What Is the Tax Gap?

By Eric Toder

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I. Introduction

"The art of taxation consists in so plucking the goose as to obtain the largest possible amounts of feathers with the smallest possible amount of hissing." Jean Baptiste Colbert (1619-1683), French Economist and Minister of Finance under King Louis XIV.

Judging only from his famous quotation on taxation, one can doubt whether Minister Colbert would have cared much about the tax gap. After all, in his view, the purpose of taxation was to extract as much money as possible from the citizenry to serve the sovereign with the least possible fuss and bother. That which could not be collected — at least not without a lot of "hissing" and other unpleasantness — was best left undisturbed.

Yet as citizens of a democracy we, or at least some of us, expect that the burden of financing the public services that we as citizens demand should be allocated in a fair way among the population. Tax experts differ on the details, but most believe tax liability should be allocated in some way based on people's economic capacity or ability to pay tax. Fewer of us believe that the tax laws our elected representatives have enacted meet our standards of fairness, efficiency or simplicity, but even critics of our tax laws usually believe they merit obedience and respect as the product of representative government. Thus, we do care about taxes owed but not reported or paid, even if they are difficult to identify and collect and, if we are intellectually consistent, we should also care about taxes paid but not owed, even though overpaid taxes benefit the sovereign.

This paper addresses issues related to measurement of the tax gap — the difference between tax liability under the current Federal tax law and taxes paid. First, I discuss how the tax gap is defined, review the main components of the tax gap, and discuss how the IRS estimates it. I then review some major methodological issues in estimating the tax gap and some weaknesses of the current estimates. The United States leads the world in tax gap estimation (some might consider this a dubious honor), but estimating that which does not happen (taxes that theoretically should be paid, but are not) is inherently much more difficult than estimating observed quantities such as GDP, employment or revenues actually collected. So while tax gap estimates can certainly be improved, there will always be significant uncertainty attached to any tax gap estimate. The final section of the paper includes some brief observations on the use and potential misuse of tax gap estimates and how better compliance data might lead to better tax law administration.

II. Definition and Measurement of the Tax Gap

A. Definition

The *gross tax gap* is the difference between tax liability in any year and the amount of tax that is paid voluntary and on time. The most recent IRS estimate of the gross tax gap was released in 2006 for tax year 2001 (Internal Revenue Service 2006). IRS estimates a gross tax gap for 2001 of $345 billion, or slightly over 16 percent of estimated federal tax liability. The net tax gap is the gross tax gap in any tax year less payments of that year's tax liability that come in later through either voluntary late payments or IRS enforcement activities. Payments of interest and penalties associated with late payments or underreported tax liability are not counted in either the gross or net tax gap measures. IRS estimates the net tax gap for tax year 2001 at $290 billion.

The gross tax gap has *three components* — non-filing, underreporting of tax owed, and underpayment. The three components are mutually exclusive and add up to the total tax gap. The *non-filing gap* is the tax not paid on time by taxpayers who have a legal requirement to file a tax return, but do not file on time. The *underreporting gap* is the tax owed by taxpayers who file returns on time, but underreport the amount of tax they owe. The *underpayment gap* is the loss of revenue owed by taxpayers who file returns on time, but do not pay their reported tax due on time. The largest component of the tax gap is underreporting. IRS estimates an underreporting gap of $285 billion, an underpayment gap of $33.3 billion, and a non-filing gap of $27 billion.

The gross tax gap is measured net of overpayments of tax liability. That is, if a taxpayer whose return is examined in a tax gap study is found to have reported and paid too much tax, his or her overpayment is subtracted from the measure of the gross tax gap. In calculating the gross tax gap, IRS also nets out withholding taxes paid by individuals who fail to file tax returns on time.

Table 1. Components of the Tax Gap (in billions of dollars)				
Tax Sources	Nonfiling	Underreporting	Underpayment	Total
Individual Income Tax	25	197	23.4	245
Non-business income		56		
Business income		109		
Adjustments, deductions, exemptions		15		
Credits		17		
Corporation Income Tax		30	2.3	32
Small corporations		5		
Large Corporations		25		
Employment Tax		54	5	59
FICA		14		
Self-employment tax		39		
Unemployment tax		1		
Estate Tax	2	4	2.1	8
Excise Tax			0.5	0.5
All Taxes	27	285	33.3	345
Memo: Taxes paid by individuals	27	240	25.5	293
Memo 2: Taxes on business income of individuals		148		
Source: Internal Revenue Service, "Tax Gap Map for Tax Year 2001," in Mark J. Mazur and Alan H. Plumley (2007) Taxes paid by individuals include individual income tax ($245 billion), self-employment tax ($39 billion), and estate tax ($8 billion) Taxes on business income of individuals include the portion of the individual income tax underreporting gap attributable to business income ($109 billion) and self-employment tax ($39 billion).				

Tables 1 and 2 show breakdowns of the estimated tax gap by tax sources, income sources within the individual income tax, and tax gap components in billions of dollars and percentages of the total tax gap. Several figures jump out from the tables. First, the individual income tax is the biggest source of the tax gap, accounting for 71 percent of the gross tax gap. When you add to the individual income tax gap the estate tax gap and the underreporting of self-employment tax, the share of the estimated tax gap attributed to individual filers rises to almost 85 percent. The biggest single line item in the tax gap is underreporting of business income in the individual income tax, which amounts to $109 billion or almost a third of the estimated tax gap. Adding in the underreporting of self-employment tax, the underreporting of business income on individual income tax returns contributes to 43 percent of the total tax gap, over half of the underreporting gap, and 63 percent (43/(57+11)) of the underreporting gap attributable to individual taxpayers. Based on the IRS estimates, the tax gap problem is primarily (though not solely) a problem of underreporting of tax by individual taxpayers with income from businesses, rents and royalties, farms, partnerships, and other flow-through entities.

Most of the tax gap comes from noncompliance by individuals and businesses participating in officially recorded economic activities, who are either failing to file tax returns, underreporting tax owed on tax returns, or failing to pay taxes due on time. But the tax gap also includes tax evasion by participants in legal activities in the *underground economy*, that is, the portion of economic activity that goes unrecorded in official economic statistics. These participants are informal suppliers, such as moonlighting professionals, household employees, and street vendors, who work "off the books" and do not report income or taxes owed. The tax gap, however, does not count unpaid taxes by people engaged in the portion of the underground economy consisting of illegal activities, such as drug dealing, illegal gambling, and prostitution.

B. Measuring the Components of the Tax Gap

IRS uses different methods to measure the three components of the tax gap. The individual income tax non-filing gap is calculated using estimates supplied by the Census Bureau. The underreporting gap is estimated from a combination of random audit and operational audit data. The underpayment gap is calculated using tabulations from the IRS Master File.

1. Estimates of the Nonfiling Rate and Nonfiling Gap. On filing compliance, the IRS regularly produces estimates of the nonfiling rate. To do this, the IRS creates tax filing units from household units in the annual Current Population Survey (CPS) produced by the U.S. Bureau of the Census. Based on family characteristics and incomes reported to CPS, the IRS then tabulates the weighted number of CPS individual tax units with a requirement to file a tax return. IRS then tabulates from tax return data the number of individual taxpayers with a requirement to file who do file on time. The non-filing rate is then computed as the ratio, $(R-F)/R$, where R = the estimated number of returns with a requirement to file (from CPS) and F = the estimated number of required filers who do file on time (from IRS tax return data).

The computation of the nonfiling percentage does not reveal the size of the non-filing gap because it supplies no

Tax Sources (percent of total)	Nonfiling	Underreporting	Underpayment	Total
Individual Income Tax	7%	57%	7	71%
Non-business income		16%		
Business income		31%		
Adjustments, deductions, exemptions		4%		
Credits		5%		
Corporation Income Tax		9%	1%	9%
Small corporations		1%		
Large Corporations		7%		
Employment Tax		16%	1%	17%
FICA		4%		
Self-employment tax		11%		
Unemployment tax		*		
Estate Tax	1%	1%	1%	2%
Excise Tax			*	*
All Taxes	8%	83%	10%	100.0%
Memo: Taxes paid by individuals	8%	70%	7%	85%
Memo 2: Taxes on business income		43%		

Table 2. Components of the Tax Gap (in percent of total)

Source: Internal Revenue Service, "Tax Gap Map for Tax Year 2001," in Mark J. Mazur and Alan H. Plumley (2007)
* = less than 0.05%

information on the characteristics of taxpayers who do not file returns on time or on how much tax would have been due if they had filed. In the 1980s, IRS obtained this information from a special audit survey of potential nonfilers. For the most recent tax gap estimates, the Census Department estimated for the IRS the tax liability of nonfilers and late filers using an exact match file of CPS and IRS data.

The IRS by law supplies to Census certain limited data items from all individual income tax returns. IRS does not supply tax liability or tax credit amounts to Census. To protect the confidentiality of CPS respondents, the Census does not supply any data from the exact match file to the IRS.

To help IRS estimate the nonfiling gap for tax year 2001, the Census used the 2003 Exact Match file to tabulate aggregate estimates of income and tax liability for tax year 2003 for those who were estimated to have a filing requirement, but did not file a return.[1] The IRS then projected those estimates backward to tax year 2001, based on the growth of individual tax liability between 2001 and 2003. Finally to get the amount of taxes not paid on time by nonfilers, the IRS subtracted from the Census

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[1] There are many technical issues with the Census estimates, particularly involving the imputation of a Social Security number (SSN) to CPS records of individuals who did not supply a valid SSN to Census. Nonetheless, tabulations for those records that Census assumes had a requirement to file and did file match closely with similar tabulations from IRS data of filers who are required to file. This suggests, but does not prove, that totals for those who are assumed to have a requirement to file and failed to file — the records used by Census to construct their estimate — may also be reasonably accurate.

estimate a separate estimate from IRS data of withholding tax that was paid on time by individuals who did not subsequently file a timely tax return. This procedure yields an estimate for the aggregate nonfiling gap, but does not provide the basis for estimating the incidence of nonfiling among different income groups or among taxpayers with different sources of income.

The IRS has not estimated a nonfiling gap for the corporate income tax or employment taxes, although it is reasonable to assume that most corporations with a requirement to file do file tax returns and that all the large corporations that account for most corporate tax liability file timely returns. The nonfiling gap for the estate tax was estimated to be $2 billion (see discussion of estate tax underreporting below).

2. Estimates of the Underreporting Gap. The primary method the IRS uses to estimate the underreporting gap is to audit a stratified random sample of tax returns and then project the audit results to population totals. Between 1963 and 1988, the IRS conducted periodic random audit studies of individual income tax returns, small corporation tax returns, and employment tax returns under the Taxpayer Compliance Measurement Program (TCMP). (Because virtually all returns of the largest corporations were audited, IRS used operational audit results to estimate underreporting of the largest corporations.) The findings from TCMP audits were used both to estimate the tax gap and to update audit selection formulas. The TCMP program was suspended in the 1990s, partly in response to taxpayer complaints about the burdens the audits imposed and partly in response to preferences of some IRS officials to use scarce audit resources to examine taxpayers selected by probability of noncompliance instead of randomly. (Over time, however, the absence of new data from random audit studies

Table 3. Comparison of National Research Program (NRP) and Taxpayer Compliance Measurement Program (TCMP) Estimates of Underreporting Gap for Individual Taxpayers		
Feature of Methodology	**NRP**	**TCMP**
Sample Size	About 46,000 returns	About 50,000 returns
Sampling Method	Stratified random sample	Stratified random sample
Audit coverage	Face to face audits for most returns, including all with business income. Some returns accepted as filed. Some returns audited by Correspondence on a few selected issues.	All returns subject to face to face audits
Face to face audit Method	Classifiers review returns and select issues for examiners to review. Examiners review all classified issues, plus others at their discretion.	Examiners do line by line audits of all returns.
Case-building	Extensive case-building material for classifiers and examiners, including prior-year returns and use of third-party data	Lesser reliance on external data.
Adjustment for Non-detection	Varying adjustments applied to different income sources based on estimates using detection control method outlined by Feinstein (2004).	Estimates for underreporting on income items with no information matching multiplied by 3.28. Factor based on comparison of 1976 TCMP audits without information returns and findings from document matching.
Informal Suppliers	Undetected income by informal suppliers (filers with unreported income from "moonlighting") included in detection control estimates.	Estimates of underreporting by informal suppliers derived from special survey of household consumption.

led to a degradation of the audit selection algorithms and an increase in the "no-change" rate of audits.)

Former Commissioner Charles Rossotti restarted the IRS random audit program and renamed it the National Research Program (NRP). NRP was meant to be a less intrusive substitute for TCMP, relying more heavily on the use of third-party data and more extensive case-building information and exempting some simple returns from intense scrutiny. NRP completed the results of its individual taxpayer reporting compliance study at the end of 2004 and IRS used the results to update its tax gap estimates for tax year 2001 in 2006. In this study, NRP audited a stratified random sample of 46,000 individual tax returns for tax year 2001.[2]

Comparison of NRP and TCMP Estimates of Individual Income Tax Underreporting. Because the individual underreporting gap is the largest portion of the tax gap, the difference between NRP and TCMP methodologies is worth some discussion (Table 3). The NRP sample included only slightly fewer individual tax returns than TCMP, but in addition about 5,000 NRP returns were not subject to face-to-face audits. Trained classifiers reviewed all the returns in the NRP sample. For those returns (about 3,400) where there were no differences between

taxpayer entries and matched items from information returns and no other apparent sources of non-matched income, the classifiers accepted the returns as filed with no adjustments. For others (about 2,300) with only one or two non-verifiable issues, the returns were audited by correspondence on just those issues. This left slightly over 40,000 returns subject to face-to-face audits.[3]

(In addition to audited returns, some returns that were accepted as filed also had small adjustments to them, but IRS did not contact taxpayers if the amounts were very small.) All returns in the larger sample that reported business income (schedule C income, partnership income, farm income, rents and royalties etc.) were selected for face-to-face audits.

For all returns subject to face-to-face audits (returns with reported business income and others), NRP classifiers selected issues for auditors to examine. Auditors examined all classified issues on tax returns, but were also free to examine line items that were not classified, if other information revealed on audit led the examiner to question the accuracy of those items as well. In short, the NRP face-to-face audits were very similar to operational audits, except that more issues were classified in NRP audits to reflect the objective of gaining additional data

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[2]The stratified sample has lower weights (that is, more representation) for high-income individuals and individuals reporting business income because these were the sectors with historically the largest compliance problems and for which there was the most urgent need to update audit selection formulas.

[3]The selection of some simple returns for no audits or lighter audits was a response to criticism of the costs on some compliant taxpayers that TCMP imposed; it was meant to ensure that taxpayers with very simple returns and no evident inconsistencies were not subject to rigorous examination.

for research purposes by examining line items that might not have been considered cost-effective to check in an operational audit.

The generally less intrusive NRP audits may have uncovered less noncompliance than TCMP audits, but NRP examiners had the benefit of better case-building materials than the TCMP examiners of a decade and a half earlier. All NRP classifiers and auditors began with a case file that included three years of prior tax returns and information reports from the IRS automated underreporter program (AUR). In addition, the NRP case files included a variety of publicly available data on assets (such as houses and cars) held by taxpayers. The use of files containing externally collected data on taxpayers was a major innovation in NRP compared with TCMP.

The starting point for calculating underreporting on individual tax returns in both NRP and TCMP is a comparison of the amount of tax liability taxpayers report on their returns and the tax liability the IRS examiner identifies on audit. This includes both negative and positive adjustments; the underreporting gap is measured as the amount of underreporting by taxpayers who report too little tax minus the amount of overreporting by taxpayers who examiners find have erroneously reported too much tax liability.[4]

For purpose of calculating the tax gap, the IRS then inflates the examiners' finding of underreporting of income to account for non-detection by auditors. In the tax gap studies based on TCMP audits of individual tax returns from tax years 1979, 1982, 1985, and 1988, the IRS inflated estimates of underreporting of non-matched income sources by a multiple of 3.28. This multiple was based on a study using a sub-sample of TCMP data from 1976 tax returns that compared non-reporting of interest and dividends that examiners found without the use of third-party matching documents with amounts that would have been detected through document matching (Internal Revenue Service 1996). The tax gap estimates associated with the TCMP surveys then added a further adjustment for unreported income by informal suppliers. This latter adjustment was derived from surveys IRS sponsored of household purchases from informal suppliers.[5]

For the NRP study of tax year 2001 individual income tax returns, IRS adjusted estimates of underreported income items using a statistical technique that adjusts for the differences in amounts of noncompliance detected by examiners of varying abilities, so that the estimates in principle reflect the amount that would be detected by a hypothetical auditor who combines the best characteristics (in terms of ability to detect different taxpayer errors)

of the entire pool of actual auditors.[6] Feinstein (2004) outlined the methodology in a presentation at the June 2004 IRS Research conference, but there has been no subsequent IRS publication that explains in detail exactly how the methodology was applied to the 2001 NRP sample and IRS has not publicly released the factors used to adjust underreported income.[7] IRS staff have indicated, however, that some of the adjustment factors are larger on average than those used in previous estimates and vary among types of income, with the largest adjustments applied to ''low visibility'' sources of income, consisting of farm or non-farm sole proprietor income, partnership or S-corporation income, rents and royalties, other income, and Form 4797 income. (The adjustments for low visibility income range from 3.3 to 4.2, according to IRS staff).

The non-detection estimation method allows for an estimate of the informal supplier income that IRS examiners fail to detect. One consequence is that estimates of misreporting percentages for different income sources that IRS has released from the 2001 tax year study do not include a separate estimate of unreported informal supplier income (Internal Revenue Service, 2006). Instead, the estimated misreporting of schedule C income incorporates the IRS estimate of the amount of informal supplier income that examiners miss. (This includes ''moonlighting'' income by people reporting no schedule C income, but filing returns to report other income.) The inclusion of informal supplier income makes the underreporting rate for schedule C income for 2001 returns look much higher than the estimate reported for 1988 returns (Internal Revenue Service 1996), but that apparent increase in Schedule C noncompliance mostly reflects a change in presentation, as compared with the 1996 report presentation that showed noncompliance on Schedule C by formal and informal suppliers separately.

Underreporting of Corporate Income, Employment, and Estate Taxes. IRS estimates of the corporate tax gap are based on very old data from the 1980s, extrapolated to tax year 2001 by assuming a constant ratio of the tax gap to reported tax liability. The gap for small corporations (those with assets of $10 million or less) was estimated from random audit TCMP studies of small corporations in the early 1980s. The gap for large corporations was estimated from operational (i.e., non-random) examination data from the 1980s. As with other components of the tax gap, the corporate tax gap is estimated from the difference between the amounts IRS auditors recommend and the amount of tax liability corporations report.

IRS estimates of the employment tax gap consist of two pieces. The estimate of the self-employment tax gap is based on the recent NRP study of 2001 individual

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[4]The tax gap measure also includes net math error adjustments, which are computed in return processing and not part of NRP audits.

[5]The University of Michigan Survey Research Center administered the surveys of household purchases from informal suppliers. See Smith and Adams (1987).

[6]This statistical technique has been applied previously to studies of both tax compliance and safety regulations. See Feinstein (1989), Feinstein (1990), and Feinstein (1991).

[7]Feinstein and Brian Erard (2007) presented a new version of the DCE methodology for estimating individual income tax underreporting with NRP data at the 2007 IRS Research conference along with some background data, but did not report adjustment multipliers under the revised approach.

income tax returns and is as up-to-date as the underreporting estimates for individual income tax. The estimate of underreporting of employment tax by employers is based on TCMP studies from the 1980s, extrapolated to 2001 and, like the corporate tax gap estimates, is seriously dated, failing to reflect two decades of changing employment and compensation behavior.

The estimates of the underreporting and nonfiling gaps for the estate tax are derived by comparing the estimated number of estate tax returns and estate taxes paid from IRS Statistics of Income sample data with estimates of the number of estate tax returns required to be filed and estate tax liability from survey data. (Internal Revenue Service, 2004). The surveys used are the Asset and Health Dynamics among the Oldest Old (AHEAD) dataset and the Health and Retirement Study (HRS), both administered by the Institute of Social Research at the University of Michigan. The estimates control for household wealth, marital status, individual mortality and the interaction between these factors. The total estate tax gap of $8.3 billion (consisting of $2 billion in non-filing, $4 billion in underreporting, and $2.3 billion in underpayment) is a small portion of the overall tax gap, but a significant share (over 30 percent) of estimated estate tax liability in 2001.[8] It will not be discussed further in this paper.

3. Estimates of the Underpayment Gap. The underpayment gap is the loss in revenue from taxpayers who have filed timely returns, but have not fully paid their reported tax on time. The IRS tabulates the underpayment gap annually from tax return and payment data on the IRS Master File. These tabulations are a highly accurate measure of the underpayment gap because IRS generally knows both the amounts reported on timely returns and the amounts paid on time.

Interest and penalties associated with delayed payments are not counted as part of the tax gap because they are not part of tax liability. They are included, however, in data on revenues from IRS enforcement activities.

C. Difference Between Gross and Net Tax Gap

IRS estimates that almost one-sixth of the estimated tax gap for tax year 2001 will eventually be recovered either through voluntary late payments or IRS enforcement activities. IRS estimates the amount of 2001 late payments that eventually will be recovered based on historical data on timing of late payments from liabilities of earlier tax years. As noted above, interest and penalties are not counted in the tax gap, so that only those payments that represent payments of tax liability due — not interest and penalties — are counted as offsets to the gross tax gap in computing the net tax gap.

IRS also maintains a database that tracks the outcomes of enforcement activities, including document matching programs, audits, appeals, litigation, offers in compromise, and actions taken to enforce collection of amounts due. Again, the amount of unpaid 2001 tax that IRS estimates will eventually be recovered from enforcement is based on historical data that tracks recovery of unpaid taxes from prior years.

The difference between the gross tax gap and the net tax gap does not match reported enforcement revenues from any single fiscal year for several reasons. First, and most importantly, enforcement receipts in any single fiscal year represent amounts recovered based on tax due from a number of previous calendar years. Some enforcement activities, such as some collection notices, may bring in receipts very quickly, but in other cases receipts could be associated with liability from tax years as much as a decade earlier, especially in cases involving payments that are the outcome of complicated litigation on corporate tax transactions. Second, late payments that are paid without IRS intervention are not included in IRS enforcement activities. Third, enforcement revenues include both penalties and interest, while only recovery of the initial shortfall in tax liability counts as part of the difference between the gross and net tax gaps.

D. Issues in Measuring the Tax Gap

The summary in the previous section gives some flavor of the complex modeling and data collection activities required to develop estimates of the tax gap. The IRS estimates of the tax gap are far more comprehensive and thorough than estimates of noncompliance in any other country, with the possible exception of Sweden.[9] Moreover, a search of web sites of other tax agencies reveals that the IRS publicly releases much more information on both the sources of the tax gap and methods of estimating it than tax agencies in other countries. In addition, not withstanding the long hiatus between the suspension of TCMP after tax year 1988 and the initiation of NRP in tax year 2001, the IRS historically has and currently performs much more detailed random audit studies than other countries (Organization for Economic Cooperation and Development, 2003).

The IRS estimate of a gross tax gap of about 16 percent of tax liability is within the range of past estimates of noncompliance in the United States and noncompliance for selected tax sources in other advanced countries. Nonetheless, a large amount of uncertainly must be assigned to the current tax gap estimate. There are both technical and conceptual issues in determining the correct measure of the tax gap. Some of the more serious issues, discussed in this section are: adjustments for failure to detect underreporting on individual income tax returns, underreporting of income through flow-through entities, measurement of overreporting of individual tax liability, timeliness of data, conceptual issues in measuring the corporate tax gap, and special problems in

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[8]Net Federal estate taxes reported on 2001 reports were $20.8 billion (Eller 2001). Adding in the estimate of taxes not reported makes estimated estate tax liability in 2001 equal to $26.8 billion and the estimated estate tax gap equal to (8.3/26.8) or 31 percent of estimated tax liability.

[9]McManus and Warren (2006) note that a number of jurisdictions around the world now undertake tax gap estimates and cite estimates of value added tax (VAT) studies in France and the United Kingdom, as well as a broader tax gap study in Sweden that covers a ''broad range of taxes and Social Security levies, including VAT.''

estimating the portion of the tax gap due to sophisticated tax avoidance techniques. I discuss each of these issues briefly.

E. Adjusting for Non-Detection (Individual Returns)

The previous section described the comparative methodologies IRS used in later TCMP studies and in the NRP study of 2001 individual returns to estimate the amount of underreported income that examiners fail to detect. It must be stressed that this is a large number. The total amount of underreported tax from small business income and self-employment tax is estimated at $148 billion. As an illustration, using a multiplier of 3.5 would imply that detection control raises the estimated tax gap from this source alone by over $106 billion, about 31 percent of the gross tax gap. (Using a multiplier of 3.5, underreporting from these two sources would consist of $42 billion of underreporting detected by examiners and $106 billion of underreporting that IRS estimates its examiners fail to detect)[10] Thus, a very significant share of the tax gap is inferred from the detection control model instead of being observed directly.

This is not meant as a criticism of the detection control analysis technique, which has been applied successfully to a number of similar detection issues in safety regulation and health care, is a large improvement over the use of outdated multipliers from a 1970s TCMP study, and provides a method for adjusting for the effects of the less thorough audits in NRP compared with TCMP. The point is instead to emphasize the inherent difficulty of estimating data that IRS cannot observe directly and would not be able to observe even if using the line by line audit method of TCMP. As Bankman (2007) notes, when transactions are conducted in cash and there are no matching documents, it is very difficult to detect non-compliance.

Use of the detection control method can potentially help measure the contribution of undetected income to the tax gap correctly, but whether it over-corrects or under-corrects for undetected income is difficult to determine.

F. Under-Reporting of Income by Flow-Through Entities

IRS has not completed a random audit survey of flow-through entities since the 1980s, although underreporting of net income of businesses that are organized as flow through entities may contribute significantly to underreporting of individual income tax by their owners. IRS is currently completing an audit survey of 5,000 S corporation returns filed in 2003 and 2004, which will be the second reporting compliance study performed as part of the NRP. The results of that study will be used to adjust estimates of individual income tax non-compliance.

The NRP study of individual income tax returns did not systematically examine the underlying income of flow through entities in which the audited individuals owned shares. In some cases, auditors also examined flow-through entities associated with the individual taxpayer they were examining, but this was typically done only in cases where the examiner believed that an accurate portrayal of the individual's tax liability required moving beyond the individual's income tax return.

Moreover, traditional IRS examining techniques that focus on examining one taxpayer at a time may fail to detect tax evasion from transactions between entities. These are often transactions with tax-indifferent entities that create losses that taxpayers can use to offset positive income. These transactions can involve distributions to offshore and foreign entities and to domestic tax-exempt entities and can be buried in complex networks that involve multiple levels of flow through entities. In effect, all parties may be reporting gross income correctly, but nonetheless tax gets evaded by shifts in income and deductions between entities.

IRS has recently funded development of advanced computation and data mining techniques to detect patterns of flows between entities that suggest the possibility of abusive transactions and can then be assigned to auditors for further examination. Preliminary tests of these new techniques identified numerous abusive transactions involving millions of dollars. (DeBarr and Harwood, 2004) While use of these new techniques holds the promise of better detection of abusive avoidance schemes, the preliminary evidence it has found of avoidance that occurs through income shifting among taxpayers and tax-indifferent entities suggests another source of noncompliance that current tax gap studies may fail to detect. Nonetheless, the preliminary research in this area has not produced any estimates of the size of the problem.

G. Possible Overstatement of Tax Liability

The underreporting gap is the difference between underreporting and overreporting of tax liability. If an auditor finds a taxpayer has made an error in the government's favor, the return will be corrected and IRS will repay any amount the taxpayer overpaid as a result of overreporting tax liability.

In estimating the tax gap, as noted above, IRS adjusts for an estimate of the amount of underreported income that examiners fail to detect. There is no corresponding adjustment, however, for unclaimed offsets to income or to tax that IRS fails to detect. While IRS willingly refunds taxes that have been incorrectly paid, one might suspect that IRS examiners are not over-zealous in searching for and finding unclaimed tax benefits. Simple computational errors and misinterpretations of the law (such as applying too low a percentage rate on an item for which a taxpayer has properly claimed a credit) will typically be adjusted, but it is less likely that examiners will search hard for potential deductions and other tax benefits that the taxpayer overlooks.

Taxpayers may often fail to claim tax benefits that are available to them. For example, the General Accounting Office (2002) estimates that over 2 million taxpayers

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[10]Recall that the NRP overall adjustment for low visibility income using the detection control method is between 3.3 and 4.2. NRP also makes an adjustment, although a smaller one, to high visibility income; adding that calculation would make the share of the tax gap attributable to detection control larger than the share estimated here.

failed to itemize deductions when potential itemized deductions (based on mortgage interest paid, state and local income taxes, and imputed charitable contributions, real estate taxes, and personal property taxes) exceeded the standard deduction. Several studies have found that about 15-20 percent of potentially eligible beneficiaries fail to claim the earned income tax credit (Scholz, 1994, Dollins, 2002, General Accounting Office, 2001). The non-participation rate for the earned income credit is low relative to the non-participation rate in spending programs that benefit low-income people, but it still represents a source of overstatement of tax liability. Failure to optimize on the use of more complex tax incentives, such as the various tax benefits, may be even larger. (See Davis, 2002, for a description of the mind-boggling complexity of education incentives.) Examples from other areas of economic research illustrate that individuals often forgo fairly obvious ways to gain a financial benefit. For example, Choi, Laibson and Madrian (2005) find that employees often contribute less to 401(k) plans than the match threshold, forgoing an employer match to their contribution even when they are allowed to make penalty-free withdrawals from the plans. Providing these individuals with specific information about the "free lunch" they are giving up fails to raise their contribution rates.

In some sense this is a philosophical question. Simple errors are reflected in the tax gap measure, but should we expect as a norm that taxpayers make use of all the complex benefits the tax law provides for them, even if using the benefits may not be worth the transaction cost? Clearly, this is an area where further research may be in order, especially as the tax code continues to be cluttered with new and more complex incentives involving difficult options and choices. At a minimum, one might ask the following question: If, in estimating the tax gap, IRS applies a detection control method to income underreporting based on what the best auditor might detect, should they not consider applying a similar method to over-reporting of tax liability based on the (legitimate) tax benefits that the hypothetically best private tax preparer might identify?

H. Timeliness of Data

For years, IRS estimates have suffered from being based on outdated sample data, extrapolated by the growth in overall tax liability. The substitution of 2001 tax return data on individual tax returns from NRP for 1988 TCMP data represents a major improvement in the timeliness of the data on which the tax gap estimates are based. But 2001 data will rapidly become outdated as well, as tax laws continue to evolve and as the age composition of the U.S. population, the composition of the workforce, and the distribution of employment by industries and occupations change. More importantly, estimates of the corporate tax gap and a large portion of the employment tax gap are still based on audit data from the 1980s.

Most of the corporate tax gap comes from underreporting of tax liability by the largest corporations (who also account for most corporate tax paid). Therefore, the most important next step in updating the tax gap estimates is to update the tax gap estimate for large corpo-

rations. The current estimated tax gap for large corporations is based on operational (i.e., non-random) examination data from the 1980s, extrapolated to 2001 levels. In the 1980s, audit coverage was so high for the largest corporations that operational data represented virtually the entire population. Since then, the audit rate of the largest corporations has fallen, so there would be issues about how best to project results from the audited sample to the entire population to the extent that firms subject to continuous audit are not selected randomly.

Moreover, even when all large corporations were audited, those audits were not comprehensive; the audits never covered all of the potential and complex issues involved in auditing a large corporation. Put another way, the question was not whether the subset of taxpayers audited was an unbiased representation of the taxpaying population, but whether the subset of issues examined for a given taxpayer captured all of the misreporting that might have been detected if every potential issue had been examined for all audited corporations and all their subsidiaries.

Short of constructing a random set of large corporation taxpayers to audit and issues to examine in a new corporate NRP study (which has never been done before either under NRP or TCMP), the most practical way to obtain more updated estimates in a reasonable time frame at reasonable cost is to use recent operational audit data to develop the new estimates. Using operational audits, however, raises important challenges of how best to extrapolate sample results that may be unrepresentative to the entire corporate taxpaying population and how to account for non-detection. Nonetheless, given how much has changed with the internationalization of U.S. corporations and how much has been written about changes in the behavior and motivations of corporate tax departments and public accounting firms, it is simply not credible to base corporate tax gap estimates on 20-year old data. Even estimates based on somewhat imprecise extrapolations of operational audit data would be an improvement.

For individual income taxes, the objective would be to update the estimates on a more regular basis. While TCMP individual random audit surveys were performed regularly every three years (though the tax gap estimates were always produced with a lag of several years), the most recent tax year included in the NRP individual random audit program is already 6 years back. Because individual audit rates have dropped substantially since the 1980s, NRP random audits absorb a much larger relative fraction of personnel that might be available for operational audits than TCMP audits did. Ways need to be found to reduce the annual cost of NRP if the program is to be sustained.

To develop more timely estimates of individual income tax reporting compliance and more frequent updates of audit selection formulas, the Internal Revenue Service (2007) just announced plans to perform random audits of smaller samples of individual tax returns under the NRP program every year. IRS will combine results of these audits to develop tax gap estimates over rolling three-year periods, with a new year's worth of audits added and one old year dropped every year. The study

will begin in October 2007 and examine about 13,000 tax year 2006 individual income tax returns.

Another possibility would be to include data from operational audits, using econometric methods to adjust for the non-randomness of operational data (Heckman, 1979). Data from these operational audits could supplement data from the random audits that IRS is now planning to perform annually. The random audits would serve as a check on the method of extrapolating from the operational sample to the population and allow for identification of emerging issues that audits based on past estimates of probable noncompliance might fail to detect. Use of a combination of random and operational audits could effectively expand the sample size and enable IRS to produce more compliance estimates for more segments of the taxpaying population.

I. Problems in Estimating the Portion of the Tax Gap Due to Sophisticated Avoidance Transactions

Much of the popular perception of the tax gap comes from articles and books that publicize how corporations and wealthy individual taxpayers use highly-paid tax lawyers and accountants to devise sophisticated schemes to reduce their tax liability to a small fraction of their economic income (See, for example, Johnson, 2003).

Sophisticated avoidance techniques may be thought of as coming in two general forms. The first involves the use of devices to hide income or transactions that if detected would clearly trigger increased tax liability. Some of the transactions discussed in an earlier section involving shifting of income between taxpayers and tax-indifferent entities through complex chains of interrelated entities are of this type. Another example is the use of offshore bank accounts in tax haven countries to hide unreported income, which can be then be accessed through credit cards to finance personal consumption at home. For transactions that are clearly outside the tax law, the only question for tax gap measurement is the ability of IRS to find and identify them.

A second set of transactions straddle the boundary between tax avoidance (legal) and tax evasion (illegal). Often these consist of a series of separate transactions, all of them within the letter of the tax law, that reduce tax liability, but produce no expectation of pretax economic gain.[11] Currently many courts will disallow tax benefits for transactions that produce no potential for economic profit, even if the tax savings come from a correct literal application of the tax rules. But courts differ in how they rule on such transactions and IRS assessments based on application of this economic substance doctrine are sometimes sustained and sometimes overruled. These transactions create issues for tax gap measurement because it is not always clear what "true" tax liability should be, even when the terms of the transaction are transparent.

More generally, there are conceptual issues in corporate tax gap estimation not present in estimates of the individual income tax gap. For most random individual income tax examinations, adjustments recommended by IRS examiners are rarely challenged and when challenged, are usually sustained on appeal or in court. The auditor's recommended amount rarely overstates true tax liability (at least in cases of underreporting by the taxpayer). In contrast, for large corporate taxpayers, both the initial tax return submission and the recommended IRS adjustment are often the opening positions in a complex negotiation about how much the taxpayer really owes. In that case, representing the tax liability after audit adjustment as the "true tax liability" may overstate the true level of noncompliance. Working in the other direction, however, IRS examiners may fail to detect evasion through complex transactions on corporate returns and the sample of large corporate returns that are audited is probably not large enough to apply the detection control methodology. This would leave as unresolved the question of whether IRS estimates based on the difference between recommended and reported liability understate or overstate the corporate tax gap.

J. Concluding Comments on Measurement Issues

The IRS has developed highly sophisticated techniques for estimating the tax gap and U.S. estimates of the tax gap are far superior to those in most other countries. Nonetheless, there are some serious conceptual and data issues in the tax gap measurements. Some of these cause the tax gap measure to be overstated and other problems cause it to be understated. The net direction of the error is unclear but the estimate is highly uncertain. To recap:

The estimates of the size of the tax gap rely heavily on statistical estimates of the amount of underreported income that auditors fail to detect. This creates a large amount of uncertainty in the tax gap measure and, because the methodology used to estimate undetected income has changed, renders comparisons with past tax gap estimates unreliable. It is important for consumers of tax gap estimates to understand how much of the tax gap comes from the adjustment for failure to detect income and therefore how much of it may be beyond the reach of IRS examiners.

The individual tax gap measures capture very incompletely the amount of tax avoidance that occurs from underreporting of income by flow through entities and probably fails to capture at all the loss in tax from complex transactions that use chains of flow through entities to reallocate income from taxable to tax-indifferent parties.

The individual tax gap measures probably fail to capture the amount of over-reporting of tax by individual taxpayers who fail to take advantage of all tax benefits to which they are entitled. IRS examiners are unlikely to search hard for errors in the government's favor and IRS does not make any adjustment in tax gap studies for non-detected over-reporting.

Some components of the tax gap measure are seriously out-of-date, especially estimates of the corporate income tax gap and the component of the employment tax gap attributable to employers. The individual income tax gap measures threaten to become dated rapidly, unless IRS moves quickly on plans to resume individual NRP audits

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[11]Michael Graetz has described these as transactions undertaken by very smart people that would be very dumb if there were no tax benefits.

and conduct them on a more regular basis, even though doing so requires them to reduce the annual number of NRP audits

Measuring the tax gap resulting from sophisticated tax avoidance strategies imposes special challenges; more work needs to be done on this.

V. Some Observations About the Use of Tax Gap Estimates

This section makes some brief comments about the use of tax gap estimates. While the IRS estimates probably are a good ballpark estimate of the amount of noncompliance, they are not useful for measuring trends in compliance or evaluating IRS performance. Measures of relative noncompliance for different tax return items do not themselves provide clear guidance for optimal enforcement strategies, although data collected in the course of tax gap studies do facilitate the design of better audit selection algorithms. Increasing audit resources and expanding the scope of information reporting can facilitate better compliance, but will not significantly reduce the measured tax gap.

A. The Tax Gap Estimate Is a Good Order of Magnitude Measure

In spite of large potential positive and negative errors, the tax gap measure provides a reasonably good indication of the order of magnitude of noncompliance. It is within the range of tax gap estimates in earlier years (Internal Revenue Service, 1990; 1996) and comparable as a percentage of tax liability to estimates from the limited number of studies (some of specific tax sources, such as value added tax) in other OECD countries.[12]

B. The Tax Gap Estimates Are Not Good for Measuring Trends or Evaluating IRS Performance

Changes over time in the compliance rate estimates that IRS releases are not good measures of trends in compliance and should not be used as measures of IRS performance. Both the quality of available data and techniques of measuring compliance are changing and the latter will probably evolve further as IRS develops new approaches to estimating the corporate tax gap and to estimating the individual income tax gap using fewer random audits in a single tax year. It also will not necessarily be possible to replicate a prior year's estimates with new methodologies. As a consequence, changes in the estimated compliance rate could reflect either changes in true compliance or changes in the method for measuring compliance. Further, there is so much noise and uncertainty in the compliance estimates that changes in year to year tax gap numbers could be purely random.[13]

Changes over time in the measured tax gap also reveal little about IRS performance. Changes in the measured tax gap could come from a variety of sources, including updating of prior estimates for the same time period with more recent data, changes in estimating techniques, changes in the ability of IRS to detect noncompliance, shifts in the composition of economic activity towards more or less compliant sectors, and changes in the tax laws. An improvement or degradation in IRS efficiency is only one of many factors influencing the estimated tax gap.

C. Comparative Non-Compliance Rates Are Not Necessarily a Guide to Optimal Enforcement Strategy

The tax gap estimates show that noncompliance is much higher for some sources of income than others and that the underreporting gap is much larger than the non-filing gap or the underpayment gap. But the relative sizes of different components of the tax gap do not reveal where IRS gets the largest return on its enforcement dollar. Compliance rates are lowest, for example for underreported income of non-matched sources of income, much of which comes from high income individual taxpayers with business income. But traditional audits of high-income returns, corporate returns, and individual returns with business income have lower returns per dollar spent than automated document matching and collection activities. These traditional audits can produce very large revenue from a single audit, but they are labor intensive and sometimes as not as cost-effective as alternative interventions.

The IRS has not released detailed estimates of the marginal or average returns per dollar spent on different enforcement programs. In recent testimony, however, former Commissioner Mark Everson (2007) presented some summary data on returns for different enforcement programs. Everson cited figures that imply yields of over 12 to 1 for additional spending on nonfiling programs, over 6 to 1 for spending on document matching, and less than 3 to 1 for additional spending on audits of large multinational businesses. Clearly, the relative cost-effectiveness of enforcement programs is not closely correlated with relative amounts of estimated noncompliance.[14]

Although the tax gap figures are not themselves good guides to how IRS should allocate its resources, the data collected from random audit studies *are very* useful for improving IRS audit selection formulas. In that sense, research to improve measures of the tax gap does greatly benefit effective enforcement.

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[12]Sweden, however, has a lower measured tax gap of about 8 percent of liability. See Swedish Tax Agency (2005).

[13]The IRS estimates confidence intervals associated with the sample design they use to represent the entire taxpaying population, but confidence intervals resulting from the detection control adjustments, the failure to adjust for undetected over-reporting errors, and ambiguities with respect to measuring the corporate tax gap have not been quantified.

[14]Note that these figures represent the direct yields in terms of increased enforcement dollars. Indirect yields from improved voluntary compliance that a higher audit presence encourages may be multiple times as large as direct yields (Plumley 1996, Dubin, 2005), but there are not reliable estimates of the relative effects on voluntary compliance of different enforcement programs.

D. Currently Proposed Approaches Will Not Significantly Lower the Tax Gap

The standard approaches to reducing the tax gap are to expand information reporting (in ways that do not inordinately burden taxpayers and third parties who must comply with additional reporting requirements) and to provide more enforcement resources to the IRS (without reducing resources for IRS taxpayer service). Both these approaches can be cost-effective ways to lower the tax gap, but neither one offers much immediate promise of having a major effect on the bottom line measure.

The President's 2008 budget includes a number of compliance proposals, including proposals to expand information reporting. Treasury estimates that these proposals will raise about $29 billion over 10 years, or less than 1 percent of the tax gap, which is $345 billion in the single year 2001. More revenue could be raised by sustained increases in funding of IRS enforcement, but again the potential gain from any likely level of increase is modest relative to the size of the problem. IRS estimates that they recover about four dollars on average in direct enforcement revenue per additional dollar spent on enforcement across the range of IRS enforcement programs. This means that if, for example, the proposed $11 billion IRS budget for fiscal year 2008 were permanently raised by 20 percent, with the increase all going to enforcement, the IRS could ultimately raise $9-$10 billion per year in direct enforcement receipts. This is a much larger budget increase than any political leader is proposing and the potential revenues from more enforcement resources (as opposed to expanding enforcement tools) will not be scored under Congressional scorekeeping procedures.

E. More Research Could Help

The IRS has revitalized its tax gap research program since 2000 and is planning additional and expanded studies. The current tax gap measures can be improved and made more timely by updating corporate tax gap estimates, completing ongoing work on flow-through entities, and setting in motion processes that would ensure continuous annual updating of individual tax gap compliance measures, even if that involves fewer random audits per year, in place of the occasional large random audit study. IRS could also develop better detailed measures of noncompliance that may provide indirect evidence on the extent to which noncompliance is willful or reflects failure to understand the tax law. A key variable of interest would be the distribution of underreporting among taxpayers. For example, do many taxpayers underreport small amounts of tax, or is a high share of underreporting accounted for by a very small share of returns? Another key variable of interest would be relative compliance rates among taxpayers who prepare returns by hand, prepare returns with software, and use paid preparers. More detailed analysis of NRP data could possibly shed light on the relative needs for more enforcement or better taxpayer education as means to improve compliance.

VI. Conclusions

This paper has reviewed the methods IRS currently uses under the National Research Program (NRP) to estimate the three components of the tax gap — nonfiling, underreporting, and underpayment — and compared them to prior estimating methods. The NRP is evolving and IRS is planning additional studies on flow-through entities and the corporate tax gap and modifications of methods for estimating individual income tax compliance to facilitate continuous updating of estimates.

The United States produces the most detailed tax gap estimates of any country in the world and the magnitudes of the overall estimates appear reasonable. But estimating the true size of the tax gap is a daunting problem, especially because even thorough audits fail to detect a very large amount of underreporting. Although there are numerous potential sources of error in the IRS tax gap estimate, there is not a clear bias towards either understating or overstating the tax gap. However, the absolute size of the potential error in the tax gap measure is large and the estimates are not precise enough to provide reliable estimates of trends in compliance rates or a reliable metric with which to evaluate IRS performance.

Because individual income tax underreporting is the largest source of noncompliance, the IRS in starting up NRP rightly chose first to update its estimates of the portion of the tax gap that results from underreporting and nonfiling of individual income tax and self-employment tax. These estimates will soon by modified by data collected in audits of flow-through entities in 2003 and 2004. There is a major need at this stage, however, to update the corporate tax gap estimates, even if the update must be performed by applying imprecise correction techniques to a less than representative sample of operational audits of corporate tax returns.

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