**Accounting & Taxation**
Vol. 10, No. 1, 2018, pp. 1-21
ISSN: 1944-592X (print)
ISSN: 2157-0175 (online)

IBFR
www.theIBFR.com

# EMPIRICAL EVIDENCE ON THE RELATIONSHIP BETWEEN AUDIT PROBABILITY AND INTERNAL REVENUE SERVICE BUDGET LEVELS

Akinloye Akindayomi, The University of Texas Rio Grande Valley
Gideon T. Akinleye, Ekiti State University
Adeduro A. Ogunmakin, Ekit State University

**ABSTRACT**

*Despite a large literature on tax avoidance strategies by individuals and the IRS ability to curb them, how the agency's audit/examination activities respond to tax expenditures within the individual taxation context is not well understood. We hypothesize that IRS audit probability of individual tax returns will positively respond to the magnitude of different tax expenditure drivers if the agency has a shot at curtailing them. We find that while the probability of IRS audit increases as the agency's budget on enforcement activities increases, tax expenditures do not appear to prompt IRS enforcement activities in many of the tax expenditures drivers.*

**JEL**: H24, M40, M41

**KEYWORDS**: Tax Expenditures, Tax Avoidance, IRS Audit, Individual Income Taxation

## INTRODUCTION

The prominence of tax expenditure in public and tax policy debates speaks to the controversies surrounding its desirability and measurement (see Burman et al., 2008). Equally controversial is its accounting and budgetary implications for the U.S. government. According to the Office of Management and Budget (2012), tax expenditures are defined as "revenue losses attributable to provisions of the Federal tax laws which allow a special exclusion, exemption, or deduction from gross income or which provide a special credit, a preferential rate of tax, or a deferral of tax liability". While some argue that tax expenditures are essentially a U.S. government off-budget financing through the tax code which must be quantified and reported for full disclosure, others believe that these expenditures cannot be accorded the same accounting and reporting treatments like other federal government expenditure lines such as education, defense, and health care among others. Tax expenditures are sizeable and believed to have consistently been a substantial percentage of the Gross Domestic Product (GDP) in the past four decades (estimated by the Tax Policy Center to be 7.3% of GDP in 2016). For example, the projections from the Office of Management and Budget put Tax Expenditures at $878 billion (over $700 billion in 2007) and $1.2 trillion for fiscal years 2008 and 2014 (October 1 through September 30), respectively. This suggests primarily that taxpayers' burden will be lowered by the respective figures at the expense of the U.S. treasury since the government arguably 'spends' the forgone revenue created by these type of 'latent' expenditures. In context, these figures translate to over 35% and 40% of the approved spending levels by Congress for the same respective periods.

Further, there is a lack of consensus on the definition of tax expenditures. As documented by Burton and Sadiq (2013), there is neither a universal definition of tax expenditure, nor a consensus among academics and practitioners on what should be its appropriate normative goal. Burton and Sadiq specifically writes,

"…we do not purport to provide a definitive answer to the question of what a tax expenditure is, but rather argue that there is no one answer." Notwithstanding the lack of its universal definition, we argue that the indisputable commonality in tax expenditure dynamics is that it is largely a product of tax avoidance strategies by individual taxpayers and corporations. It therefore remains an empirical question whether the Internal Revenue Service (IRS) has the ability to constrain those taxpayers' tax avoidance strategies thereby, limiting the amount of tax expenditures that taxpayers receive from this 'latent' government off-balance sheet spending. This off-balance sheet government spending is considered to be dominated by individual taxation relative to corporate taxation. For example, the tax expenditures for fiscal year 2014 are 87% individual and 13% corporate (Cole, 2014). Although individual income taxation is the larger 'player' in tax expenditures, the existing literature examining the latter within the context of the former is relatively limited.

Therefore, within the individual income tax context, and knowing fully that the IRS is a "strategic actor" in the tax compliance scheme (Dubin and Wilde, 1988), we specifically investigate whether the IRS audit/examination activities respond to the levels and direction of tax expenditure drivers at different income groups given the agency's budget activity on tax law enforcement between 1993 and 2011. These tax expenditure drivers are: (1) charitable contributions, (2) home mortgage interest deductions, (3) casualty or theft loss deductions, (4) medical and dental expenses deductions, (5) gambling loss deductions, (6) miscellaneous deductions other than gambling, (7) unreimbursed employee business expenses, (8) tax preparation fees, (9) miscellaneous deductions subject to 2% AGI limitation, and (10) total tax credits.

The findings of this study reveal that IRS enforcement activities regarding auditing/examination of individual tax returns largely ignores the magnitude of the dollar amounts and the directions of many of the tax expenditure drivers investigated in this study. In some cases, IRS enforcement activities are arguably counter-productive as there is a significant negative relationship between tax expenditure drivers (i.e. charitable contributions, miscellaneous deductions other than gambling, and miscellaneous deductions subject to 2% AGI limitation) and the probability of audit in a given year and across the various levels of tax income groups. With the exception of home mortgage interest deductions, which is significant and positive, other tax expenditure drivers (i.e. casualty or theft loss deductions, medical and dental expenses deductions, gambling loss deductions, unreimbursed employee business expenses, tax preparation fees, and total tax credits) are not shown to be significantly related to IRS audit/examination activities of individual tax returns, notwithstanding the consistent allocation of budgetary resources by the agency to auditing/examination of these tax expenditure drivers (as the IRS budget on enforcement is significantly positive in all of our empirical models).

Uniquely, this study contributes to the literature as it contextualizes tax expenditures study within the individual taxation environment as many studies tend to focus on corporate tax avoidance (see for example, Dyreng et al., 2010; Hoopes et al., 2012). To the best of our knowledge, this study is one of the first attempts to link tax expenditures with individual tax avoidance. Scholz and Pinney (1995) earlier acknowledge that the probability of being audited by the IRS affects the behavioral responses of taxpayers to tax compliance. This is vital in that, many will agree, there is no political will on the part of Washington to concretely address tax expenditures (both individual and corporate) in a substantial way. Therefore, if not much can legislatively be done to reform this huge 'latent' government spending by politicians, providing evidence on IRS scorecard regarding how these expenditures have been administered can potently signal to policy makers and the agency the need to target and improve its tax returns audit/examination activities efficiently for effective desired outcomes (i.e. constraining individual tax avoidance vis-à-vis tax expenditures). Specifically, the findings of this study show the association between individual tax expenditure driver and IRS audit/examination activities within the budget constraints faced by the agency.

The remainder of the paper is organized as follows. The next section reviews the prior literature and develops the hypotheses tested in this study. In section 3, we present the empirical design, with the results

and the discussions of the findings presented in section 4. Further, the findings from the additional sensitivity analysis and diagnostics performed are also presented in that section. The final section concludes the study.

## PRIOR LITERATURE AND HYPOTHESES DEVELOPMENT

There is no shortage of debates (with relative individual merits) on virtually every area of the U.S. tax code. On the one hand, central to the debates is the complexity of the tax code. On the other hand, there is the issue surrounding the sufficiency of the revenue generated through it. Both issues revolve around the strategic relevance and operational importance of the Internal Revenue Service (IRS), especially as it relates to its enforcement activities. An emerging stream of research in accounting examines extensively the amplitude at which corporate tax avoidance is constrained by IRS monitoring activities. For example, studies examine and find that IRS monitoring and enforcement mechanisms impact corporate financial reporting quality (Hanlon et al. 2014); corporate tax avoidance (Hoopes et al. 2012; Akindayomi and Warsame, 2016); equity pricing of public firms (El Ghoul, 2011); debt pricing of private firms (Guedhami and Pittman, 2008). However, as mentioned earlier, tax expenditures relating to personal income taxation substantially exceeds those on corporate taxation and since tax expenditures are largely the outcome of tax taxpayers' avoidance activities, it is no doubt desirable to accord similar research efforts to them within the individual taxation context.

Scholz and Pinney (1995) note the importance of 'objective audit probabilities' by the IRS in ensuring taxpayers compliance. Earlier studies (e.g., Violette 1989) stress the importance of tax audits and penalties in the overall compliance scheme, especially within the voluntary compliance regime of the U.S. tax system. Klepper and Nagin (1989) find no evidence that higher tax rate leads to increased noncompliance but instead, that compliance responds to enforcement realties. Efebera et al. (2004) observe that prior tax compliance research focused more on high-income taxpayers and less on low-income taxpayers because federal tax proceeds come largely from the former income group. However, their research signifies that policy makers can reduce tax evasion/avoidance among low-income individual taxpayers through enhanced compliance strategy. In addition, Dubin and Wilde (1988) find that compliance is associated with audits, specifically in the low and middle-income group. This in part informs the need for the current study to include all income groups in the empirical analysis, more so that the majority of taxpayers who itemize tend to fall below the six-digit income group. For example, in the 2011 tax year, nearly 64% of itemizers made less than $100,000.

To further stress the importance and the potential potency of the IRS compliance activities, the most recent tax gap estimates report released by the IRS in 2012 (see Black et al. 2012) shows that the gross (net) tax gaps increased from $345 ($290) billion in the 2001 tax year to $450 ($385) billon in the 2006 tax year (see also Internal Revenue Service, 2012). The gross tax gap is defined as the taxpayer's true tax liability that is not paid on a timely manner. With IRS enforcement efforts and (sometimes) voluntary compliance of the affected taxpayers, the amount subsequently collected is deducted from the gross to arrive at the net tax gap which essentially is the taxpayer's true liability that is never collected from taxpayers or paid to the treasury. In addition to the overall increase in economic activity during this period, the 30% (33%) increase in the tax gaps can be attributed to a decline in the voluntary compliance rate from 83.7% (86.3%) to 83.1% (85.5%) during the same periods. The tax gap components are (1) nonfilling gap; (2) underreporting gap; and (3) underpayment gap. Underreporting gap accounts for over 83% of the tax gap in tax year 2006 which is a 32% increase from the 2001 tax year. The tax expenditure drivers examined in the current study fit into the underreporting component of the tax gap. To further put into perspective, the individual income tax category of the underreporting tax gap component in 2006 tax year is over 62% compared to 18% of corporation income tax. The individual tax category is a 20% jump from the 2001 tax year compared to just a little over 1% increase in the corporation income tax category. These statistics motivates in part, the current study efforts to examine tax expenditure drivers relating only to individual income taxation. One

speculation on the dominance of individual income taxation in the tax expenditures scheme could be that many of the expenditure drivers are tax items available only to individuals and not corporate taxpayers.

Charitable Contribution

Of particular interest is the charitable donations deduction by individual tax payers because it is one of the top tax expenditure maximizers. Ample of evidence abounds regarding the enabling impact of charitable giving on the receiving charitable organizations. There appears not to be much controversy on the public good that such giving serves. To further encourage more charitable giving, there have been proposals to extend charitable deduction to non-itemizers. It should be noted that this deduction was briefly available to that category of taxpayers between 1982 and 1986 (for more see Ackerman and Auten 2006). The real question has been the intellectual controversy on whether the forgone tax revenue (i.e. tax expenditure) from such a deduction serves right the treasury purpose. This unease becomes more dynamic if one considers the fact that charitable giving could be cash or non-cash. While the deduction of the former might somewhat be straightforward, the latter is not as simple as one can sometimes run into complicated measurement issues. Even though cash donations are more popular, noncash contributions are not insignificant. For example, the reported deductions of noncash charitable giving was $48 billion, which according to Ackerman and Auten (2011) translates to over $9 billion in tax expenditures and approximately 25% of all charitable deductions in the 2005 tax year. Halperin (2002) submits that the tax expenditure arising from donated appreciated properties is grossly understated because capital gains tax revenue that would have accrued to the treasury is not factored into the calculations of the tax expenditure numbers.

O'Neil et al (1996) claim that top-income earners are more likely to be tax motivated to make charitable giving relative to other individual taxpayer groups. However, Bakija and Heim (2011) caution against making such an assertion as the authors could not find "strong evidence of differences in persistent price elasticities across income levels". In fact, Ackerman and Auten (2011) note that, "noncash charitable deductions are claimed by taxpayers in all income classes" which makes up to one-fifth of "total deductions in most groups…" Therefore, the current study finds it compelling to examine all tax expenditure drivers for all income groups.

The tendency for over-reporting of charitable giving by taxpayers is real. Several studies including Ackerman and Auten (2011) document the mismatch between taxpayers' valuations of noncash charitable donations and the 'true' value of the donated items (see also Buchheit et al., 2005). Attempts by the IRS to shift monitoring to charities have not been particularly effective. We posit that this is in part because, from the charity perspective, any positive net amount from charitable giving is value-enhancing to it as the opportunity cost of the alternative (i.e. no donation) is zero. It must be noted that undoubtedly, there is an unease tension between policy reforms (see Baneman et al., 2014 for more on the policy proposal/prescriptions) on tax expenditure drivers and the potential disincentive effect on rational taxpayers who may avoid some of the associated activities that produce tax expenditures. This may become counterproductive if such avoided activities serve public good purpose (such as charitable donations). Kemp et al. (2011) clearly link charitable giving to poverty alleviation, submitting that, "charitable giving is an important way in which a rich society tries to alleviate poverty". Consequently, we will argue that it is possible for the tax code to support fiscally the art of charitable giving so that it continues to serve public purpose but reduce the abuse with measured IRS scrutiny and enforcement (both are not and should not be mutually exclusive!). It must be noted that tax motivations drive primarily, but not exclusively, many donors in their charitable giving (see Cermak et al., 1994).

Home Mortgage Interest Deduction

Another big and highly controversial tax expenditure driver in this consistent era of persistent budget deficits is the Home Mortgage Interest Deduction (MID). Hanson and Martin (2013) see MID as the "largest

government intervention in the housing markets" that Hilber and Turner (2014) assert create "one of the largest tax expenditures in the U.S.". In 2010 alone, approximately 37 million households claimed nearly $400 billion in MID through their tax returns, notwithstanding the $1.1 million limit on mortgage debt upon which interest deduction can be taken by a taxpayer. MID is considered a tax expenditure driver mainly because there is no imputed rent taxation in the U.S. Bourassa et al. (2013) identify three developed economies that tax imputed rent to include Switzerland, Poland and Netherlands. It is universally believed that the tax deductibility of mortgage interests in the U.S. impacts homeownership (Poterba and Sinai, 2008). However, this tax deduction costs the treasury in the form of lost tax revenue. Notwithstanding the findings of Follain and Melamed (1998) on the potential negative consequences of eliminating MID, many academic studies tend to converge on the idea that keeping MID in the tax code will have minimal or no effect on homeownership rate due to capitalization influence (Hanson, 2012, but see Hilber and Turner, 2014). Hilber and Turner (2014) specifically state that, "MID is an effective policy to promote homeownership and improve social welfare". However, it is considered a 'backdoor' means of making the tax code less progressive as wealthier Americans tend to have relatively larger amounts of mortgage debts (Glaeser and Shapiro, 2002), thereby skewing the distributional burden of the tax code in favor high-income tax payers. But the practical question is whether the government has the political will to limit or remove MID from the tax code. Therefore, working within the current regime, it is important to examine IRS efficiency regarding MID in terms of the agency's audit/examination activities when it comes to curbing the avoidance strategies by taxpayers.

Hendershott and Pryce (2006) argue that there will be an asymmetric treatment between mortgage debt and equity financing without mortgage interest deduction and that MID allows for "tax equality" between the two costs of mortgage and equity financing (see also Woodward and Weicher, 1989). The authors warn that MID does not necessarily make the debt financing cheaper than equity financing, but claim that the absence of MID creates a "debt tax penalty" that can incentivize taxpayers to "shift from debt toward equity financing". They claim that there will be a large decline in mortgage debt in the U.S. if MID is removed from the tax code, a conjecture that is more bullish (in favor of MID) than the earlier findings of Follain and Melamed (1998). Both studies concur with the evidence in prior and emerging studies that eliminating MID will not have a noticeable impact on homeownership rates in the U.S. at least in the short-term.

The current study sees the findings in Hendershott & Pryce and Follain & Melamed as impressive in that they focus on the direct technical fundamentals of MID and not merely on the qualitative importance of MID or the implicit moral arguments supporting its desirability. Such arguments in favor of homeownership orbit around active political participation evidenced by relatively higher voting rates, lower crime rates, enhanced civic engagement, and improved governance at the local level, among others (see Dietz and Haurin, 2003; Hilber and Mayer, 2009 for more). Further, if the findings are true, one can only imagine the toll a substantial decline in mortgage financing will have on the U.S. banking industry and the potential untoward multiplier effects on the economy. The key findings in Follain and Melamed have the following three consequential implications for eliminating MID: (i) the anticipated increase in tax revenue is overestimated; (ii) younger married households with considerable amount of mortgage debts will be "most likely" impacted and not only wealthy American homeowners; and (iii) the overall demand for mortgage debt financing will drop substantially. We consider these findings consequential in that aside from the politics and the dormancy of the political will, they may explain why policy makers and Congress have been very reluctant in drastically changing MID, but instead continually accommodate MID within the tax code since its inception in 1913 (see Stansel and Randazzo, 2011 for more on the history of MID in the U.S.). If this is true, it therefore accentuates the need for the IRS, through compliance mechanisms, to curtail the potentials for avoidance that taxpayers may engage in when it comes to MID.

Medical Expenses Deduction

Medical expenses deduction (MED) introduced in 1942 is primarily conceived and designed to provide some relief in the form of tax subsidy to Americans who incur medical bills, especially of catastrophic nature, provided the taxpayer possesses tax-specific income appropriate to absorb the allowed deduction. Some criticize MED for its failure on the ground that it is merely an affordable deduction, which Johnson (2013) referred to as "counterfeit charity". Lurie and Minicozzi (2010) note that this deduction (including qualified dental expenses) is mainly claimed persistently by taxpayers who are 65 years or older relative to younger Americans (see also Kopecky and Koreshkova, 2014). Citing the Congressional Research Service analysis of the Joint Committee on Taxation estimates of tax expenditure, Lowry (2014) notes that medical expenses deduction is categorized as one of the top four tax expenditure drivers. Kopecky and Koreshkova (2014) show that medical expenses do impact the aggregate savings stock of many Americans, which we argue may lead to tax avoidance activities by some taxpayers. In fact, Johnson (2013) lays out the scenarios that can increase the likelihood of aggressive tax avoidance strategies regarding MED by taxpayers. If healthcare cost reduction, which is one of the prominent expectations of the Patient Protection and Affordable Care Act (2010), is actualized, then the share of MED in the tax expenditure drivers group will likely diminish.

Gambling Loss Deduction

Gambling loss deduction is another component of tax expenditure driver in the U.S. tax code. Recognizing that the gambling industry is embedded in the American economy (Zorn, 1995), Warren (1980) suggests that the tax code rationale for deducting the losses stem from the belief that gambling activities can be likened to business activities capable of generating profit to the taxpayer, and that full tax deduction of the losses ignores the significant consumption that gamblers derive from the activity. Therefore, it is believed that limiting deductible gambling losses to gambling gains accounts for the personal consumption portion of the activity. Zorn (1995) characterized such a limitation as "purely theoretical" relying on the winnings-losses asymmetry that is pervasive in gambling dynamics. In context, we interpret this asymmetry to mean that gambling losses are generally higher than gambling winnings, and allowing the latter to be a benchmark for deducting the former could still produce substantial tax expenditures. Consequently, IRS enforcement mechanisms in this respect could be vital, especially if one agrees that gambling loss deduction is another choice area in taxpayers' avoidance strategies mix. In fact, Zorn worries that gambling loss limitations potentially open doors for tax manipulations by taxpayers.

Tax Credits

Tax credits claimed by Americans through the federal tax code continue to be substantial not only in the dollar amount, but also in proportion of individual taxpayers obtaining the credits. For example, of the nearly 145 million returns filed, approximately 65% claimed one credit or the other in the 2012 tax year. Further, Individual tax credits are also a substantial chunk of tax expenditures. We note that while virtually all the tax expenditure drivers earlier discussed are meant to minimize taxable income and the consequent tax liability, tax credits not only reduce tax liability dollar for dollar, they can literarily put money in qualifying taxpayers (with no tax liability) pockets if they are refundable credits. For example, in the 2010 tax year, approximately 27 million taxpayers claimed earned income credit, a substantial component of which was refundable.

Other Tax Expenditure Drivers

Casualty and theft losses deduction is an insurance-like personal deduction allowed in the U.S. tax code that indemnifies taxpayers' uninsured losses mainly using the ability to pay criterion argument (see Dodge, 2013 for more). Although this tax expenditure is relatively less prominent, we argue that its deductions can

only at best reduce tax proceeds coming to the treasury. Therefore, efforts aimed at curtailing this deduction may prove rewarding.

The deduction of the tax return preparation fees is another subsidy granted by the federal tax code assisting taxpayers to defray the costs arising from engaging the services of fee-based tax returns professionals. Jackson et al. (2005) find a strong positive relationship "between taxpayers' prepayment positions and tax return preparation fees". They test and find that tax refund/due positions faced by taxpayers determine the taxpayers' view of tax preparation fees either as a loss or a cost. The extent to which this view motivates taxpayers into tax avoidance strategies is unclear. We leave that to future research. Notwithstanding, we will submit that a rational taxpayer will want to explore opportunities to minimize cost or loss. Following this finding, we maintain that the part of the revenue loss from such a deduction is somewhat offset by the "interest-free" loans available to the government with positive prepayment positions. This may explain partly the reason the federal government continues to allow this subsidy, especially in view of the findings of Jackson et al. (2005) that nearly half of taxpayers have positive prepayment positions; and that taxpayers receiving tax refunds are willing to pay higher tax return preparation fees (Jackson and White, 2008). However, we like to caution that this seemingly mutual understanding between taxpayers and their tax professionals may not be the optimum outcome for the tax system in an all-party scenario, especially if the treasury is thrown into the all-party mix. The assertion by Jackson and White (2008) highlighting the inadequacy or ineffectiveness of legislative efforts to constrain tax refunds lends credence to the need for improved IRS effective audit activities and enforcement mechanisms in the overall tax environment.

The unreimbursed employee business expenses deduction is another popular item that has attracted IRS scrutiny in recent years. Its tax treatment pre Tax Reform Act of 1986 is different from the post reform regime, which we posit is in part, to discourage employer-employee connivance skewing the structuring of compensation packages towards tax-favored treatment. As noted by Dennis-Escoffier (2013), the IRS continues to engage taxpayers and their employers when it comes to wage re-characterization, as the character of wages and reimbursements often determines their tax treatment. The extent to which IRS enforcement activities are effective in this regard remains an empirical question.

Research Question and Hypothesis

At the center of IRS enforcement activities are the financial resources appropriated by Congress that are available to the agency specifically regarding enforcement and compliance. We note that there are sometimes volatile political realities around IRS budget dynamics with one certain fact that budgetary resources are not infinite. Therefore, effective prioritization of the agency's mutually exclusive activities (driven by finite budgetary resources) becomes paramount, especially as it relates to its primary role of bringing in tax revenue (i.e. constraining both tax evasion and avoidance). The above review of the extant literature and the accompanying discussions motivates the main research question of this study: Does IRS audit/examination respond to tax expenditures within individual income taxation context? To answer this research question, the following hypothesis stated in alternative form is tested:

$H_a$: *in years when tax expenditure drivers are high, the probability of IRS audit/examination is high.*

The above hypothesis tests the responsiveness of IRS audit/examination activities to the trend and magnitude of tax expenditure drivers arising from individual income taxation. Recall that the tax expenditure drivers examined in this study are: charitable contributions, home mortgage interest deduction, casualty or theft loss deduction, medical and dental expenses deduction, gambling loss deduction, miscellaneous deduction other than gambling, unreimbursed employee business expenses, tax preparation fees, miscellaneous deductions subject to 2% AGI limitation, and total tax credits.

## EMPIRICAL SPECIFICATIONS

The current study collects usable data from the Statistics of Income (SOI) tax numbers of the Internal Revenue Service (IRS) Data Book for the years ranging from 1993 to 2011. These data include the dollar amount of deductions and credits taken by individual taxpayers on what we refer to as tax expenditure drivers, namely: (1) charitable contributions, (2) home mortgage interest deduction, (3) casualty or theft loss deduction, (4) medical and dental expenses deduction, (5) gambling loss deduction, (6) miscellaneous deduction other than gambling, (7) unreimbursed employee business expenses, (8) tax preparation fees, (9) miscellaneous deduction subject to 2% AGI limitation, and (10) total tax credits. From the same source, enforcement and examination coverage data across income groups are also collected, as well as the IRS budget as it relates specifically to costs incurred on enforcement activities. Other secondary data sources are the Bureau of Labor Statistics (for gross domestic product figures) and Office of Management and Budget (for federal government budget numbers).

In order to test the hypothesis stated earlier, the following empirical model is specified:

$$ProbAud_{it} = \alpha_0 + \alpha_1 TaxExpd_{it} + \alpha_2 IRSbdgt_t + \alpha_3 GDP_t + \alpha_4 President_t + \alpha_5 Senate_t + \alpha_6 House_t + \alpha_7 TaxExpd_{it-1} + \alpha_8 DumIncomeGrp_i + \alpha_9 IntTaxExpd_{it} + \mu_i + \varepsilon_{it} \quad (1)$$

Where:

ProbAud = probability of audit which is the number of individual tax return audits in the IRS's fiscal year t for income group i divided by the number of individual tax returns received by IRS for the same income group i at the IRS fiscal year t.

TaxExpd = tax expenditures for individual income group i at time t for each of the tax expenditure drivers (namely: charitable contributions, home mortgage interest deduction, casualty or theft loss deduction, medical and dental expenses deduction, gambling loss deduction, miscellaneous deductions other than gambling, unreimbursed employee business expenses, tax preparation fees, miscellaneous deductions subject to 2% AGI limitation, and total tax credits).

IRSbdgt = IRS budget in its fiscal year t, normalized by overall federal non-defense outlay.

GDP = real gross domestic product at time t to control for the overall economic activity.

President = dummy variable that equals one (zero) when a democrat (republican) is the president

Senate = dummy variable that equals one (zero) when a democrat (republican) is the majority leader of the senate.

House = dummy variable that equals one (zero) when a democrat (republican) is the Speaker of the House of Representative.

DumIncomeGrp = dummy variable that equals one if the income group is $200,000 ($500,000) or more and zero otherwise.

IntTaxExpd = variable interacting TaxExpd with DumIncomeGrp

$\mu$ = unobserved individual income group specific (fixed) effect and $\varepsilon$ is the error term.

The above model is applied to the aggregate as well as to the individual tax expenditure drivers. In other words, there will be eleven estimated models in the study. We do not examine the reverse of the above

empirical design because there is no *a priori* theory justifying the fact that individual taxpayers *ex ante* pay attention to the probability of being audited (as captured in the dependent measure). This is different from corporations where evidence abounds that managers and Tax Directors anticipate concretely the probability of IRS audit/examination and therefore place their tax avoidance strategies within that context (see for example Hoopes et al., 2012).

TaxExpd (tax expenditures, $\alpha_1$) is the primary variable of interest in the model. The expected sign of the coefficient ($\alpha_1$) for this variable relative to the dependent variable is positive. That is, in years when tax expenditure is high, the probability of audit should be high if IRS enforcement activities and priorities reflect the trend and magnitude of those tax expenditures. Relatedly, it is practical to expect a positive sign for $\alpha_2$ as higher budgetary allocations for IRS enforcement activities should increase the ability of the agency to conduct audit examinations. A negative sign may indicate a counterintuitive interplay between resource availability and examination/enforcement activities (i.e. inefficiency in budgetary resource allocation). We use gross domestic product as a variable to control for macroeconomic conditions. Given the model set up, it is difficult *a priori* to predict the sign of its coefficient $\alpha_3$. Knowing that the federal budget of the U.S. government is generally determined in the preceding fiscal year, we lag the IRSbdgt variable (t-1) in the regression. Also in equation 1 above, we use the IRS budget numbers without normalizing them (i.e. with no scale) so as to ensure that normalizing the IRSbdgt variable does not mask the substantial year-to-year changes in the agency's budget. The tenor of the inferences (results untabulated for parsimony) remains unchanged.

The political variables (i.e. party affiliations of the President, Senate and House) were thrown into the model to accommodate the theoretical insights in the literature regarding the effect of the power dynamics in Washington on the IRS's activities, as major IRS strategic structures including top leadership and budget allocations are Washington driven. As noted by Bagchi (2012), a similar ratio (i.e. normalized IRS enforcement budget by federal outlay) reflects tax enforcement priorities of political powers in Washington. DumIncomeGrp variable is created to examine whether the IRS enforcement activities follow the money by targeting 'higher' income taxpayers in its (IRS) individual income tax audit. Two different cutoffs selected are $200,000 and $500,000. Other cutoffs are examined and the results (untabulated) remain substantially the same. The interaction variable (IntTaxExpd) captures tax expenditures within the two delineated income groups, i.e. adjusted gross income of $200,000 and $500,000. A positive coefficient $\alpha_9$ will mean that in that particular income group, an increase in tax expenditure driver is responded to by the IRS through increased examination/audit activities. The income group effect (i.e. $\mu$) is important to address the econometric concern that certain characteristics or variations may exist between or among income groups that could correlate with the main variable of interest (TaxExpd), other explanatory variables and also the error term. In essence, the covariance between $\mu$ and the explanatory variables are not equal to zero. When this is true, the coefficient estimates from fixed effect regressions are considered more persuasive than those of the random effects regressions if such an econometric anomaly situation subsists (more tests are conducted and discussed in the additional analysis section to further explore varying scenarios).

## RESULTS AND DISCUSSION

Table 1 contains descriptively the summary statistics of the relevant variables in the empirical model as it relates to the sample period 1993 – 2011. There are seven panels in Table 1 (Panel A – G) with the first panel (Panel A) reporting the statistics of the combined tax expenditure drivers. Panels B through G respectively report statistics of: charitable contributions, home mortgage interest deduction, medical and dental expenses deduction, unreimbursed employee business expenses, miscellaneous deductions subject to 2% AGI limitation, and total tax credits. For brevity, we do not tabulate the results of Gambling Loss Deductions, Miscellaneous Deductions other than Gambling, and Tax Preparation Fees. These expenditure drivers are a small component of the combined tax expenditures (results are available upon request).

Table 1: Descriptive/Summary Statistics - Sample Period (1993 – 2011)

| Variables | Units | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| ***Panel A: Combined (N = 367)*** | | | | | |
| Tax Expenditure | In dollars (millions) | 31,400 | 38,600 | 1,587.96 | 236,000 |
| IRS Budget | In dollars (millions) | 4,231.85 | 733.62 | 3,103.64 | 5,510.73 |
| Federal Non-Defense Outlay | In dollars (billions) | 1,892.87 | 553.06 | 1,118.30 | 2,897.51 |
| Gross Domestic Product (GDP) | In dollars (billions) | 11,700 | 1,439.41 | 8,870.70 | 13,300 |
| President | 1 = Democratic<br>0 = Republican | 0.5204 | 0.5003 | 0 | 1 |
| Senate | 1 = Democratic<br>0 = Republican | 0.4578 | 0.4989 | 0 | 1 |
| House | 1 = Democratic<br>0 = Republican | 0.3351 | 0.4727 | 0 | 1 |
| DumOver200 | 1 = AGI > $200,000<br>0 = AGI ≤ $200,000 | 0.2643 | 0.4416 | 0 | 1 |
| DumOver500 | 1 = AGI > $500,000<br>0 = AGI ≤ $500,000 | 0.2153 | 0.4116 | 0 | 1 |
| ***Panel B: Charitable Contributions (N = 367)*** | | | | | |
| Tax Expenditure | In dollars (millions) | 6,700.46 | 7,957.22 | 54.90 | 42,800 |
| IRS Budget | In dollars (millions) | 4,231.85 | 733.62 | 3,103.64 | 5,510.73 |
| Federal Non-Defense Outlay | In dollars (billions) | 1,892.88 | 553.06 | 1,118.30 | 2,897.51 |
| Gross Domestic Product (GDP) | In dollars (billions) | 11,700 | 1,438.94 | 8,870.70 | 13,300 |
| President | 1 = Democratic<br>0 = Republican | 0.5204 | 0.5003 | 0 | 1 |
| Senate | 1 = Democratic<br>0 = Republican | 0.4578 | 0.4989 | 0 | 1 |
| House | 1 = Democratic<br>0 = Republican | 0.3351 | 0.4727 | 0 | 1 |
| DumOver200 | 1 = AGI > $200,000<br>0 = AGI ≤ $200,000 | 0.2643 | 0.4416 | 0 | 1 |
| DumOver500 | 1 = AGI > $500,000<br>0 = AGI ≤ $500,000 | 0.2153 | 0.4116 | 0 | 1 |
| ***Panel C: Home Mortgage Interest Deductions (N = 367)*** | | | | | |
| Tax Expenditure | In dollars (millions) | 16,100 | 23,000 | 106.36 | 143,000 |
| IRS Budget | In dollars (millions) | 4,231.85 | 733.62 | 3,103.64 | 5,510.73 |
| Federal Non-Defense Outlay | In dollars (billions) | 1,892.88 | 553.06 | 1,118.30 | 2,897.51 |
| Gross Domestic Product (GDP) | In dollars (billions) | 11,700 | 1,438.94 | 8,870.70 | 13,300 |
| President | 1 = Democratic<br>0 = Republican | 0.5204 | 0.5003 | 0 | 1 |
| Senate | 1 = Democratic<br>0 = Republican | 0.4578 | 0.4989 | 0 | 1 |
| House | 1 = Democratic<br>0 = Republican | 0.3351 | 0.4727 | 0 | 1 |
| DumOver200 | 1 = AGI > $200,000<br>0 = AGI ≤ $200,000 | 0.2643 | 0.4416 | 0 | 1 |
| DumOver500 | 1 = AGI > $500,000<br>0 = AGI ≤ $500,000 | 0.2153 | 0.4116 | 0 | 1 |
| ***Panel D: Medical and Dental Expenses Deductions (N = 355)*** | | | | | |
| Tax Expenditure | In dollars (millions) | 2,735.71 | 2,269.73 | 853 | 12,400 |
| IRS Budget | In dollars (millions) | 4,226.06 | 732.86 | 3,103.64 | 5,510.73 |
| Federal Non-Defense Outlay | In dollars (billions) | 1,884.91 | 553.78 | 1,118.30 | 2,897.51 |
| Gross Domestic Product (GDP) | In dollars (billions) | 11,600 | 1,449.51 | 8,870.70 | 13,300 |
| President | 1 = Democratic<br>0 = Republican | 0.5300 | 0.4998 | 0 | 1 |
| Senate | 1 = Democratic<br>0 = Republican | 0.4535 | 0.4985 | 0 | 1 |
| House | 1 = Democratic<br>0 = Republican | 0.3352 | 0.4727 | 0 | 1 |
| DumOver200 | 1 = AGI > $200,000<br>0 = AGI ≤ $200,000 | 0.2394 | 0.4273 | 0 | 1 |
| DumOver500 | 1 = AGI > $500,000<br>0 = AGI ≤ $500,000 | 0.1887 | 0.3918 | 0 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| ***Panel E: Unreimbursed Employee Business Expenses (N = 367)*** | | | | | |
| Tax Expenditure | In dollars (millions) | 2,901.42 | 3,831.23 | 9.305 | 21,900 |
| IRS Budget | In dollars (millions) | 4,231.85 | 733.62 | 3,103.64 | 5,510.73 |
| Federal Non-Defense Outlay | In dollars (billions) | 1,892.88 | 553.06 | 1,118.30 | 2,897.51 |
| Gross Domestic Product (GDP) | In dollars (billions) | 11,700 | 1,438.94 | 8,870.70 | 13,300 |
| President | 1 = Democratic<br>0 = Republican | 0.5204 | 0.5003 | 0 | 1 |
| Senate | 1 = Democratic<br>0 = Republican | 0.4578 | 0.4989 | 0 | 1 |
| House | 1 = Democratic<br>0 = Republican | 0.3351 | 0.4727 | 0 | 1 |
| DumOver200 | 1 = AGI > $200,000<br>0 = AGI ≤ $200,000 | 0.2643 | 0.4416 | 0 | 1 |
| DumOver500 | 1 = AGI > $500,000<br>0 = AGI ≤ $500,000 | 0.2153 | 0.4116 | 0 | 1 |
| ***Panel F: Miscellaneous Deductions Subject to 2% AGI Limitation (N = 176)*** | | | | | |
| Tax Expenditure | In dollars (millions) | 1,411.15 | 1,489.04 | 57.80 | 6,651.86 |
| IRS Budget | In dollars (millions) | 4,845.71 | 466.77 | 4,140.48 | 5,510.73 |
| Federal Non-Defense Outlay | In dollars (billions) | 2,376.84 | 389.56 | 1,837.03 | 2,897.51 |
| Gross Domestic Product (GDP) | In dollars (billions) | 12,900 | 3,324.59 | 12,222.00 | 13,300 |
| President | 1 = Democratic<br>0 = Republican | 0.3750 | 0.4855 | 0 | 1 |
| Senate | 1 = Democratic<br>0 = Republican | 0.5000 | 0.5014 | 0 | 1 |
| House | 1 = Democratic<br>0 = Republican | 0.4943 | 0.5014 | 0 | 1 |
| DumOver200 | 1 = AGI > $200,000<br>0 = AGI ≤ $200,000 | 0.3182 | 0.4671 | 0 | 1 |
| DumOver500 | 1 = AGI > $500,000<br>0 = AGI ≤ $500,000 | 0.2727 | 0.4466 | 0 | 1 |
| ***Panel G: Total Tax Credits (N = 367)*** | | | | | |
| Tax Expenditure | In dollars (millions) | 1,289.94 | 2,172.70 | 0 | 17,800 |
| IRS Budget | In dollars (millions) | 4,231.85 | 733.62 | 3,103.64 | 5,510.73 |
| Federal Non-Defense Outlay | In dollars (billions) | 1,892.88 | 553.06 | 1,118.30 | 2,897.51 |
| Gross Domestic Product (GDP) | In dollars (billions) | 11,700 | 1,438.94 | 8,870.70 | 13,300 |
| President | 1 = Democratic<br>0 = Republican | 0.5204 | 0.5003 | 0 | 1 |
| Senate | 1 = Democratic<br>0 = Republican | 0.4578 | 0.4989 | 0 | 1 |
| House | 1 = Democratic<br>0 = Republican | 0.3351 | 0.4727 | 0 | 1 |
| DumOver200 | 1 = AGI > $200,000<br>0 = AGI ≤ $200,000 | 0.2643 | 0.4416 | 0 | 1 |
| DumOver500 | 1 = AGI > $500,000<br>0 = AGI ≤ $500,000 | 0.2153 | 0.4116 | 0 | 1 |

*This table shows summary descriptive statistics across all the models examined in this study excluding Gambling Loss Deductions, Miscellaneous Deductions other than Gambling, and Tax Preparation Fees. Theses tax expenditure drivers are substantially a small component of the combined tax expenditures and are all virtually insignificant statistically in the empirical tests. President = dummy variable that equals one (zero) when a democrat (republican) is the president; Senate = dummy variable that equals one (zero) when a democrat (republican) is the majority leader of the senate; House = dummy variable that equals one (zero) when a democrat (republican) is the Speaker of the House of Representative: DumOver200 & DumOver500 are defined as dummy variable that equals one if the income group is $200,000 ($500,000) or more and zero otherwise.*

The combined tax expenditures for the period 1993 – 2011 amount to an average of $31. 4 billion with a minimum (maximum) of $1.588 ($236) billion and a standard deviation of $38.6 billion. During the same period, home mortgage interest deductions (charitable contributions) on the average amount to $16.1 ($6.7) billon with a minimum of $106.36 ($54.90) million; a maximum of $143 ($42.8) billion and standard deviation of $23 ($7.96) billion (see Table 1 for similar information on each of the remaining four individual expenditure drivers). It is worthy to note that home mortgage interest deductions (charitable contributions) account for approximately 50% (20%) of the mean and approximately 60% (18%) of the maximum amounts. The Internal Revenue Service (IRS) budget devoted to examination and enforcement during the sample period averaged $4.232 billion. The budget peaked in 2011 and reached its lowest in 1998, thus having a minimum (maximum) amount of $3.104 ($5.511) billion and standard deviation of $733 million. The Gross Domestic Product (GDP) during the period 1993 – 2011 averaged $11.7 trillion with a maximum of $13.3 trillion, minimum of $8.871 trillion and standard deviation of $1.439 trillion. Similarly, the mean

(standard deviation) of the Total Federal Non-Defense Outlay is $1.893 ($0.553) trillion with a minimum outlay of $1.118 trillion and maximum outlay of $2.898 trillion.

On the political variables, the president from the Democratic Party was in the White House on average for over half (0.520) of the sample period. However, on average, neither the Democratic Party nor the Republican Party controls either the Senate or the House of Representative for up to half of the time. This suggests that neither Party definitively has political control through legislative process on the IRS policy initiatives and priority ramifications. Notwithstanding, it must be mentioned that the occupant of the White House and the Party often have relative influence (compared to Congress) on the strategic direction of the IRS through, for example, nomination and appointment of IRS Commissioners.

Table 2 provides the correlation coefficients of the variables tested in the empirical model. With respect to the main explanatory variable of interest (TaxExp), its relationship to the dependent variable (ProbAudit) is positive and statistically significant at the 5% confidence interval in two (charitable contributions, miscellaneous deductions subject to 2% AGI limitation) of the six individual tax expenditure drivers. Further, the correlation between these two variables is negative and statistically significant at the 5% threshold in three (home mortgage interest deduction, medical and dental expenses deduction, unreimbursed employee business expenses) out of the six tax expenditure drivers. This variation in significance and signs suggest a non-identical effect of the IRS audit/examination responses to different tax expenditure drivers. This insight is explored further below in the presentation and discussion of the results from the regression models.

Table 2: Correlation Coefficients

| ***Panel A: Combined*** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1 ProbAudit | 1.00 | | | | | | | | |
| 2 TaxExpd | -0.0882*** | 1.00 | | | | | | | |
| 3 BudgNonDef | -0.0988* | -0.1636*** | 1.00 | | | | | | |
| 4 GDP | 0.1709*** | 0.1966*** | -0.8891*** | 1.00 | | | | | |
| 5 President | 0.1490*** | -0.1073** | 0.3920*** | -0.4897*** | 1.00 | | | | |
| 6 Senate | 0.1922** | -0.0091 | 0.0450 | -0.0254 | 0.1890*** | 1.00 | | | |
| 7 House | 0.2094*** | 0.0274 | 0.2047*** | -0.0291 | 0.2153*** | 0.5560*** | 1.00 | | |
| 8 DumOver200 | 0.4360*** | -0.1473*** | -0.1350*** | 0.1478*** | -0.0916* | 0.0193 | -0.0123 | 1.00 | |
| 9 DumOver500 | 0.4583*** | -0.2368*** | -0.1446*** | 0.1564*** | -0.1163** | 0.0093 | -0.0176 | 0.865*** | 1.00 |
| ***Panel B: Charitable Contributions*** | | | | | | | | | |
| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1 ProbAudit | 1.00 | | | | | | | | |
| 2 TaxExpd | 0.1146** | 1.00 | | | | | | | |
| 3 BudgNonDef | -0.0988* | -0.1518*** | 1.00 | | | | | | |
| 4 GDP | 0.1709*** | 0.1782*** | -0.8891*** | 1.00 | | | | | |
| 5 President | 0.1490*** | -0.1692** | 0.3920*** | -0.4987*** | 1.00 | | | | |
| 6 Senate | 0.1922*** | -0.0393 | 0.0450 | -0.0254 | 0.1890*** | 1.00 | | | |
| 7 House | 0.2094*** | -0.0179 | 0.2047*** | -0.0291 | 0.2153*** | 0.5560*** | 1.00 | | |
| 8 DumOver200 | 0.4360*** | 0.1819*** | -0.1350*** | 0.1478*** | -0.0919* | 0.0193 | -0.0123 | 1.00 | |
| 9 DumOver500 | 0.4583*** | 0.0650 | -0.1446*** | 0.1564*** | -0.1163** | 0.0093 | -0.0176 | 0.865*** | 1.00 |
| ***Panel C: home Mortgage Interest Deductions*** | | | | | | | | | |
| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1 ProbAudit | 1.000 | | | | | | | | |
| 2 TaxExpd | -0.1553*** | 1.000 | | | | | | | |
| 3 BudgNonDef | -0.0988* | -0.1095** | 1.00 | | | | | | |
| 4 GDP | 0.1709*** | 0.1309*** | -0.8891*** | 1.00 | | | | | |
| 5 President | 0.1490*** | -0.0814 | 0.3920*** | -0.4987*** | 1.00 | | | | |
| 6 Senate | 0.1922*** | -0.0138 | 0.0450 | -0.0254 | 0.1890*** | 1.00 | | | |
| 7 House | 0.2094*** | 0.0252 | 0.2047*** | -0.0291 | 0.2153*** | 0.5560*** | 1.00 | | |
| 8 DumOver200 | 0.4360*** | -0.2209*** | -0.1350*** | 0.1478*** | -0.0916* | 0.0193 | -0.0123 | 1.00 | |
| 9 DumOver500 | 0.4583*** | -0.3127*** | -0.1446*** | 0.1564*** | -0.1163** | 0.0093 | -0.0176 | 0.865*** | 1.00 |

| ***Panel D: Medical and Dental Expenses Deductions*** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1 ProbAudit | 1.00 | | | | | | | | |
| 2 TaxExpd | -0.3201*** | 1.00 | | | | | | | |
| 3 BudgNonDef | -0.0721 | -0.3099*** | 1.00 | | | | | | |
| 4 GDP | 0.1438*** | 0.3763*** | -0.8906*** | 1.00 | | | | | |
| 5 President | 0.1680*** | -0.1506*** | 0.3963*** | -0.5038*** | 1.00 | | | | |
| 6 Senate | 0.1953*** | 0.0589 | 0.0488 | -0.0286 | 0.1922*** | 1.00 | | | |
| 7 House | 0.2357*** | 0.0733 | 0.2075*** | -0.0359 | 0.2203*** | 0.5640*** | 1.00 | | |
| 8 DumOver200 | 0.4800*** | -0.5992*** | -0.1163** | 0.1304** | -0.0781 | 0.0229 | -0.0035 | 1.00 | |
| 9 DumOver500 | 0.4978*** | -0.5649*** | -0.1243** | 0.1375*** | -0.1027** | 0.0129 | -0.0077 | 0.853** | 1.00 |
| ***Panel E: Unreimbursed Employee Business Expenses*** | | | | | | | | | |
| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1 ProbAudit | 1.00 | | | | | | | | |
| 2 TaxExpd | -0.1935*** | 1.00 | | | | | | | |
| 3 BudgNonDef | -0.0988* | -0.1486*** | 1.00 | | | | | | |
| 4 GDP | 0.1709*** | 0.1732*** | -0.8891*** | 1.00 | | | | | |
| 5 President | 0.1490*** | -0.1024** | 0.3920** | -0.4987*** | 1.00 | | | | |
| 6 Senate | 0.1922*** | -0.0126 | 0.0450 | -0.0254 | 0.1890*** | 1.00 | | | |
| 7 House | 0.2094*** | 0.0028 | 0.2047*** | -0.0291 | 0.2153*** | 0.5560*** | 1.00 | | |
| 8 DumOver200 | 0.4360*** | -0.3359*** | -0.1350** | 0.1478*** | -0.0916* | 0.0193 | -0.0123 | 1.00 | |
| 9 DumOver500 | 0.4583*** | -0.3671*** | -0.1446*** | 0.1564*** | -0.1163** | 0.0093 | -0.0176 | 0.865*** | 1.00 |
| ***Panel F: Miscellaneous Deductions Subject to 2% AGI Limitation*** | | | | | | | | | |
| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1 ProbAudit | 1.00 | | | | | | | | |
| 2 TaxExpd | 0.2948*** | 1.00 | | | | | | | |
| 3 BudgNonDef | -0.2603*** | -0.0831 | 1.00 | | | | | | |
| 4 GDP | 0.2164*** | 0.1534** | -0.3807*** | 1.00 | | | | | |
| 5 President | 0.3060*** | 0.0675 | -0.8492*** | 0.3833*** | 1.00 | | | | |
| 6 Senate | 0.2941*** | 0.1058 | -0.8733*** | 0.5396*** | 0.7935** | 1.00 | | | |
| 7 House | 0.1851*** | 0.0905 | -0.4976*** | 0.4846*** | 0.3131*** | 0.5450*** | 1.00 | | |
| 8 DumOver200 | 0.4991*** | 0.4228*** | -0.0122 | 0.0121 | 0.0203 | 0.0161 | 0.0016 | 1.00 | |
| 9 DumOver500 | 0.5403*** | 0.2609*** | -0.0051 | -0.0051 | -0.086 | -0.0068 | -0.0007 | 0.876*** | 1.00 |
| ***Panel G: Total Tax Credits*** | | | | | | | | | |
| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1 ProbAudit | 1.00 | | | | | | | | |
| 2 TaxExpd | 0.0716 | 1.00 | | | | | | | |
| 3 BudgNonDef | -0.0988* | -0.2891*** | 1.00 | | | | | | |
| 4 GDP | 0.1709*** | 0.3101** | -0.8891*** | 1.00 | | | | | |
| 5 President | 0.1490*** | -0.0650 | 0.3920*** | -0.4987*** | 1.00 | | | | |
| 6 Senate | 0.1922*** | 0.0746 | 0.0450 | -0.0254 | 0.1890*** | 1.00 | | | |
| 7 House | 0.2094*** | 0.0915* | 0.2047*** | -0.0291 | 0.2153*** | 0.5560*** | 1.00 | | |
| 8 DumOver200 | 0.4360*** | -0.0047 | -0.1350*** | 0.1478*** | -0.0916* | 0.0193 | -0.0123 | 1.00 | |
| 9 DumOver500 | 0.4583*** | -0.0106 | -0.1446*** | 0.1564*** | -0.1163** | 0.0093 | -0.0176 | 0.865*** | 1.00 |

*This table shows the correlation coefficients of the variables used in our analysis. ProbAud = probability of audit which is the number of individual tax return audits in the IRS's fiscal year t for income group i divided by the number of individual tax returns received by IRS for the same income group i at the IRS fiscal year t. TaxExpd = tax expenditure for individual income group i at time t for each of the tax expenditure drivers. GDP = real gross domestic product at time t. President = dummy variable that equals one (zero) when a democrat (republican) is the president. Senate = dummy variable that equals one (zero) when a democrat (republican) is the majority leader of the senate. House = dummy variable that equals one (zero) when a democrat (republican) is the Speaker of the House of Representative. DumIncomeGrp = dummy variable that equals one if the income group is $200,000 ($500,000) or more and zero otherwise. *, **, *** indicate significance at 10, 5 and 1 percent levels respectively.*

## Regression Results

All regression results for the seven models are provided in Table 3. Panel A (B) of the table contains results for income group with $200,000 ($500,000) or more. For the respective tax expenditure drivers: Model 1 = Combined; Model 2 = charitable contributions; Model 3 = home mortgage interest deduction; Model 4 = medical and dental expenses deduction; Model 5 = unreimbursed employee business expenses; Model 6 = miscellaneous deductions subject to 2% AGI limitation; and Model 7 = total tax credits.

We first examine the combined model (Model 1) which is the aggregate of tax expenditures amounts across the ten tax expenditure drivers (refer to introduction for the list). TaxExpd was not significant in both income groups for Model 1. This may suggest that the probability of audit/examination of individual returns by IRS does not respond to the magnitude or direction of tax expenditures across all the tax expenditure drivers examined in this study. However, further analysis of the individual tax expenditure driver shows

the differentiated effect of each of the tax expenditures drivers' vis-à-vis their ability to drive IRS audit/examination exercises. For both income groups and across all the tax expenditures drivers, the coefficients of the IRSbdgt are positive and significant. This suggests that in years when the IRS budget on enforcement is high, the agency's audit activities are pronounced within the context of individual taxation. A Similar trend persists with respect to economic buoyancy as measured by the GDP coefficients.

Table 3: Fixed-Effect Regression with ProbAud as the Dependent Variable across all Models

| Variable | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| ***Panel A: Fixed-Effect Regressions of Income Group with $200,000 Adjusted Gross Income (AGI) or More*** | | | | | | | |
| TaxExpd | 5.140 | -2.220* | 1.410** | 3.620 | 5.290 | -2.320** | -6.980 |
| | (1.26) | (-1.96) | (2.49) | (0.18) | (1.50) | (-2.07) | (-0.48) |
| IRSbdgt | 1.527*** | 1.581*** | 1.372** | 1.587*** | 1.484*** | 10.052** | 1.350*** |
| | (2.71) | (2.80) | (2.44) | (4.16) | (2.63) | (2.38) | (2.61) |
| GDP | 9.850*** | 9.130*** | 9.790*** | 1.080*** | 1.030*** | 4.830 | 6.250*** |
| | (4.60) | (4.31) | (4.70) | (6.54) | (4.80) | (0.57) | (3.16) |
| President | 2.375*** | 2.197*** | 2.400*** | 1.621*** | 2.288*** | 3.570*** | 1.811*** |
| | (7.69) | (7.31) | (7.91) | (8.03) | (7.61) | (3.71) | (6.62) |
| Senate | 0.5662* | 0.5055* | 0.6139** | 0.4590** | 0.4606 | 1.623 | 0.5233* |
| | (1.86) | (1.68) | (2.04) | (2.28) | (1.56) | (1.65) | (1.94) |
| House | 0.3154 | 0.1329 | 0.3849 | 0.2524 | 0.4013 | 0.3729 | -0.0609 |
| | (0.91) | (0.38) | (1.11) | (1.09) | (1.15) | (0.66) | (-0.19) |
| LagTaxExpd | -6.250 | 1.850* | -1.590*** | -4.370** | -6.790 | 1.510** | -2.720 |
| | (-1.58) | (1.80) | (-2.91) | (-2.06) | (-1.97)* | (1.98) | (-0.19) |
| IntTaxExpd | 2.880 | 1.050 | -1.680 | -4.300 | -1.130 | 4.190*** | 3.290*** |
| | (1.32) | (1.33) | (-0.41) | (-0.86) | (-0.22) | (3.28) | (9.73) |
| R-sq. | 0.2069 | 0.2085 | 0.1756 | 0.3550 | 0.1870 | 0.3442 | 0.4563 |
| N | 367 | 367 | 367 | 355 | 367 | 176 | 367 |
| ***Panel B: Fixed-Effect Regressions of Income Group with $500,000 Adjusted Gross Income (AGI) or More*** | | | | | | | |
| TaxExpd | 4.440 | -2.400** | 1.380** | 3.580 | 5.330 | -2.090** | -7.870 |
| | (1.11) | (-2.13) | (2.46) | (0.18) | (1.51) | (-2.08) | (-0.56) |
| IRSbdgt | 1.434** | 1.551*** | 1.377** | 1.583*** | 1.504*** | 9.940** | 1.158** |
| | (2.57) | (2.75) | (2.44) | (4.13) | (2.66) | (2.39) | (2.35) |
| GDP | 8.990*** | 9.040*** | 9.740*** | 1.060*** | 1.000*** | 4.380 | 5.590*** |
| | (4.21) | (4.28) | (4.65) | (6.27) | (4.67) | (0.52) | (2.96) |
| President | 2.278*** | 2.158*** | 2.400*** | 1.627*** | 2.300*** | 3.415*** | 1.627*** |
| | (7.42) | (7.16) | (7.91) | (8.05) | (7.66) | (3.59) | (6.20) |
| Senate | 0.6455** | 0.5363* | 0.6155** | 0.4635** | 0.4767 | 1.665* | 0.5420** |
| | (2.14) | (1.78) | (2.04) | (2.30) | (1.62) | (1.71) | (2.12) |
| House | 0.2658 | 0.1249 | 0.3764 | 0.2375 | 0.4019 | 0.4278 | -0.0050 |
| | (0.77) | (0.35) | (1.09) | (1.02) | (1.15) | (0.77) | (-0.02) |
| LagTaxExpd | -5.390 | 2.020* | -1.570** | -4.310** | -6.730* | 1.640** | -2.590 |
| | (-1.38) | (1.95) | (-2.88) | (-2.03) | (-1.95) | (2.20) | (-0.19) |
| IntTaxExpd | 1.290*** | 1.650* | 2.960 | -3.700 | 2.560 | 4.520*** | 4.220*** |
| | (3.13) | (1.81) | (0.02) | (-0.11) | (0.87) | (3.88) | (11.81) |
| R-sq. | 0.3463 | 0.2696 | 0.1803 | 0.3503 | 0.2081 | 0.4863 | 0.5217 |
| N | 367 | 367 | 367 | 355 | 367 | 176 | 367 |

*This table shows the regression coefficients equation 1. For respective tax expenditure drivers, Model 1 = Combined ; Model 2 = charitable contributions; Model 3 = home mortgage interest deductions; Model 4 = medical and dental expenses deductions; Model 5 = unreimbursed employee business expenses; Model 6 = miscellaneous deductions subject to 2% AGI limitation; and Model 7 = total tax credits. TaxExpd = tax expenditure for individual income group i at time t for each of the tax expenditure drivers; IRSbdgt = IRS budget in its fiscal year t, normalized by overall federal non-defense outlay: President = dummy variable that equals one (zero) when a democrat (republican) is the president; Senate = dummy variable that equals one (zero) when a democrat (republican) is the majority leader of the senate; House = dummy variable that equals one (zero) when a democrat (republican) is the Speaker of the House of Representative: LagTaxExpd = TaxExpd in the previous year: IntTaxExpd = variable interacting TaxExpd with DumIncomeGrp; where DumIncomeGrp is dummy variable that equals one if the income group is $200,000 ($500,000) or more and zero otherwise. *, **, *** indicate significance at 10, 5 and 1 percent levels respectively*

On the political variables, only the President is positive and significant in both income groups. The Senate is positive and significant at the >$500,000 income level but only positively significant at the 10% threshold for >$200,000 income level. The House is positive but not significant at both income levels. These results imply that IRS audit/examination activities are higher in years when a Democratic President is in the White House and when the Democratic Party controls the United States Senate. Interestingly, the House of

Representatives has no effect on IRS audit activities irrespective of the party (Democratic or Republican) in control of that lower chamber. This insight is remarkable in that statutorily, the House is generally the initiator of budgetary dynamics as it relates to taxation. However, it may be believed that the Senate is a more deliberative body with potentially bigger clout to shape statutory and policy responses of agencies such as the IRS. In 2012 for example, the majority of lobbying activities/money go to Senate Committees and politicians relative to the House according to the Center for Responsive Politics (2012, https://www.opensecrets.org/lobby/lobby_contribs.php?cycle=2012&type=C) statistics. This might explain the value placed on the Senate compared to the House by the lobbying community. We must acknowledge that while there might not be pronounced individual-level political lobbying activities on the IRS when it comes to individual taxation, it is a valid expectation that corporate lobbying activities could shape the overall audit/enforcement activities of the agency (i.e. complementarity effect). However, if there is a 'substitution effect', then the audit/enforcement landscape becomes more interesting. We leave that to future research.

On the six respective tax expenditure drivers, the findings are mixed. For both categories of income levels, only home mortgage interest deductions (Model 3) is positive and significant. Charitable contributions (Model 2) and miscellaneous deductions subject to 2% AGI limitation (Model 6) are all negative and significant at the conventional thresholds. Since charitable deductions are constrained by income level as well as type of donations and recipient charities (50%, 30% and 20%), one interpretation of our findings on charitable donations is that more IRS attention needs to be devoted to the income audits and not necessarily the magnitude of charitable deductions as the former might be driving the latter. This becomes important if one considers the fact that in 2011, the Joint Committee on Taxation notes that charitable deduction is a top 10 driver of the federal tax expenditures. Therefore, the IRS may need to re-examine its audit mechanisms across all income groups when it comes to charitable giving. In another analysis, we include all the tax expenditure drivers in a single regression model, our results (not reported here) remain unchanged.

Medical and dental expense deductions (Model 4); unreimbursed employee business expenses (Model 5); and total tax credits (Model 7) are not significant at the conventional 5% confidence threshold. While some inferences may be speculated on those models at the margin, we will caution that the lack of statistical significance suggests that no strong conclusions can be drawn therefrom.

The above results suggest that it is only in the case of home mortgage interest deductions that IRS audit/examination activities increase in years when the associated tax expenditures increase. In the case of charitable contributions and miscellaneous deductions subject to 2% AGI limitation, IRS audit/examination activities increase in years when those tax expenditures are trending downward even after controlling for prior year tax expenditures in the same model. One interpretation could mean that IRS is aggressive in its enforcement activities but plausibly misplacing its budgetary priorities on these two cost drivers mainly because of the conventional belief that individual taxpayers have the incentives to misreport on them. This becomes tenable with the findings that for both income levels, IRSbdgt is positive and significant across all models. A similar trend subsists with respect to GDP which is positive and highly significant across all the models (excepting model 6). We note that the opposite sign between these two tax expenditure drivers and the GDP is also worth mentioning. It shows that in years where the economy is showing slower strength, charitable deductions and the other driver are high. This may explain the rationale for the plausible aggressiveness of the IRS on those three tax expenditure drivers.

Further, in order to determine whether the IRS pays attention to varying income levels in its audit/examinations activities, we interact TaxExpd with the DumIncomeGrp for each of the seven models (see equation 1 above). Under the >$500,000 income category, four out of the seven models are positive and significant. These are the combined model (Model 1); charitable contributions (Model 2); miscellaneous deductions subject to 2% AGI limitation (Model 6); and total tax credits (Model 7). It implies

that the IRS probability of audit increases as the income level increases. A similar pattern exists within the >$200,000 income category. Hence the IRS follows the money!

Additional Analysis

The above regression analyses are based on fixed effect regressions. Using a random effect model, one will assume that all the income groups are the same in their tax expenditure drivers with respect to the probability of audit and other explanatory variables. In econometric terms, it is assumed that all the income groups have a common mean value for the intercept. As this is not likely to be the case practically, it is important to account for the potential unobservable effects that may be unique to each group (heterogeneity) but are time-invariant. The random effect model assumes that the unobserved heterogeneity in individual income groups is uncorrelated with the explanatory variables. Hence the justification for the use of the fixed effect regression, as doing otherwise can accentuate the omitted variable bias (for more see Cameron et al, 2011). Notwithstanding, we performed random effect analysis in order to rule out econometric bias in our analyses and results which involves correcting for serial correlation; otherwise the error terms will no longer be independent and identically distributed with a mean of zero (i.e. nonspherical error variance). To do this, we run each of the seven models with both fixed effect and random effect regression analyses so as to choose the appropriate analysis using the Hausman Test. It must be noted that generally, coefficient estimates from fixed effect regressions are considered more persuasive than those of the random effects regressions (Wooldridge, 2010).

The null in Hausman Test is that there is no difference between both models ($H_0$: $Cov(u_i,X_{it})=0$). Failure to reject the null means that the difference in coefficients is not systematic, thus implying that both the random effect and fixed effect models are consistent. However, the former is recommended because it has smaller variance. The results from the Hausman Test reveal (results suppressed for parsimony) that for the income group of $200,000 or more, the null for each of the seven models is rejected confirming that fixed effect regression analyses are appropriate. With respect to the $500,000 or more income group, only two (model 3, & 6) of the seven models suggest using the random effect regression analysis. However, since the magnitude and signs of the coefficients as well as the statistical significance are not substantively inconsistent with the reported fixed effect regression analyses, we can report that the overall tenor of the findings remains substantially similar.

Further, we employ different scalar for the IRS budget to ensure that the results are not sensitive to scalars used. Specifically, we use total federal outlay as opposed to total non-defense outlay to scale the IRS budget (we also run the regression without scaling the budget numbers). The results still hold. Also, nominal (and not the real) numbers for the gross domestic product are used. The results remain unchanged.

We also investigate the possibility that the IRS budget in one year may affect the probability of audit in the following year by introducing a lagged IRS budget variable in the models (thanks to the anonymous referee suggestion). Results not reported here for parsimony (but available upon request) remain qualitatively unchanged. On one hand, the construction of our ProbAud variable ties our model construction to fit current year IRS budget resources. On the other hand, due to resource constraints faced by the agency as well as the magnitude and complexities of its enforcement responsibilities, it may be somewhat farfetched to expect that it (IRS) will carry enforcement budget forward to pursue new potential audit cases arising from noncompliance, especially given that the agency is funded by the annual congressional budget procedure referred to as the appropriation process. Therefore, we choose to report results from models using current year IRS budget resources as this is considered more descriptive of the IRS budget dynamics and priorities. Overall, the findings of the study reveal that calculated adjustments to IRS enforcement activities can be extraordinarily important in constraining the growth of tax expenditures in the U.S., especially if one considers the assertion of Kleeper and Nagin (1989) that, "…taxpayers will respond to marginal adjustments in enforcement policy". Getting rid of all or some tax expenditures does not readily place the

savings in the treasury coffers, especially when put within the context of the opportunity cost or benefit forgone if a tax expenditure is outlawed. Therefore, a targeted approach to IRS enforcement activities in the individual taxation system can curb the avoidance (and probable evasion) that may abound in the tax expenditures regime. Specifically, within the individual income taxation context, the current study shows that IRS enforcement activities (through its audit/examinations) need, and can be improved, to minimize tax avoidance strategies of individual taxpayers as reflected in related tax expenditures.

## CONCLUSION

This study examines the Internal Revenue Service (IRS) audit/examination activities of individual tax returns within the context of tax expenditures arising from individual taxation. We find that while the probability of IRS audit increases as the agency's budget on enforcement activities increases, tax expenditures do not appear to prompt IRS enforcement activities in some of the tax expenditure drivers. Specifically, it is only the home mortgage interest deduction as a tax expenditure driver that influences heightened IRS audit/examination. Other tax expenditure drivers namely: charitable contributions and miscellaneous deductions subject to 2% AGI limitation, arguably imply that IRS budgetary resource-allocation to enforcement activities, as a driver of the agency's audit probability, has a conflicting signal and an inconsistent effect as reflected in the magnitude and direction of those tax expenditure drivers. The magnitude or direction of the remaining tax expenditure drivers investigated in this study does not influence or impact IRS audit/examination activities. Additionally, individual taxpayers' income level generally influences IRS enforcement activities suggesting that the agency follows the money. We also document a strong relationship between the Party that occupies the White House or controls the U.S. Senate but not the House of Representative, and the probability of IRS audit activities. Our results are robust to the choice of regression analyses employed (fixed versus random effects) and difference measures or scales of some explanatory variables examined in the study.

Overall, our results are consistent with the view that individual taxpayers' avoidance activities, as manifested in tax expenditures, can be curbed with appropriately targeted IRS audit/examination responses. This is important if one considers the reality that there is no political will on the part of Washington to legislatively or by executive leadership constrain the growth of tax expenditures, in part, because different political constituencies are passionately connected to different tax expenditure drivers. Results from the current study contribute to the literature in understanding the response of IRS audit/examination activities to the magnitude and direction of individual tax expenditure drivers within the context of individual income taxation.

As indicated above, this study has stimulated some intellectual insights. Notwithstanding, its analyses and findings must be interpreted with certain caveats in mind. For example, this study focuses on deductions and credit and not so much on income induced tax expenditure drivers. Also it does not get into the realm of negative tax expenditures. We opine that these are fertile research grounds for future studies, with the findings of our study providing a starting leverage point. Further, there is always the likelihood of omitted variable bias in virtually all empirical designs. We attempt to address this concern econometrically by using the fixed effect regression analyses. However, this cannot be a sufficient remedy conceptually. In addition, our inability to find a positive relationship between IRS audit and tax expenditure drivers (such as charitable contribution) consistent with conventional expectations require further research, as such a worthy research effort could potentially ignite legislative or tax administration changes on the dynamics of charitable contributions. Further, there could be a potential endogeneity bias between our dependent measure (ProbAud) and our main independent variables of interests (TaxExpd and IRSbdgt). We attempt to attend to this by including lag variable of IRS budget, but our findings remain unchanged. In addition, we are not aware of a compelling theoretical justification for a reverse relationship between ProbAud and TaxExpd. We look to future research for further investigation.

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## ACKNOWLEDGEMENT

The authors gratefully acknowledge comments and constructive critiques from colleagues at the various presentation forums where the study was presented. We are also grateful to the editor and the two anonymous reviewers for the helpful comments provided during the review process.

## DATA AVAILABILITY

Data are available from public sources indicated in the text.

## DISCLOSURES

The authors have no financial arrangements that might give rise to conflicts of interest with respect to the research reported in this paper.

## BIOGRAPHY

Dr. Akinloye Akindayomi (who is the lead and corresponding author) is an Associate Professor of Accounting, at the Robert C. Vackar College of Business and Entrepreneurship, The University of Texas Rio Grande Valley (UTRGV). He can be contacted at: 1201 West University Drive, Edinburg, Texas 78539-2999, U.S.A. Phone: (956) 665 – 7842. Email: akinloye.akindayomi@utrgv.edu

Dr. Gideon. T. Akinleye is a Senior Lecturer at the Ekiti State University, Ado-Ekiti, Nigeria. He is also the Chair and Head of the Accounting Department.

Adeduro A. Ogunmakin is a lecturer at the Ekiti State University, Ado-Ekiti, Nigeria