THE DISTRIBUTION OF UNDERREPORTED INCOME: WHAT WE CAN LEARN FROM THE NRP

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This paper presents new information about the underreporting of income on individual tax returns over the last 25 years by type of income and income class. The analysis is based on detailed audit studies conducted by the IRS, including the 1988 TCMP study and the 2001 and 2006 through 2013 studies under the NRP program. While the likelihood of having underreported income increases at higher reported income levels, the average ratio of underreported to reported income actually declines as reported income increases. In addition, underreporting of business income is substantially greater than that of income subject to information reporting and is especially concentrated among taxpayers reporting business losses. We also compare results ranking by reported income with results ranking by audit-corrected incomes. Because of our interest in helping other researchers account for underreported income in data based on reported incomes, most of our analysis focuses on reported income groups.

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In 1963, the IRS began a program of special detailed audit studies of individual income tax returns. The results of these studies have been used to improve the selection of returns for regular operational audits and to estimate the tax gap, the amount of revenue not collected on time. Under the Taxpayer Compliance Measurement Project (TCMP), periodic studies were conducted from 1963 through 1988. This TCMP program was discontinued after 1988 due to controversy over costs of a planned study for 1994.[1] In 2001, the IRS initiated the National Research Program (NRP), intended to obtain this information while making the audits less onerous for affected taxpayers and less costly for the IRS. Under this program, the IRS conducted a new large sample study for tax year 2001 and began a series of smaller annual sample studies in 2006.

In addition to being a valuable tool for the IRS, the results of these detailed audits are also an important resource for government agencies, think tanks and researchers for improving their income measures.[2] With a few exceptions, however, there has been very little published information on the amounts of underreported income by type of income and income group.

Using the 1988 TCMP file and the more recent NRP data, this paper provides previously unavailable information about the types and amounts of unreported income by income class and the extent to which this may have changed over time. Not surprisingly, there is relatively little underreporting of income subject to information reporting (such as wages, dividends and interest), but much higher underreporting for income subject to little or no information reporting, especially business income. When tax units are ranked by audit-corrected or "true" income, the largest proportions of underreported income are found at the top of the distribution. When ranking by reported income, however, larger portions of unreported income are in lower deciles, especially the bottom decile which includes returns with negative incomes. Because of our interest in helping to understand where taxpayers with unreported income can be found in published data, most of our analysis groups taxpayers based on their reported incomes.

I. NONCOMPLIANCE BY INCOME LEVEL IN PRIOR STUDIES

While there have been many previous studies on various aspects of tax compliance, only a few have reported on non-compliance by income class using micro data, and those have only examined a single year. Using the 1988 TCMP file, Charles Christian (1994) found that compliance levels were higher for taxpayers with higher reported incomes, reaching 97 percent for returns with $500,000 or higher AGI.[3]

In contrast, using the 2001 NRP data, Johns and Slemrod (2010) found that when ranking by "true" income, underreporting was higher in high income groups. Specifically, the ratio of unreported to true income rises with income, peaking in the 90 to 99.5 centiles. Another finding was the inclusion of

[1] Additional factors in the cancellation included criticism from Congress and others that the planned sample size was too large and the audits would be too burdensome on taxpayers (GAO, 2001). TCMP audit studies were also conducted of tax returns of corporations, partnerships, estates and fiduciaries.

[2] For example, the Bureau of Economic Analysis uses them as the basis for underreported income in the national income accounts. The treatment of underreported business income is explained in Bureau of Economic Analysis (2019), Chapter 11.

[3] These results were for compliance with taxes paid, but should correlate closely with compliance rates for income. There were only two statutory rates in 1988: 15 and 28 percent, but a phaseout of the benefit of the 15 percent rate created an effective rate of 33 percent. There was a slight dip in the compliance rate in the $100,000 to $250,000 AGI group that roughly corresponds to the phaseout range with the higher 33 percent rate. Other early studies reporting compliance by income class, such as Bishop, et al. (2000) seem to have used aggregated data on average incomes by 3-digit zipcodes.

unreported income has little effect on inequality as measured by Gini coefficients due to re-ranking.[4] While not discussed in the papers, other tabulations of the 2001 data show the importance of business losses: the underreporting rate for sole proprietorship income is about 100 percent for returns with negative AGI. This implies that the NRP audits essentially offset all sole proprietorship losses in the aggregate for the returns with negative AGI.[5] In this paper, we provide additional insights into the issues of the effects of alternative rankings of returns and the importance of underreporting of taxpayers claiming business losses. More recently, Debacker, et al. (2020) examined NRP data for 2006 through 2014 and concluded that measures of inequality are lower after accounting for non-compliance. Both Gini coefficients and top income are slightly reduced after including unreported income for AGI and specific types of income.

II. DATA

The analysis in this paper is based on data from the 1988 TCMP study and the NRP studies for 2001 and 2006 through 2013. The first two studies were large cross-section samples for tax years 1988 (54,000 observations) and 2001 (45,000 observations). Beginning in 2006, the NRP program changed to smaller annual samples of about 14,000 to 15,000 returns. Because of the smaller sample sizes, our analysis combines annual samples in similar parts of the business cycle to obtain greater reliability. The resulting samples are for 2006 and 2007, 2008 and 2009, 2010 and 2011, and 2012 and 2013. Combining 2012 and 2013 helps account for the shifting of income between these two years in response to the 2013 tax increases anticipated in 2012.

While frequently referred to as "random audits", these data are more accurately described as stratified random samples. Sampling rates are based on audit classes (presence of certain types of business income) and the amount of total positive income. Returns including income with little or no information reporting, such as sole proprietorships and farms, are sampled at higher rates. Returns including only income subject to substantial information reporting are sampled at lower rates. While other studies often use AGI, total positive income can be considered a better measure of economic income (and to some degree, of wealth) and of the incentive to engage in tax shelters or other tax avoidance strategies.[6]

While these audits potentially involve in-person audits of every return item, not all will necessarily receive the same scrutiny. An initial review classifies returns into three groups: accept as filed (or with minor adjustments) based on information returns, conduct a correspondence audit or conduct an in-person audit. This approach was one of the ways the IRS reduced the burden on taxpayers, especially those believed most likely to be compliant based on preliminary examination of information returns.

III. RESULTS

[4] While all differences are very small, Johns and Slemrod (2010) estimates that when unreported income is added the Gini coefficient for pre-tax income is lower, but is unchanged for after-tax "true" income. Johns and Slemrod (2010) use the term "true" income to describe their estimates that are DCE corrected for underreported income not discovered in the NRP audit.

[5] Tables in Johnston (2008) and Johns and Slemrod (2008) break out returns with no positive reported AGI showing net underreporting rates of 101 and 102 percent respectively. Another hint of the importance of business losses in Johns and Slemrod (2010) is that the bottom decile that includes negative AGI returns accounts for 13 percent of underreported income, while the next two deciles each account for only 8 percent.

[6] Periods before the Tax Reform Act of 1986 and when tax rates have increased significantly (such as in 1993) have been associated with increases in tax shelters that defer tax or provide losses that can be used to offset high taxable income. See Auten, Splinter and Nelson (2013).

In this section, we examine various dimensions of taxpayer compliance and underreporting using the TCMP and NRP audit studies from 1988 to 2013. Questions include what percent of taxpayers underreport income, by how much they underreport and by how much underreporting varies by type of income, by income class and over time.

Table 1 shows summary information on underreporting by type of income discovered in the TCMP and NRP studies. Total income as reported on the front of Form 1040 was increased by these audits by a relatively modest 3.9 percent.[7] As discussed in more detail later, we adjust underreporting of types of income for cases where income was reported, but on the wrong line of tax forms. Sources of income subject to substantial information return reporting to the IRS, such as wages, dividends and interest, were found to have only small amounts of underreporting and account for only small shares of total underreporting. Sole proprietorship income was increased by 54 percent under audit and accounted for 46 percent of all underreported income discovered. Partnership and S corporation income was increased by only 5.7 percent and accounted for 7.6 percent of underreported income. As discussed later, this does not include any underreporting on the tax return of the business. Net rent and royalty was increased by 94 percent and accounted for 9 percent of unreported income. Net farm income was increased by 120 percent, largely because farm losses are almost as large as farm profits so that net farm income is relatively small.

A. Underreporting of Total Income

The choice of the variable used to rank taxpayers in the income distribution can also affect how underreporting is distributed. Johns and Slemrod argue that distributions by corrected income are most appropriate. While this approach clarifies underreporting by truly wealthy taxpayers, it isn't helpful for researchers who only observe reported incomes. If underreporting rates by true income are applied to reported incomes, this can produce misleading results by overstating top incomes.

To illustrate the effects of ranking, Figure 1 compares ranking returns by reported income with ranking by audit-corrected income for 1988 through 2013. Figure 1A shows that under both rankings, the percent of taxpayers with unreported income generally increases with income, from less than one-fourth of the lowest income quintile to about half of the top one percent. In part, this reflects the fact that most income in this group is wages and salaries and other sources subject to third-party information reporting. The exception is among taxpayers reporting negative total incomes: nearly 70 percent of returns with negative reported incomes had unreported income, primarily disallowed business losses and loss carryovers. In comparison, less than 40 percent of returns with negative corrected incomes had unreported income. This large difference is due to auditors discovering enough unreported income to change total income from negative to positive.

Another perspective is unreported income as a percent of reported income and how this varies under alternative rankings (see Figure 1B). When returns are ranked by reported incomes, the ratio of unreported to reported income declines at higher reported incomes, sharply at first and then much more gradually to only 2 or 3 percent for the top half of the distribution. When ranking by audit-corrected incomes, the ratio is relatively constant and is higher in the top two quintiles. The most dramatic

[7] Total income is the sum of the income items on Form 1040. This is before any adjustments for calculating adjusted gross income. These adjustments have varied considerably, making AGI less comparable over time.

differences are among taxpayers with negative incomes: unreported income is more than one-third of reported income for those with negative reported income but less than 10 percent for those with audit-corrected negative income. This difference is a result of the re-ranking: some returns found to have substantially overstated their losses end up in the middle of the distribution, and a few near the top of the distribution.

Another useful perspective is the shares of unreported income under the different definitions of income (Figure 1C). By reported income groups, the largest shares of unreported income are in the negative income and quantile groups up to about the 80th percentile and small shares in the top income groups. The pattern is similar when ranked by total positive income except for the lack of a negative income group. By corrected income, the largest shares are in the middle of the distribution and there is now much less in the negative income group after including the income discovered in the audit.

Finally, as might be expected, while underreporting is smaller for those with the highest reported incomes, the average amounts generally increase with higher reported incomes with some notable exceptions. When ranking by reported income, the highest average unreported amount is found among firms with negative incomes. When ranking by audited incomes, somewhat surprisingly, the highest average amounts are found not in the top 0.1 percent but in the lower part of the top 1 percent.

For the rest of the analysis of overall underreporting, this section uses total income as found on Form 1040. Additional dimensions in understanding underreporting include how much underreporting patterns have changed over time and how much variation there is within each income group. (Figures 2A-2D). Have these underreporting patterns changed over time? Figure 2A shows the ratio of unreported income by reported income group for each of the separate time periods in our data: 1988, 2001, 2006-7, 2008-9, 2010-11 and 2012-13. The decline in this ratio at higher reported income levels is found in all the time periods, but with some variation in the levels and patterns. In 1988, for example, underreporting was relatively lower in all income groups except for the top 1 percent. This may have been related to the transition to new rules under the Tax Reform Act that targeted high-income taxpayers.

There is wide variation in the extent underreporting both within and across income groups, especially in the bottom two income quintiles (Figure 2B shows all years combined). While about half have little or no unreported income in all income groups, small percentages have quite high ratios of unreported to reported income. At the 20th centile of the income distribution, for example, 10 percent of returns have failed to report almost half of their income and 5 percent have failed to report almost one-third. A few taxpayers (well under 1 percent) are found to have reported less than 5 percent of their audit-corrected income. For taxpayers with negative incomes and low positive incomes, the line for the 5 percent (95th percentile) with the highest ratios goes off the chart: these taxpayers reported less than12 percent of their income. In the top of the distribution, the underreporting ratios are much lower. In the top one percent of the distribution, for example, while per return dollar amounts can be large, only 5 percent have underreported income more than 8 percent of reported income.

Another perspective is provided in Figure 2C that shows the shares of unreported income by reported income groups for each time period. From 2001 through 2013, about 11 percent of unreported income is found among the typically 1 or 2 percent of returns with negative total incomes. Having a negative total income is the result of some combination of current year business losses and loss carryovers

from prior years. After adjusting for unreported income, the remaining returns with negative incomes account for only less than two percent of unreported income. In the 1988 TCMP data, the share of unreported income of returns with negative incomes is larger: about 17 percent. This is likely due to taxpayers not yet being fully compliant with provisions of the Tax Reform Act to reduce tax shelter losses and limit deductions of passive losses. The top one percent share was 7.5 percent in 1988, but smaller in more recent years: about 6 percent in 2006-2007 and 4 to 5 percent in other years.

Comparison of the top one percent share with the rest of the distribution yields some surprising results. Returns with negative total incomes accounted for over twice the share of unreported income of the top one percent except in 2006-2007 when it was only 80 percent higher. Even the middle three quintiles and the rest of the top and bottom quintiles accounted for twice the share of the top one percent share in all periods.

Taking all of these findings into account yields the following picture for total income. Taxpayers with higher reported incomes have a greater likelihood of having underreported income. But the average ratio of unreported income declines at higher levels of reported income. This is at least partly accounted for by relatively small percentages of taxpayers who have substantially understated their income.

An additional question is the extent to which the share of income subject to substantial information reporting to the IRS varies by income group and how this might affect what is observed about underreporting. It is useful to consider this in three categories. Some income, such as wages and salaries, Social Security, and interest and dividends, is subject to substantial information reporting. Some income is subject to little or no reporting, including sole proprietorships, rent and farm income. An in-between category has some information reporting but is more subject to error or underreporting. This category includes partnership and S-corporation, pension and IRA, and alimony income. As shown in Table 3, most of the income distribution is subject to substantial information reporting on over 80 percent of their income. While the percentages vary over time, the top one percent has much less of its income subject to substantial income reporting, less than half for the top 0.5 percent. Including income subject to some reporting, however, the percentage subject to some information reporting increases to about 90 percent. This is due to K-1 reporting for partnerships and S corporations. Returns reporting low positive incomes have experienced a significant increase in the portion of their income subject to some or little information reporting. This likely reflects the shift to more independent contracting and the Gig economy. While this group should be receiving 1099-Misc reporting, they have the opportunity to claim deductions not available to most employees when they file a Schedule C.

Returns with negative total incomes are typically subject to little information reporting on their losses, and account for disproportionate shares of unreported income. Since these negative incomes are the result of business losses, the next section considers the underreporting of business income.

B. Underreporting of Business Income

Business income from sole proprietorships, rental properties, farms and pass-through business (partnerships and S corporations) has been subject to relatively little information reporting and therefore found to have much higher rates of noncompliance and underreporting. In this section we measure

business income as all income included on Schedules C (sole proprietorships), E (rent and royalty, farm rent, partnerships and S corporations) and F (farms).[8]

Several measures of underreporting of business income are illustrated in Figures 3A to 3D in which businesses are ranked and grouped by reported business income. Returns with business losses are part of the bottom quintiles, but in a separate group.

Figure 3A illustrates that over 70 percent of returns with overall negative business income have some amount of underreported income. Among returns with positive business income percentage with underreported income over 60 percent in the upper middle of the distribution (60th to 90th percentiles) dropping to less than 40 percent both at the top and bottom.

As with total income, Figure 3B shows that the average ratio of unreported to reported income declines substantially among taxpayers with high reported business incomes. Among taxpayers with business losses, the audits reduce these losses by about half. Taxpayers in the middle of the distribution (40th to 60th centile group) have unreported income roughly equal to what they reported, that is, they reported about half of their business income. In the highest income groups, the income discovered in the audits is only about one percent of the reported amounts.

The most striking part of this figure is for returns with positive business incomes below the 40th percentile where unreported income is over seven times the reported amount in all periods except 2012-2013 when it is over five times. It turns out that because returns with business losses are grouped separately and account for large portions of the bottom 40%, these are primarily taxpayers who reported very modest amounts of business income who auditors found should have reported much larger amounts. Examples would be returns reporting $2,000 to $4,000 of business income that is increased to $15,000 to $40,000 as a result of the audit.

As with total income, Figure 3C illustrates that relatively small percentages of returns are found to have substantial non-compliance, reporting only a small fraction of their actual income. The 95th percentile of underreporting reaches a peak in the middle of the distribution showing that 5 percent of these taxpayers have unreported income of at least 5.5 times the amounts reported. Another 5 percent of business taxpayers in this range have unreported income of two to three times their reported amounts. The extent of underreporting declines at the highest reported income levels. The 5th centile is below zero over much of the distribution, illustrating that business income is adjusted downward in some cases, perhaps because of additional expenses the taxpayer claimed during the audit process.

The importance of unreported income by taxpayers claiming business losses is illustrated in Figure 3D which shows the shares of unreported business income by reported income groups. Well over one-third of unreported business income has been accounted for by taxpayers reporting business losses in all periods since 2001. This helps explain the high ratios in Figure 3A for the group with modest positive business income up to the 40th centile. Returns in the 60th to 90th centiles accounted for approximately another one-

[8] Schedule E has also included typically small amounts of miscellaneous other income sources that may also be considered business income such as REMICS. Some items reported on the “other income” line of Form 1040 could be considered business income. For example, net operating loss carryovers often constitute a substantial share of negative amounts on this line.

third of this unreported income, roughly their share of returns with business income. The share of unreported income of the top one percent of returns is two to three percent since 2001.

The distribution of unreported business income in the 1988 study is quite different than in the later periods. The roughly two percent of returns with business losses accounted for about 13 percent of unreported business income, a much smaller share than in the later period. As a result, the shares of unreported business income are much higher in the middle and top of the distribution. The top one percent accounted for about 6 percent in 1988. The reasons for the much different distribution are unclear. Some of this difference may be because this was so soon after the Tax Reform Act of 1986 when the top individual income tax was only 28 percent and taxpayers had not fully adjusted to the changed incentives.

IV. IRS COMPLIANCE EFFORTS AND LIMITATIONS OF DATA

While the emphasis of IRS compliance efforts is typically on field audits, it is useful to consider the overall program of compliance, summarized in Table 2. When returns are filed and before refunds are paid, the IRS checks for "math errors" such as errors in calculating income and deductions or the number and amount of exemptions. Since these are computer generated, the IRS can check a large percentage of returns and many can be handled with little or no interaction with the taxpayer. In recent years, this has resulted in about 2 million notices to taxpayers. The IRS does not report the effects on tax liabilities. In the Automated Underreporter (AUR) Program, the IRS compares information returns, such as Forms W-2 and 1099 filed by employers and other third parties with what is reported on tax returns. The IRS then contacts taxpayers to resolve significant discrepancies. In FY2019, the IRS closed about 2 million cases generating about $6.7 billion in assessments. These checks are applied to all returns with income subject to third-party reporting.

In fiscal year 2019, the IRS conducted 133,000 field exams and 547,111 correspondence exams, which is down from 310,000 and 1,081,000 in fiscal year 2008 respectively. These exams are typically focused on one or a small number of specific issues. In fiscal year 2019, field exams generated about $3.6 billion and correspondence exams generated about $3.3 billion in recommended additional tax. For field exams, 63 percent of the recommended amounts were agreed to by the taxpayer, 10,909 audited taxpayers (0.8 percent) accounting for the other 37 percent did not agree and went to appeal and perhaps additional steps. For correspondence exams, 99 percent of the recommended amounts were agreed to by the taxpayer and 5,476 taxpayers went to appeal and perhaps took additional steps. Using information returns, the IRS Automated Substitute for Return Program constructs tax returns for certain non-filers and assesses taxes, interest and penalties based on the substitute returns. In fiscal year 2019, the IRS obtained 207,000 closures and assessed $6.6 billion in taxes, interest and penalties. Finally, the Criminal Investigation Program completed about 2,800 cases in fiscal year 2019, about half of which resulted in incarcerations. The cases included legal income source tax crimes, illegal source financial crimes and narcotics-related financial crimes.

The NRP program is included in these numbers. About 5 percent of returns selected for these studies are relatively simple and are accepted as filed or accepted with adjustments based on associated information returns. Another 35 percent receives correspondence audits that generally focus on selected issues. The remainder, about 60 percent, receive more comprehensive field audits. Auditors have the option of opening prior year returns if there is evidence suggesting earlier non-compliance or if some income or deductions should have been included in a prior year return.

While income subject to third-party reporting, such as wages, interest and dividends can readily be checked for accuracy, identifying underreported tip income and other income not subject to third-party reporting is subject to much more uncertainty. To account for unreported income not found during the TCMP and NRP audits, the IRS has long estimated additional amounts of unreported income. Early TCMP studies increased the income discovered by simple multipliers. For example, Internal Revenue Service (1996) reported that the effective multiplier was 3.28 in most cases. For sole proprietor, farm and rent and royalty income, a smaller multiplier was applied to gross income but overstated expenses were assumed to have been found. This would result in an effective multiplier closer to 3.28 in most cases. For more recent analysis, the IRS has turned to more sophisticated detection controlled estimation (DCE) methods (Feinstein, 1990, 1991, 2004).

For this paper, we have not adjusted the results for estimated unreported income not discovered in the NRP audits. Debacker et al. (2020) and others have raised concerns about such estimates. The multipliers used in Johns and Slemrod (2010), for example, had only two basic return categories (with and without low visibility income from Schedules C and F) and two income categories: under and over $100,000 of total positive income. Having only two income groups and a relatively low break point seems inconsistent with the noncompliance rate peaking below the very top incomes even when ranking by true income. The IRS has updated its DCE procedures which include substantial improvements. While we will be updating our analysis to include DCE analysis, this should not significantly affect relative results for different types of income considered separately, but could affect results for total income by income group due to varying compositions of income.

Another issue is that while sole proprietor (Schedule C) and farm income (Schedule F) are included in individual income tax returns, business income from partnerships and S corporations is reported on separate tax returns not generally included in NRP or TCMP studies. While these returns are accounted for separately in tax gap estimates, unreported income at the business level is not attributed to specific individuals. Thus, NRP and TCMP likely understate the underreported income of individuals with partnership and S corporation income.

Several studies offer insights into this issue. Using a 1987 TCMP compliance study of smaller C corporations with assets of $10 million or less, Joulfaian (2000) found that firms with executives that underreported income on their individual tax returns were more likely to underreport income. About half of the non-compliant firms had officers non-compliant on their individual returns compared to only 15 percent of the compliant firms. These non-compliant firms understated their net income by about 35 percent. Joulfaian concluded that the results indicate a preference for evasion by these executives. Preliminary results in Johns (2009) found that S corporations underreported income by $50 billion in 2003 and $56 billion in 2004 (not accounting for income not detected). He also found that the income misreporting rates of small S corporations with one or two shareholders (26 percent and 29 percent in the two years) were similar to those of sole proprietors (27 percent in additional underreported income at the business level), at least as a sensitivity test.

A statement in Cooper et al. (2016) that 20% of partnership income was earned by partners that they were not able to classify by type has been interpreted as implying substantial underreporting of partnership income. While there may be substantial underreported partnership income and fraudulent K-1s

intended to evade income taxes, a footnote clarifies that the information return did not report the type of entity, i.e., an individual, estate or other business. Thus, this result does not help in quantifying actual tax evasion.

Using IRS corporate audit data, Hanlon et al (2007) found that private corporations have higher proposed deficiency rates than public companies (17.1 and 12.5 percent respectively), perhaps reflecting greater aggressiveness since they don't face financial market pressure to report high earnings.

Noncompliance rates may also change over time with the introduction of additional information returns. Some studies have found that information reporting introduced in the 1980s increased reporting of interest, dividends and other income. More recently, Slemrod, et al. (2017) examined the effects of new information return 1099-K providing new information for the IRS about credit card sales. They found that many small sole proprietorship businesses increased their reported sales and additional businesses began reporting their activity, but some businesses increased their expense deductions thereby offsetting some portion of the increased sales.

Noncompliance due to unreported income from offshore accounts is also a concern. As explained in Johanneson, et al. (2020), the U.S. began a series of actions in 2008 to improve tax compliance by taxpayers with offshore accounts, especially in tax havens. Johanneson, et al. (2020) found that these efforts resulted in at least $100 billion in additional offshore accounts being reported (about 10 percent of offshore accounts) and estimated that $2 to $4 billion additional capital income was reported on tax returns. Other analysis by Guyton et al. (2020) found that the NRP program found only 7 percent of the taxpayers that began reporting and paying tax on their offshore accounts by 2012. Preliminary DCE corrected estimates in that study suggest that new filers under the voluntary programs and new "quiet filers" may account for at least 10 percent of previously evaded taxes.

It is also important to consider aspects of NRP and TCMP data that can overstate underreporting. For example, some taxpayers report income on the wrong line. For example, pension income or Schedule C income may be reported as wages. Since the income shows up on another line, total income may not change. Tax liability would not generally be affected in some cases of putting income on the wrong line. But tax liability may be affected if self-employment tax is owed on Schedule C income. In other cases, taxpayers are found to have reported income that should have been reported in a different tax year. In 1988, for example, high-income taxpayers had an incentive to report income in 1988 rather than 1987 so as to benefit from the lower tax rate. In this situation, the auditors require an amending the return for the year where the income should have been reported as well as correcting the current year return. In neither case was there any net underreporting in the long run, but there may appear to be under- or overreported income in the audit year. In this paper, we have adjusted for line changes to the extent these could be identified, but have not been able to account for reporting in the wrong year.

V. CONCLUSIONS

This paper provides new information on the underreporting of income on individual tax returns discovered in the IRS comprehensive audit studies for tax years 1988, 2001 and 2006 through 2013. It focuses on the amounts and types of underreported income by type of income and income classes based on reported income.

Our results show that returns with negative total incomes and with business losses have the highest rates of underreporting and the highest ratios of unreported to reported income. Among those with positive total incomes, the percentage of returns with unreported income tends to increase at higher levels of reported income, but the ratio of unreported to reported income generally declines at higher incomes. Our results also illustrate the considerable variation in the extent of underreporting among taxpayers. The majority of returns have no discovered underreported income, and most of the rest are found to have underreported by less than 20 percent. However, small percentages of returns are found to have substantial underreporting. In some cases, taxpayers reported less than 5 or 10 percent of the correct amount.

When returns are ranked by audit-corrected rather than reported income, the ratio of unreported to corrected income increases rather than declines. This is primarily the result of the re-ranking of returns which results from relatively small numbers of returns that reported only modest incomes while their audit-corrected income would put them in higher income groups.

Underreporting is lower for wages, interest and dividends, retirement income and other income subject to substantial income reporting to the IRS. Underreporting is much higher for income not subject to information reporting, primarily sole proprietorships, pass-through business income, rental and farm income. Underreporting is found to be especially frequent and large among returns reporting business losses.

The results of this paper should help researchers and others using tax data to better understand the role of underreported income and potentially to improve their income estimates. The intent of the authors is to make additional tables and summary information available on the IRS TaxStats website. The results may also be of interest to policymakers and others considering tax reform.

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Table 1
Net Discovered Unreported Income, 1988-2013

Type of Income	Average Annual Total Income	Percent Share of Unreported Income	Percent Increase Due to Audit
Total Income	347,300	100.0%	3.9%
Sole proprietorships	161,072	46.4%	54.2%
Rent and royalty	31,226	9.0%	94.4%
Partnerships and S corps.	26,318	7.6%	5.7%
Other income: Negative	26,653	7.7%	29.0%
Other Income: Positive	11,255	3.2%	10.6%
Net capital gains	23,886	6.9%	5.1%
Retirement income	16,846	4.9%	2.3%
Net farm income	11,424	3.3%	120.1%
Wages	10,511	3.0%	0.2%
Ordinary gains: Form 4797	5,565	1.6%	73.8%
Taxable Social Security	7,825	2.3%	4.0%
Interest and dividends	7,264	2.1%	2.1%
Unemployment comp.	4,073	1.2%	5.9%
Taxable tax refunds	2,438	0.7%	8.5%
Other Schedule E	866	0.2%	17.6%
Alimony Income	76	0.02%	0.6%

Notes: Dollar amounts are in millions of dollars and are the average annual amounts from the 1988 TCMP and the 2001 and 2006 through 2013 NRP studies Total income is the sum of income as reported on Form 1040, before certain items are deducted in computing adjusted gross income. Total income does not include non-taxable Social Security benefits, non-taxable unemployment compensation in 2009, tax-exempt interest or non-taxable retirement distributions reported on the 1040 (almost all such distributions reflect pension or IRA rollovers). Most income items are defined as reported on Form 1040. Rent and royalty, partnership and S corporation incomes are from Schedule E. Sole proprietor income is reported on Schedule C and farm income is that reported on Schedule F. Ordinary gain is from the sale of certain business assets reported on Form 4797. Taxable tax refunds are an adjustment for state and local tax refunds previously deducted as an itemized deduction.

Table 2
IRS Compliance and Exam Programs

Fiscal Year	Math Error Corrections	Automated Underreporter Program	Correspondence Exams	Field Exams
Number of Returns				
FY2008	3,239,152	3,530,000	1,081,152	310,429
FY2018	2,299,222	3,012,000	722,772	169,415
FY2019	2,184,366	1,968,731	547,111	133,432
Recommended Additional Tax				
FY2008	n/a	6,396	6,518	5,945
FY2018	n/a	5,339	4,594	4,457
FY2019	n/a	6,656	3,325	3,573
Notes: Dollar amounts in millions. The dollar amounts of recommended additional tax have not been reported by the IRS. Source: IRS Data Books for 2008, 2018 and 2019.				

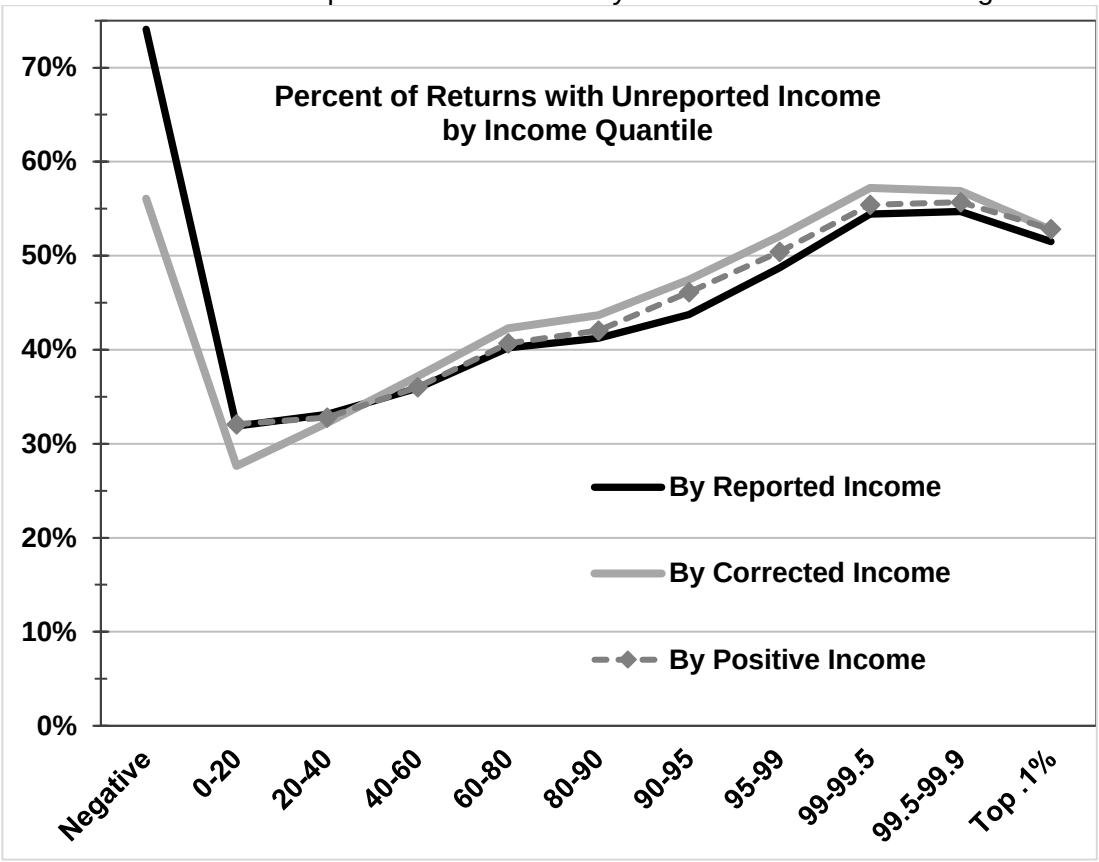
Table 3

Extent of Information Reporting by Income Class

Income	Substantial Information Reporting (%)					
Quantile	1988	2001	2006-07	2008-09	2010-11	2012-13
Negative	11.7	17.7	16.7	15.8	15.7	11.2
0 - 20	91.1	87.0	84.4	82.4	77.8	80.4
20 - 40	85.3	83.0	82.7	83.3	82.5	81.1
40 - 60	88.0	87.4	87.0	87.3	86.6	84.4
60 - 80	90.8	87.4	85.8	87.9	84.9	83.5
80 - 90	90.5	86.0	85.1	85.2	83.6	82.5
90 - 95	89.1	84.2	79.8	84.7	80.7	82.0
95 - 99	79.7	76.0	72.6	77.6	76.6	73.4
99 - 99.5	68.8	66.3	56.9	68.6	66.4	64.3
Top 0.5%	50.8	48.4	41.4	44.1	46.5	41.7
Total	81.6	79.5	75.5	79.4	78.3	76.3
Income	Some Information Reporting (%)					
Quantile	1988	2001	2006-07	2008-09	2010-11	2012-13
Negative	9.2	23.7	21.0	32.0	22.4	7.8
0 - 20	4.7	7.3	8.8	9.8	12.1	9.9
20 - 40	10.6	12.0	13.0	11.4	10.7	11.7
40 - 60	8.6	9.7	10.5	9.8	9.9	12.4
60 - 80	5.9	9.9	11.7	10.3	12.9	13.7
80 - 90	6.2	10.8	12.1	12.2	13.8	14.5
90 - 95	7.1	11.6	15.6	11.7	15.6	13.9
95 - 99	11.6	16.1	20.4	15.9	16.9	19.8
99 - 99.5	18.9	22.8	32.9	22.3	23.5	27.6
Top 0.5%	41.9	46.1	53.6	47.1	45.6	51.7
Total	12.1	16.6	20.8	16.9	18.2	20.8
Income	Little or No Information Reporting (%)					
Quantile	1988	2001	2006-07	2008-09	2010-11	2012-13
Negative	79.1	58.6	62.3	52.2	61.9	81.0
0 - 20	4.2	5.8	6.8	7.7	10.1	9.7
20 - 40	4.1	5.0	4.3	5.3	6.8	7.2
40 - 60	3.3	2.9	2.6	2.9	3.5	3.1
60 - 80	3.3	2.7	2.5	1.8	2.3	2.7
80 - 90	3.2	3.2	2.8	2.6	2.6	3.0
90 - 95	3.8	4.3	4.6	3.6	3.6	4.1
95 - 99	8.7	7.9	7.0	6.6	6.5	6.8
99 - 99.5	12.2	10.9	10.2	9.1	10.1	8.1
Top 0.5%	7.4	5.5	5.0	8.9	8.0	6.5
Total	6.3	3.9	3.7	3.6	3.5	2.8

Notes: Income groups are based on centile groups of total income. Returns with negative income are part of the bottom 20 percent. Substantial reporting includes wages, dividends, interest, Social Security, unemployment compensation, and state tax refunds. Some reporting includes capital gains, pension and IRA distributions, partnership and S corporation income, alimony, other Schedule E. Little or no reporting includes sole proprietorship, rent and royalty, farm, ordinary gain and other income. Shares of negative income group are based on absolute values due to mix of positive and negative values.

Figure 1A
Returns with Unreported Total Income by Alternative Income Rankings



Notes: See notes after Figure 1C

Figure 1B
Unreported Income as Percent of Reported Income by Income Class

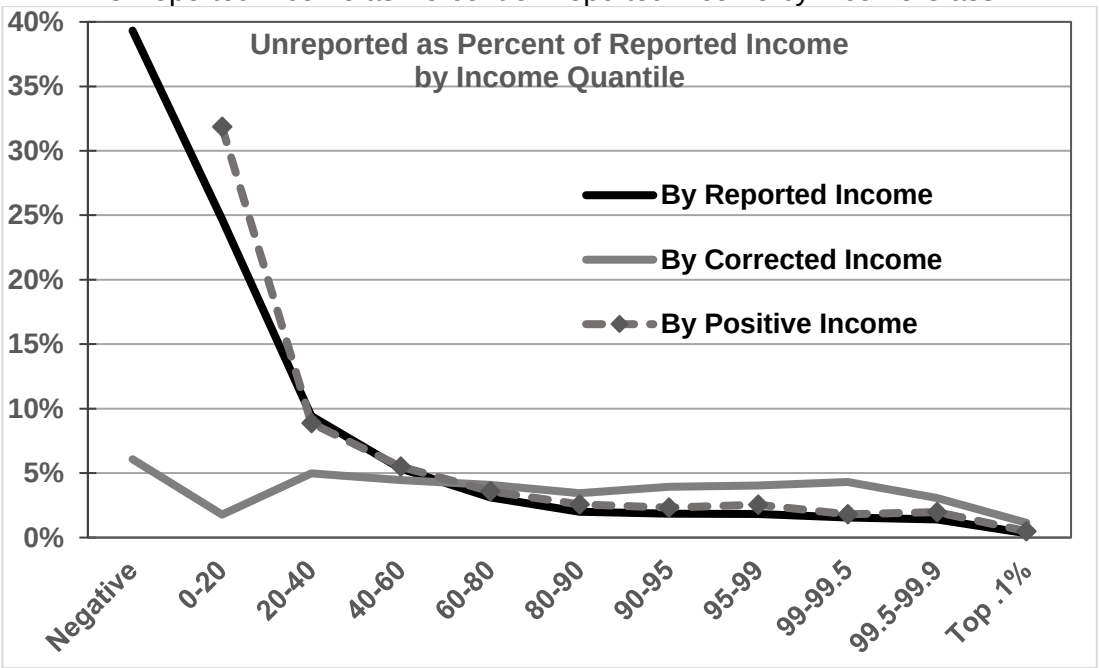


Figure 1C
Shares of Unreported Total Income by Alternative Income Measures

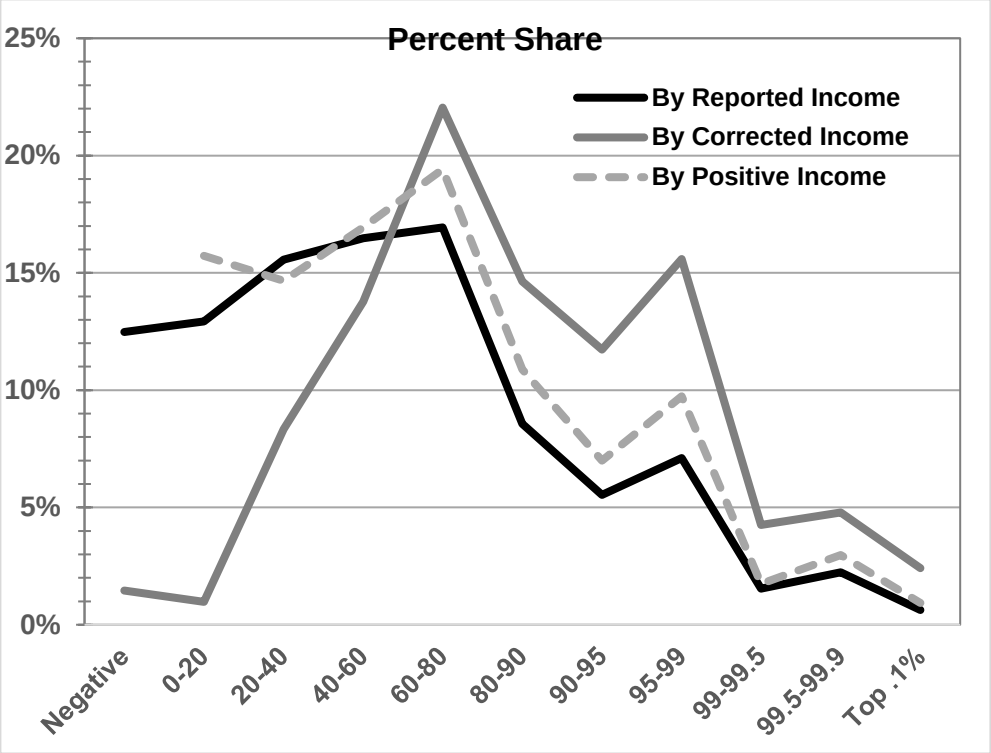
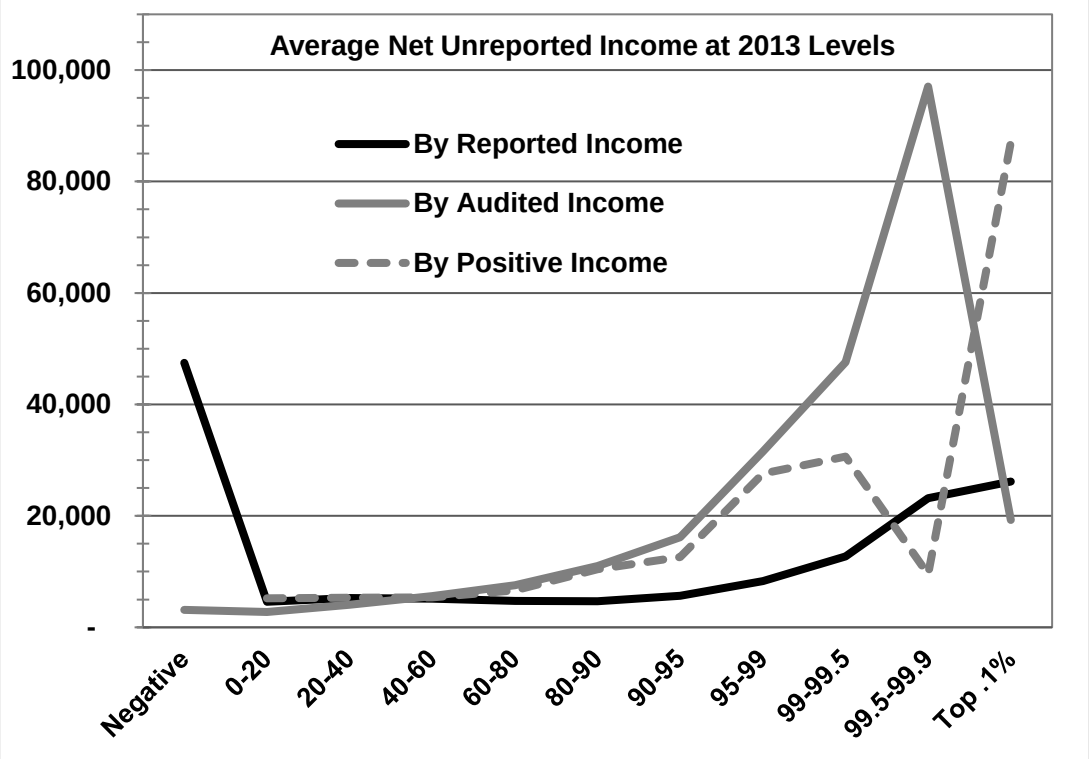


Figure 1D
Average Net Unreported Income Discovered in TCMP and NRP Audits, 1988-2013



Notes: Figures are based on the averages of the 1988 TCMP file, and the 2001 and 2006 through 2013 NRP files and converted to 2013 levels using per capita personal income.. Black lines show the results when returns are ranked by reported total income. Grey lines show the results when returns are ranked by corrected total income. Dashed lines show the results when returns are ranked by total positive income. Returns with negative total incomes are a subset of the bottom quintile, the rest of which is in the group labeled 0-20. Average dollar values in Figure 1D are for tax returns with a change in reported income.

Figure 2A

Percent of Returns with Underreporting of Total Income by Year, 1988-2013

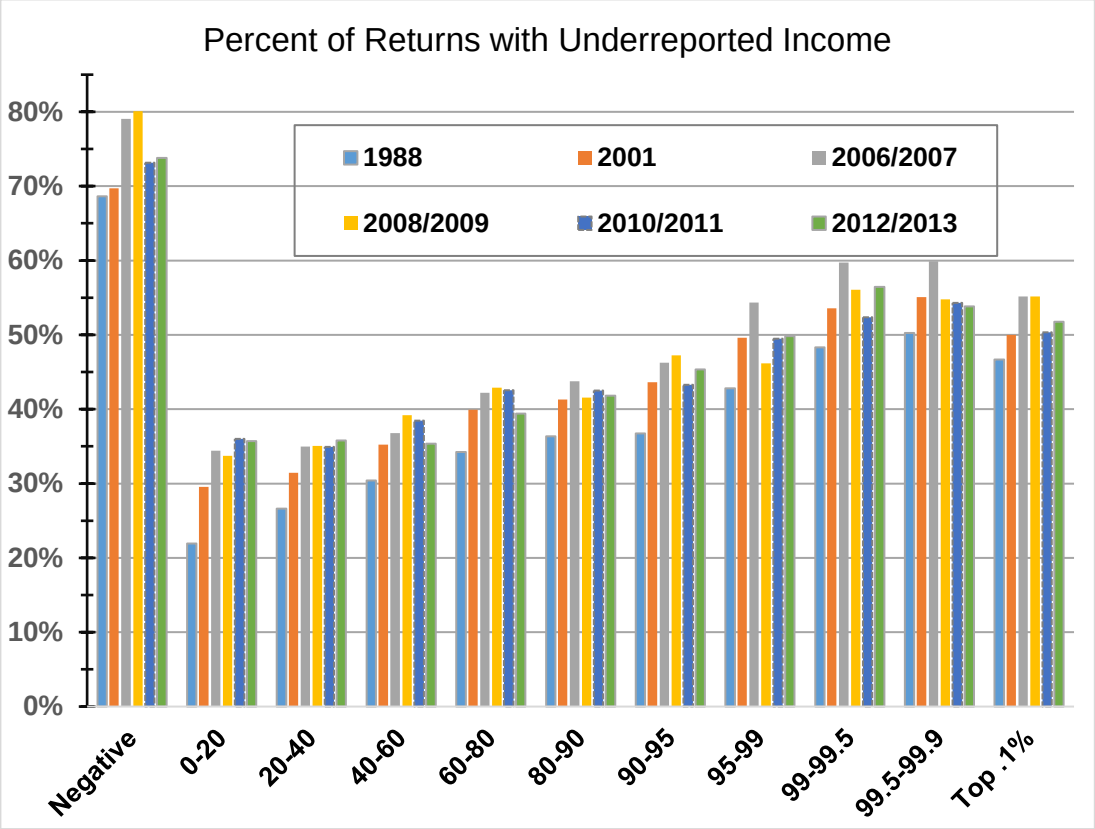
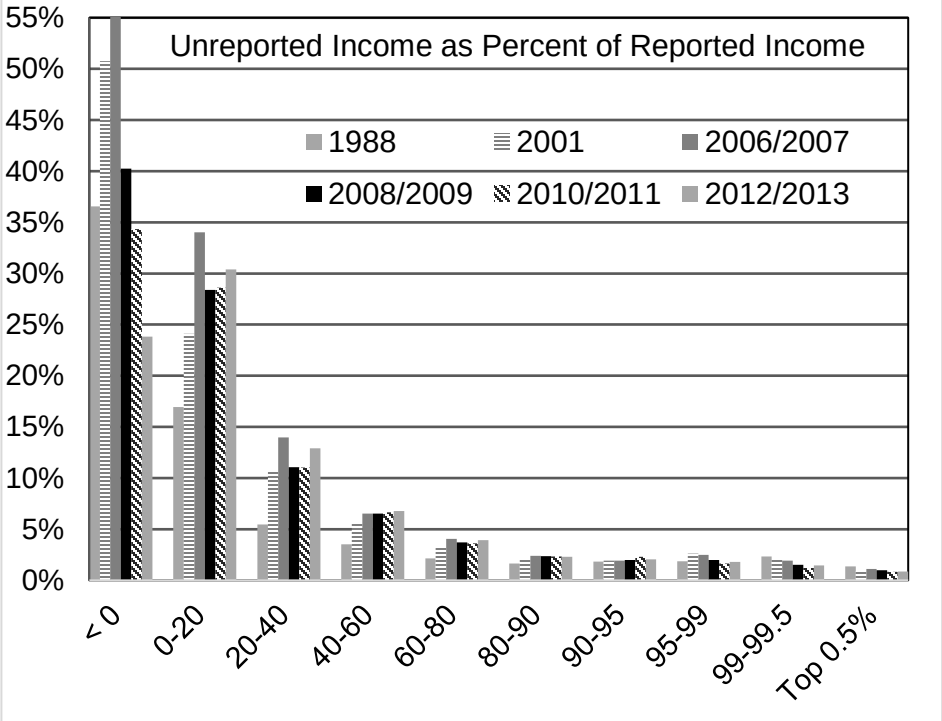


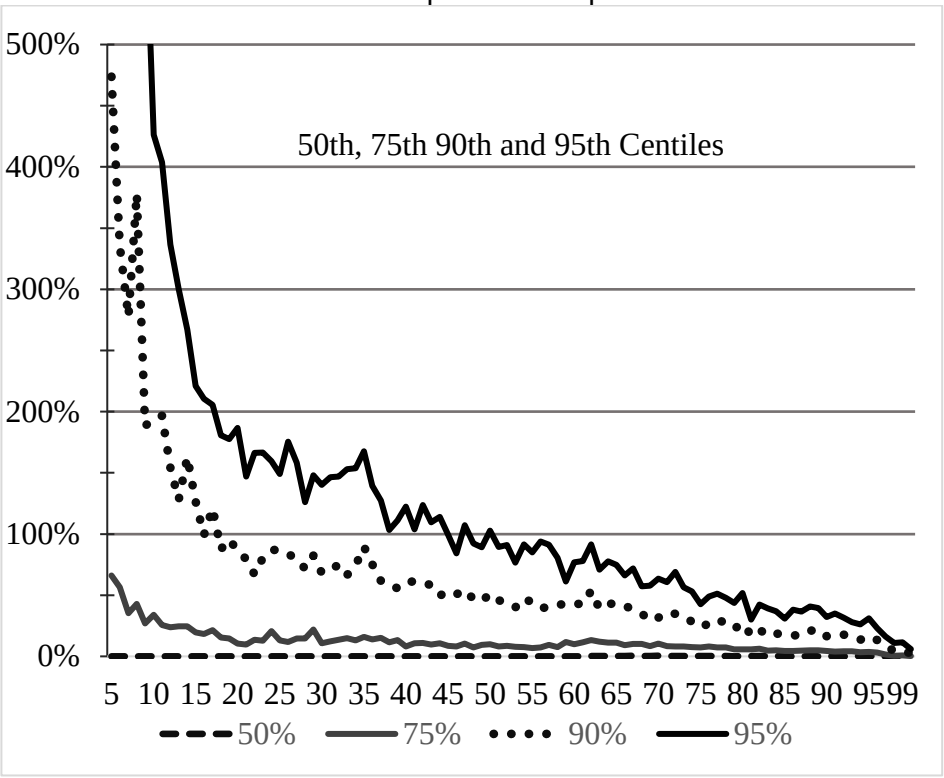
Figure 2B

Net Underreported Total Income as Percent of Reported Total Income



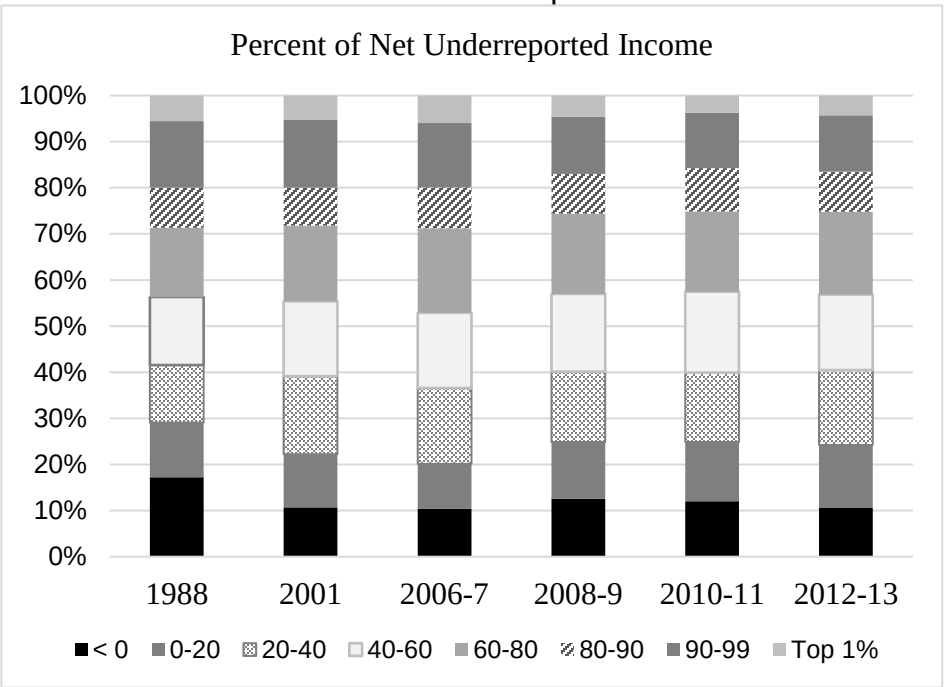
Notes: See notes following Figures 1D and 2D.

Figure 2C.
Variation of Ratio of Unreported to Reported Total Income



See notes following 2D.

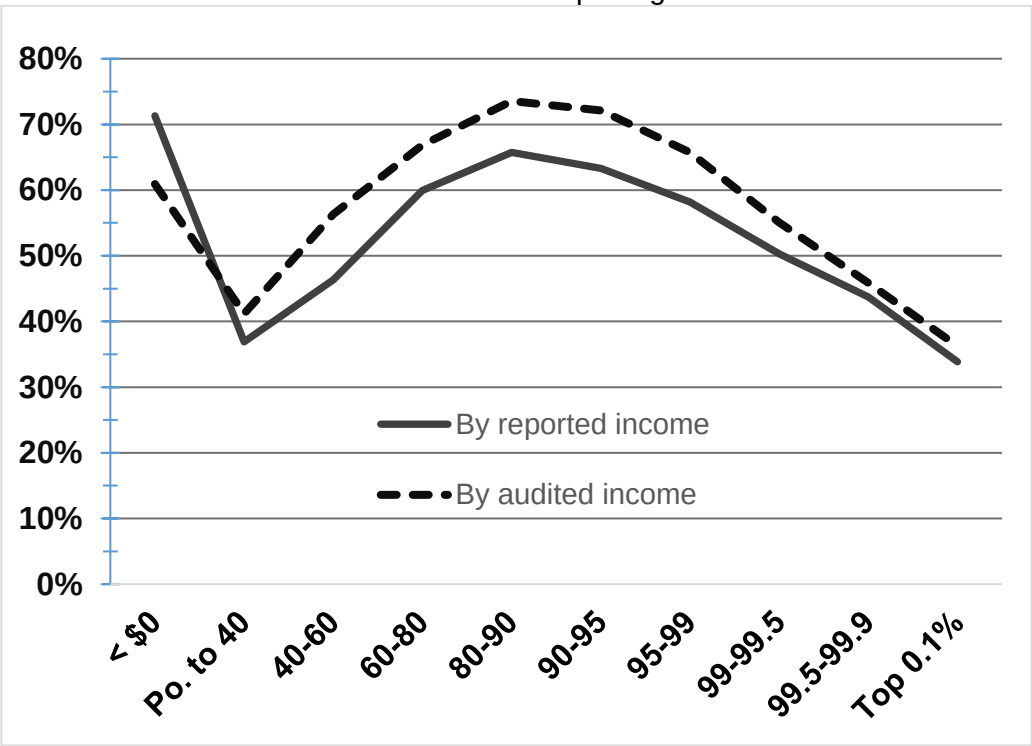
Figure 2D
Percent Shares of Net Underreported Total Income



Notes: Total income is the sum of taxable income items on Form 104, before deducting various adjustments to obtain AGI. Total income does not include tax-exempt interest or non-taxable Social Security benefits and therefore understates the income of low income retirees who are generally age 62 and over.

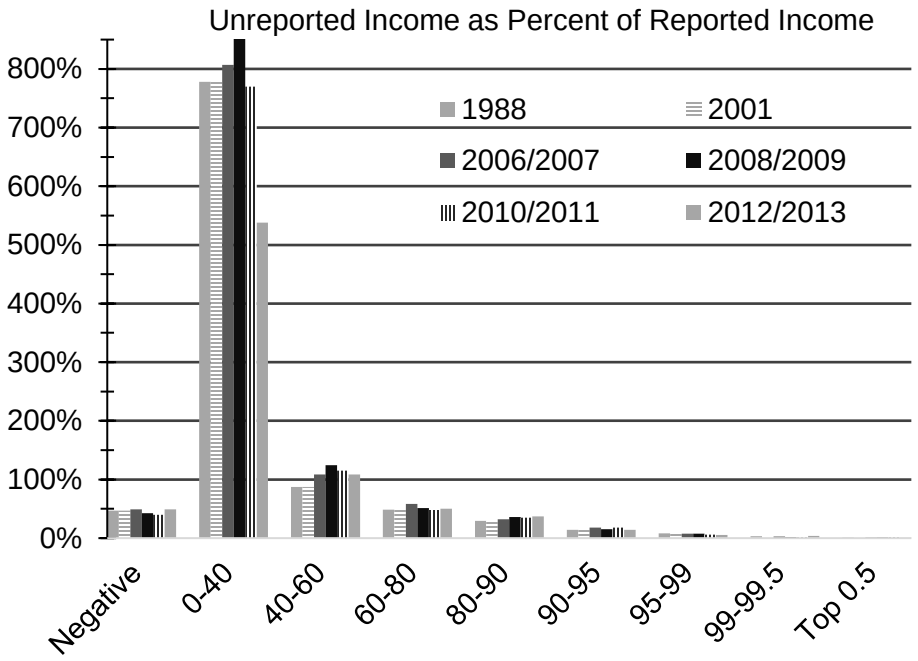
Figure 3

3A. Percent of Returns with Underreporting of Business Income



See notes following 3D.

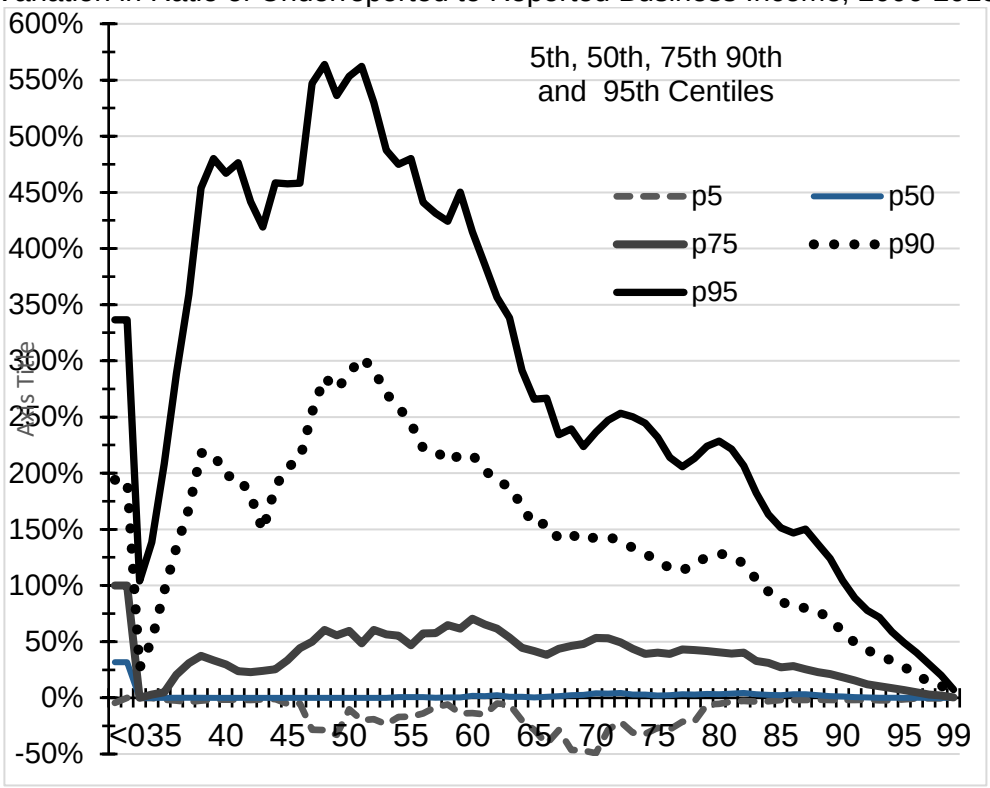
3B. Ratio of Unreported to Reported Business Income



See notes following 3D.

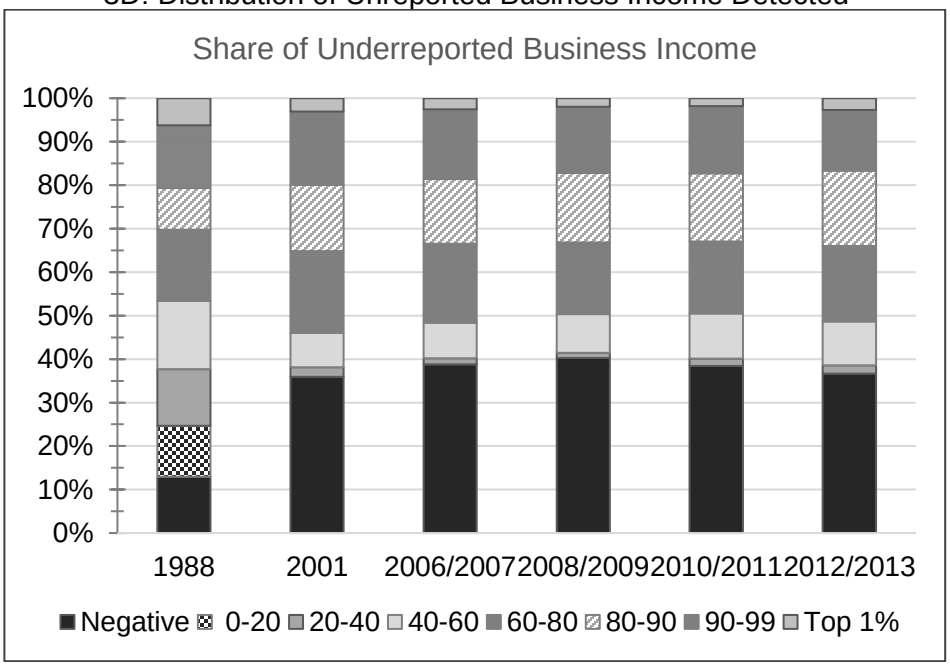
Figure 3C

Variation in Ratio of Underreported to Reported Business Income, 2006-2013



Notes: See notes following 3D.

3D: Distribution of Unreported Business Income Detected



Notes: Business income includes all ordinary income on Schedules C, E and F, including from sole proprietorships, partnerships and S corporations, rent and farm rent, estates and trusts, and farms. Returns are ranked by reported income. Returns with negative total incomes are a subset of the bottom quintile. For 1988, the rest of which is in the group labeled 0-20. For 2001 to 2013, more than 20 percent of returns have negative business income. The 20-40 group includes the rest of the lowest two quintiles.

Appendix

The tables in this appendix provide an approach for researchers to add unreported income to data that does not include such income, including IRS tax data. Based on the TCMP and NRP data, the approach involves selecting returns to be assigned varying amounts of unreported income and then multiplying the reported incomes by appropriate multipliers to obtain estimated audit-corrected income.

Using the 1988 tables as an example, the steps for doing this are:

1. Rank observations by reported income and find the income group in the table. The income groups are based on income centiles. Observations with negative total incomes are divided into two groups: those with losses less than $50,000 and those with $50,000 or more losses in $2013. Returns with negative $10,000 income would be in row 2
2. Select observations in each income group for each ratio class in proportion to the percentages in the appropriate row using a uniform random number function. For example, in the 20-40 centile group, 2.94% would be in the 0.5 ratio group and 75.84% would be in the 1 ratio group.
3. Multiply the absolute value of the reported income by the average ratio in the average ratio group (sign of the ratio in each cell accounts for whether the reported and corrected incomes have the same or different sign). For example, the reported income of an observation in the 40-60 income centile group and assigned to the 1.2 ratio group would be multiplied by 1.30. The largest ratio group 1 is for observations with little or no unreported income so their multiplier is 1. Group 1.01 is observations unreported income up to 10% of reported income. Groups 1.1, 1.2, 1.5 have unreported income of at least 10, 20 and 50 percent.

Ratio group 0.5 works differently for observations with positive and negative incomes. For returns with positive incomes, the ratio is less than one because these returns have overreported their incomes and their income is actually reduced in the audit. For returns with negative incomes, the 0.5 ratio group applies to cases where the audit reduces the amount of their losses. In 1988, 56.28% of returns with negative incomes of at least $50,000 in $2013 are in this group. The ratio of -0.670 means auditors disallowed 33% of the losses. Multiplying the absolute value by -.670 generates the correct audit-corrected income with smaller negative amounts ($67,000=.670*abs(-100,000) loss if the original amount was $100,000 loss). This also works when the discovered unreported income results in positive audit-corrected incomes. For example, an observation with total income of negative $100,000 in ratio class 2 would have audit-corrected income of positive $243,600(=2.436*abs(-100,000)).

Tables for generating estimates of audit-corrected income starting from reported total income These table are based on the distributions of audit corrections by reported total income groups in the TCMP and NRP studies. The negative reported total income groups are up to $49,999 in losses and $50,000 and over in losses in $2013 based on the CPI-RS series.

1988										
Percent of Returns by Ratio Class										
rank	-0.5	0.5	1	1.01	1.1	1.2	1.5	2	4	8
<-$50k	6.94	56.28	19.42	4.87	1.83	3.37	2.95	3.60	0.36	0.38
< $0	7.19	19.30	25.99	1.27	1.36	3.11	4.03	16.01	13.17	8.55
0-20		3.30	77.89	7.41	2.32	2.70	1.98	2.34	1.21	0.72
20-40		2.94	75.84	11.61	3.12	3.50	1.58	1.19	0.18	
40-60		3.33	76.27	12.92	3.06	2.71	1.06	0.52	0.09	
60-80		4.04	74.49	15.99	2.50	2.00	0.70	0.20	0.03	
80-90		4.68	74.10	17.02	2.22	1.39	0.38	0.18	0.03	
90-95		4.72	73.99	17.11	2.12	1.42	0.36	0.25	0.02	
95-99		5.56	68.06	21.58	2.52	1.79	0.34	0.13	0.00	
99-99.5		7.20	59.85	26.88	2.91	2.59	0.35	0.22	.	
Top 0.5		6.24	65.28	24.24	2.23	1.24	0.59	0.16	0.03	
All	0.00	3.85	75.04	13.23	2.65	2.49	1.15	0.96	0.36	0.19
Average Ratio of Corrected to Reported Income by Ratio Class										
rank	-0.5	0.5	1	1.01	1.1	1.2	1.5	2	4	8
<-50	-1.375	-0.730	0.999	1.043	1.151	1.319	1.723	2.436	6.633	9.959
< 0	-2.303	-0.501	1.000	1.053	1.138	1.351	1.772	2.770	5.556	15.767
0-20		0.778	1.000	1.035	1.146	1.344	1.684	2.691	5.359	15.562
20-40		0.847	1.000	1.033	1.148	1.323	1.682	2.639	5.397	
40-60		0.935	1.000	1.032	1.140	1.307	1.697	2.561	5.386	
60-80		0.951	1.000	1.032	1.143	1.317	1.702	2.438	4.774	
80-90		0.942	1.000	1.031	1.137	1.319	1.667	2.555	5.014	
90-95		0.963	1.000	1.030	1.136	1.300	1.704	2.420	5.970	
95-99		0.965	1.000	1.029	1.138	1.301	1.618	2.576	4.744	
99-99.5		0.963	1.000	1.029	1.136	1.304	1.694	2.465	.	
Top 0.5		0.948	1.000	1.027	1.136	1.307	1.685	2.294	5.632	
All	0.313	0.890	1.000	1.032	1.143	1.322	1.689	2.652	5.390	15.452
Standard Error for Ratio by Ratio Class										
rank	-0.5	0.5	1	1.01	1.1	1.2	1.5	2	4	8
<-50	0.100	0.014	0.000	0.008	0.010	0.015	0.040	0.149	0.629	2.189
< 0	0.399	0.021	0.000	0.007	0.006	0.012	0.017	0.046	0.090	1.179
0-20		0.015	0.000	0.002	0.002	0.005	0.008	0.025	0.061	0.817
20-40		0.013	0.000	0.001	0.002	0.004	0.007	0.028	0.107	
40-60		0.004	0.000	0.001	0.001	0.003	0.007	0.027	0.161	
60-80		0.003	0.000	0.001	0.001	0.003	0.008	0.039	0.196	
80-90		0.005	0.000	0.001	0.001	0.004	0.014	0.078	0.121	
90-95		0.003	0.000	0.001	0.002	0.007	0.019	0.059	0.177	
95-99		0.004	0.000	0.001	0.002	0.005	0.014	0.093	0.201	
99-99.5		0.006	0.000	0.001	0.003	0.011	0.039	0.123	.	
Top 0.5		0.008	0.000	0.001	0.003	0.011	0.032	0.065	.	
All	0.429	0.003	0.000	0.000	0.001	0.001	0.003	0.014	0.042	0.621

2001										
Percent of Returns by Ratio Class										
rank	-0.5	0.5	1	1.01	1.1	1.2	1.5	2	4	8
<-50	5.37	41.37	30.89	3.52	2.95	7.89	2.92	4.24	0.53	
< 0	3.87	20.52	33.50	3.35	2.47	2.07	5.67	9.91	10.27	8.37
0-20		2.49	73.13	7.64	2.85	4.39	3.12	3.84	1.32	1.16
20-40		2.56	73.07	11.58	2.86	5.14	2.35	1.80	0.50	
40-60		2.91	73.47	13.87	3.67	3.43	1.49	1.00	0.12	
60-80		3.73	73.29	15.70	3.12	2.77	0.91	0.44	0.02	
80-90		3.93	75.13	16.21	2.41	1.74	0.38	0.15	0.05	
90-95		4.12	74.50	17.00	2.36	1.44	0.40	0.16	0.02	
95-99		4.99	69.58	20.72	2.11	1.83	0.51	0.22	0.02	
99-99.5		5.09	69.83	20.82	2.22	1.56	0.37	0.07	0.04	
Top 0.5		5.02	74.34	17.20	1.79	1.32	0.24	0.07	0.00	
All	0.05	3.37	73.02	13.25	2.96	3.46	1.66	1.47	0.45	0.31
Average Ratio of Corrected to Reported Income by Ratio Class										
rank	-0.5	0.5	1	1.01	1.1	1.2	1.5	2	4	8
<-50	-1.136	-0.670	1.000	1.057	1.159	1.346	1.702	2.823	5.117	
< 0	-2.258	-0.613	1.000	1.035	1.139	1.292	1.657	2.656	5.560	19.908
0-20		0.662	1.000	1.038	1.150	1.332	1.718	2.678	5.626	18.194
20-40		0.814	1.000	1.039	1.147	1.329	1.685	2.583	5.535	
40-60		0.908	1.000	1.036	1.144	1.322	1.697	2.512	4.956	
60-80		0.937	1.000	1.034	1.138	1.305	1.673	2.569	4.965	
80-90		0.956	1.000	1.029	1.138	1.301	1.683	2.452	5.492	
90-95		0.951	1.000	1.029	1.142	1.311	1.647	2.464	6.026	
95-99		0.932	1.000	1.032	1.139	1.299	1.718	2.548	4.540	
99-99.5		0.952	1.000	1.028	1.138	1.322	1.772	2.373	4.104	
Top 0.5		0.955	1.000	1.024	1.143	1.281	1.676	2.478		
All	0.049	0.860	1.000	1.034	1.144	1.322	1.697	2.621	5.552	18.142
Standard Error for Ratio by Ratio Class										
rank	-0.5	0.5	1	1.01	1.1	1.2	1.5	2	4	8
<-50	0.098	0.022	0.000	0.010	0.006	0.019	0.026	0.155	0.675	
< 0	0.453	0.022	0.000	0.007	0.006	0.013	0.022	0.048	0.121	1.856
0-20		0.027	0.000	0.002	0.002	0.005	0.009	0.023	0.063	1.062
20-40		0.012	0.000	0.001	0.001	0.003	0.005	0.019	0.067	
40-60		0.009	0.000	0.001	0.001	0.003	0.006	0.025	0.091	
60-80		0.004	0.000	0.001	0.001	0.003	0.006	0.034	0.166	
80-90		0.004	0.000	0.001	0.002	0.005	0.014	0.070	0.412	
90-95		0.008	0.000	0.001	0.002	0.008	0.025	0.073	0.457	
95-99		0.009	0.000	0.001	0.002	0.007	0.022	0.120	0.192	
99-99.5		0.011	0.000	0.001	0.004	0.016	0.106	0.226	0.057	
Top 0.5		0.008	0.000	0.001	0.005	0.018	0.046			
All	0.429	0.004	0.000	0.000	0.001	0.001	0.003	0.011	0.039	0.800

2006/2007										
Percent of Returns by Ratio Class										
rank	-0.5	0.5	1	1.01	1.1	1.2	1.5	2	4	8
<-50	3.90	42.40	28.71	4.23	1.27	2.30	11.58	5.35	0.13	
< 0	1.14	21.29	23.45	1.33	1.36	4.87	11.21	10.20	12.98	12.16
0-20		3.55	67.75	8.86	3.05	5.20	3.67	3.70	2.04	2.11
20-40		2.55	69.92	12.76	3.50	4.88	2.85	2.67	0.57	
40-60		3.23	73.34	12.76	3.50	4.31	1.53	1.04	0.25	
60-80		3.47	71.21	17.00	3.44	3.15	1.04	0.59	0.07	
80-90		4.28	74.04	16.28	2.35	2.07	0.69	0.27	0.02	
90-95		4.20	71.33	19.42	2.48	2.14	0.32	0.07	0.04	
95-99		5.31	67.87	20.52	2.86	2.68	0.61	0.14	0.01	
99-99.5		6.50	65.83	22.94	2.05	2.14	0.44	0.10	0.00	
Top 0.5		3.94	71.41	20.27	2.53	1.16	0.37	0.28	0.00	
All	0.04	3.66	70.62	14.12	3.18	3.86	1.90	1.57	0.59	0.48
Average Ratio of Corrected to Reported Income by Ratio Class										
rank	-0.5	0.5	1	1.01	1.1	1.2	1.5	2	4	8
<-50	-1.191	-0.630	1.000	1.056	1.140	1.350	1.700	2.933	7.994	
< 0	-2.868	-0.605	1.000	1.060	1.144	1.361	1.697	2.862	6.036	18.924
0-20		0.652	1.000	1.037	1.146	1.314	1.745	2.709	5.451	22.031
20-40		0.798	1.000	1.039	1.147	1.330	1.687	2.677	5.106	
40-60		0.874	1.000	1.035	1.147	1.330	1.688	2.694	4.807	
60-80		0.925	1.000	1.034	1.145	1.312	1.684	2.549	4.971	
80-90		0.947	1.000	1.030	1.138	1.301	1.638	2.425	5.733	
90-95		0.959	1.000	1.027	1.148	1.274	1.711	2.233	4.358	
95-99		0.906	1.000	1.028	1.147	1.277	1.673	2.453	4.823	
99-99.5		0.954	1.000	1.030	1.135	1.248	1.752	2.057		
Top 0.5		0.933	1.000	1.027	1.138	1.346	1.689	2.233		
All	-4.133	0.842	1.000	1.034	1.146	1.319	1.703	2.683	5.399	20.356
Standard Error for Ratio by Ratio Class										
rank	-0.5	0.5	1	1.01	1.1	1.2	1.5	2	4	8
<-50	0.107	0.038	0.000	0.013	0.006	0.031	0.022	0.123		
< 0	0.889	0.033	0.000	0.003	0.009	0.025	0.023	0.072	0.161	2.355
0-20		0.034	0.000	0.002	0.002	0.005	0.011	0.035	0.088	2.472
20-40		0.021	0.000	0.001	0.002	0.005	0.009	0.035	0.140	
40-60		0.012	0.000	0.001	0.002	0.004	0.010	0.044	0.176	
60-80		0.009	0.000	0.001	0.001	0.004	0.011	0.051	0.297	
80-90		0.007	0.000	0.001	0.002	0.007	0.019	0.077	0.543	
90-95		0.006	0.000	0.001	0.003	0.008	0.036	0.072	0.298	
95-99		0.014	0.000	0.001	0.003	0.008	0.023	0.133	0.452	
99-99.5		0.011	0.000	0.002	0.006	0.012	0.035	0.055		
Top 0.5		0.014	0.000	0.001	0.005	0.022	0.059	0.231		
All	4.176	0.006	0.000	0.000	0.001	0.002	0.005	0.018	0.064	1.659

2008/2009										
Percent of Returns by Ratio Class										
rank	-0.5	0.5	1	1.01	1.1	1.2	1.5	2	4	8
<-50	5.14	45.79	17.29	8.83	1.06	10.02	2.76	8.58	0.52	
< 0	5.48	23.17	22.77	2.71	0.63	6.10	7.11	12.16	10.20	9.67
0-20		3.93	68.37	9.07	2.96	4.54	3.70	3.68	2.02	1.57
20-40		3.39	70.78	11.44	3.79	4.82	3.10	1.94	0.59	
40-60		3.67	71.29	14.58	3.21	3.91	2.04	1.08	0.18	
60-80		4.00	71.40	16.21	3.70	3.09	1.16	0.34	0.08	
80-90		3.37	72.29	18.51	2.95	2.15	0.48	0.24	0.00	
90-95		4.65	73.75	17.06	2.49	1.44	0.34	0.26	0.01	
95-99		3.77	76.67	15.18	2.27	1.48	0.42	0.18	0.02	
99-99.5		4.11	70.11	20.79	3.88	0.77	0.25	0.09	0.00	
Top 0.5		3.95	75.05	18.42	1.46	0.41	0.59	0.12	0.00	
All	0.09	4.00	70.62	13.73	3.25	3.64	2.10	1.52	0.63	0.41
Average Ratio of Corrected to Reported Income by Ratio Class										
rank	-0.5	0.5	1	1.01	1.1	1.2	1.5	2	4	8
<-50	-1.090	-0.715	1.000	1.053	1.134	1.386	1.832	2.270	5.150	
< 0	-2.884	-0.626	1.000	1.061	1.136	1.396	1.752	3.024	6.209	31.207
0-20		0.566	1.000	1.037	1.143	1.340	1.727	2.666	5.489	23.427
20-40		0.706	1.000	1.036	1.148	1.319	1.704	2.684	5.194	
40-60		0.889	1.000	1.035	1.146	1.332	1.692	2.620	4.837	
60-80		0.904	1.000	1.032	1.145	1.310	1.704	2.547	5.145	
80-90		0.936	1.000	1.032	1.139	1.298	1.681	2.609		
90-95		0.954	1.000	1.030	1.148	1.294	1.643	2.489	4.738	
95-99		0.947	1.000	1.027	1.137	1.280	1.649	2.702	6.928	
99-99.5		0.951	1.000	1.029	1.132	1.263	1.584	2.065		
Top 0.5		0.930	1.000	1.021	1.148	1.302	1.770	2.718		
All	0.766	0.796	1.000	1.033	1.145	1.324	1.709	2.675	5.484	24.074
Standard Error for Ratio by Ratio Class										
rank	-0.5	0.5	1	1.01	1.1	1.2	1.5	2	4	8
<-50	0.045	0.030	0.000	0.008	0.001	0.022	0.065	0.088	0.567	
< 0	0.487	0.027	0.000	0.009	0.006	0.015	0.020	0.078	0.173	8.559
0-20		0.029	0.000	0.002	0.002	0.005	0.010	0.034	0.087	2.506
20-40		0.027	0.000	0.001	0.002	0.005	0.010	0.042	0.149	
40-60		0.014	0.000	0.001	0.002	0.004	0.010	0.054	0.176	
60-80		0.012	0.000	0.001	0.002	0.005	0.012	0.071	0.289	
80-90		0.008	0.000	0.001	0.002	0.006	0.020	0.117		
90-95		0.007	0.000	0.001	0.004	0.011	0.026	0.150	0.365	
95-99		0.009	0.000	0.001	0.002	0.009	0.028	0.123	0.013	
99-99.5		0.018	0.000	0.002	0.004	0.023		0.071		
Top 0.5		0.016	0.000	0.001	0.007	0.026	0.033	0.488		
All	0.522	0.008	0.000	0.000	0.001	0.002	0.005	0.021	0.065	2.561

2010/2011										
Percent of Returns by Ratio Class										
rank	-0.5	0.5	1	1.01	1.1	1.2	1.5	2	4	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	0.00	
99-99.5		4.84	74.74	17.74	1.72	0.46	0.40	0.09	0.00	
Top 0.5		3.79	77.73	15.40	2.02	0.82	0.18	0.07	0.00	
All	0.12	4.47	70.63	12.95	3.21	4.10	1.97	1.61	0.52	0.44
Average Ratio of Corrected to Reported Income by Ratio Class										
rank	-0.5	0.5	1	1.01	1.1	1.2	1.5	2	4	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	4.169	
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
Standard Error for Ratio by Ratio Class										
rank	-0.5	0.5	1	1.01	1.1	1.2	1.5	2	4	8
<-50	0.104	0.026	0.000	0.010	0.008	0.019	0.042	0.192	0.149	
< 0	0.379	0.033	0.000	0.008	0.012	0.025	0.024	0.083	0.171	2.720
0-20		0.029	0.000	0.002	0.002	0.005	0.011	0.031	0.101	0.928
20-40		0.028	0.000	0.001	0.002	0.005	0.009	0.042	0.137	
40-60		0.025	0.000	0.001	0.002	0.005	0.010	0.035	0.184	
60-80		0.006	0.000	0.001	0.001	0.004	0.011	0.053	0.287	
80-90		0.009	0.000	0.001	0.002	0.007	0.018	0.075	0.486	
90-95		0.007	0.000	0.001	0.003	0.008	0.024	0.132		
95-99		0.006	0.000	0.001	0.003	0.011	0.021	0.114		
99-99.5		0.022	0.000	0.002	0.008	0.020	0.065	0.004		
Top 0.5		0.009	0.000	0.001	0.004	0.014	0.064	0.083		
All	0.267	0.009	0.000	0.000	0.001	0.002	0.005	0.018	0.072	0.831

2012/2013										
Percent of Returns by Ratio Class										
rank	-0.5	0.5	1	1.01	1.1	1.2	1.5	2	4	8
<-50	4.82	32.08	44.03	1.96	0.42	9.28	5.10	1.92	0.34	0.00
< 0	5.89	19.17	27.31	3.34	0.04	3.12	8.35	14.45	8.20	10.13
0-20	0.31	4.42	66.76	9.77	3.08	3.95	3.48	4.62	2.05	1.54
20-40		3.94	69.70	11.08	3.44	4.63	3.89	2.65	0.55	
40-60		2.64	72.28	13.86	3.60	4.16	1.98	1.26	0.17	
60-80		3.09	73.09	14.96	3.45	3.61	1.11	0.60	0.03	
80-90		4.10	73.62	16.43	3.27	1.86	0.56	0.15	0.01	
90-95		3.24	73.42	18.37	2.74	1.62	0.46	0.12	0.03	
95-99		3.59	72.59	19.10	2.79	1.48	0.36	0.05	0.02	
99-99.5		4.35	72.80	19.60	2.05	0.57	0.58	0.06	0.00	
Top 0.5		3.72	77.70	15.85	1.34	1.07	0.10	0.22	0.00	
All	0.13	3.77	70.69	13.39	3.27	3.59	2.21	1.92	0.61	0.41

Average Ratio of Corrected to Reported Income by Ratio Class

rank	-0.5	0.5	1	1.01	1.1	1.2	1.5	2	4	8
<-50	-1.127	-0.828	1.000	1.059	1.151	1.312	1.679	2.615	5.281	
< 0	-1.576	-0.561	1.000	1.053	1.145	1.366	1.760	2.987	5.405	19.112
0-20	-1.442	0.490	1.000	1.036	1.144	1.333	1.742	2.673	5.339	19.657
20-40		0.610	1.000	1.039	1.145	1.319	1.718	2.589	5.136	
40-60		0.799	1.000	1.032	1.142	1.319	1.706	2.593	5.025	
60-80		0.924	1.000	1.034	1.144	1.305	1.704	2.492	5.388	
80-90		0.961	1.000	1.032	1.141	1.321	1.719	2.619	6.068	
90-95		0.955	1.000	1.027	1.140	1.301	1.692	2.607	5.498	
95-99		0.959	1.000	1.029	1.140	1.310	1.643	2.457	5.419	
99-99.5		0.964	1.000	1.027	1.142	1.323	1.639	2.601		
Top 0.5		0.935	1.000	1.025	1.139	1.288	1.822	3.232		
All	-0.221	0.735	1.000	1.034	1.143	1.319	1.722	2.647	5.296	19.199

Standard Error for Ratio by Ratio Class

rank	-0.5	0.5	1	1.01	1.1	1.2	1.5	2	4	8
<-50	0.058	0.017	0.000	0.005	0.022	0.019	0.041	0.142	0.529	
< 0	0.346	0.033	0.000	0.007		0.015	0.025	0.061	0.151	2.676
0-20	0.709	0.032	0.000	0.002	0.003	0.007	0.012	0.031	0.085	1.870
20-40		0.029	0.000	0.001	0.002	0.005	0.009	0.029	0.110	
40-60		0.023	0.000	0.001	0.002	0.004	0.008	0.036	0.168	
60-80		0.010	0.000	0.001	0.001	0.004	0.009	0.035	0.289	
80-90		0.005	0.000	0.001	0.002	0.005	0.015	0.085	0.868	
90-95		0.007	0.000	0.001	0.002	0.008	0.021	0.097	0.209	
95-99		0.006	0.000	0.001	0.002	0.008	0.022	0.149	0.497	
99-99.5		0.009	0.000	0.002	0.006	0.026	0.042	0.138		
Top 0.5		0.012	0.000	0.001	0.004	0.011	0.060	0.214		
All	0.283	0.009	0.000	0.000	0.001	0.002	0.004	0.016	0.055	1.354