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How Large is the “Tax Gap” for the Georgia Personal Income Tax?

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Andrew Young School of Policy Studies
Georgia State University
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**FRC Report No. 232
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ANDREW YOUNG SCHOOL
OF POLICY STUDIES

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Table of Contents

I.	Introduction	1
II.	Overview of the Georgia Personal Income Tax	3
III.	What is the "Tax Gap," Why Does it Exist, and How it is Measured?	5
	Defining the "Tax Gap"	5
	Why Does the Tax Gap Exist?	6
	Previous Tax Gap Studies	6
IV.	Data and Methods.....	11
	Data	11
	Tax Gap Estimation Methods	12
V.	Tax Gap Estimates.....	16
	Underreporting Gap Estimates	16
	Underpayment Gap.....	18
	Non-filing Gap.....	19
	Summary	20
	Some Implications of the Estimates	21
VI.	Conclusions	27
	Improve Tax Administration: The "Enforcement" Paradigm.....	27
	Provide Better Taxpayer Services: The "Service" Paradigm	28
	Change Tax Culture: The "Trust" Paradigm	28
	Summary	29
	References.....	30
	Methods Appendix I: Applying the Feldman and Slemrod (2007) Method	32
	Methods Appendix II: Applying a Census-based Method.....	35
	About the Authors.....	37

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

I. Introduction

The “tax gap” is defined as the difference between tax revenues actually collected and the amount that should be collected if taxpayers fully complied with the tax laws. Studies that attempt to estimate the tax gap have grown in number within the past decade. However, these studies typically focus on estimates of national tax gaps, such as the federal government individual and corporate income taxes, and are not often conducted for specific taxes at the state level. In particular, there are no prior estimates of the tax gap for the personal income tax (PIT) in the State of Georgia. Neither the Georgia Department of Revenue nor any outside group has attempted to quantify uncollected PIT tax revenues. In this report, we report on the results from several methods to estimate the total personal income tax gap in Georgia. Our tax gap estimates are in the range of \$2.28 billion to \$2.88 billion, which implies an estimated “voluntary compliance rate” (or the amount of taxes paid voluntarily as a percentage of legally due taxes) between 80.2 percent to 84.6 percent. We also analyze the distribution of the tax gap across different income levels in order to gauge the distributional effects of the tax gap and to estimate which proportion of the tax base accounts for the largest portion of the tax gap. We also compare our results with the few estimates of tax gaps in other states.

It should be recognized at the outset that measuring the tax gap faces a fundamental difficulty: measuring the tax gap requires measuring tax evasion, and there is no reliable information on the extent of tax evasion. After all, tax evasion is illegal, and individuals have strong incentives to conceal their cheating given financial and other penalties that are imposed on individuals who are found cheating on their taxes. There have been many approaches used to the measurement of evasion, but, as discussed in detail by Alm (2011), all of them are subject to various and serious criticisms. Any resulting estimates of the tax gap from any of these approaches are necessarily subject to much imprecision. Even so, researchers have been increasingly creative in their approaches to measurement of evasion, and the methods that we use here are reflective of these modern approaches.

Section 2 overviews the Georgia personal income tax and its importance to the State of Georgia. Section 3 describes the tax gap and its main components, and

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

also presents a discussion of previous tax gap studies of note. Section 4 introduces the datasets used in estimating the tax gap and the methods used in estimating all components of the tax gap. Section 5 presents and discusses our PIT tax gap estimates. Section 6 concludes.

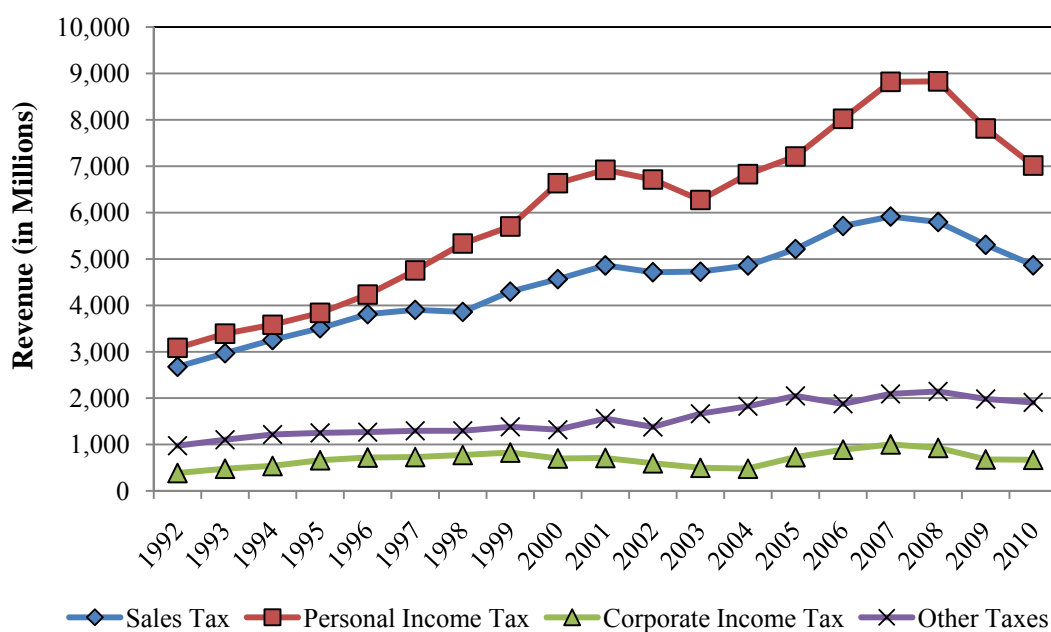
How Large is the "Tax Gap" for the Georgia Personal Income Tax?

II. Overview of the Georgia Personal Income Tax

It is useful to start with a brief overview of the Georgia Personal Income Tax (PIT). This tax is an individual income tax that uses Federal Adjusted Gross Income (FAGI) as its starting tax base. Then, through a series of scheduled adjustments, itemized or standard deductions, and personal exemptions Georgia Taxable Income (GTI) is derived. A graduated tax rate schedule is applied to GTI, with the minimum tax rate being 1 percent and the maximum tax rate being 6 percent. Nearly two-thirds of the taxable population reports income over the taxable income threshold at which income is taxed at the 6 percent tax rate. A variety of credits are deducted from the tax liability.

The State of Georgia is heavily and increasingly reliant on the personal income tax. As Figure 1 indicates, PIT tax revenues have become increasingly important relative to other taxes.

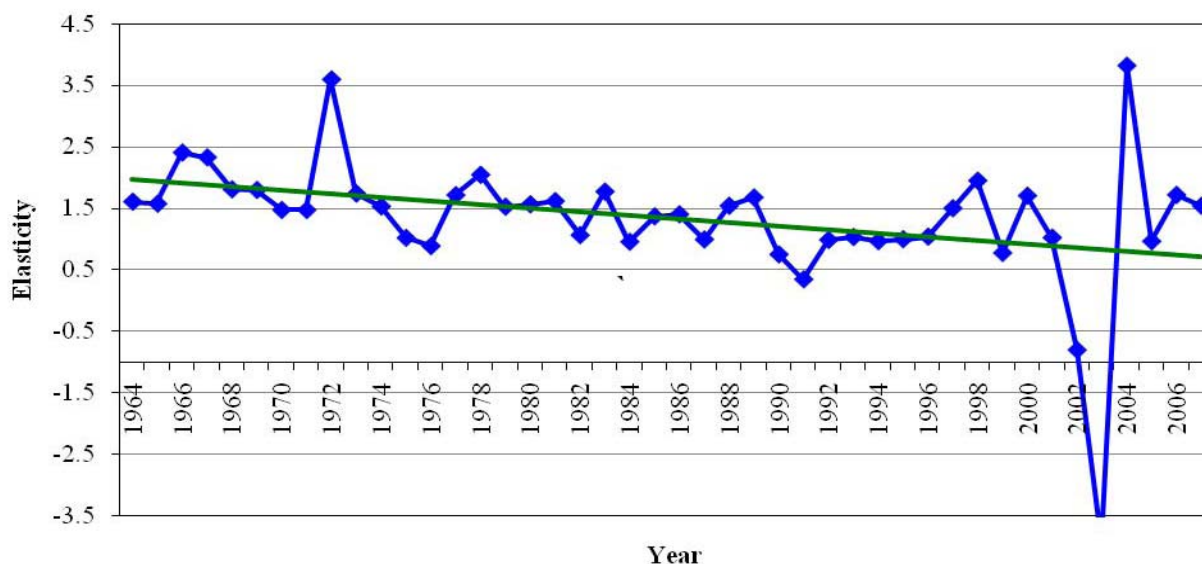
FIGURE 1. STATE OF GEORGIA TAX REVENUES, 1992-2007



How Large is the "Tax Gap" for the Georgia Personal Income Tax?

Over the past 15 years the PIT has far surpassed sales taxes in terms of its importance in total tax revenues. While this may appear to suggest that income tax non-compliance is not a significant issue, an examination of “tax buoyancy” indicates that income tax revenues are not moving in lock-step with state economic growth, as would normally be expected. “Tax buoyancy” is calculated as the percent change in tax revenues divided by the percent change in economic growth, usually represented by using growth in personal income (Wallace 2009). The Georgia PIT buoyancy over time is indicated in Figure 2. The straight-line trend in Figure 2, which slopes down significantly, suggests that Georgia PIT revenues are not keeping pace with the growth in income. The difference between the growth in PIT revenues and personal income suggests the potential existence of a substantial tax gap.

FIGURE 2. GEORGIA PERSONAL INCOME TAX BUOYANCY



III. What is the "Tax Gap," Why Does it Exist, and How is it Measured?

Defining the "Tax Gap"

The "tax gap" is typically defined as the difference between tax revenues actually collected in any given year and the amount that should be collected if agents fully complied with the tax laws. Researchers and policymakers often focus on two different measurements of the tax gap (Toder 2007). The first measurement is the "gross tax gap," or the difference between tax liability paid and the true tax liability. The "net tax gap" is the gross tax gap less payments of the year's tax liability that are collected either via voluntary late payments or via a tax agency's compliance efforts. Policymakers are often more concerned with the net tax gap than with the gross tax gap because the net tax gap is considered a better indication of the effectiveness of tax compliance efforts (Alm 2007).

There is substantial debate on the reliability and value of tax gap estimates. Tax policymakers are often unenthusiastic about tax gap studies due to the uncertainty of the estimates. In fact, Toder (2007) has labeled as a "dubious achievement" the Internal Revenue Service (IRS) efforts in "leading the world" in the number of tax gap studies. Other researchers like McManus and Warren (2006) view IRS tax gap estimates as helping to identify more efficient uses of the agency's limited funds (e.g., identifying specific sources of non-compliance). State revenue agencies have also proclaimed tax gap estimates as a productive method for measuring the effectiveness of Department of Revenue compliance efforts (Minnesota Department of Revenue 2004).

There are in principal several separate components of the tax gap. These components include the "underreporting gap," the "underpayment gap," and the "non-filing gap." The largest of the three is typically the underreporting gap, which consists of taxpayers who file a return and report their income in a timely manner but who fail to report their full amount of income (Toder 2007; IRS 2007). The underpayment gap is any underpayment of the correctly calculated and known tax liability. There is some disagreement as to whether the misreporting of credits, personal exemptions, and standard and itemized deductions should be included in the

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

underpayment portion of the tax gap or the underreporting component of the tax gap. The IRS chooses to include these sources of lost tax revenue as a part of the underreporting gap, and state departments of revenue generally follow suit (IRS 2007). Some other independent researchers have included this misreporting as part of the underpayment gap as it is not an “underreporting of taxable income” but rather an “over-reporting of tax deductions, credits, and exemptions” (McManus and Warren 2006). We follow the latter approach, and thus include the tax revenue lost due to over-reported deductions, credits, and exemptions as a portion of the underpayment gap. The third component of the tax gap is the non-filing gap, or the tax revenue lost from taxpayers who fail to file a tax return.

Why Does the Tax Gap Exist?

There are three basic reasons for the existence of a tax gap: taxpayers make mistakes, taxpayers cheat, and there is poor tax administration. The first part of the explanation for the tax gap is simply that people make unintentional errors in their bookkeeping, and that they also make errors because they do not fully understand the tax law.

A second part, probably the major part, is that people cheat on their taxes. Some individuals or firms simply do not file tax returns. Many of those who do file misreport various items, either underreporting income or sales, or over-reporting expenses and deductions. There are also instances where firms who withhold income or payroll taxes, or who collect sales and excise taxes, do not remit these taxes to the authorities.

Third, underlying all of this is poor tax administration—poor taxpayer services, overly complicated and inadequately explained tax forms, few audits, tax auditing systems that are outdated, underfunded, and poorly targeted, and even corruption and malfeasance in the tax administration.

Previous Tax Gap Studies

The existing literature for the tax gap estimates of underreporting consists of two main approaches, whose difference lies in the type and availability of the data.

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

The more frequently used procedure employs thorough line-by-line audits of a sample of individual tax returns to determine the underreporting of specific types of income from the selected sample; these results are then extrapolated to the entire taxable population in computing a measure of the total underreporting tax gap. The second method also uses a subset of tax returns but is not based upon tax audits. Instead, it estimates true income through more indirect methods that are by their nature somewhat less precise than audit-based measures. There is also a smaller literature that attempts to estimate the extent of non-filing. The following review details specific papers, studies, and government publications for these methodologies.

Underreporting: Audit-based Methods. The audit-based approaches have been popular with the IRS and with the few states that have attempted to estimate a state tax gap. The benefits of this type of study are the precision and the flexibility to make observations beyond just the extent of the tax gap using the characteristics of individuals likely to be underreporters (McManus and Warren 2006). The most prominent and widely cited tax gap estimate has been completed by the IRS originally through its Taxpayer Compliance Measurement Program (TCMP) and more recently through its National Research Program (NRP).

This methodology consists of a detailed line-by-line audit of a (stratified random) sample of individual tax returns. These audits yield IRS estimates of “true” reported items, which when compared to “actual” individual reported items allows the IRS to generate estimates of underreported income and/or underreported taxes. There has also been a separate (if sporadic) IRS compliance program that attempts to identify non-filers.

The most recent IRS estimates were completed as a part of the NRP program in 2001. The IRS estimated the federal tax gap to be \$345 billion for tax year 2001, for a non-compliance rate of 16.3 percent of the total true tax liability (IRS 2007). Within this gross tax gap estimate of \$345 billion, the IRS attributes \$285 billion, \$27 billion, and \$33 billion to the underreporting, non-filing, and underpayment gaps, respectively (IRS 2007).

In addition to estimating the broad components of the tax gap, the IRS also estimated the underreporting of income by different income sources. Through the

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

audits, the IRS established misreporting percentages for different sources of income, which measure the unreported income as a fraction of the estimated "true" income. As indicated in Table 1, the IRS estimates that the largest portion of the underreporting portion of the tax gap can be attributed to non-farm business income, partnerships and trusts, and other unearned income.

TABLE 1. IRS ESTIMATES OF MISREPORTING PERCENTAGES AND TAX GAP

Source of Income	Misreporting Percentage (%)	Estimated Tax Gap (\$ billions)
Wages and Salaries	1.20	13-15
Interest and Dividends	3.70	3-5
Pensions and IRA Income	4.10	4-8
Unemployment Income	11.10	NA
S Corps, Partnerships, and Trusts	17.80	16-24
Capital Gains	11.80	6-9
Alimony Income	7.20	NA
Non-Farm Business Income	57.10	59-65
Farm Income	72.00	2-3
Other Capital Gains	64.40	NA
Rent and Royalties	51.30	7-8
Other Income	63.50	14-18

Source: IRS (2007). Note that the IRS does not generate tax gap estimates for all income sources; "NA" (for "Not Available") refers to these categories.

Underreporting: Indirect Methods. Within the past decade, several state revenue departments have attempted to quantify the tax gap for their states (McManus and Warren 2006). In total, six states have published tax gap estimates: California, Idaho, Minnesota, Montana, New York, and Oregon.

These studies have used different methodologies. New York Department of Revenue (2005) and Minnesota Department of Revenue (2004) employed a Census-based aggregate approach in which the state department of revenue estimated the income that should be reported according to Census data, and compared this estimate with the income that was actually reported on tax returns. The states then disaggregated the total tax gap into underreporting and non-filing gaps by using the previously mentioned IRS (2007) tax gap component estimates. Other approaches include the less complex estimation strategies employed by California, Idaho, Montana, and Oregon, which simply apply the IRS-estimated misreporting percentages to calculate the state tax gap, given the distribution of income across

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

TABLE 2. STATE ESTIMATES OF TAX GAPS AND VOLUNTARY COMPLIANCE RATES

State	Year	Tax Gap (\$ millions)	Voluntary Compliance Rate (%)
California	2004	6,500	85.00
Idaho	2005	NA	82.90
Minnesota	1999	604	89.50
Montana	2006	NA	78.00-82.00
New York	2005	2,838	86.10
Oregon	2006	1,247	81.50-88.90

Source: Oregon Department of Revenue (2009). Note that Idaho and Montana do not generate estimates of the tax gap; "NA" (for "Not Available") denotes for these states.

different income sources in a particular state; for example, see California Legislative Analyst's Office (2005). State estimated tax gaps (in millions of dollars) are listed in Table 2, where the estimated voluntary compliance rate again measures actual tax collections as a percentage of legally due taxes.

While federal and state agencies have typically used auditing results and Census data to generate tax gap estimates, individual researchers have used more indirect approaches to estimate the tax gap. The advantage of these estimations is their ability to quantify the tax gap using less detailed data. However, these indirect approaches are also generally less reliable estimates for all components of the tax gap. Especially novel illustrations of these indirect approaches are by Pissarides and Weber (1989) and Feldman and Slemrod (2007), who use consumption-based or tax deduction-based measures as indirect indicators of tax evasion, on the assumption that a taxpayer's choices of consumption or of deductions are based on their "true" amount of income, not on their reported amounts of income. We apply here a variant of the Feldman and Slemrod (2007) method, as discussed in more detail in Appendix I.

Non-filing: Audit-based Methods. Other researchers have focused on measuring the number of non-filers. Erard and Ho (2001) use a special sample of filers and non-filers whom the IRS was able to identify (or "locate"), from the 1988 TCMP, in order to estimate the characteristics of non-filers versus filers in the federal individual income tax. Using the mean values of the characteristics of the subsample of "located" non-filers, they compute the non-filing tax gap to be approximately

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

\$11 billion and the number of non-filers to be around 7.9 million. These estimates suggest that, although non-filing is not an especially widespread problem in the federal income tax (only 7 percent of tax non-compliers are non-filers), those who do not file account for almost 15 percent of the total federal income tax gap; that is, while underreporting of income is the more widespread problem, non-filing is a sizable portion of the tax gap.

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

IV. Data and Methods

Data

Our tax gap estimates for the Georgia personal income tax use two major datasets: the 2001 Georgia personal income tax returns dataset from the Fiscal Research Center, and the IRS 2001 Income Tax Master File (ITMF) tax return information. The Georgia PIT dataset has 3,686,093 tax returns, which include total reported income, total deductions (both standard and itemized), and total credits. The ITMF dataset is a sample of 143,121 audited federal tax returns that have been weighted to be representative of the entire taxable population; the ITMF dataset has a state identifier that is used to obtain tax returns for the State of Georgia. The ITMF dataset contains 1,927 observations for Georgia, including 877 that use itemized rather than standard deductions. We use 2001 returns in order to apply IRS estimates, which are based on 2001 returns; however, our procedures can in principle also be applied to other years.

Two issues emerge with the datasets used in this study. First, regarding the Georgia tax returns, reported income is not broken down by different income sources. To deal with this first issue, we used the Georgia tax returns from the ITMF to create proportions of total income reported from each income source and type, and these percentages are then applied to the Georgia income tax returns.

More precisely, we followed a two-state process to determine the proportion of total income attributed to each source of income for which the IRS estimated misreporting percentages. Using the ITMF 2001 Georgia returns and the high income random sample (see below), we calculated for each taxpayer: reported wage, interest and dividends, pensions and IRA accounts, unemployment income, S-corp and partnership income, capital gains income, alimony income, business income, farm income, other gain, rents and royalties, other income, and social security income. We then combined these separate incomes to get aggregate income amounts for the sample. Each of these aggregate incomes was divided by the sum of all of the income variables plus scheduled adjustments to yield the percentage of total income attributed to each income source. Table 3 includes the amounts and the estimated percentages of total income for each source of income.

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

TABLE 3. AMOUNTS AND PERCENTAGES OF GEORGIA TOTAL INCOME FROM DIFFERENT SOURCES

Source of Income	Estimated Reported Income (\$ millions)	Percentage of Total Income (%)
Wages and Salaries	94,663.34	46.48
Interest and Dividends	9,999.94	4.91
Pensions and IRA Income	20,834.90	10.23
Unemployment Income	159.27	0.08
S Corps, Partnerships, and Trusts	1,531.56	0.75
Capital Gains	56,930.39	27.95
Alimony Income	130.55	0.06
Non-Farm Business Income	8,932.73	4.39
Farm Income	-1,209.77	-0.59
Other Capital Gains	2,922.59	1.44
Rent and Royalties	5,843.14	2.87
Other Income	692.46	0.34
Social Security Benefits	2,219.94	1.09

Source: Calculations by authors.

A second data issue arises because the ITMF dataset is top-coded, meaning that the state identifier is removed from individuals who report total income in excess of \$200,000. To get a more representative sample of Georgia taxpayers, we used the Fiscal Research Center dataset to calculate the percentage of Georgia taxpayers who filed a tax return reporting income in excess of \$200,000 as a percentage of total taxpayers and as a percentage of the total taxpayers who filed returns using itemized rather than standard deduction. The computed percentages were 2.65 percent of total taxpayers with income in excess of \$200,000 and 5.47 percent of itemizing taxpayers filed income in excess of \$200,000. Using these percentages and applying them to the total of 1,927 Georgia tax returns in the ITMF and the 877 itemized tax returns in the ITMF yields simple random samples of 51 tax returns and 48 tax returns, respectively.

Tax Gap Estimation Methods

As mentioned earlier, the tax gap consists of three different components, the underreporting gap, the underpayment gap, and the non-filing gap. Our basic

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

approach is to estimate each of these gaps separately using various methods and then to add the different gap estimates together to obtain a range of possible values for the tax gap. The estimation strategies for each of the components of the tax gap are described below.

It should be noted that all estimates of the tax gap are estimates of the difference between reported taxes actually paid and the “true” tax liability. In making these calculations, credits, adjustments, and deductions are not subtracted from the estimated tax amounts. This is done for simplicity and in the absence of any information on these respective compliance rates. We also derive all tax gap estimates by applying a flat 6 percent tax rate, again largely for simplicity. Both assumptions likely lead to a slight overstatement of our resulting estimates of the tax gap.

It should also be noted that we attempted two alternative methods to estimate the Georgia PIT tax gap. One method attempted to estimate Georgia-specific compliance rates using the Feldman and Slemrod (2007) approach. Unfortunately, the absence of a detailed breakdown of reported income by different income sources for the Georgia PIT dataset made implementation of this estimation method difficult. Our attempt to apply this method is discussed in more detail in the Methods Appendix I. We also applied a method based on Census data to estimate the PIT tax gap. This approach was somewhat more successful, and our strategy and results from this approach are discussed in Methods Appendix II. We focus our discussion here on a range of estimation strategies, as discussed in detail next.

It should finally be noted that the State of Georgia, like the United States federal government, allows losses to be carried forward through years, thereby deducting the losses from income in future years. The over-reporting of losses diminishes the tax revenue in future years as taxable income is diminished by a yearly decreasing amount of past losses. We deal with this issue by assuming that all of the over-reported losses are (eventually) realized, and we apply a 6 percent flat tax rate to all over-reported losses in the same fashion as we do for all estimates of unreported income.

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

Underreporting Gap. To measure the tax revenues lost from the underreporting of personal income in the state of Georgia in 2001, we use two different strategies.

The first method uses the IRS-determined net misreporting percentages for different sources of income summarized in Table 1 to estimate the unreported income for each source, to which a flat 6 percent tax rate is then applied to estimate underreported taxes. This approach assumes that the Georgia subset of the ITMF dataset is representative of all Georgia taxpayers and that federal taxpayers and Georgia taxpayers misreport different sources of income equally. We call the resulting numbers "IRS-based Estimates."

The second approach applies the estimated compliance rates for Schedule C, D, E, and F sources of income from Feldman and Slemrod (2007) to the Georgia tax returns. (Note that Schedule C is for Non-farm Sole Proprietor Income/Loss, Schedule D is for Capital Gains Income/Loss, Schedule E is for Farm Rent, Rent, Royalties, and Estate Incomes/Loss, and Schedule F is for Farm Income/Loss.) The estimated compliance rates are listed in Table 3. This approach assumes: that the Georgia tax returns in the ITMF dataset used to determine the percentage of income filed under each source of income are representative of the actual Georgia taxpayer population; that federal taxpayers' non-compliance is equivalent to the Georgia taxpayers' non-compliance; and that underreporting of income only occurs on schedule C, D, E, and F incomes. We call these numbers "Deduction-based Estimates."

Underpayment Gap. To measure the underpayment gap, we adjusted Georgia information on reported credits, deductions, and adjustments by the corresponding IRS misreporting percentages. The IRS misreporting percentages for each of credits, deductions, and adjustments are listed in Table 4.

TABLE 4. IRS ESTIMATES OF MISREPORTING PERCENTAGES

Source of Underpayment	Estimated Misreporting Percentage (%)
Scheduled Adjustments	21.00
Standard and Itemized Deductions	5.00
Total Tax Credits	26.00

Source: IRS (2007).

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

As with the estimation techniques used to measure underreporting of income, this approach assumes that national taxpayers and Georgia taxpayers act similarly.

Non-filing Gap. We made two estimates of the non-filing gap, both derived from Erard and Ho (2001). Their two main findings are that non-filers comprise slightly over 7 percent of the total tax non-compliers and that the non-filing gap is 13.09 percent of the total tax gap. These two results are separately used to generate two estimates of the amount of tax revenues lost from non-filers. Using the assumption that 7 percent of tax non-compliers are non-filers, we also assume that the non-filers are not significantly different from those who do file taxes. Therefore, we add the underreporting and underpayment gaps and scale the sum of these two gaps by a factor of 1.07 to derive the total tax gap. Our other approach is to use the sum of the underreporting and underpayment gap and to estimate the non-filing gap according to the 13.09 percent figure of Erard and Ho (2005), to scale up the calculated underreporting and underpayment gap.

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

V. Tax Gap Estimates

Underreporting Gap Estimates

IRS-based Estimates. Using the IRS misreporting percentages to estimate the underreporting in the state of Georgia yields an estimate of \$2.29 billion dollars in lost tax revenue. These estimates are presented in Table 5.

TABLE 5. UNDERREPORTING TAX GAP (1): IRS-BASED ESTIMATES OF TAX GAP

Source of Income	Reported Tax Liability (\$ millions)	Estimated True Tax Liability (\$ millions)	Estimated Tax Gap (\$ millions)	Percentage of Tax Gap (%)
Wages and Salaries	5,679.80	5,748.79	68.99	3.01
Interest and Dividends	599.99	623.05	23.05	1.01
Pensions and IRA Income	1,250.09	1,303.54	53.45	2.33
Unemployment Income	9.56	10.75	1.19	0.05
S Corps, Partnerships	91.89	111.79	19.90	0.87
Capital Gains	3,415.82	3,872.82	456.99	19.94
Alimony Income	7.83	8.44	0.61	0.03
Business Income (SchC)	535.96	1,249.33	713.37	31.13
Farm Income (SchF)	-72.59	114.06	186.65	8.15
Other Gains	175.36	492.57	317.22	13.84
Rents, Royalties (SchE)	350.59	719.89	369.31	16.12
Other Income	41.55	113.83	72.28	3.15
Social Security Income	133.20	141.70	8.50	0.37
Total Tax Calculated	12,219.06	14,510.56	---	---
Underreporting Tax Gap	---	---	2,291.50	100.00

Source: Calculations by authors.

This method allows for comparison of the tax gap liability across different income sources. The fifth column of Table 6 features the percentage of the total tax gap attributable to each income source. Not surprisingly, and similar to the IRS-estimated underreporting gap, Non-Farm Business Income (Schedule C) is the highest component of the underreporting tax gap.

However, the other sources of income are different in magnitude in Georgia than in the United States. For comparative purposes, the magnitude of the tax gap attributable to each source of income for the federal income tax and the Georgia PIT are listed in descending order in Table 6.

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

TABLE 6. CONTRIBUTORS TO THE UNDERREPORTING TAX GAP: IRS VERSUS GEORGIA

IRS Tax Gap Estimates	Georgia Tax Gap Estimates
Non-Farm Business Income	Non-Farm Business Income
S-Corps and Partnerships Inc.	Capital Gains
Other Income	Rent and Royalties Income
Wages and Salaries	Other Gain
Rent and Royalties Income	Farm Income
Capital Gains Income	Other Income
Pensions and IRA Income	Wages and Salaries
Interest and Dividends	Pensions and IRA Income
Farm Income	Interest and Dividends
Other Gain	S-Corps and Partnerships Inc.
Social Security Income	Social Security Income
Unemployment Income	Unemployment Income
Alimony Income	Alimony Income

Deduction-based Estimates. The second method for estimating the underreporting gap yields an underreporting gap of \$1.91 billion. This technique uses the Feldman and Slemrod (2007) estimated compliance rates discussed earlier. Similar to the first IRS-based method, the ITMF Georgia returns are used to calculate the percentage of total income attributable to Schedule C, Schedule D, Schedule E, and Schedule F. However, unlike the IRS-based method, losses and income are summed and used to calculate tax gap estimates separately because Feldman and Slemrod (2007) are able to estimate separate compliance rates for both positive income and negative income, rates that are often substantially different from one another. For this reason, we calculate tax gap estimates for both the underreporting of profits and the over-reporting of losses. Note that there is no unreported income for positive Schedule D income and negative Schedule C income because Feldman and Slemrod (2007) computed that there is no non-compliance for these income sources. As with the IRS-based method, a flat tax rate of 6 percent is applied to the reported income and the true income to obtain the reported tax liability and the true tax liability. The sum of the difference between the true tax liability and the reported tax liability for each source of income yields the underreporting tax gap. The underreporting gap yielded is \$1.91 billion. Table 7 summarizes these estimates.

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

TABLE 7. UNDERREPORTING TAX GAP (2): DEDUCTION-BASED ESTIMATES OF TAX GAP

Source of Income	Reported Tax Liability \$ millions)	Unreported Tax Liability (\$ millions)	Estimated Tax Gap (\$ millions)	Percentage of Gap (%)
Schedule C (POS)	398.37	537.88	139.51	7.30
Schedule D (POS)	5,630.92	5,630.92	0	0
Schedule E (POS)	998.36	1,876.92	878.56	45.94
Schedule F (POS)	16.62	28.21	11.59	0.61
Schedule C (NEG)	NA	NA	0	0
Schedule D (NEG)	0	504.65	504.65	26.38
Schedule E (NEG)	0	314.74	314.74	16.46
Schedule F (NEG)	0	63.24	63.24	3.31
Tax Calculated	7,044.27	8,073.93	---	---
Tax Gap	---	---	1,912.29	100.00

Source: Calculations by authors. Note that the Deduction-based approach does not generate estimates for all categories. "NA" (for "Not Available") refers to these categories.

Obviously, there is far less distribution of the underreporting of income across different income sources given the assumption that underreporting of income can only occur in Schedules C, D, E, and F income sources. Noticeably different from the IRS-based approach is that far less of the tax gap is attributable to Schedule C income. Instead, Schedule E income is now a much higher portion of the underreporting gap. Also, a large proportion of the tax gap is attributable to over-reported tax losses.

Underpayment Gap

The estimation of the underpayment gap follows a similar approach to the IRS-based estimation of the underreporting gap, by using IRS misreporting percentages for credits, deductions, and adjustments. To estimate the underpayment gap, we take the sum of all credits, deductions, and adjustments from the Fiscal Research Center Georgia PIT returns. We then apply the misreporting percentages obtained from the IRS audits to compute the amount misreported. All misreported income is assumed to be taxable income at the flat 6 percent tax rate, to yield the underpayment tax gap. The underpayment gap is estimated to be \$212 million. These findings are summarized in Table 8.

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

TABLE 8. UNDERPAYMENT TAX GAP

Source of Underpayment	Reported Amount (\$ millions)	Estimated Misreported Amount (\$ millions)	Tax Gap (\$ millions)
GA AGI Adjustments	8,055.20	2,141.25	128.48
Deductions	25,613.55	1,348.08	80.88
Credits	109.62	38.52	2.31
Total Underpayment Gap	---	---	211.67

Source: Calculations by authors.

Non-filing Gap

Recall that the estimates of the non-filing gap are dependent upon the estimated underreporting and underpayment gaps; we have two estimates of the former and one of the latter. We also apply two different percentages from Erard and Ho (2001) to these estimates.

The non-filing gap estimates are calculated first for the IRS-based estimate of the underreporting gap plus the constant underpayment gap. Starting with an underreporting and underpayment gap equal to \$2.29 billion, two estimates of the tax gap are then derived, depending on which Erard and Ho (2001) estimate of non-filers is used. Our first estimate uses the Erard and Ho (2001) finding that non-filers are 7.18 percent of those who do not comply with tax laws; assuming that those who do not file a tax return are not statistically different in terms of their demographic characteristics from those who do file, then the estimated underreporting plus underpayment gap is multiplied by a factor of 1.07 to yield the overall tax gap. The estimated non-filing gap for the IRS-based underreporting gap is \$179.7 million. Table 9 presents this approach.

**TABLE 9. NON-FILING GAP (1): IRS-BASED ESTIMATE
USING 7.18 PERCENT NON-FILING RATE**

Underreporting/ Underpayment Gap (\$ millions)	2,503.17
Non-filers as Percentage of Non-compliers (%)	7.18
Estimated Non-filing Gap (\$ millions)	179.77

Source: Calculations by authors.

The second approach is based on the Erard and Ho (2001) finding that the non-filing gap is 13.09 percent of the total tax gap. Using this estimate, the non-

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

filing gap for the IRS-based underreporting gap is then estimated to be approximately \$377 million. The approach is summarized in Table 10.

**TABLE 10. NON-FILING GAP (2): IRS-BASED ESTIMATE
USING 13.09 PERCENT NON-FILING GAP**

Underreporting/ Underpayment Gap (\$ millions)	2,503.17
Non-filing Gap as Percentage of Total Tax Gap (%)	13.09
Estimated Non-filing Gap (\$ millions)	377.02

Source: Calculations by authors.

The same approach is used in estimating the non-filing gaps for the Feldman and Slemrod-based estimation of underreporting income. The estimates based on non-filers being 7.18 percent of the total number of non-compliers yields an estimated non-filing gap of approximately \$152 million (Table 11). Using the assumption of non-filing gap being equal to 13.09 percent of the total tax gap yields an estimate of the non-filing gap of approximately \$319 million (Table 12).

**TABLE 11. NON-FILING GAP (3): DEDUCTION-BASED ESTIMATE
USING 7.18 PERCENT NON-FILING RATE**

Underreporting/ Underpayment Gap (\$ millions)	2,123.96
Non-Filers as Percentage of Non-compliers (%)	7.18
Estimated Non-filing Gap (\$ millions)	152.54

Source: Calculations by authors.

**TABLE 12. NON-FILING GAP (4): DEDUCTION-BASED ESTIMATE
USING 13.09 PERCENT NON-FILING GAP**

Underreporting/ Underpayment Gap (\$ millions)	2,123.96
Non-Filing Gap as Percentage of Total Tax Gap (%)	13.09
Estimated Non-Filing Gap (\$ millions)	319.90

Source: Calculations by authors.

Summary

The above estimation strategies for each of the components of the overall tax gap generate a range of values of the personal income tax gap in the State of Georgia. In the aggregate, the estimated range of the tax gap is \$2.28 billion to 2.88 billion. Table 13 summarizes the calculations.

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

TABLE 13. SUMMARY OF TAX GAP ESTIMATES (\$)

	-----IRS-based Approach----		--Deduction-based Approach--	
Underreporting Gap	2,291.50	2,291.50	1,912.29	1,912.29
Underpayment Gap	211.67	211.67	211.67	211.67
Non-Filing Gap – 7.18 Percent Non-filing Rate	179.77	---	152.54	---
Non-Filing Gap – 13.09 Percent Non-filing Gap	---	377.02	---	319.90
Total: Tax Gap Estimates	2,682.94	2,880.19	2,276.50	2,443.86

Source: Calculations by authors.

Some Implications of the Estimates

Potential Issues with Estimates. There are several potential issues with the estimates above, including the lack of Georgia-specific compliance rates, the representatives of the ITMF Georgia returns and high income sample, and the over-reporting of losses. Consider each issue.

The attempt at estimating Georgia specific compliance rates for different sources of income was largely unsuccessful because of potential data and weighting issues (see Methods Appendix I). The inability to generate Georgia-specific compliance rates forces us to assume that the compliance rates of national taxpayers and of Georgia taxpayers are the same.

The issue of whether the ITMF Georgia returns and the high income sample is representative of the Georgia populace is another potential concern. While the IRS claims that its dataset is representative of the state population, the IRS does not make clear whether aggregating the data and assuming the distribution of total income across different income sources is accurate.

Also, it is likely that the assumption about the over-reporting of losses leads to an overestimate of the lost tax revenues due to over-reporting of tax losses.

On balance, it is not clear how these potential biases influence the overall tax gap estimate, and whether they tend to over- or underestimate the Georgia tax gap.

Comparison with Other State Estimates. Compared with other state estimates, our estimates of the Georgia PIT tax gap appear to be representative of the results in other states. For example, the voluntary compliance rate (again defined as actual tax revenues divided by potential tax revenues) from our report yields an

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

estimate for Georgia's voluntary compliance rate that lies within a range of 80.15 percent to 84.55 percent. The six states discussed earlier had a mean compliance rate of 84.78 percent.

While the difference between these compliance rates does not seem significant, the reality is that the implied lost tax revenues are quite significant. Assuming that the more conservative estimate of the Georgia PIT tax gap and the corresponding compliance rate of 84.55 percent are accurate, the estimated tax revenues lost due to the 0.23 percent point difference is \$34 million dollars. Using the more liberal estimate of the tax gap and the corresponding 80.15 percent estimated compliance rate for the Georgia PIT, the 4.63 percent difference from the mean compliance rates of other states results in a loss of approximately \$672 million tax dollars. It is clear that small differences in compliance rates have significant implications for revenues.

Distributional Effects. The distributional effects of taxation are also of interest, even though most state tax gap studies are not able to consider such distributional effects. In contrast, we are able to assess the distribution of the tax gap across different income percentiles. It might be expected that the portion of total income attributable to each percentile would be the corresponding portion of the tax gap attributed to that percentile. However, this expectation is based on two assumptions that may not be accurate: that each income percentile contains the same proportional distribution of the different income sources, and that each income percentile complies with existing tax law at the same rate. Although we cannot test the latter assumption, we can estimate the distribution of the tax gap across income classes by using the ITMF dataset to measure the amount of each income source and by then applying the Feldman and Slemrod (2007) multipliers to estimate the tax gap at different income percentiles.

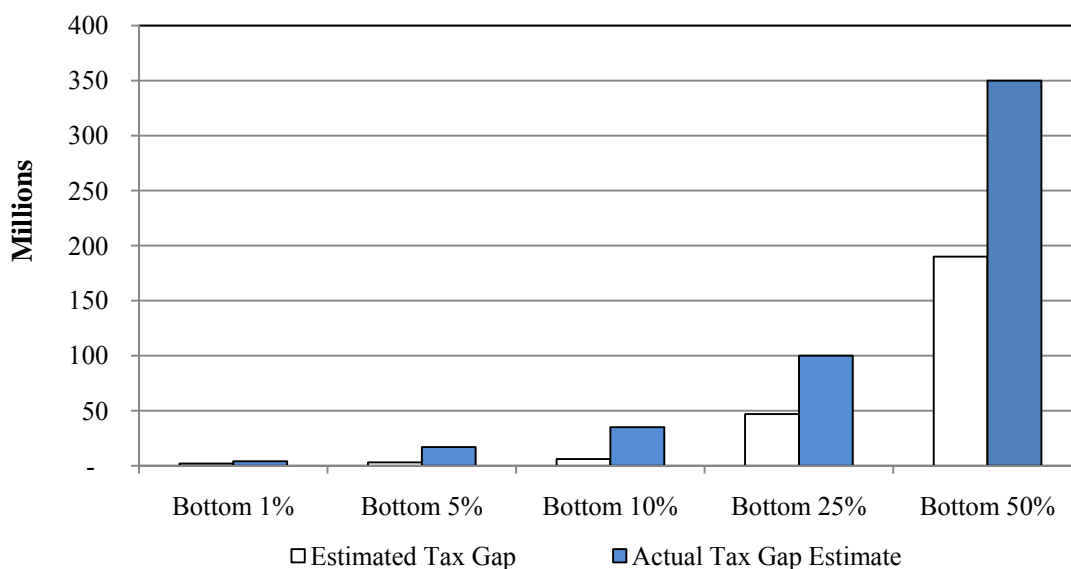
Specifically, we use the Georgia ITMF dataset to measure the amount of income or loss reported for different sources of income at each income percentile, and we then apply the Feldman and Slemrod (2007) multipliers to estimate the tax gap at different income percentiles. The Georgia ITMF tax returns are used to determine the amount of income or loss reported for different sources of income as each income

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

percentile. The predicted tax gap attributed to each income percentile is equal to the percentage of total income attributable to the relevant income percentile. For ease of comparisons, we present our results separately for the bottom income percentiles of the taxpayers and for the higher income percentiles.

This distributional analysis yields some surprising results. It is commonly thought that those with the highest incomes are responsible for the most evasion. While we cannot control for a different propensity to evade at different income levels, we can demonstrate the distributional impact on the (restrictive) assumption of similar evading decisions across income deciles. Doing so yields a tax gap that is overwhelming skewed to the lower income levels. Figures 3 and 4 illustrate this result. Figure 3 is for the lowest percentile of the tax payers; Figure 4 is for the highest percentile of taxpayers. In both figures, the left bar represents the estimated amount of the tax gap attributed to each income percentile using the total income percentages, while the right bar indicates the actual estimate of the tax gap.

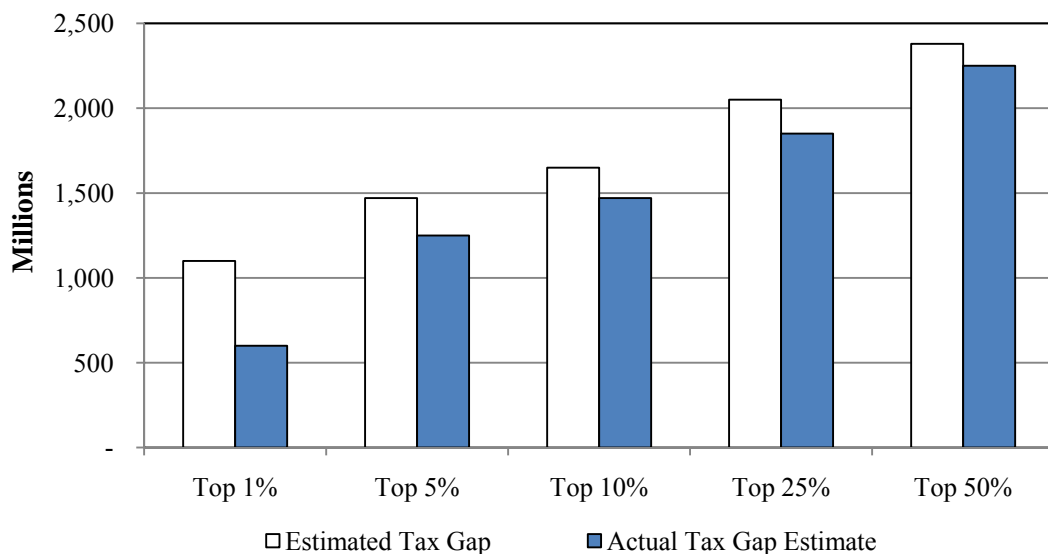
FIGURE 3. BOTTOM INCOME PERCENTILE, PREDICTED VERSUS ACTUAL TAX GAP ESTIMATES (PERCENT OF TAXPAYERS)



Source: Calculations by authors.

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

FIGURE 4. UPPER INCOME PERCENTILE, PREDICTED VERSUS ACTUAL TAX GAP ESTIMATES



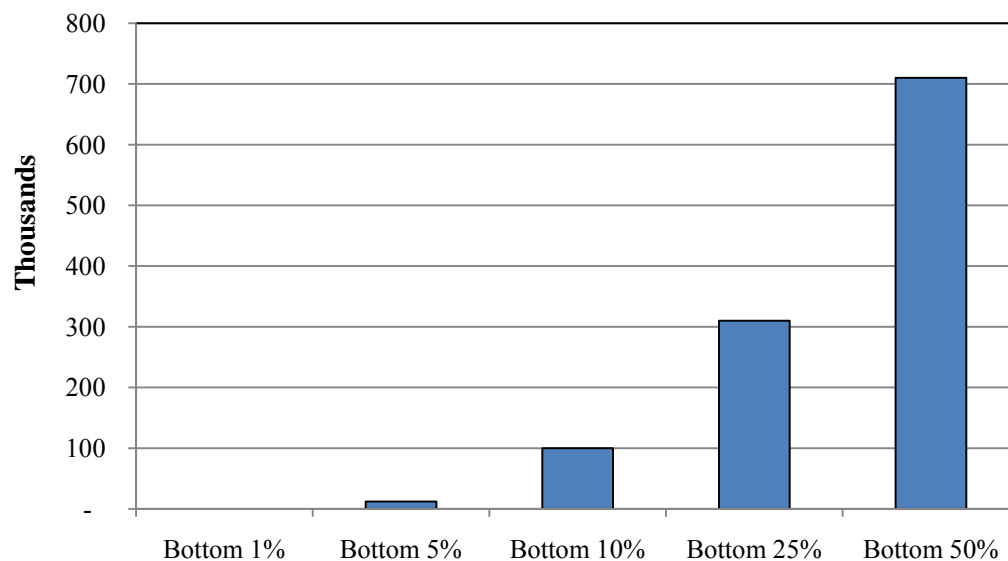
Source: Calculations by authors.

At all income distributions for the bottom half of taxpayers, the actual tax gap estimate exceeds the predicted tax gap estimate, while the predicted tax gap exceeds the actual tax gap estimate for higher income percentiles.

Before concluding that the tax gap is skewed proportionately towards lower income percentiles, it is necessary to look at potential alternative explanations. Recall that Feldman and Slemrod (2007) did not generate any non-compliance for positive Schedule D (capital gains) income. As Figures 5 and 6 illustrate, individuals at higher income levels have returns with substantially more positive Schedule D income.

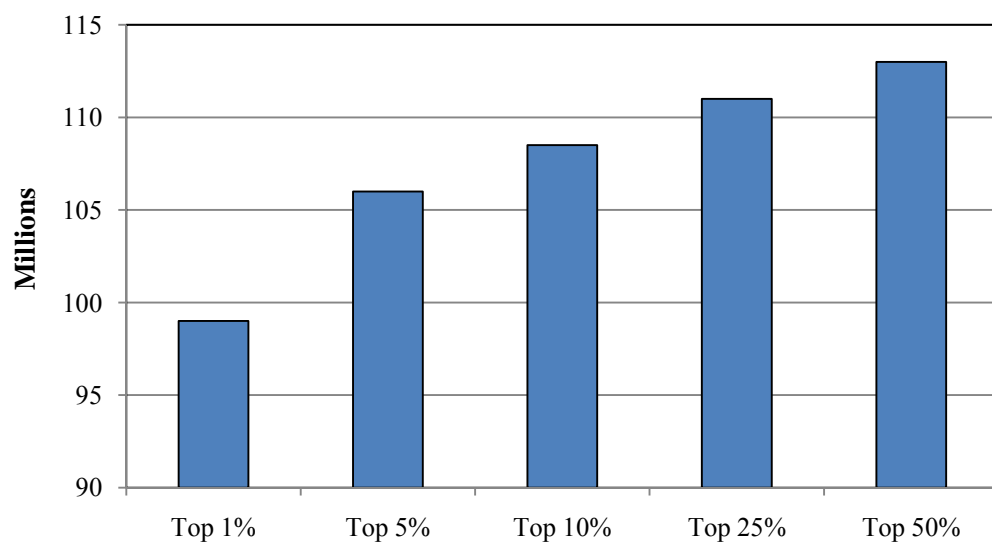
How Large is the "Tax Gap" for the Georgia Personal Income Tax?

FIGURE 5. REPORTED SCHEDULE D INCOME, LOWER INCOME PERCENTILES



Source: Calculations by authors.

FIGURE 6. REPORTED SCHEDULE D INCOME, HIGHER INCOME PERCENTILES



Source: Calculations by authors.

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

The greater portion of total income filed as Schedule D income for higher income percentiles could explain the differences between the predicted tax gap and the actual estimated tax gap, thereby skewing the tax gap distribution to lower income percentiles who file far less schedule D income.

Also, we assumed that all of the possible tax revenues from over-reporting of losses would be eventually realized, when in fact a lesser amount would most likely be realized; that is, those at lower income levels, who often report higher losses, will have more of the tax gap attributed to them by our procedures than they may be truly accountable.

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

VI. Conclusions

Our methods for measuring the tax gap used in this report estimate the Georgia personal income tax to be within a range of \$2.28 billion to \$2.88 billion, before controlling for adjustments, deductions, and credits. This estimated range corresponds with a compliance rate of 80.15 percent to 84.55 percent, which is comparable to if slightly lower than the mean compliance rates of states that have completed personal income tax gap studies. We also find that the tax gap is distributed more towards lower income percentiles; that is, lower income households tend to be less compliant than higher income households.

A natural question is what can be done to reduce the tax gap. Methods to address the broad issue of tax compliance fall into several main categories: improve the tax administration, improve its administrative services, and improve the “culture” of the tax system (Alm, Sjoquist, and Wallace 2006; Alm 2007; Alm 2011). We identify several general strategies in each category that apply to all taxes and also to all tax administrations. Listing these strategies is of course not meant to suggest that the Georgia Department of Revenue is in fact not pursuing these methods.

Improve Tax Administration: The “Enforcement” Paradigm

First, there is scope for an improvement in tax administration. Traditionally, there are three main aspects of tax administration: taxpayer registration, taxpayer audit, and collections. Improvements in each of these areas are feasible, all of which would enhance detection and punishment. These policies includes such obvious actions as increasing the number of audits, improving the quality of the audits (and of the auditors), using more systematic audit selection methods (e.g., “scoring” methods), improving information-sharing across governments that impose taxes on similar bases, increasing penalties for tax cheating, publicizing tax evasion convictions in the media as an alternative non-financial type of penalty, applying penalties often and consistently, relying more heavily on source-withholding, granting additional power for collecting delinquent accounts, and increasing taxpayer registration and identification via better use of third-party information. In addition to these somewhat standard suggestions, the state might disallow cash deductions unless

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

the taxpayer identifies the person or firm that was paid, or require increased information from selected taxpayers. For example, as a form of simple audit, the state might request more detailed information from certain taxpayers about sources of income or deductions, particularly regarding business income. These are all standard methods for increasing enforcement.

Provide Better Taxpayer Services: The “Service” Paradigm

It is increasingly the case that administrative reforms are not limited to these traditional enforcement mechanisms, which tend to emphasize the threats of detection and punishment. Instead, tax administration may be changed by introducing policies that see the taxpayer more as a client in need of services; that is, there is a role of tax administration as a facilitator and as a provider of services to taxpayer-citizens. This approach emphasizes the provision of taxpayer services via such things as promoting taxpayer education, providing taxpayer services to assist taxpayers in filing returns and paying taxes, improving phone advice service, improving the tax agency website, simplifying taxes and tax forms, and simplifying the payment of taxes. The basic thrust of these “service paradigm” actions is to treat the taxpayer more as a client than as a potential criminal, so that the tax administration becomes more “consumer-friendly.”

Change Tax Culture: The “Trust” Paradigm

Individuals are more likely to respond either to enforcement or services if they believe that the government generally and the tax administration specifically are honest; that is, “trust” in the authorities can have a positive impact on compliance. Government can take various actions that change the culture of paying taxes. Among the steps that might be considered are the following:

- Promoting a taxpayer and a tax administrator “code of ethics”;
- Use the mass media, or send personal letters, to reinforce tax compliance as the social norm of behavior—and publicize cheaters;
- Emphasize the link between payment of taxes and the receipt of government services;

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

- Target certain groups (e.g., new firms or employees) in order to introduce from the start the notion that paying taxes is the social norm;
- Enlist other organizations such as retired teachers to promote compliance, so that it is seen (again) that paying taxes is the accepted pattern of behavior;
- Avoid leading individuals to think cheating is “okay”—a tax amnesty is a classic example of sending the wrong signal, as is demonizing the tax code and tax collectors such as the IRS or the State Department of Revenue;
- Address perceived tax inequities in the ways people feel that they are treated through the tax system. If taxpayers think they are being treated unfairly, they are less inclined to respect the tax code and therefore less likely to comply.

Summary

Individuals exhibit a remarkable diversity—what might be termed a “full house”—in their behavior, and especially in their compliance decisions. There should be a corresponding “full house” of strategies to control these varied behaviors (Alm 2007; Alm 2011).

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

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How Large is the "Tax Gap" for the Georgia Personal Income Tax?

Methods Appendix I: Applying the Feldman and Slemrod (2007) Method

Feldman and Slemrod (2007) develop a method for estimating the tax gap by different sources of income. They base their research on three assumptions: the existence of third-party employers assures wage and salary earners truthfully report their wage income; the relationship between true income and reported income does not vary by income source; and a taxpayer's likelihood to make and report charitable contributions does not vary by source of income. With these assumptions, Feldman and Slemrod (2007) use tax return data from the 1999 IRS Income Tax Microfile Data to estimate charitable contributions as a function of reported income, the amount of income from different sources, the marginal price of charitable contributions, demographic variables, and binary independent variables equal to 1 if the taxpayer reports income from a source other than wage or salaries. The underlying premise behind their specifications is that, assuming no correlation between source of income and charitable contribution, any estimated difference in the relationship between charitable contributions and income earned from different sources can be attributed to underreporting of income.

Feldman and Slemrod (2007) then use their econometric estimates to generate compliance rates for positive and negative values of each source of income. The estimated compliance rates for each source of income are listed in the table below. Note that Feldman and Slemrod (2007) are unable to control for non-filers, which biases downwards their estimates of the tax gap for the individual income tax.

We attempted to replicate the Feldman and Slemrod (2007) method, using the Georgia specific returns plus a random sample of high income tax returns of the ITMF dataset. This replication was undertaken with the hope of obtaining Georgia-specific tax compliance rates for different sources of income. This appendix outlines the assumptions of the model and compares our results using the Georgia dataset with those of Feldman and Slemrod (2007).

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

Feldman and Slemrod (2007) Compliance Rate Estimates

Source of Income	Estimated Compliance Rates (2001)	Estimated Compliance Rates (Panel)	IRS Estimated Compliance Rates
Schedule C _{POS}	62.6%	64.98%	67.7%
Schedule D _{POS}	100%	100%	89.9%
Schedule E _{POS}	21.4%	22%	NA
Schedule F _{POS}	21.39%	25.85%	67.8%
Schedule C _{NEG}	NA	100%	NA
Schedule D _{NEG}	NA	24.64%	NA
Schedule E _{NEG}	NA	29.82%	NA
Schedule F _{NEG}	NA	30.25%	NA

Source: Feldman and Slemrod (2007). Note that their method does not generate estimates for all categories. "NA" (for "Not Available") refers to these categories.

Like Feldman and Slemrod (2007), we estimated a double-log regression equation that estimated the cash charitable contributions of itemized tax filers as a function of the income attributed to different schedules and control and demographic variables. The full equation estimated was:

$$\ln(G + 100) = \alpha_0 + \alpha_1 \ln(V + \sum_{ih} k_{ih} R_{ih} + \sum_j b_j S_j) + \alpha_2 \ln(\text{Price}) + \alpha_3 \text{NPEX} + \alpha_4 \text{MAR} + u$$

where

G = Cash Charitable Contributions

V = Visible Income (Income that cannot be misreported)

K = Coefficient on each source of non-visible income (Schedule C, D, E, and F)

R = Reported income from each source of non-visible income

B = Coefficient on dummy variable S

S = Dummy variable for *each* income source (Schedule D is omitted condition), equal to 1 if taxpayer files a tax return for that schedule, 0 otherwise.

Price = First-dollar marginal tax rate price of charitable contributions

NPEX = Number of non-personal exemptions

MAR = Dummy variable equal to 1 if taxpayer is married, 0 otherwise.

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

The regression estimates using the Georgia tax return data are in the following table:

	Specification 1	Specification 2	Specification 3	Specification 4
Constant	4.421 (0.368)***	3.704 (0.461)***	6.667 (0.260)***	5.026 (0.353)***
Visible Income	0.141 (0.36)***	0.216 (0.047)***	-0.080 (0.029)***	0.107 (0.037)***
ScheduleC_Pos	5.098 (8.800)	5.206 (5.649)	-0.0002 (0.0034)	6.751 (12.850)
ScheduleD_Pos	1675.200 (3379.700)	174.780 (233.360)		3786.720 (10446.500)
ScheduleE_Pos	68.650 (119.680)	17.670 (20.530)	0.0001 (0.0016)	113.330 (251.380)
ScheduleF_Pos	0.641 (9.580)	0.380 (4.407)	0.0034 (0.0067)	0.113 (5.178)
ScheduleC_Neg	-3028.170 (7207.020)	-371.310 (584.780)	0.0007 (0.0001)***	
ScheduleD_Neg	-80.050 (165.820)	-28.614 (46.820)		
ScheduleE_Neg	-485.340 (965.870)	-84.162 (115.780)	0.0001 (0.0002)	
ScheduleF_Neg	-42778.650 (157112.800)	-1388.300 (3441.970)	0.0013 (0.0137)	
Ln_Price	-2.165 (0.493)***	-1.885 (0.520)***	-3.313 (0.520)***	-1.767 (0.512)***
NPEX	0.055 (0.046)	0.047 (.046)	0.067 (0.048)	0.041 (0.047)
MAR	0.067 (0.142)	0.052 (0.142)	0.280 (0.144)	0.159 (0.143)

Unfortunately, the standard errors are quite large, so that the estimated slope coefficients on the Schedule income variables are not significant, due largely to the small sample size. However, even besides the insignificance of the estimated slope coefficients, the magnitudes of the coefficients make little sense. These magnitudes are the inverse of the estimated slope coefficients on the schedule income variables, and are then used as the estimated compliance rate for that specific income schedule. Using these estimation results yields odd compliance rates. For example, the slope coefficient on negative Schedule F income in Specification 1 implies a compliance rate of essentially zero for reported farm losses. Similarly, the slope coefficient for positive Schedule E income in Specification 3 indicates a compliance rate of essentially 100 percent.

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

Methods Appendix II: Applying a Census-based Method

We attempted a census-based approach in estimating the tax gap in the State of Georgia. The census-based approach is based on two main assumptions: that all citizens report income correctly to the Census Bureau; and that the difference between income reported to the Census Bureau and income voluntarily reported income on state tax returns is the gross tax gap.

The process by which a Census-based tax gap estimate is derived includes significant data manipulation of the Census data and the Georgia PIT dataset. Since the Census Bureau top-codes all income above a given level for certain sources of income, this process must also be applied to the PIT sample. Also, types of income are defined differently in the two different samples, and a common definition must be applied in the PIT sample to correspond with the Census data sample. Finally, taxpayers who report income less than the standard deduction are removed from the dataset. After these data manipulations are complete, comparisons between the estimated incomes from the Census data and the state PIT sample for each source are possible. The difference between incomes estimated by the Census data (which is presumed to be greater) and the state tax income sample is the gross tax gap (including both the underreporting and the non-filing gap). Note that we do not have access to audited returns, so we are unable to distinguish between the portion attributable to non-filing and the portion attributable to underreporting. However, we are able to estimate the percentage of the gross tax gap attributable to each source of income.

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

The results of these calculations are in the following table:

Source of Income	Reported Tax Liability (\$ million)	Estimated True Tax Liability (\$ million)	Estimated Tax Gap (\$ million)
Wages and Salaries	7,113.08	10,492.49	3,379.38
Interest, Dividends, and Rents Inc.	1,023.23	631.00	-392.23
Self-Employment Income	577.38	783.73	2,063.57
Retirement Income	1,345.46	751.35	-594.10
Public Assistance Income	102.85	7.52	-95.33
Social Security Income	143.36	799.98	656.62
All Other Income	44.70	244.20	199.49
Total Tax Calculated	10,350.06	13,710.25	---
Gross Tax Gap	---	---	3,360.19

The estimated gross tax gap is approximately \$3.360 billion in 2006, a slightly higher estimate relative to our previous estimates. Note, however, that in two of the income categories our estimates indicate that taxpayers over-report their income; while possible, this is a somewhat worrisome result. Note also that the tax gap associated with wages and salaries is \$3.379 billion, which seems high given the extensive use of withholding on wage income, although it is possible that this tax gap is attributable to non-filing by wage and salary earners.

How Large is the "Tax Gap" for the Georgia Personal Income Tax?

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How Large is the "Tax Gap" for the Georgia Personal Income Tax?

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How Large is the "Tax Gap" for the Georgia Personal Income Tax?

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