IRS Enforcement and State Corporation Income Tax Revenues

Margot Howard,[1]
University of North Carolina at Chapel Hill

1. Introduction

I examine the relation between IRS enforcement and state corporate income tax (SCIT) revenues. Many states are currently facing severe financial crises. For example, in early 2012 Moody's revised its outlook on Washington bonds from stable to negative.[2] In January 2013, Illinois postponed a bond auction amid concerns about the state's fiscal stability after S&P downgraded the state's debt (Nolan and Peters 2013). In 2011, Congress considered a measure that would have allowed states to declare bankruptcy in order to "get out from under crushing debts" (Walsh 2011). In July 2012, the State Budget Crisis Task Force, founded by Richard Ravitch and Paul A. Volcker, released its report on the threats to near- and long-term state fiscal sustainability.[3] One of the major threats discussed in the report is "narrow, eroding tax bases and volatile tax revenues." The report states, "The personal income, sales, and *corporate income taxes* are states' most economically sensitive and volatile revenues and they have grown in importance in recent years…. Since 1990, states' reliance on income taxes has continued to increase and the tax itself has become more volatile." [Emphasis added] Considering the current condition of state finances, it is imperative to understand the different factors that can affect state tax revenues.

I investigate one mechanism that may affect SCIT revenues: IRS enforcement.[4] The results suggest that there is a positive relation between tax enforcement at the federal level and SCIT revenues, even after controlling for SCIT rate, sales factor weighting, and federal corporate taxable income reported in the state. These results can be viewed in the context of Desai *et al.* (2007), with state governments as another set of outside stakeholders benefiting from higher levels of IRS enforcement. Following Guedhami and Pittman (2008), the proxies for IRS enforcement include IRS corporate income tax return audit rates, various IRS employment levels, and the number of fraud proceedings. In addition, based on prior evidence that the implementation of FIN 48 was associated with lower levels of state corporate tax avoidance (Gupta *et al.* 2013), I hypothesize and find that the positive relation between IRS monitoring and SCIT collections has been attenuated by the implementation of FIN 48.

In this paper, I attempt to examine both the mechanical and non-mechanical channels through which federal-level monitoring may be related to SCIT revenues. I control for the mechanical portion of the relation, driven by the fact that federal taxable income is typically the starting point for SCIT calculations, by including in my regression the federal corporate taxable income in a state in a given year. I then use the IRS enforcement variables mentioned above to examine the non-mechanical portion of the relation. However, even with the seemingly obvious mechanical relation it does not necessarily follow that a higher level of federal-level monitoring is associated with a higher level of SCIT revenues. IRS enforcement can focus on items, such as credits, that may not affect SCIT calculations. Even if additional federal taxable income flows through to the state-level return as the result of an IRS audit, that adjustment could lead to little, if any, additional tax at the state level as a result of the complexities of state-specific corporate income tax calculations. In addition, I examine *contemporaneous* IRS monitoring and SCIT collections. Since it typically takes years to complete a federal tax audit, this significantly lowers the likelihood that this relation is just the result of mechanical calculations.

[1] I appreciate helpful comments and suggestions from Josh Coyne, Brian Erard, Ed Maydew, Katie McDermott, Jenna Meints, Doug Shackelford, workshop participants at the University of North Carolina, and participants at the 2013 IRS-TPC Research Conference. All errors remain my own.

[2] For the revised opinion announcement see: http://www.moodys.com/research/MOODYS-REVISES-STATE-OF-WASHINGTON-RATING-OUTLOOK-TO-NEGATIVE-FROM—PR_236450.

[3] The State Budget Crisis Task Force focused their analysis on six states: California, Illinois, New Jersey, New York, Texas, and Virginia.

[4] Ideally, I would study IRS enforcement at the federal level in conjunction with enforcement by state tax authorities. Unfortunately, there is a large variance in what, if any, statistics states provide on the enforcement actions of their tax authorities. However, considering the size and resources of the IRS compared to state departments of revenue and the fact that federal corporate taxable income is incorporated into state corporate income tax calculations, the relation between IRS monitoring and state corporate income tax revenues is worthy of investigation.

I contribute to the literature in several ways. Prior studies have documented the relation between IRS monitoring and debt pricing, financial reporting quality, and cash effective tax rates. This paper provides evidence that IRS monitoring is also related to SCIT revenues. In the context of Desai *et al.* (2007), the state government appears to be another outside stakeholder that benefits from IRS enforcement, suggesting that states should consider federal-level enforcement when discussing state-level corporate income tax revenue and policy. This paper is also the first to document an attenuated relation between IRS enforcement and SCIT revenues after FIN 48 was implemented, providing further evidence that financial statement policies can affect cash tax outcomes. Comparing the results of this study to prior research also indicates that the SCIT landscape has shifted in recent years (as more states have adopted a more heavily weighted sales factor) and that this shift may be important in examining the determinants of SCIT revenues.

The paper proceeds as follows. Section 2 provides background information on state corporate income taxes. Section 3 discusses the related literature. Section 4 explains the hypothesis development. Section 5 discusses the data and research design. Section 6 provides the results. Section 7 concludes.

2. State Corporate Income Tax Background

Before examining SCIT collections, it is important to understand the basic components of the calculation of a firm's SCIT liability. First a corporate taxpayer must determine whether it has nexus with a state for corporate income tax purposes. Nexus exists when the taxpayer has a substantial enough connection to the state such that the state has the right to impose its income tax on the taxpayer. Then the taxpayer must look to a state's statutes and regulations to determine whether it will file a separate return or a combined return as part of a consolidated group.[5] Once the taxpayer has determined the correct filing group, it can begin the calculation of its SCIT liability. That calculation typically begins with federal taxable income. Each state then prescribes its own specific set of adjustments to that tax base, such as adding back state income taxes that were subtracted on the federal tax return.

If a firm operates in more than one state it must then separate its apportionable income from its allocable income. Apportionable income is typically considered to be "business income," income that is tied to the firm's core business, while allocable income is "nonbusiness income." The same item of income may be considered apportionable or allocable depending on the nature of the business of the firm. For example, a manufacturer would typically consider interest received on a bond to be allocable since it is not related to the general business of the firm. However, a financial services entity may consider the same interest to be apportionable income since holding bonds may be considered part of the central business of the firm. The taxpayer must then add back to apportionable income any specifically disallowed deductions. In many states, these disallowed deductions include royalty or interest payments to related passive investment companies or PICs.[6]

Once a firm has calculated its apportionable income it must multiply that figure by its apportionment factor. The formulae for calculating apportionment factors are state-specific, although generally they are based on some combination of property, payroll, and sales factors. The property factor is calculated as the fraction of total property in the United States that is located within that state. The payroll and sales factors are calculated similarly. However, states differ in their treatment of what is included in each of those factors and when an item is considered "sourced" to that state in calculating the numerator.

Once the firm has multiplied its apportionable income by its apportionment factor to arrive at apportioned state income, it must add any allocated income sourced to that state to arrive at state taxable income. State taxable income is multiplied by the applicable rate and then allowable credits are subtracted to arrive at the firm's liability.

3. Related Literature

This study is related to two streams of literature, research investigating SCIT policy and research investigating enforcement. Some SCIT policy studies focus on firm responses to those policies. For example, firms shift

[5] The terms "consolidated" and "combined" returns can have different implications for state tax purposes. However, that distinction is beyond the scope of this paper.

[6] See Dyreng *et al.* (2013) for a detailed discussion on the PICs.

their tax bases to favorable jurisdictions (as based on tax rates and sales factor weighting) and structure sales to reduce exposure to the throwback rule (Klassen and Shackelford, 1998).[7] Other SCIT policy studies examine the economic consequences of those policies. Goolsbee and Maydew (2000) and Lightner (1999) find that a state's payroll factor has a negative relation with manufacturing employment in that state. Gupta *et al*. (2009) examine the relation between various state tax policies and the level of SCIT revenue collected in the state for the years 1982 through 2002. They find that a higher sales factor weight is associated with lower SCIT revenue. Gupta *et al*. (2013) investigate the effect of FASB Interpretation No. 48 (FIN 48) on multistate income tax uncertainty. The model in Mills *et al*. (2010) illustrates that a mandatory disclosure environment (such as FIN 48) will deter certain taxpayers from engaging in tax avoidance transactions. Gupta *et al*. (2013) build on this finding and hypothesize that SCIT payments and revenues will increase with the implementation of FIN 48. They find that state effective tax rates and SCIT collections increased around the implementation of FIN 48, suggesting that the new rules for uncertain tax positions are related to lower levels of state tax avoidance by firms.

Desai *et al*. (2007) model the interaction between a corporate tax system and corporate governance. Their results suggest that higher levels of enforcement can benefit outside stakeholders by deterring managerial diversion. Guedhami and Pittman (2008) introduced into the accounting/finance literature the use of data from Transactional Records Access Clearinghouse (TRAC) on the level of IRS monitoring. They provide evidence that debt financing is less costly for private firms when there is a higher probability of a face-to-face IRS audit. They also hypothesize and find that private firms with high ownership concentration will have a stronger association between IRS enforcement and less costly debt financing, since these firms are particularly susceptible to agency issues between inside owners and outside shareholders. Higher levels of IRS monitoring have also been linked to higher quality financial reporting and increased firm cash effective tax rates (Hanlon *et al*., 2012; Hoopes *et al*., 2012).

Similar to this paper, Gupta and Lynch (2012) also examine the overlap of these two areas of research. Using data on corporate income tax enforcement expenditures collected from various state departments of revenue, they look at the association between those state-level expenditures and SCIT collections for 2000 through 2008. Their results suggest that state corporate income tax enforcement expenditures in year t are associated with increased SCIT collections in year t+2. They control for IRS enforcement in several of their specifications and find an insignificant or negative relation between federal-level enforcement and SCIT collections, although they note that those results may be because the variables they use "are likely an imperfect proxy for federal *corporate* enforcement." As mentioned earlier, ideally I would have run the analyses in this paper with a control for state-level enforcement as well. However, I do not have access to such data. Since the results in Gupta and Lynch (2012) show that both state- and federal-level enforcement may be related to SCIT collections, and this paper does not include a proxy for state-level enforcement, it is important to use caution when interpreting the results of this paper. Gupta and Lynch (2012) briefly address FIN 48, but only to note that their results are robust even after excluding 2007 and 2008 from their sample. They do not discuss the potential interaction between the enforcement and the FIN 48 financial reporting environments.

4. Hypothesis Development

4.1 IRS Monitoring and State Corporate Income Tax Collections

It may seem that the positive relation between contemporaneous federal tax monitoring and SCIT revenues is obvious. Hoopes *et al*. (2012) show that higher levels of federal tax monitoring are related to higher contemporaneous cash effective tax rates, which suggests higher levels of federal taxable income in that year. As discussed earlier, states generally begin their SCIT computations with federal taxable income. Therefore, it would seem that SCIT revenues should have a positive relation with IRS enforcement. However, there are several reasons why this may not be the case.

First, filing groups for federal and state tax returns often differ. While firms are generally required to file on a consolidated basis for federal purposes, states vary in their filing rules. Some states require each taxable

[7] In some states the sales factor has an additional restriction known as the "throwback rule." The throwback rule states that if the firm is not taxable in the destination state of a sale, that sale is thrown back into the numerator of the sales factor of the origination state.

entity to file a separate tax return. Even states that require or allow related taxpayers to file in a group may require that the group include only entities with activity in that state, causing the group to differ from the federal consolidated group. Consider a situation where, for federal tax purposes, one entity can use the losses of a related entity to offset its taxable income, resulting in no federal corporate income tax liability. Under state group filing rules, those entities could be required to file separate returns, prohibiting the profitable entity from offsetting its taxable income with the losses of the other entity, resulting in a SCIT liability for the profitable firm. It is not readily obvious how all federal audit adjustments will flow through to the state returns.

Second, it is not clear that the items investigated by an IRS audit will always affect state taxes. For example, enforcement efforts that are related to federal-level credits could have no effect on state returns for that year. In addition, as discussed earlier, there are many complexities involved in the SCIT computations that are unrelated to the federal tax return.

Third, in my analyses I examine *contemporaneous* IRS enforcement and SCIT revenues. IRS audits typically take multiple years to complete (Gleason and Mills, 2002). After a firm has determined its final federal audit adjustments it must recalculate its SCIT liabilities, report to the state(s), and often undergo a state audit process. This protracted timeframe means that it is unlikely that IRS enforcement activity is related to SCIT revenues in that same year through the mechanical SCIT calculation process.

Therefore, it is not immediately clear what connection, if any, exists and so I state my hypothesis in the null:

H1: IRS enforcement has no effect on state corporate income tax collections.

4.2 IRS Monitoring in a Post-FIN 48 World

FASB Interpretation No. 48, "Accounting for Uncertainty in Income Taxes" (FIN 48), was intended to clarify the treatment of uncertainty related to the accounting for taxes under Statement 109. Statement 109 did not provide a specific threshold or guideline to be used in situations where the tax outcome was uncertain. Under FIN 48, a firm can only "recognize the financial statement effects of an uncertain tax position when it is more likely than not, based on the technical merits, that the position will be sustained upon examination." The guidance sets forth a two-step process. The first step is to determine whether a particular tax position satisfies the "more likely than not" threshold. The second step is the measurement of the position that satisfies that threshold, which involves an analysis of different possible outcomes and their related probabilities. FIN 48 was effective for public entities for fiscal years beginning after December 15, 2006.[8]

Mills *et al*. (2010) model how the interaction between the government and public corporate taxpayers changed with the move to the mandatory disclosure environment of FIN 48. They show that FIN 48 makes the government weakly better off, but that taxpayers are not necessarily harmed. However, certain taxpayers will be worse off because they will be deterred from entering into tax avoidance transactions. Based on that model Gupta *et al*. (2013) hypothesize that SCIT payments by firms "will increase because taxpayers will claim fewer weak tax positions once the tax authority observes more information about the strength of tax positions." The authors find that firm state effective tax rates and SCIT collections do in fact increase around implementation of FIN 48. However, although the authors control for several state tax policies, they do not control for enforcement activity at the state or federal level. Without controlling for enforcement, it is impossible to know if the increased effective tax rates were related to FIN 48, enforcement activities, or both. If, as Gupta *et al*. (2013) posit, corporate taxpayers became more conservative on their tax returns around FIN 48, then it is possible that there was decreased opportunity for IRS enforcement to affect SCIT revenues. This leads to my second hypothesis:

H2: The relation between IRS enforcement and state corporate income tax revenue was reduced with the implementation of FIN 48.

[8] See Blouin *et al*. (2007) for a more detailed discussion of FIN 48.

5. Sample and Empirical Specification

5.1 Data and Sample

I hand-collected data on 43 states that impose a SCIT over the time period 1995 through 2010. Nevada, South Dakota, Washington, and Wyoming are excluded because they do not impose a SCIT. Michigan and Texas are excluded because the relevant corporate taxes in those states are not based solely on income. Ohio is included only for years 1995 through 2004 because starting July 1, 2005, the state transitioned to a Commercial Activity Tax that is based on gross receipts rather than income.[9] Alaska is excluded because its revenue data does not include pure income tax data. The state tax policy variables are adopted from Gupta *et al.* (2009). My enforcement variables are based on Guedhami and Pittman (2008). See Appendix A for variable definitions and data sources.

Table 1 provides descriptive statistics on all 682 observations. The statistics on the tax policy variables are generally consistent with Gupta *et al.* (2009). Any differences are the result of the later time period used in this paper. For example, Gupta *et al.* (2009) find a mean value of 44.9 for the sales factor weight (indicating that, on average, the sales factor accounted for 44.9% of the overall apportionment factor) in their sample (covering 1982 through 2002), compared to 53.8 in my sample (covering 1995 through 2010).[10] This difference is indicative of the trend during this time period of states moving from the traditional equally-weighted three factor formula to a more heavily weighted sales factor or even a single sales factor apportionment formula.[11]

TABLE 1. Descriptive Statistics for the State-Level Variables, 43 States, 1995–2010

Variable	Mean	Standard Deviation	Minimum	25th Percentile	Median	75th Percentile	Maximum
SCIT	762,204	1,300,693	28,273	188,016	359,757	789,655	11,849,097
SCIT_GSP	0.0033	0.0015	0.0006	0.0023	0.003	0.004	0.0105
SALES	0.664	0.473	0	0	1	1	1
TXRATE	0.076	0.016	0.046	0.064	0.075	0.088	0.12
FLOWTHRU	0.696	0.079	0.436	0.64	0.7	0.757	0.885
FEDBASEGSP	0.062	0.052	-0.004	0.029	0.045	0.076	0.424
UNEMP	5.14	1.74	2.27	4	4.85	5.74	12.43
LN_POP	15.13	0.93	13.29	14.41	15.23	15.67	17.44
IRS_AUDIT	0.014	0.006	0.006	0.009	0.012	0.02	0.026
EMP	0.0149	0.0027	0.0114	0.0132	0.0146	0.0159	0.0228
REV_AGT	0.0023	0.0004	0.0019	0.002	0.0021	0.0025	0.0034
CI	0.0005	0.0001	0.0004	0.0004	0.0005	0.0006	0.0007
FRAUD	0.00005	0.00003	0.00002	0.00002	0.00004	0.00007	0.00012

682 observations; variables are calculated as detailed in Appendix A.

[9] Inferences are unchanged when I remove the Ohio observations from my sample.

[10] The mean of the *SALES* variable in Table 1 is 0.664 rather than 0.538 since *SALES* is an indicator variable rather than the actual sales factor weight. See footnote 12 and Appendix A.

[11] This trend has been widely documented, including Mazerov (2001) and Harrie (2008).

5.2 Empirical Specification

5.2.1 Base Regression Model

Following Gupta *et al.* (2009), my main specification is:[12]

$$SCIT/GSP_{it} = \alpha_i + \beta_1 TXRATE_{it} + \beta_2 SALES_{it} + \beta_3 FLOWTHRU_{it} + \beta_4 FEDBASEGSP_{it} + \beta_5 UNEMP_{it} + \beta_6 LN\_POP_{it} + \beta_7 IRS\_AUDIT_t + S_i + \varepsilon_{it} \quad (1)$$

TXRATE is the top statutory marginal state corporate income tax rate for the year. *SALES* is an indicator variable equal to one if the weight on the sales factor is 50% or greater in a state in a given year, zero otherwise.[13] Following the results of Gupta *et al.* (2009), I expect β_1 to be positive and β_2 to be negative. *FLOWTHRU* is defined as the proportion of total business federal income tax returns filed in a state that are from flow-through entities. Gupta *et al.* (2009) use this variable in an attempt to control for tax planning activities through the use of flow-through entities, and so in line with their results I expect β_3 to be negative. *FEDBASEGSP* is estimated federal corporate taxable income reported from each state, scaled by gross state product. Federal corporate taxable income is estimated by taking IRS corporate income tax collections in each state and grossing them up by the top marginal federal corporate income tax rate in that year. This variable should help control for any portion of the relation between IRS enforcement and SCIT collections that is driven by the mechanical process of using federal taxable income in calculating SCIT liabilities, so I expect β_4 to be positive. *UNEMP*, the state unemployment rate, is included as a control for general economic conditions in the state. Higher unemployment rates indicate poor economic conditions, which may be associated with lower corporate revenues and lower SCIT collections. Therefore, I expect β_5 to be negative. *LN_POP* is the natural log of the state's population, included as a control for the general size of the state. Based on the results of Gupta *et al.* (2009) I expect β_6 to be positive. Considering H1, I make no predictions on the sign or significance of β_7.

IRS_AUDIT, the enforcement variable in my main specification, is the percentage of federal corporate tax returns filed that are audited by the IRS. *EMP* is equal to the number of permanent IRS employees at the end of the year, scaled by the total number of corporate returns filed during the year. *REV_AGT* is equal to the number of IRS revenue agents at the end of the year, scaled by the total number of corporate returns filed during the year. *CI* is equal to the number of IRS criminal investigators at the end of the year, scaled by the total number of corporate returns filed during the year. *FRAUD* is equal to the number of corporate fraud assessments for the year, scaled by the total number of corporate returns filed during the year. As expected, Table 2 shows that the enforcement variables are highly correlated with each other, suggesting that they are all capturing a similar construct. All enforcement variables are adopted from Guedhami and Pittman (2008) and vary only by year, not by state.

[12] Gupta *et al*. (2009) find that endogeneity is an issue with the *SALES* (the percentage weight of the sales factor in the state's apportionment formula) and *TXRATE* (top marginal state corporate tax rate) variables in their data. Using the same version of the Hausman test used in their analysis I find that the endogeneity of *SALES* and *TXRATE* is not an issue with my sample. As a robustness check on my results, I also conducted my analysis using two stage least squares (2SLS). As part of that analysis I followed the guidance in Larcker and Rusticus (2010), including the use of the overidentification test and acceptable levels of F-statistics, to confirm that I used appropriate instruments. Inferences are unchanged whether I use the 2SLS or OLS specification. Therefore, I focus on the OLS specification in this paper.

[13] Gupta *et al*. (2009) include *SALES* in their model as the value of the sales factor weight. I use an indicator variable since it is not a truly continuous variable, but rather has observations mainly clustered around 33%, 50%, and 100%. Inferences are unchanged when *SALES* is included in the same form as in Gupta *et al*. (2009).

TABLE 2. Correlations* Between the Variables

	SCIT_GSP	TXRATE	SALES	FLOWTHRU	FEDBASEGSP	UNEMP	LN_POP	IRS_AUDIT	EMP	REV_AGT	CI	FRAUD
SCIT_GSP		0.34	0.24	-0.17	0.10	-0.12	-0.05	0.21	0.08	0.15	0.09	0.15
TXRATE	0.42		0.21	-0.15	0.18	-0.10	-0.10	0.04	0.05	0.05	0.06	0.05
SALES	0.25	0.21		0.04	0.01	0.15	0.45	-0.05	-0.07	-0.07	-0.07	-0.07
FLOWTHRU	-0.18	-0.15	0.02		-0.03	0.31	-0.02	-0.51	-0.68	-0.68	-0.75	-0.68
FEDBASEGSP	0.11	0.19	0.14	-0.13		-0.14	-0.04	0.07	0.00	0.04	0.02	0.05
UNEMP	-0.10	-0.06	0.16	0.24	-0.19		0.24	-0.07	-0.13	-0.16	-0.28	-0.20
LN_POP	0.00	-0.08	0.45	0.00	0.27	0.23		-0.02	-0.03	-0.03	-0.03	-0.03
IRS_AUDIT	0.29	0.03	-0.04	-0.39	0.15	-0.06	-0.03		0.63	0.80	0.69	0.90
EMP	0.07	0.07	-0.07	-0.76	0.09	-0.17	-0.05	0.48		0.95	0.95	0.85
REV_AGT	0.19	0.06	-0.06	-0.67	0.14	-0.22	-0.04	0.65	0.86		0.94	0.93
CI	0.10	0.07	-0.07	-0.78	0.12	-0.28	-0.05	0.43	0.97	0.84		0.91
FRAUD	0.15	0.07	-0.07	-0.75	0.15	-0.30	-0.05	0.55	0.91	0.87	0.92	

* Pearson (above diagonal) and Spearman (below diagonal) correlation coefficients for all variables used in primary analyses.

I also include state indicator variables. I do not include year indicator variables because the enforcement variables vary only by year, not by state, leading to multicolinearity in a model with year indicator variables.

In order to address concerns related to variable scaling I also tested a log specification, again following Gupta *et al*. (2009):

$$LN\_SCIT_{it} = \alpha_i + \beta_1 TXRATE_{it} + \beta_2 SALES_{it} + \beta_3 FLOWTHRU_{it} + \beta_4 FEDPERCAP_{it} + \beta_5 UNEMP_{it} + \beta_6 LN\_GSP_{it} + \beta_7 IRS\_AUDIT + \varepsilon_{it} \quad (2)$$

LN_SCIT is the natural log of corporate income tax revenue collections in a given state in a given year. *FEDPERCAP* is estimated federal corporate taxable income reported from each state, scaled by state population. *LN_GSP* is the natural log of the gross state product. All other variables are the same as in the main specification. The results (untabulated) under this log specification (using *IRS_AUDIT* and the other federal enforcement variables) are qualitatively similar to the results of the main specification. Therefore, for the remainder of the paper I focus my discussion on the main specification, equation (1).

5.2.2 FIN 48

To address whether the relation between IRS monitoring and SCIT decreased with the implementation of FIN 48 I create an indicator variable, *FIN48*, to denote the period when FIN 48 was in effect.[14] I also interact *IRS_AUDIT* with *FIN48* (*IRS*FIN48*) to capture the effect of federal enforcement in the post-FIN 48 period:[15]

$$SCIT/GSP_{it} = \alpha_i + \beta_1 SALES_{it} + \beta_2 TXRATE_{it} + \beta_3 FLOWTHRU_{it} + \beta_4 FEDBASEGSP_{it} + \beta_5 UNEMP_{it} + \beta_6 LN\_POP_{it} + \beta_7 IRS\_AUDIT_t + \beta_8 FIN48_t + \beta_9 IRS*FIN48_t + \varepsilon_{it} \quad (3)$$

6. Results

The results for the main specification of equation (1) are included in Panel A of Table 3. Panel B includes the results of equation (1) using the other proxies for IRS enforcement. Looking at Panels A and B, the results are

[14] FIN 48 was effective for all public entities for fiscal years beginning on or after December 31, 2006. Therefore, *FIN48* equals one for years 2007 through 2010 and equals zero for all other years.

[15] As with equation (1), in alternate specifications of the model I include the other IRS enforcement variables and interact them with *FIN48*.

generally consistent across specifications. *TXRATE* is significantly positive across specifications, as is *SALES*. In contrast, Gupta *et al.* (2009) find that *SALES* has a statistically significant negative coefficient.[16]

TABLE 3. OLS Regression Results for Alternative Specifications of Equation 1

Variable (Predicted Sign)	Panel A	Panel B			
	Orig. Specification	Alternate Proxies for the Enforcement Variable			
	IRS_AUDIT	EMP	REV_AGT	CI	FRAUD
TXRATE (+)	0.0259 ***	0.0240 **	0.0261 ***	0.0234 **	0.0246 ***
	(0.009)	(0.0095)	(0.0089)	(0.0096)	(0.0093)
SALES (-)	0.0006 ***	0.0006 ***	0.0007 ***	0.0006 ***	0.0006 ***
	(<0.001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
FLOWTHRU (-)	0.0071 ***	0.0058 ***	0.0130 ***	0.0065 ***	0.0108 ***
	(0.001)	(0.0013)	(0.0012)	(0.0019)	(0.0011)
FEDBASEGSP (+)	0.003 ***	0.007 ***	0.0044 ***	0.0067 ***	0.0041 ***
	(0.001)	(0.0012)	(0.0011)	(0.0012)	(0.0011)
UNEMP (-)	-0.0002 ***	-0.0002 ***	-0.0003 ***	-0.0002 ***	-0.0002 ***
	(<0.001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)
LN_POP (+)	-0.0022 ***	-0.0022 ***	-0.0023 ***	-0.0023 ***	-0.0023 ***
	(<0.001)	(0.0002)	(0.0002)	(0.0003)	(0.0002)
ENFORCEMENT (?)	0.0906 ***	0.1135 ***	1.8240 ***	3.6398 ***	19.7332 ***
	(0.007)	(0.0284)	(0.1732)	(1.2313)	(2.0430)
INTERCEPT	0.0305 ***	0.0302 ***	0.025 ***	0.0303 ***	0.0297 ***
	(0.004)	(0.0037)	(0.0036)	(0.0037)	(0.0038)
R^2	0.7926	0.7438	0.7866	0.7406	0.7750
No. of Observations	682	682	682	682	682

Robust standard errors in parentheses. State indicator variables are included in the model, but the coefficients are not included here for sake of brevity. ***, **, and * represent 1%, 5%, and 10% significance levels respectively.

It seems possible that the differences in coefficients on *SALES* could be driven by the trends in apportionment formulae over the past 30 years. The mean sales factor weight in 2010 is 61.1, while the mean sales factor weight in 1995 is 49.3. The mean value for 1982 would undoubtedly be even lower. It is possible that the first wave of states that moved to a more heavily weighted sales factor paid for that in the form of lower SCIT revenues (compared to states that kept the equal weighted factor). As more states have increased the weight on the sales factor, somewhat leveling the apportionment playing field, it is possible that there is no longer a detrimental effect on SCIT revenues in comparison to other states.

The results of my model along with the results in Gupta *et al.* (2009) suggest that the landscape of SCIT policy has changed. Although the ultimate economic effects (both in terms of SCIT revenues and investment and employment within the state) of modifying a state's apportionment factors have long been debated (Mazerov (2001), Hamm and Verma (2002), Harrie (2008), and Swenson (2011), among others), moving to a more heavily weighted sales factor has long been cited as a tool to encourage economic development in a state.

[16] When I run the regression in equation (1) without the enforcement variable (similar to the specification used in Gupta *et al.*, 2009) I get similar results in terms of sign and significance as in Panel A, except that the coefficient on *FLOWTHRU* is insignificant.

In its Multistate Audit Technique Manual, the California Franchise Tax Board states, "[t]o promote investment within our state, California moved to a double weighted sales factor...." The difference in results between the time period examined by Gupta *et al*. (2009) and the time period examined in this paper suggests that states need to be careful to consider the current, not historical, state tax landscape (as well as any imminent changes) when determining how state tax policy changes will affect their revenues.

Also in contrast to Gupta *et al*. (2009), *FLOWTHRU* has a positive significant coefficient (significantly negative in Gupta *et al*., 2009) and *LN_POP* has a negative significant coefficient (significantly positive in Gupta *et al*., 2009). The change in coefficient on *FLOWTHRU* may be attributable to the expanding use of LLCs. The mean value of *FLOWTHRU* is .59 for 1995, but grew to .79 in 2010, indicating increased use of flow-through entities, including LLCs, during my sample period. Many states did not enact LLC legislation until the early to mid-1990's, towards the end of the sample period in Gupta *et al*. (2009). With the increase in LLCs in my sample period, used not only for tax planning purposes, but also for legal liability purposes, *FLOWTHRU* may now be capturing the level of business activity in the state rather than tax planning activity. Without access to data for the earlier part of the sample used in Gupta *et al*. (2009), it is difficult to draw conclusions about these differences in results.[17]

Consistent with the notion that higher federal taxable income is related to higher SCIT revenues due to the incorporation of federal taxable income into SCIT calculations, the coefficient on *FEDBASEGSP* is significantly positive in all specifications. However, even after controlling for the level of federal corporate income tax collections from each state, the coefficients on all of the enforcement variables are positive and statistically significant at the .01 level.[18,19]

The results of equation (3) are displayed in Table 4 and are generally consistent with the earlier results. Again, while the coefficient on *FEDBASEGSP* is significantly positive across all specifications, the coefficients on all of the various enforcement proxy variables also remain positive and statistically significant. The coefficient on *FIN48* is positive and significant in four of the five specifications, suggesting that SCIT revenues increased after the implementation of FIN 48. This is consistent with the results in Gupta *et al*. (2013). The coefficients on the interactions between the enforcement proxies and *FIN48* are negative across all specifications and they are statistically significant in the models with *IRS_AUDIT, REV_AGT*, and *FRAUD* as the enforcement variable. The results are consistent with H2, indicating that the positive relation between IRS enforcement and SCIT revenues was reduced by the implementation of FIN 48.

[17] I have access to tax rate and apportionment information going back to only the mid-1990s, prohibiting me from analyzing the full period examined in Gupta *et al*. (2009).

[18] Since the enforcement variables are only known ex post, the relation between SCIT revenues and enforcement in equation (1) assumes that taxpayers somehow anticipate the level of enforcement for the year. In a sensitivity check (results untabulated) I use one year lagged enforcement instead of current year enforcement and inferences remain unchanged.

[19] I also ran tests with equation (1), but with an additional interaction term between *FEDBASEGSP* and the given enforcement variable (e.g. *FEDBASEGSP*IRS_AUDIT*) to examine the relation between the mechanical (*FEDBASEGSP*) and non-mechanical (enforcement variables) aspects of the federal corporate income tax process. The results (untabulated) are inconclusive. Across all specifications the coefficient on the interaction term is positive, but the coefficient is significant only in the specifications where the enforcement variable is related to IRS employment (EMP, REV_AGT, and CI). In addition, in those employment-related specifications the coefficient on *FEDBASEGSP* becomes negative.

TABLE 4. Regression Results for Alternative Specifications of Equation 3

Variable (Predicted Sign)	Panel A	Panel B			
	Orig. Specification	Alternate Choices for the Enforcement Variable			
	IRS_AUDIT	EMP	REV_AGT	CI	FRAUD
TXRATE (+)	0.0270 ***	0.0276 ***	0.0278 ***	0.0274 ***	0.0271 ***
	(0.008)	(0.0084)	(0.0081)	(0.0085)	(0.0085)
SALES (-)	0.0005 ***	0.0005 ***	0.0006 ***	0.0005 ***	0.0005 ***
	(<0.001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
FLOWTHRU (-)	0.0034 ***	0.0002	0.0079 ***	0.0041 **	0.0046 ***
	(0.001)	(0.0014)	(0.0017)	(0.0019)	(0.0014)
FEDBASEGSP (+)	0.0033 ***	0.0052 ***	0.0033 ***	0.0048 ***	0.0038 ***
	(0.001)	(0.0011)	(0.0010)	(0.0011)	(0.0011)
UNEMP (-)	-0.0002 ***	-0.0003 ***	-0.0003 ***	-0.0003 ***	-0.0003 ***
	(<0.001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)
LN_POP (+)	-0.0021 ***	-0.002 ***	-0.0022 ***	-0.0021 ***	-0.0021 ***
	(<0.001)	(0.0002)	(0.0003)	(0.0002)	(0.0003)
ENFORCEMENT (?)	0.0682 ***	0.0853 ***	1.5113 ***	5.1274 ***	14.1394 ***
	(0.009)	(0.0283)	(0.2064)	(1.2282)	(2.0993)
FIN48 (+)	0.0053 ***	0.0019 *	0.0049 ***	0.0031	0.0031 ***
	(0.001)	(0.0011)	(0.0014)	(0.0019)	(0.0008)
*ENF*FIN48* (-)	-0.3819 ***	-0.0699	-2.1311 ***	-4.9441	-104.889 ***
	(0.120)	(0.0878)	(0.7196)	(4.9600)	(38.5925)
INTERCEPT	0.0314 ***	0.0312 ***	0.027 ***	0.0289 ***	0.0309 ***
	(0.004)	(0.0037)	(0.0037)	(0.0036)	(0.0038)
R^2	0.8031	0.7864	0.8096	0.7906	0.8004
No. of Observations	682	682	682	682	682

Robust standard errors in parentheses. State indicator variables are included in the model, but the coefficients are not included here for sake of brevity. ***, **, and * represent 1 percent, 5 percent, and 10 percent significance levels respectively.

It appears that as state tax avoidance behavior by firms decreased, the relationship between federal-level enforcement and SCIT collections was weakened. These results suggest that enforcement and financial regulation should be examined together, not just separately.

7. Conclusion

In this paper I examine the relationship between tax enforcement at the federal level and SCIT revenues. My results suggest that higher levels of federal tax enforcement are associated with higher levels of SCIT collections, even after controlling for applicable tax rates and sales factor weighting. These results can be viewed in the context of Desai *et al.* (2007), with state governments as an additional set of outside stakeholders benefiting from IRS enforcement. This relationship seems to be the result of both mechanical and non-mechanical aspects of the SCIT environment. These results hold for a variety of proxies for IRS enforcement, including IRS corporate income tax audit rates, various IRS employment levels, and the number of fraud proceedings.

In examining how enforcement matters in a post-FIN 48 environment, I find that the positive relation between IRS monitoring and SCIT revenues is reduced during the time period that FIN 48 has been in effect for public companies. This study can help inform policymakers as they discuss solutions to the current financial crises faced by states. The results in this paper suggest that such discussions should extend beyond just state tax policy choices to consider federal-level enforcement, the financial reporting environment, and the interaction of these various factors.

APPENDIX
Variable Definitions (sources in parentheses)

Dependent Variables

SCIT	State corporate income tax revenue collections (Census Bureau)
SCIT/GSP	SCIT divided by GSP

Tax Policy Variables

SALES	Indicator variable equals 1 if weight on sales factor is 50% or greater, zero otherwise (Commerce Clearing House)
TXRATE	Top statutory marginal state corporate income tax rate (Commerce Clearing House)

Enforcement Variables

IRS_AUDIT	Percentage of corporate returns filed that were audited by an IRS revenue agent (TRAC)
EMP	Number of permanent IRS employees at the end of the year, scaled by the total number of corporate returns filed (IRS)
REV_AGT	Number of IRS revenue agents at the end of the year, scaled by the total number of corporate returns filed (IRS)
CI	Number of IRS criminal investigators at the end of the year, scaled by the total number of corporate returns filed (IRS)
FRAUD	Number of corporate fraud assessments for the year, scaled by the total number of corporate returns filed (IRS)

Other Variables

FLOWTHRU	Percentage of business returns filed by flow-through entities in a particular state, measured as the number of partnership and S corporation returns filed divided by the total of partnership, S corporation, and C corporation returns filed (IRS)
FEDBASE	Federal corporate income tax collections by state, grossed up by the top marginal tax rate in effect for the year (IRS)
FEDBASEGSP	FEDBASE divided by GSP
GSP	Gross state product (Bureau of Economic Analysis)
UNEMP	State unemployment rate (Bureau of Labor Statistics)
POP	State population (Bureau of Economic Analysis)
LN_POP	Natural log of POP
FIN48	Indicator variable that equals 1 for years 2007 through 2010, 0 otherwise
IRSFIN48	Interaction of IRS_AUDIT and FIN48

References

Blouin, J., C. Gleason, L. Mills, and S. Sikes. (2007). What can we learn about uncertain tax benefits from FIN 48? National Tax Journal 60, 521–535.

California Franchise Tax Board Multistate Audit Technique Manual. December 2002.

Desai, M, A. Dyck, and L. Zingales. (2007). Theft and taxes. Journal of Financial Economics 84, 591–623.

Dyreng, S., B. Lindsey, and J. Thornock. (2013). Exploring the Role Delaware Plays as a Domestic Tax Haven. Journal of Financial Economics 108, 751–772.

Financial Accounting Standards Board (FASB). (2006). Accounting for Uncertainty in Income Taxes, an Interpretation of FASB Statement No. 109. FASB Interpretation No. 48. Financial Accounting Series. Norwalk, CT: FASB.

Gleason, C. and L. Mills. (2002). Reporting and Recording of Contingent Tax Liabilities. The Accounting Review 77, 317–342.

Goolsbee, A. and E. Maydew. (2000). Coveting Thy Neighbor's Manufacturing: The Dilemma of State Income Apportionment. Journal of Public Economics 75, 125–143.

Guedhami, O. and J. A. Pittman. (2008). The importance of IRS monitoring to debt pricing in private firms. Journal of Financial Economics 90, 38–58.

Gupta, S., J. Moore, J. Gramlich, and M.A. Hofmann. (2009). Empirical Evidence on the Revenue Effects of State Corporate Income Tax Policies. National Tax Journal 62, 237–267.

Gupta, S. and D. Lynch. (2012). The Effects of Changes in State Tax Enforcement on Corporate Income Tax Collections. Working paper, Michigan State University.

Gupta, S., L. Mills, E. Towery. (2013). The Effect of Mandatory Financial Statement Disclosures on Tax Reporting and Collections: The Case of FIN 48 and Multistate Tax Avoidance. Working paper, The University of Texas at Austin.

Hamm, W., and A. Verma. (2002). "If California Adopted the Single-Factor (Sales) Apportionment Formula, What Would be the Impact?" State Tax Notes 10 June.

Hanlon, M., J. Hoopes, and N. Shroff. (2012). The Effect of Tax Authority Monitoring and Enforcement on Financial Reporting Quality. Working paper, Massachusetts Institute of Technology.

Harrie, D. (2008). "Utah Enacts Corporate Income Apportionment Change to Attract Services." State Tax Notes 24 March.

Hoopes, J., D. Mescall, and J. A. Pittman. (2012). Do IRS Audits Deter Corporate Tax Avoidance? The Accounting Review 87, 1603–1639.

Klassen, K., and D. Shackelford. (1998). State and Provincial Corporate Tax Planning: Income Shifting and Sales Apportionment Factor Management. Journal of Accounting and Economics 25, 385–406.

Larker, D. F., and T.O. Rusticus. (2010). On the use of instrumental variables in accounting research. Journal of Accounting and Economics 49, 186–205.

Lightner, T. (1999). The Effect of the Formulary Apportionment System on State-Level Economic Development and Multijurisdictional Tax Planning. Journal of the American Taxation Association 21, 42–57.

Mazerov, M. (2001). "The Single-Sales-Factor Formula: A Boon to Economic Development or a Costly Giveaway?" State Tax Notes 21 May.

Mills, L., L. Robinson, and R. Sansing. (2010). FIN 48 and Tax Compliance. The Accounting Review 85, 1721–1742.

Nolan, K. and M. Peters. (2013). "Illinois Yanks Bond Amid Pension Woes." Wall Street Journal 31 January.

State Budget Crisis Task Force. (2012). Report of the State Budget Crisis Task Force.

Swenson, C. (2011). On the Effectiveness of Single Sales Factors for State Taxation. Working paper, The University of Southern California.

Walsh, M. W. (2011). "A Path Is Sought for States to Escape Their Debt Burdens." New York Times 20 January.