the third quintile and *detected* evasion equal to or exceeding reported income. The upward re-ranking of these and other returns when adding undetected evasion, which is exaggerated by using the same multipliers

[9] For example, applying a multiplier of 10 to *b*'s $1 of detected evasion and of 2.5 to *c*'s $4 of detected evasion results in the same amount of total evasion but a top share of only 42%, a decrease relative to reported income.

regardless of auditor skill, explains a large share of GLRRZ's estimated top 1% underreporting rate increase from 1 percent to 21 percent.[10]

B. DCE multipliers imply much more evasion than in national income

National accounts include estimated evasion based on special audits studies, including both detected and undetected evasion. However, the GLRRZ amount of audit-based filer evasion appears to exceed amounts in national income by about one half. This is based on a simple comparison of evasion in national income with the total detected and DCE undetected amounts. Note that GLRRZ's additional passthrough evasion and income from offshore wealth are not in national income and ignored in this discussion.

National accounts explicitly break out proprietor evasion (combined amount for sole proprietors and partnerships) of $561 billion and wage evasion of $75 billion when averaging 2006–2013 (at 2012 dollars). Auten and Splinter (2019a, online data Table T1) provide estimates of likely evasion in national accounts for other income sources. For 2006–2013, there is annual evasion of about $44 billion for farms, $43 billion for rents, and $80 billion for S corporations. To compare with GLRRZ, there are smaller amounts for dividends and interest evasion that should be added and non-filer portions that should be removed from the values above. If we assume the former is $50 billion and the latter is 10 percent, this suggests about $770 billion in filer evasion in national income.

In comparison, GLRRZ add $1,304 in audit-based evasion in 2012 (Table A6, exam and DCE columns). But this amount includes capital gains realizations that are not in national income. Excluding $70 billion in added evaded capital gains (5.3 percent of total based on Table A1) suggests that GLRRZ add audit-based filer evasion comparable to national income definitions of about $1,230 versus about $770 billion in national income.[11] Therefore, the GLRRZ filer evasion estimate appears to exceed amounts in national income by $460 billion, or more than one half. This represents an additional 3 percent of national income.

The use of detected evasion from audits of passthrough businesses at the entity level could be one source of bias. While only 3.8 percent of returns with passthrough business income had this additional level of audits, unless these were randomly chosen, this could introduce bias if those with greater suspicion of substantial evasion or more aggressive auditors were subject to this additional scrutiny. This bias seems likely to the extent that entity-level examination was based on auditor discretion or evasion risk. The average detected evasion amounts for this group is large: while only 3.8 percent of returns with passthrough income, they account for over half of partnership and S corporation detected evasion. Applying simple multipliers to these amounts likely results in exaggerated estimates of high-income evasion. For tax years 2003 and 2004, IRS conducted special random audit studies of S corporations, which addressed the selection bias. IRS (2008a, pg. 14) noted that the simple DCE average multipliers "likely account for more misreporting of S-Corporation income than was detected

[10] The 1 percent underreporting estimate corresponds to detected evasion only. DeBacker et al. (2020) show that adding detected evasion causes negligible re-ranking of returns into the top 1%, hence the re-ranking effects in GLRRZ appear mostly due to scaling up of detected evasion with DCE multipliers.

[11] GLRRZ's analysis would benefit from showing how much evasion they add for each source of income.

in the S-Corporation study. Based on these findings, no additional adjustment is presently recommended to the Schedule E partnership and S-Corporation tax gap estimate..." These results suggest that S corporations should be omitted form GLRRZ's allocation of additional passthrough evasion.

There are additional reasons to update and refine DCE multipliers. Since these multipliers were originally estimated, there is new and expanded third-party information reporting that could reduce noncompliance and increase detected evasion. Since 1990, passthrough business income payments to owners are reported to the IRS with Schedule K-1. Since 2011, credit card and third-party network transactions (e.g., gig economy payments) are reported to the IRS with Form 1099-K and the cost basis of stocks purchased that year or later are reported to the IRS on Form 1099-B.[12] Reporting of cost basis of other assets, such as mutual funds and options, began in the following years. There have also been changes in the structure of the NRP audit studies and sampling. Earlier audit studies were only conducted intermittently, likely requiring new auditors for each study. But since 2006 smaller samples are conducted every year and continuing auditors may detect more evasion on average due to accumulating skills or improved matching of auditors with return types (as well as other information technology improvements).

C. More consistent options for allocating undetected evasion

Undetected evasion can be allocated with distributionally consistent approaches. The basic idea is that if information on auditors is available, one could apply smaller multipliers to the most effective auditors and larger multipliers to less effective auditors. In the absence of auditor effectiveness, a reasonable assumption is that taxpayers with high rates of detection relative to reported income should have lower multipliers because they likely had a more effective auditor. To match aggregate totals, taxpayers with lower rates of detection should have higher than average multipliers.

These approaches build on the detailed work with recent NRP audit studies by Auten and Langetieg (2020), which develops an allocation approach accounting for both a small share of tax returns having high evasion rates and most returns having low evasion rates. They divide each reported income group into detected evasion to reported income ratio bins, with bins corresponding to evasion rates of 10–20 percent, 20–50 percent, etc. (for an example, see appendix Table A1). By selecting the appropriate number of returns within each income-evasion ratio cell, one can closely approximate the results of audit data, resulting in correct distributions of detected evasion when ranking by both reported and true income.[13] As an

[12] Form 1099-K requirements have become more comprehensive. Previously, a third-party settlement organization was not required to report unless transactions with respect to a taxpayer exceeded $20,000 and the total number of transactions exceeded 200. Going forward, reporting will be required if aggregate transactions exceed $600, regardless of the number of transactions (Joint Committee on Taxation, 2021).

[13] Tax returns are assigned to ratio cells using a random number approach resembling the approach in the official tax gap estimates (which do not rely on simple DCE multipliers). IRS (2019, pg. 18) writes: "In order to simulate a realistic distribution of undetected income consistent with the predicted incidence of undetected income, a simulation process randomly allocates undetected income…by assigning a random number to each return and then assigning undetected income to that return if the random number was less than the probability of undetected income for that return." See Table A1 notes for more details.

alternative to simple DCE multipliers, this method can be extended to allocate undetected evasion.

The effect of adding evaded income on top income shares is shown in Table 2, which is based on estimates using 2010 representative tax return data (results are similar for nearby years). First, the GLRRZ results are approximately replicated. Top 1% reported income shares decrease 0.4 pp when adding detected evasion and increase 0.7 pp when applying the DCE multipliers, which accounts for both detected and undetected evasion. The overall increase for 2010 is near the GLRRZ increase of 0.6 pp for 2006–2013 and the DCE-only effects are equal.

To proxy for differences in auditor effectiveness, we construct illustrative multiplier gradients that are higher for returns with low detected evasion rates and lower for returns with high detections rates (see appendix Table A2).[14] Applying a gradient across the evasion ratio bins implies that total evasion causes top 1% shares to *decrease* by 0.9 pp. These multipliers result in much less re-ranking than DCE multipliers and therefore cause about three times the effect of detected evasion from exams (offset by some re-ranking). Next, we account for the old DCE multipliers leading to amounts of evasion that significantly exceed amounts in national accounts. When scaling estimated undetected evasion to match levels of total evasion in national accounts, top 1% shares decrease 0.7 pp, slightly less than without scaling.[15] As a sensitivity check, flatter and steeper gradients are applied and top 1% shares are unchanged—because there is still little re-ranking when using distributionally consistent multipliers. These results show that a more distributionally consistent approach than simple DCE multipliers could imply that incorporating this evasion significantly *decreases* top income shares.

Table 2: Income Shares for Different Allocations of Undetected Evasion, 2010 tax returns

	Income ($billions)				Income Shares (%)			Top 1% chg. from reported (pp)
	Total	P0-50	P50-99	Top 1%	P0-50	P50-99	Top 1%	
Panel A: Replicate GLRRZ Table 3 changes from reported income								
Reported income	7.7	0.8	5.4	1.5	10.0	70.3	19.8	---
After exam, no DCE	8.0	0.9	5.6	1.6	10.8	69.8	19.4	–0.4
After exam, with DCE	9.0	1.0	6.2	1.8	11.2	68.3	20.5	0.7
Panel B: Distributionally consistent alternatives to DCE								
Gradient	9.0	1.0	6.3	1.7	11.0	70.1	18.9	–0.9
Gradient, level	8.5	0.9	5.9	1.6	11.1	69.9	19.0	–0.7
Panel C: Sensitivity Checks								
Flat gradient, level	8.5	0.9	5.9	1.6	11.1	69.9	19.0	–0.7
Steep gradient, level	8.5	0.9	5.9	1.6	11.1	69.9	19.0	–0.7

Notes: Income after exam includes both underreported income (evasion) and small amounts of overreported income.
Source: Authors' calculations using 2010 INSOLE file and tables from Auten and Langetieg (2020).

[14] The baseline ratios decline from 8 for returns with less than 10% detected evasion to 1 for the very small percent of returns where evasion is more than 700% the originally reported income. The ratio of 1 only applies to the 0.4 percent of returns in the bottom income quintile with positive income or small negative total incomes. The "flat" gradient declines from 4 to 1 and the "steep" gradient declines from 12 to 1.

[15] In 2010, the estimated amount of total tax return filer evasion in national accounts is $32 billion farm, $505 billion proprietor (filer only), $51 billion rents, $67 billion S corporation, and $113 billion wages. A total of $768 billion less $330 billion detected (per GLRRZ), leaves $438 billion of undetected evasion added with the level-targeted multipliers.

III. Evaded Passthrough Income: Allocating by Reported Income & Other Issues

In addition to adding detected and undetected evasion based on the special audit studies, GLRRZ also discusses evidence for additional evasion of passthrough income that occurs on business entity-level tax returns. In addition to partnerships and S corporations, GLRRZ passthrough income includes estate and trust fiduciary income, and 50 percent of positive rental income on Schedule E assumed to be from partnerships.

The likelihood of additional evasion seems compelling, but the method of imputing this evasion is not. Several of the steps used to empirically estimate the effects of adding this additional evasion tend to allocate too much evasion to the top of the distribution.[16] GLRRZ assumes the total passthrough business-level evasion rates are 20 percent of true income. But a large amount of business-level passthrough evasion is already in the baseline amount added for detected and DCE multiplier evasion. For their benchmark estimates, GLRRZ (pg. 33) therefore "remove 57.6% of the DCE-adjusted estimate of partnership and S-corporation evasion in the NRP before adding" business entity-level passthrough evasion. This step throws out the distributional information in the NRP and replaces it with an allocation that has no empirical basis (and contradicts evidence regarding returns with losses).

Assumed business-level passthrough evasion is then allocated by reported passthrough income within income bins (i.e., deciles and top groups). Losses are netted out from gains within each income bin and the net losses in the bottom decile are ignored for this allocation.[17] It appears that the GLRRZ "benchmark" estimates include the excessive DCE-induced re-rankings (due to multiplying detected passthrough business evasion by 3.4 or 4.2).

Allocating evasion by reported business income is an incorrect approach. Splinter (2020, pg. 3) writes that "if a filer increases their reported income by decreasing evasion, then the filer is allocated more, not less, evaded income." A similar point is made by GLRZZ (pg. 12): "Ranked by reported income, top earners by construction tend to have low evasion (since they are selected on high declared income)." An additional issue is that reported passthrough business income is volatile over time (Splinter, 2012; Hines, 2020). GLRRZ uses this volatile income measure to allocate additional passthrough evasion, exacerbating an underlying upward bias in annual top income shares relative to multi-year income shares. Finally, the GLRRZ approach allocates little additional evasion to returns with business losses, which is inconsistent with the evidence that such returns account for a large share of evaded income (Auten and Langetieg, 2020). Allocating only by positive reported income likely leads to distorted results. Returns with business losses should be treated as a separate group and allocated a share of the additional evaded income. Moreover, the effect of allocating by positive reported business income is that nearly all additional passthrough evasion goes to the top 1%. Essentially none is allocated to the bottom 90% of tax returns, despite returns of wealthy taxpayers with business losses or dramatically understated business income being in this group. If the sophisticated evasion schemes were successful, these taxpayers would often be found in

[16] Since the GLRRZ description of their imputation method is incomplete, our analysis reflects our current understanding based on information found in the paper and discussions with the authors.

[17] It is unclear whether evaded income allocated to rental income on the grounds that it comes from partnerships has been netted against other evaded passthrough income.

lower income bins.[18] While those at the top may engage in careful tax planning, GLRRZ's allocation assumption likely overstates top income shares.

The issue confronted by any researcher trying to allocate evasion is the lack of good empirical evidence. A gradient approach, such as the illustrative one in the prior section, could be used to allocate additional passthrough evasion—apply larger multipliers to returns with smaller detected evasion rates. But given that only a small number of passthrough business entity-level audits are observed in the NRP, there are likely additional returns with no entity-level audit that should be allocated entity-level evasion (these are missed by any multiplier approach).[19] This could be addressed by selecting additional returns with no detected passthrough evasion but with similar observable characteristics as returns subject to entity-level audits. For example, a return's reported income and industry (retail, construction, law firm, finance, etc.) or occupation (store owner, builder, lawyer, investor, etc.) could be considered for this purpose. Once selected, these returns would be allocated a similar amount of detected passthrough evasion. Note that the entity-level returns appear to have been selected because of greater likelihood of entity-level evasion, which would need to be considered. A gradient method and an additional-return method could be easily combined. This approach would also be more consistent with the findings of the 2003/2004 S-corporation audit study (IRS, 2008b). These representative entity-level audits found that underreporting rates were highest among S corporations with the least amount of assets (28% underreporting for assets under $0.2 million) and lowest among S corporations with the most assets (11% underreporting for assets of $10.0 million or more).

This section shows that GLRRZ allocates nearly all additional passthrough evasion to the top 1%, presents evidence suggesting there is less total additional passthrough evasion than their baseline assumption, and discusses issues with their comparison of operational audits and audit studies, which motivates the argument for additional passthrough evasion.

A. GLRRZ allocate nearly all additional passthrough income to the top 1%

This section uses the data in GLRRZ to back out the implied share of additional pass-through evasion being allocated to the true top 1%. First, consider the amounts of passthrough and offshore evasion GLRRZ added before DCE (sophisticated after exam). Table 3 follows GLRRZ by allocating $54 billion of offshore evasion to the top 1%. Removing this amount implies that 73 percent of total passthrough evasion is allocated to the top 1% before DCE ($87 of $119 billion).[20]

Next, consider the additional passthrough evasion GLRRZ add after DCE for their "benchmark" estimate. This results in a larger implied top 1% share of additional passthrough evasion of 99 percent ($49 of $50 billion). The reason this is larger than without DCE is likely because DCE re-ranks into the top 1% returns with more net positive reported passthrough income than the returns they replace, which mostly have wage or other capital income with

[18] It's unlikely that most of the evasion by returns with reported losses would be reranked to the top 1%. DeBacker et al. (2020) Table 2 shows that adding detected evasion (including some passthrough entity-level evasion) results in essentially no reranking of returns with reported losses into the top 1%.

[19] Official tax gap estimates also impute undetected evasion to returns with no detected evasion (IRS, 2019).

[20] To check this result, we examine the representative tax data for returns filed in 2012 (INSOLE file), grouping returns by fiscal income and estimate that 76 percent of reported net partnership and S corporation income is in the top 1%.

little evasion. GLRRZ Figure A3 re-ranking patterns fit this mechanism. While GLRRZ suggests that this allocation results in a lower-bound for top 1% shares, the maximum of allocating all to the top 1% is essentially equivalent to their “benchmark” approach. Instead, the results of allocating by reported income are likely already an upper bound.[21]

Table 3: Share of additional passthrough evasion allocated to top 1%

Income Group	GLRRZ Table A6		Offshore evasion removed			
	Sophisticated after exam ($)	Benchmark after DCE ($)	Total passthrough evasion after exam ($)	Additional passthrough evasion after DCE ($)	Total passthrough evasion after exam (%)	Additional passthrough evasion after DCE (%)
P0–90	8	1	7	0	6%	0%
P90–95	6	1	5	0	4%	0%
P95–99	25	5	21	1	17%	1%
Top 1%	141	103	87	49	73%	99%
Total	**180**	**110**	**119**	**50**	**100%**	**100%**

Notes: GLRRZ averages for 2006–2013, amounts in $2012 billions. As shown in GLRRZ Table A3, $54 billion of offshore income is allocated to the top 1%. Remaining amounts are allocated $1 billion to each of the bottom two groups and rest to the P95–99 group. *Source*: GLRRZ Table A6, offshore evasion from Table A3, and authors’ calculations.

B. Total business-level evasion: Recent audits suggest lower evasion rate

This section reconsiders the assumed 20 percent total business-level passthrough evasion rate (as a percent of true income). This is based on an estimated corporate tax evasion rate of 19% from the 2008–2010 tax gap (taxes evaded divided by taxes paid and evaded). But those were recessionary years and these initial estimates have been revised. The new tax gap measures revised this down to about 15% and for more recent non-recessionary years it fell to 14%.[22]

In addition, GLRRZ consider estimated misreporting rates for S corporations (12 to 14% for 2003–2004) and partnerships (26% for 1982). Weighting these by their share of reported passthrough income (two thirds S corporation), suggests an average misreporting rate of 18%. But given the increase in information reporting, especially with Schedule K-1, we agree with GLRRZ’s suggestion that the partnership evasion rate is likely lower in more recent decades.[23] The combined evidence from C corporations and these studies suggest an overall passthrough evasion rate of about 15%. Decreasing the assumed total evasion rate from 20% to 15% would reduce the additional passthrough evasion added by almost two-thirds, implying the evasion-induced increase in top 1% true income shares would fall from 0.6 to 0.2 percentage point.[24]

[21] Note that GLRRZ sensitivity tests for passthrough evasion allocation are based on pre-DCE income, while here we are interested in the GLRRZ “benchmark” estimates, which are after DCE. The results of sensitivity tests should be shown after including undetected income.

[22] These are one less the voluntary compliance rates in Table 3 of IRS (2019). Similarly, following the GLRRZ method, for 2011–2013 there was an estimated corporate tax gap of $42 billion and dividing by total taxes evaded and paid ($42 billion plus one third of $797 billion from NIPA table 3.2 line 8) suggests a corporate tax evasion rate of 14%.

[23] GLRRZ’s data extend through 2013. More recent years may have lower evasion rates because the PATH Act of 2015 created a new large partnership audit regime. Rather than auditing each partner separately, it allows audits of the entire partnership at the entity-level (see section 6221 of the Internal Revenue Code).

[24] The total increase of 0.6 percentage point is noted by GLRRZ on page 39. Total additional passthrough evasion falls by 60 percent because based on GLRRZ Tables A2 and A6, the total business-level evasion for a 20% evasion

C. Issues with comparing operational audits and audit studies

To argue that audit studies miss evasion at the top of the reported distribution, GLRRZ compare detected evaded taxes—not evaded income—in operational audits and NRP audit studies in the top 0.01% of reported income. Evaded income amounts are not available in the operational audit data. However, the shift from evaded income to evaded taxes makes this comparison problematic because the implied tax rates on evaded income are far too low. In addition, the single operational audit year shown is not representative of other years.

First, the implied top tax rates on NRP audit study income are too low. GLRRZZ Table A6 implies a DCE-based top 0.01% tax rate on evaded income of only 11 percent. Table 3 only considers detected evasion (no DCE) and implies a top 0.01% tax rate on evaded income of only 3 percent. For nearly all the years considered, the top tax rate was 35 percent and preferred rates were 15 percent. GLRRZ Table A1 shows that dividends and capital gains account for only one tenth of top 1% evasion. This implies that tax rates on top 0.01% evaded income should be about 33 percent—three times the DCE-inclusive estimate.[25] Applying even a slightly higher top tax rate on evaded income would imply that the NRP audit studies capture more tax evasion than operational audits for all reported income groups.

Second, GLRRZ compare 2006–2013 audit studies to 2010 operational data. For the top 0.01%, this year had an unusually large level of assessments as a fraction of tax liability: 1.7 percent compared to 0.7 percent, on average, for the other years shown in GLRRZ Figure A8. A multi-year average provides a more appropriate comparison, in part because assessed amounts are usually reported for the audits closed in 2010, regardless of when they began. Using the multi-year average would put the operational audit tax assessments well below those of the NRP audits (even without the tax rate correction discussed above). In summary, while there likely is unidentified passthrough business evasion in the audit studies, we find the argument based on comparing top 0.01% operational audit assessment to be unconvincing. At a minimum, the comparison should be based on income evaded rather than on taxes not timely paid.

IV. Short Comments

1. Offshore Evasion: Accounting for Recent Initiatives and Increases in Reporting— Estimating the effect of income from offshore wealth on income inequality is complicated: not all offshore wealth is owned by individuals, reporting of foreign bank accounts to the IRS has increased dramatically since 2009, and enforcement efforts have increased. GLRRZ estimates are based on the following assumptions: total household offshore wealth of $1,058 billion (based on 2007 data) and that 95% of this wealth is undeclared.[26] The assumption that 95% of offshore wealth is undeclared is too high for 2006–2013 and especially for years since 2009. Zucman (2015) states that "a growing fraction of offshore wealth is duly declared, namely

rate is $120 ($180 sophisticated – $60 offshore) and the amount deducted from the NRP is $70 ($180 sophisticated – $110 benchmark), meaning a 15% evasion rates adds only $120*0.15/0.20 – $70 = $20 and ($20 – $50)/$50 = –60% (all in $billions). This appears consistent with the GLRRZ Figure 7(b) sensitivity analysis.

[25] Tax returns with reported losses will have lower average tax rates for evaded income.

[26] GLRRZ use estimates of total offshore wealth that are labelled as "household" wealth, but non-profit organizations make similar investments in private equity and hedge funds provided by U.S. investment banking firms. Estimates of offshore wealth show that non-profit organizations hold over $200 billion of offshore wealth (Auten et al., 2020).

20% in 2014, up from 10% in 2008." This implies the current GLRRZ benchmark assumption that 95% is undeclared should be lowered to 90% in earlier years and 80% in later years. Rosenthal (2021) expresses similar concerns. In addition, GLRRZ's "benchmark" estimates assume undisclosed offshore wealth is distributed equally weighted between the distribution observed in U.S. Foreign Bank Account Reports (FBARs) and leaked Nordic offshore assets. While U.S. taxpayers still hiding offshore income may have higher income than those who voluntarily disclosed, it is not clear that Nordic data is appropriate because it represents a different policy context and the top group is based on only ten observations.

2. Returns with Reported Losses are Crucial—Over one third of detected evasion in audit studies is among returns with reported losses. This is seen not only in the 1988 and 2001 audit studies, but also in the more recent studies (Auten and Langetieg, 2020). GLRRZ currently do not break out the effects of their imputations on returns with reported losses nor do they show the bottom decile in passthrough evasion figures. In conversations with the GLRRZ authors, they have explained that they hope to break out returns with reported losses.

3. Line Switches and Income Shifting Across Years—It would be helpful if GLRRZ clarified how line switches and income shifting across years are corrected in their analysis. Underreported amounts (evasion) are scaled up with DCE multipliers but overreported amounts are not. This makes intuitive sense but can lead to excess estimated evasion due to line switching and income shifting. Line switching occurs when an amount is added on the wrong line of a form and missing from another line. These amounts should be cancelled out, but if only the underreported amount is scaled up by a DCE multiplier, total net underreporting would be overstated. Income shifting from 2013 to 2012 tax returns to avoid tax rate increases was common among high-income taxpayers (Auten, Splinter, and Nelson, 2016). To the degree it's detected, the GLRRZ approach may incorrectly scale up the 2013 shifted income with DCE multipliers, exaggerating total evasion and top income shares. These are potentially large issues. Johns and Slemrod (2010) removed almost a fifth of observations due to data issues such as line switching.

4. Piketty, Saez, and Zucman (2018, PSZ) Claim Appears Understated—GLRRZ (pg. 39) states: "In Piketty et al. (2018) the top 1% income share is higher by 0.7 percentage point after including the forms of evasion explicitly identified in the NIPAs, with no time trend." First, it's unclear what is meant by the evasion explicitly in the NIPAs. Second, it's unclear why there would be no time trend to this PSZ imputation—national accounts show much less proprietor evasion relative to total national income in earlier decades. For 2006–2013, it averaged 3.7 percent and for the 1970s only 2.6 percent. Third, the 0.7 percentage point increase appears understated. This is because PSZ scaled up positive partnership and sole proprietor income reported on tax returns to national income targets. The top 1% earns about 40 percent of this income and there was a total of explicit $637 billion proprietor evasion, implying about $250 billion imputed to the top 1% or 1.8 percentage of national income.[27]

[27] PSZ scale up positive reported income after imputations to target national income totals. Including the $74 billion of evaded wages explicitly shown in national accounts should slightly decrease the top 1% amount, while including the evasion not explicitly shown, should increase it due to highly concentrated S corporation income.

5. Evasion among Non-Filers—GLRRZ write that, "high-income non-filers drive the bulk of the non-filer tax gap in recent years (TIGTA, 2020)." But this TIGTA report differs from the surrounding discussion in several ways. The TIGTA report discusses evaded *taxes*—not evaded *income*. It is obviously the case that evaded taxes are more highly concentrated among those with higher incomes because a large share of tax units have no federal individual income tax burden (Splinter, 2019) and most payroll taxes of non-filers are withheld by their employers. There are also differences in the use of the term "high-income." For filers, GLRRZ use the term high-income to refer to the top 1% or 0.1%, with fiscal incomes above $450,000 and about $2 million, respectively. For non-filers, TIGTA uses a much lower threshold. TIGTA (2020, pg. 2) explains that "a high-income nonfiler is any nonfiler with a total income greater than or equal to $100,000." Finally, the definition of non-filer for purposes of tax gap estimates includes many late filers and is not directly comparable to estimates of income inequality in PSZ or Auten and Splinter (2019), which use annual SOI tax return files that include some non-timely filed prior-year returns.

V. Policy Implications of Estimated Evasion

Caution is needed if the results from studies such as GLRRZ are used to understand the impact of additional high-income audits. It may seem that the GLRRZ estimate of a high underreporting rate at the top of the "true" distribution implies the IRS can raise substantial revenue by targeting audits at high-income returns. But the IRS cannot observe those in the top of the "true" income distribution until after performing audits. As GLRRZ (pg. 13) explains: "The majority of evasion attributed to the top 0.01%...comes from individuals initially reporting income below the top 0.01% threshold who are re-ranked into the top 0.01% after DCE adjustment." This means that many returns with significant evasion at the top of the *true* distribution are lower down in the *reported* distribution. Therefore, increasing audit rates of returns with the highest reported income is not necessarily the best use of IRS resources.[28]

The effectiveness of audits is generally evaluated in term of the return on investment (ROI), the expected additional revenue collected per dollar of enforcement activity costs. Holtzblatt and McGuire (2016) summarize these ROIs.[29] Allowing for some start-up time, the estimated ROIs were 8.0 for increasing audit coverage.[30] Lower ROIs are observed for enforcement programs focused on the sources of high-income evasion evaluated by GLRRZ.

[28] Audits are already targeted at the top of the reported income distribution. TIGTA (2020) shows high audit rates at the top of the distribution, with audits among 20 percent of returns with adjusted gross income of at least $10 million (audit rates averaged over the three years shown). Note that a risk assessment targets audits within each income group (pg. 10): "The case is risk assessed to determine if an audit is warranted on the taxpayer's and his or her related entities' tax returns. During the risk assessment process, additional internal and external research is performed to identify large, unusual, or questionable items to determine the reasons for a low effective tax rate." For some programs, IRS also considers complexity when assessing risk of evasion. Sarin and Summers (2019, 2020) discuss how additional audits and technology investments could help better target high-income returns.

[29] ROIs from 2016 Treasury: pg. 13 of https://home.treasury.gov/system/files/266/15.-IRS-FY-2016-BIB-Final.pdf

[30] CBO (2020) assumes a lower ROI of 6.4 (after three years). Using IRS data, Holtzblatt and McGuire (2020) estimate that additional funding would have a maximum ROI of 5.7 that decreases with additional funding. Sarin and Summers (2020) argue for a higher ROI. Belokowsky (2021) also discusses the likelihood of diminishing returns to ROIs. Increasing audit rates would further decrease the ROI toward 1 and subject many more non-evaders to audits.

Improving audit coverage of large partnerships had an ROI of 7.6, but a program to address international and offshore compliance had an ROI of only 3.7. ROIs for additional audits of large partnerships may have changed due to recent legislation. The Protecting Americans from Tax Hikes (PATH) Act of 2015 created a new partnership audit regime—instead of the IRS needing to pursue each partner separately, the IRS may audit large partnerships and assess evaded taxes and penalties at the entity-level.

Efforts to limit high-income tax evasion are not new. Troiano (2017) discusses policies introduced in the 1950s and 1960s that limited significant high-income evasion: expansions of income tax withholding, third-party reporting, and intergovernmental agreements to coordinate audits. These policies caused large increases in reported top income shares, suggesting that prior efforts to address evasion disproportionately affected those with high incomes.

These various findings suggest implications for considering the best use of additional IRS funding for compliance. While some increase in high-income audit rates may be appropriate, additional enforcement resources could also help audit selection by better identifying returns with lower reported incomes but higher likelihood of evasion. The combined efforts and increased cooperation of IRS divisions could lead to improved methods of selecting returns for audit and help maintain high ROIs for enforcement activities.

VI. Conclusion

There are many limitations of tax data, perhaps most significantly that it misses evaded income. GLRRZ seek to identify and allocate high-income evasion beyond that found in the detailed NRP audits. We are impressed by their dedicated efforts and use of many sources of data to raise awareness and understanding of the extent of sophisticated and offshore evasion. We note in this comment, however, that estimates of evasion not detected in NRP audits using simple DCE multipliers and allocating in proportion to reported income are not distributionally consistent. Moreover, we believe these approaches tend to overstate true top incomes and underreporting rates. We suggest alternative methods that would be more distributionally consistent. These suggest substantially less impact of evasion on top income shares. We are aware that there is considerable additional sophisticated evasion by some high-income individuals not found in NRP audits. However, GLRRZ would benefit from more specific empirical evidence to support their analysis and better understand the extent and distribution of evaded income.

References

Auten, Gerald, Joseph Hancuch, and Paul Arnsberger. 2020. "Offshore Investments: The Case of US Non-Profits." Presentation at 113th Annual Conference of the National Tax Association.

Auten, Gerald, and Patrick Langetieg. 2020. "The Distribution of Underreported Income: What We Can Learn from the NRP." Working paper.

Auten, Gerald, and David Splinter. 2019a. "Income Inequality in the United State: Using Tax Data to Measure Long-term Trends." Working paper.

Auten, Gerald, and David Splinter. 2019b. "Top 1% Income Shares: Comparing Estimates Using Tax Data." *AEA Papers and Proceedings 109*, 307–311.

Auten, Gerald, David Splinter, and Susan Nelson. 2016. "Reactions of High-Income Taxpayers to Major tax Reforms." *National Tax Journal* 69(4): 935–964.

Belokowsky, Simon. 2021. "New Research Suggests IRS Underestimates Tax Evasion by Wealthiest Filers." https://tax.unc.edu/index.php/news-media/new-research-suggests-irs-underestimates-tax-evasion-by-wealthiest-filers/

Bloomquist, Kim, Ed Emblom, Drew Johns, and Patrick Langetieg, 2012. "Estimates of the Tax Year 2006 Individual Income Tax Underreporting Gap." IRS Research Bulletin: Proceedings of the 2012 IRS/TPC Research Conference: 70–78.

Congressional Budget Office. 2020. "Trends in the Internal Revenue Service's Funding and Enforcement."

DeBacker, Jason, Bradley Heim, Anh Tran, and Alexander Yuskavage. 2020. "Tax Non-compliance and Measures of Income Inequality." *Tax Notes Federal*, February 17, 1103–1118.

Erard, Brian, and Chih-Chin Ho, 2003. "Explaining the U.S. Income Tax Continuum." *eJournal of Tax Research* 1(2): 93–109.

Erard, Brian, and Jonathan Feinstein, 2011. "The Individual Income Reporting Gap: What We See and What We Don't." IRS Research Bulletin: Proceedings of the 2011 IRS/TPC Research Conference: 129–142.

Feinstein, Jonathan S. 1990. "Detection Controlled Estimation." *Journal of Law and Economics* 33(1): 233–276.

Feinstein, Jonathan S. 1991. "An Econometric Analysis of Income Tax Evasion and Its Detection." *RAND Journal of Economics* 22(1): 14–35.

Guyton, John, Patrick Langetieg, Daniel Reck, Max Risch,, and Zucman. 2021. "Tax Evasion at the Top of the Income Distribution: Theory and Evidence." March. NBER working paper No. 28542.

Hines, James R., Jr.. 2020. "Corporate Taxation and the Distribution of Income." NBER Working Paper No. 27939.

Holtzblatt, Janet, and Jamie McGuire. 2016. "Factors Affecting Revenue Estimates of Tax Compliance Proposals." CBO working paper 2016-05, JCT working paper JCX-90-16.

Holtzblatt, Janet, and Jamie McGuire. 2020. "Effects of Recent Reductions in the Internal Revenue Service's Appropriations on Returns on Investment." IRS Research Bulletin: Proceedings of the 2019 IRS/TPC Research Conference: 128–146.

IRS. 2008a. "Preliminary Methodology for Estimating the TY2004 Tax Gap Associated with S-Corporations." Draft version August 22, 2008.

IRS. 2008b. "Preliminary Results of the 2003/2004 National Research Program S-Corporation Underreporting Study." Draft version August 22, 2008.

IRS. 2019. "Federal Tax Compliance Research: Tax Gap Estimates for Tax Years 2011–2013." IRS Publication 1415 (Rev. 9-2019).

Johannesen, Niels, Patrick Langetieg, Daniel Reck, Max Risch, and Joel Slemrod. 2020. "Taxing Hidden Wealth: The Consequences of US Enforcement Initiatives on Evasive Foreign Accounts." *American Economic Journal: Economic Policy* 12(3): 312–346.

Johns, Andrew, and Joel Slemrod. 2010. "The Distribution of Income Tax Noncompliance." *National Tax Journal* 63(3): 397–418.

Johnston, David Cay. 2008. "Trust, But Verify." *Tax Notes* 120 (August 4): 485-488.

Joint Committee on Taxation. 2019. "Overview of the Tax Gap." JCX-19-19.

Joint Committee on Taxation. 2021. "Technical Explanation of the Modification Of Exceptions of Reporting Third Party Network Transactions in New Section 9674 of Subtitle IX of the America Rescue Plan Act Of 2021, as Amended by the Proposed Manager's Amendment."

Piketty, Thomas, Emmanuel Saez, and Gabriel Zucman. 2018. "Distributional National Accounts: Methods and Estimates for the United States." *Quarterly Journal of Economics* 133(2): 553–609.

Rosenthal, Steven M. 2021. "If Congress Wants the IRS to Collect More Tax from the Rich, It Needs to Pass Better Laws." Tax Policy Center, Tax Vox. Available at www.taxpolicycenter.org/taxvox/if-congress-wants-irs-collect-more-tax-rich-it-needs-pass-better-laws

Sarin, Natasha, and Lawrence H. Summers. 2019. "Shrinking the Tax Gap: Approaches and Revenue Potential." NBER working paper No. 26475.

Sarin, Natasha, and Lawrence H. Summers. 2020. "Understanding the Revenue Potential of Tax Compliance Investment." NBER working paper No. 27571.

Slemrod, Joel, Brett Collins, Jeffrey Hoopes, Daniel Reck, and Michael Sebastiani. 2017. "Does Credit-Card Information Reporting Improve Small-Business Tax Compliance." *Journal of Public Economics* 149: 1–19.

Splinter, David. 2012. "Income Variability: Effects on U.S. Income Inequality and Tax Progressivity." Rice University, PhD Dissertation.

Splinter, David. 2019. "Who Pays No Tax? The Declining Fraction Paying Income Taxes and Increasing Tax Progressivity." *Contemporary Economic Policy* 37 (3): 413–426.

Splinter, David. 2020. "Reply: Trends in US Income and Wealth Inequality: Revising After the Revisionists." Working Paper.

TIGTA. 2015. "Improvements are Needed in Resource Allocation and Management Controls for Audits of High-Income Taxpayers." Treasury Inspector General for Tax Administration publication 2015-30-078.

TIGTA. 2020. "High-Income Nonfilers Owing Billions of Dollars are Not Being Worked by the Internal Revenue Service." Treasury Inspector General for Tax Administration publication 2020-30-015.

Troiano, Ugo. 2017. "Do Taxes Increase Economic Inequality? A Comparative Study Based on the State Personal Income Tax." NBER working paper No. 24175.

Zucman, Gabriel. 2015. "Factual mistakes in "Robin Hood's Very Merry Man." Wall Street Journal. Available at https://gabriel-zucman.eu/files/press/201510WSJAnswer.pdf

Appendix

GLRRZ replicates the simple DCE multiplier approach used by Johns and Slemrod (2010). The following explanation of the application and limitations of the DCE multipliers comes directly from Johns and Slemrod (2010, pp. 400–401):

"The DCE analysis was done separately for two groups of returns. A return was allocated to one of the following groups: (1) Returns without reported Schedule C or Schedule F profit or loss, and with reported total positive income (TPI)[7] less than $100,000, or (2) Returns with reported Schedule C or Schedule F profit or loss, or with reported total positive income greater than or equal to $100,000. Within each of these two tax return groups, noncompliance equations were then estimated separately for total income and for "low-visibility" income subject to little or no information reporting, which included farm or nonfarm proprietor income, income from a partnership or S corporation, rental or royalty income, gains or losses reported on Form 4797, and income reported on the Form 1040 "other income" line. "High-visibility" income had at least some systematic information reporting and included wages and tips, interest and dividends, state and local tax refunds, alimony, capital gains, pensions, unemployment compensation, and Social Security income.

The noncompliance equations that resulted from the DCE analysis were used to estimate the amount of total income underreporting (i.e., detected plus undetected) and the amount of low-visibility income underreporting. Unreported high-visibility income was then set to the difference between these two DCE estimates. Each DCE estimate for total underreported income was divided by the amount of underreporting actually detected. This procedure generates four separate "multipliers," one for each type of return and income-visibility category:

Non-business returns with reported TPI < $100,000
- Low-visibility income: 4.158
- High-visibility income: 2.009

Business returns or returns with reported TPI > $100,000
- Low-visibility income: 3.358
- High-visibility income: 2.340.

The DCE multipliers were then used to calculate, on a return-by-return basis, line-item net misreported amounts (NMAs) by multiplying the amount of underreported income detected during the NRP audit by the appropriate one of the four DCE multipliers. The multiplier was applied only to the detected underreporting of a line item if the sample return was selected for face-to-face audit and the examiner detected some underreported income. Note that this technique assumes that detection rates are similar across line items within each type of return and income-visibility category. The use of the DCE multipliers will understate estimates of undetected income for some taxpayers, and almost certainly will do so for the class of returns subject to correspondence audits and those audited returns where no income underreporting was detected, because no adjustment is made in these cases. Conversely, it may overstate estimates of undetected income for other taxpayers. Note specifically that the use of the multipliers implicitly allocates undetected income in proportion to the amount of income that was detected, within a given income visibility category. To the extent that certain types of low-visibility income are harder to detect than others, the use of the DCE multipliers may also overstate or understate the amount of noncompliance for some income sources.[8]

Note finally that the individual underreporting gap estimates reported here focus only on misreporting on returns filed on a timely basis, and therefore do not take into account all noncompliance by individual taxpayers; the IRS estimates a separate tax gap for individual nonfilers, which includes late-filed returns. Nor do the estimates explicitly account for income derived from illegal activities. If the NRP examiner found income from illegal activities during the audit, that income is included but, as this would have been detected incidentally, it likely represents a very small portion of the whole."

Footnote 8 from Johns and Slemrod (2010): "The estimates based on the DCE-adjusted NRP subset do not come with standard errors, but we can infer something about the confidence surrounding estimates by looking at Table A1, which shows the number of tax returns, by income class, that comprise the sample."

Table A1: Percent of returns by ratio class, 2010–2011

Panel A: Percent of Returns by Ratio Class

rank	-0.5	0.5	1	1-1.1	1.1-1.2	1.2-1.5	1.5-2	2-4	4-8	8+
<-50	4.06	37.01	34.09	3.07	3.50	11.42	1.90	4.15	0.61	---
< 0	6.98	20.09	29.11	2.80	2.31	5.50	6.28	10.46	9.26	7.23
0-20	---	5.12	66.40	8.62	3.29	5.62	3.43	3.73	1.78	1.89
20-40	---	4.70	70.54	10.57	3.34	5.07	2.97	2.22	0.50	---
40-60	---	4.18	72.52	11.80	3.40	4.48	2.03	1.28	0.19	---
60-80	---	3.59	70.95	17.15	3.38	3.45	0.93	0.53	0.01	---
80-90	---	3.75	74.39	16.42	2.48	2.15	0.63	0.17	0.01	---
90-95	---	3.38	75.20	15.47	3.27	2.12	0.43	0.12	0.01	---
95-99	---	4.58	72.80	18.19	2.73	1.32	0.25	0.13	---	---
99-99.5	---	4.84	74.74	17.74	1.72	0.46	0.40	0.09	---	---
Top 0.5	---	3.79	77.73	15.40	2.02	0.82	0.18	0.07	---	---
All	0.12	4.47	70.63	12.95	3.21	4.10	1.97	1.61	0.52	0.44

Panel B: Average Ratio of Corrected to Reported Income by Ratio Class

rank	-0.5	0.5	1	1-1.1	1.1-1.2	1.2-1.5	1.5-2	2-4	4-8	8+
<-50	-1.207	-0.770	1.000	1.078	1.174	1.357	1.667	2.918	4.639	---
< 0	-1.666	-0.594	1.000	1.029	1.116	1.362	1.863	2.850	6.242	24.082
0-20	---	0.560	1.000	1.039	1.145	1.338	1.716	2.743	5.628	17.410
20-40	---	0.514	1.000	1.038	1.145	1.322	1.677	2.753	5.294	---
40-60	---	0.763	1.000	1.039	1.145	1.328	1.700	2.548	4.906	---
60-80	---	0.940	1.000	1.032	1.141	1.314	1.701	2.591	5.158	---
80-90	---	0.942	1.000	1.031	1.138	1.316	1.705	2.463	5.172	---
90-95	---	0.964	1.000	1.034	1.152	1.306	1.636	2.586	4.848	---
95-99	---	0.954	1.000	1.028	1.134	1.314	1.688	2.660	---	---
99-99.5	---	0.931	1.000	1.027	1.136	1.363	1.683	2.034	---	---
Top 0.5	---	0.952	1.000	1.028	1.132	1.313	1.661	3.082	---	---
All	0.103	0.725	1.000	1.035	1.143	1.326	1.702	2.707	5.603	17.834

Panel C: Standard Error for Ratio by Ratio Class

rank	-0.5	0.5	1	1-1.1	1.1-1.2	1.2-1.5	1.5-2	2-4	4-8	8+
<-50	0.104	0.026	---	0.010	0.008	0.019	0.042	0.192	0.149	---
< 0	0.379	0.033	---	0.008	0.012	0.025	0.024	0.083	0.171	2.720
0-20	---	0.029	---	0.002	0.002	0.005	0.011	0.031	0.101	0.928
20-40	---	0.028	---	0.001	0.002	0.005	0.009	0.042	0.137	---
40-60	---	0.025	---	0.001	0.002	0.005	0.010	0.035	0.184	---
60-80	---	0.006	---	0.001	0.001	0.004	0.011	0.053	0.287	---
80-90	---	0.009	---	0.001	0.002	0.007	0.018	0.075	0.486	---
90-95	---	0.007	---	0.001	0.003	0.008	0.024	0.132	---	---
95-99	---	0.006	---	0.001	0.003	0.011	0.021	0.114	---	---
99-99.5	---	0.022	---	0.002	0.008	0.020	0.065	0.004	---	---
Top 0.5	---	0.009	---	0.001	0.004	0.014	0.064	0.083	---	---

Notes: Ratio classes group returns by the ratio of reported income plus detected evasion divided by reported income. For example, ratio class 1 has a detected evasion rate of zero and ratio class 2–4 includes returns with detected evasion rates of 50–75%. Detected evasion is allocated by randomly assigning tax returns within each reported income group to a ratio class according to panel A. Other than those in the no-evasion class, each return receives detected evasion (or overreporting) by multiplying the absolute value of AGI by a draw from a distribution with a mean and standard error for the corresponding average ratio group (ratio class 8+ maximum is three times the mean). For ratio group 0.5, returns with positive income have overreported income, and returns with negative income have their losses reduced but the resulting income is still negative. *Source*: Auten and Langetieg (2020).

Table A2: Undetected evasion multipliers by ratio class

Ratio Class	1-1.1	1.1-1.2	1.2-1.5	1.5-2	2-4	4-8	8+
DCE Multipliers (approx. GLRRZ)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Gradient	8.0	6.8	5.7	4.5	3.3	2.2	1.0
Flat gradient	4.0	3.5	3.0	2.5	2.0	1.5	1.0
Steep gradient	12.0	10.2	8.3	6.5	4.7	2.8	1.0

Notes: Multipliers times detected evasion (underreporting only) gives an estimate of detected plus undetected evasion.