Information Reporting and Tax Compliance: An Investigation Using Individual TCMP Data

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Empirical studies of tax compliance have typically used data aggregated by audit class to analyze the impact of federal income tax and enforcement structures on the individual's compliance decision. This paper uses micro data from individual tax returns audited during the 1971 cycle of the Internal Revenue Service's (IRS) Tax Compliance and Measurement Program to reexamine the determinants of tax compliance. IRS data have also consistently revealed marked differences in voluntary reporting rates across different types of income. These differences may be driven by differential information reporting requirements. Hence, separate compliance equations are estimated for income subject to third-party information reporting and for all other income. The results show third-party information reporting to be an effective deterrent to noncompliance, but cast doubt on the presumption that lower marginal tax rates led to greater compliance. (JEL H2)

I. Introduction

The economics literature on compliance has proliferated over the two decades following the seminal contribution of Allingham and Sandmo [1972]. Data constraints, however, have restricted most empirical studies to using aggregate data. In addition, few studies differentiate between income sources such as wages, capital gains, rents, and so forth, even though noncompliance rates vary considerably across the principal categories of income.

Compliance may vary across income sources due in part to differential information reporting requirements. While it has long been noted that compliance is greater on income subject to third-party information reporting, few studies have attempted to verify the existence of a causal relationship. Furthermore, the empirical analyses in these studies are based on compliance data on audit classes, rather than on individual taxpayer reports. Since information reporting has assumed the central role that audits once played in the Internal Revenue Service's (IRS) enforcement strategy, its impact on compliance merits further investigation.

This study uses micro data from the 1971 examination cycle of the Tax Compliance and Measurement Program (TCMP)[1] to reexamine the factors influencing total income tax

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[1]The TCMP audits a stratified random sample of about 50,000 individual income tax returns from the filing population once every three years. The filing population is divided into return classes on the basis of the level and type (non-business, farm and non-business, non-farm) of income. The return classes are then further subdivided into strata on the basis of characteristics of the return, such as... (continued)

noncompliance.[2] Total income is then divided into two categories based upon whether or not the source of income was subject to third-party information reporting. Compliance equations for the two types of income are estimated separately. Though the data set employed is dated, it appears to be the only publicly available source of micro data on tax compliance.

The paper is organized in the following manner. The next section provides a brief literature review. Section III discusses the specification of the compliance equations, characteristics of the data set, and estimation issues. Regression results are presented in Section IV, and a summary and conclusion are provided in Section V.

II. Prior Research

Theoretical models typically employ either an expected utility or a game-theoretic framework to analyze the individual's compliance response to factors such as the marginal tax rate, income, penalties, and the probabilities of detection [Allingham and Sandmo, 1972; Srinivasan, 1973; Yitzhaki, 1974; Koskella, 1983; Greenberg, 1984; Reinganum and Wilde, 1985, 1986, 1988; Erard and Feinstein, 1994]. Regardless of the paradigm employed, the predictions of these models are plagued by ambiguities and are extremely sensitive to the underlying assumptions. In these circumstances, empirical research is of crucial importance in providing guidance to the appropriate path for future policies.

Unfortunately, empirical research has been constrained by limited access to data. Due to privacy and security considerations, the IRS has been very cautious about releasing compliance data to the general research community. The few empirical studies that employ data collected from actual IRS audits typically use TCMP data that have been aggregated either by audit class or zip code rather than individual level data.[3]

These studies present authors with conflicting evidence as to the relative importance of sanctions, audit rates, and marginal tax rates on tax compliance. In general, sanctions are negatively related to evasion in theoretical models of tax compliance, but are often statistically insignificant in empirical studies [Allingham and Sandmo, 1972; Witte and Woodbury, 1985]. Audit rates are significant for some, but not all audit classes [Dubin and Wilde, 1988], and the relationship between the marginal tax rate and level of compliance is the subject of much debate [Yitzhaki, 1974; Clotfelter, 1983; Graetz and Wilde, 1985; Slemrod, 1985; Dubin et al., 1987, 1990].

The literature cited above also does not distinguish between income obtained from different sources. Theoretical models of an individual's decision to evade income taxes typically assume that income is derived from a single source. Accordingly, the taxpayer has a single decision to make: the amount of income to underreport. Similarly, most empirical studies have focused on the determinants of total income noncompliance.

In practice, however, noncompliance rates vary considerably across the principal categories of income. Compliance may vary by source of income in part due to differences

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[1](continued) ...the number of exemptions claimed and whether or not the taxpayer claimed the standard deduction. The proportion of filed returns selected for audit varies by strata.

[2]The author thanks Susan Long and TRAC Reports Inc. at Syracuse University for generously providing these data.

[3]Exceptions include Clotfelter [1983] and Tauchen et al. [1989]. Both of these studies employed individual TCMP data.

in information reporting requirements. Long and Swingen [1989] argue that third party information reporting serves two roles. Aside from increasing the taxpayer's perceived probability of detection, information reporting also reduces the taxpayer's computational and record-keeping burden. Using 1982 and 1985 TCMP data aggregated by audit class, they find that while information reporting reduced underreporting errors, it failed to have a statistically significant effect on overreporting errors in all but one class.

Klepper and Nagin [1989] offer the only study that presents a theoretical model of line item noncompliance.[4] They focus attention on how the taxpayer's compliance decision on each line item responds to the differential risks of evasion on that line item being detected. Klepper and Nagin [1989] contend that underreporting is easiest to establish on income line items subject to third party information reporting, and that misreporting on subtraction items is easier to establish than misreporting on income items not subject to information reporting. Using compliance data from the 1982 TCMP examination cycle, they find support for these hypotheses. However, their sample is rather small, containing only aggregate data by audit class for each line item. Hence, further empirical research would be helpful in refining the author's understanding of the determinants of compliance and the impact of information reporting. The remainder of this paper is devoted to such an effort.

III. Empirical Work

Specification of the Estimated Compliance Equations

Standard theoretical models of compliance assume that the amount of income reported by the taxpayer is a function of true income and the tax and enforcement structures. Such a model may also be expressed in the following manner:

reported income = (true income, marginal tax rate, perceived probability of detection, penalties for noncompliance, socioeconomic and demographic characteristics)

Equation (1)

Accordingly, the first equation estimated (1) has as its dependent variable misreported taxable income, defined as the difference between "corrected" (as determined by the TCMP auditor) and reported levels of taxable income.[5] With regard to the independent variables, data on penalties were not available. The choice of other explanatory variables is informed by prior theoretical and empirical work on tax evasion Variable definitions are provided in Table 1.

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[4]The term "line item" refers to all income and subtraction items listed separately on the various lines of a tax return.

[5]The dependent variable, UTAXINC, captures both underreporting and overreporting errors. The IRS may be less eager to detect the latter type of error, leading to an upward bias in the observed dependent variable which would affect the coefficients as well as the R^2. The same qualification should also be made with regard to estimating (2) and (3).

$$\begin{aligned} \text{UTAXINC}_i = {} & \alpha_0 + \alpha_1 \text{AGIC}_i + \alpha_2 \text{MTRR}_i + \alpha_3 \text{NUMSOURC}_i \\ & + \alpha_4 \text{FARM}_i + \alpha_5 \text{SOLEPROP}_i + \alpha_6 \text{WAGAGI}_i \\ & + \alpha_7 \text{INTDAGI}_i + \alpha_8 \text{MARJOINT}_i + \alpha_9 \text{TAXADVIS}_i \\ & + \alpha_{10} \text{NOSCHD}_i + \alpha_{11} \text{NOSCHE}_i + \epsilon_i \ . \end{aligned} \tag{1}$$

TABLE 1

List of Variable Definitions

Variable	Definition
UTAXINC	The difference between the corrected (auditor adjusted) and voluntarily reported amounts of taxable income
AGIC	Corrected amount of adjusted gross income
MTRR	Marginal tax rate based on reported income
MTRC	Marginal tax rate based on corrected income
NUMSOUR	Number of sources from which the taxpayer derives income
FARM	Dummy variables for farm returns
SOLEPROP	Dummy variable for non-farm business returns
WAGAGI	Ratio of corrected wages to corrected AGI
INTDAGI	Ratio of corrected interest and dividend income to corrected AGI
MARJOINT	Dummy variable for married couples filing jointly
TAXADVIS	Dummy variable for returns prepared by a tax preparer
NOSCHD	Dummy variables for returns that have no Schedule D income (i.e., income from capital gains)
NOSCHE	Dummy variable for returns that have no Schedule E income (i.e., income from rents and royalties)
UWID	The difference between the corrected and reported sums of wage, interest, and dividend income
UNONWID	The difference between the corrected and reported sums of all income other than wages, interest, and dividends
WIDC	Sum of corrected wages, interest, and dividends
NONWIDC	Corrected sum of all income other than wages, interest, and dividends

The auditor-adjusted amount of Adjusted Gross Income (AGIC) is used as a measure of true income to examine the relationship between income and noncompliance. Most theoretical models predict that the magnitude of underreporting will increase with income; hence, α_1 is expected to be positive.

Since the federal income tax is progressive in structure, the perceived marginal tax is not independent of the income-reporting decision. Fortunately, the marginal tax rate based on the taxpayer's reported income can be calculated by using the tax return data and the 1971 tax rate schedules.[6] Clearly, the tax rate is endogenous when it is based on reported income.

The responsiveness of compliance to changes in the marginal tax rate is a national focus of attention. Theoretical predictions about the relationship between the marginal tax rate and evasion, however, are highly sensitive to assumptions about risk aversion and the specification of the tax and enforcement structures. For example, the Allingham and Sandmo [1972] model found that the effect of an increase in the tax rate is ambiguous, given decreasing absolute risk aversion and a penalty levied on underreported income. On the other hand, Yitzhaki [1974] demonstrated that if the penalties were modelled as a function of evaded taxes (as is the case in the U.S.) rather than evaded income, compliance would increase with the tax rate.

The IRS believes that noncompliance is more prevalent among individuals with business income from farms or sole-proprietorships, as such individuals have superior opportunities to underreport income and overstate deductions. Hence, one would expect the coefficients of FARM and SOLEPROP to be positive.

The perceived probability of detection has been the focus of much attention in both the theoretical and empirical literature on tax compliance. While it is recognized that the perceived probability of detection may depend upon a myriad of factors, empirical studies typically use actual audit rates to proxy the perceived susceptibility to detection. This is tantamount to assuming that taxpayers have perfect information about their relevant detection probabilities. However, the IRS typically does not publicize this information,[7] and survey evidence appears to indicate that taxpayers systematically overestimate their likelihood of being audited.[8] Further, it is likely that the perceived probability of detection is influenced by types of income received, as surveys have shown that taxpayers believe (and popular tax guides say) that specific characteristics of their return may increase the likelihood of an audit.

In the absence of a direct measure of the perceived probability of detection, a number of variables (other than the actual audit rate) are used to proxy the perceived probability of detection. The rationale is that it is likely that taxpayers in 1971 had little information

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[6]The computed marginal tax rate measures the change in the sum of the federal income and self-employment income tax liability in response to an additional dollar of gross income, assuming that the composition of taxable income does not change when gross income changes.

[7]Since the mid 1970s, the *Annual Reports of the Commissioner of Internal Revenue* do provide some information about mean audit rate for all taxpayers by state. More recently, the Annual Reports have also begun to provide audit information by income class for the national filing population but, again, these represent average probabilities for each broad income classification.

[8]In a 1980 survey carried out by Aitken and Bonneville, respondents were asked to estimate the audit rate per return at their own income level. Estimates ranged from 0 to 50 percent with a mean rate of 43 percent. This is substantially higher than the actual audit rates for that period. According to the 1980 *Annual Report of the Commissioner of Internal Revenue* [Internal Revenue Service, 1980], audit rates for individual income tax returns ranged from a low of 1.14 percent for non-business returns with reported income under $10,000 to a high of 8.74 percent for non-business returns with reported income greater than $50,000. The average audit rate for all returns filed in 1980 was 2.02 percent.

about actual IRS audit selection rules. As Clotfelter [1983, p.366] notes, "The IRS had only begun using audit selection formulas in 1969, so taxpayers apparently knew less about the odds of being audited than is the case today."

Hence, NUMSOURC, WAGAGI, and INTDAGI are used to capture the impact of differential probabilities of detection across taxpayers. NUMSOURC measures the number of sources from which the taxpayer derives income. Taxpayers' perceived likelihood of audit may increase with the number of sources of income if taxpayers believe that the IRS is more likely to audit complex returns reporting multiple sources of income. As a result, compliance may increase with the number of sources of income. However, compliance costs (time and effort spent in understanding the tax laws and filling out the return) also increase with the number of sources of income, and these higher compliance costs may hinder compliance. Thus, the sign of α_3 is not clear, *a priori*. If the deterrence effect of increased susceptibility to audit is greater than the compliance cost effect, then α_3 will be negative.

As stated earlier, compliance may vary with the type of income in part because information requirements and noncompliance opportunities vary by source of income. In 1971, information reporting was required only for wages, interest, and dividend income. Wages were also subject to withholding, while interest and dividend income were only subject to information reporting. Total noncompliance is expected to decrease as the percentage of income subject to third-party reporting increases, since information reporting increases the probability of detecting noncompliance. The two variables used to study the impact of information reporting on noncompliance are WAGAGI and INTDAGI, and the coefficients of both these variables are expected to be negative.

While third-party information reporting increases the visibility of income to the IRS, it also reduces the taxpayer's compliance costs. Record-keeping and calculation burdens are minimal for income from wages which are subject to withholding and information reporting. Income from capital gains, rents and royalties, and self-employment lie at the other end of the spectrum. In order to compute the correct tax liability on income from such sources, taxpayers must keep detailed and careful records of transactions, understand complex regulations, and perform burdensome calculations. High compliance costs may lead to greater noncompliance on income from such sources. Two dummy variables, NOSCHD and NOSCHE, are used in the empirical analysis to proxy the impact of higher compliance costs on compliance.[9] If noncompliance increases with the costs of compliance, α_{10} and α_{11} will be negative.

The inclusion of MARJOINT and TAXADVIS were suggested by previous studies of tax compliance. α_8—the coefficient of MARJOINT—is expected to be negative, but it is not clear *a priori* what sign the coefficient of TAXADVIS, α_9, will take.

Equations (2) and (3)

In 1971, the percentage of returns in the sample that underreported a given source of income ranged from 1.98 for wage income to 56.66 for income from sole proprietorships.

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[9]Slemrod [1989] examined the relationship between compliance costs and certain sources of income. He found that income from self-employment and income from capital gains were significantly and positively correlated with both own time spent and the amount of professional assistance purchased, while Schedule E income was significantly and positively correlated with only the latter measure of compliance costs.

It may be argued that observed differences in compliance rates are driven by differential information reporting requirements. This provides the rationale for dividing the various sources of income into two broad groups based upon whether or not they were subject to third-party information reporting.

Recall that in 1971, the only sources of income subject to information reporting were wages, interest, and dividends. Hence, the dependent variable in (2) is the difference between the auditor-adjusted and the voluntarily reported sums of wage, interest, and dividend income. The dependent variable in (3) is the difference between the auditor-adjusted and voluntarily reported sums over all income other than wages, interest, and dividends.

$$\begin{aligned} \text{UWID}_i = {} & \beta_0 + \beta_1 \text{WIDIC}_i + \beta_2 \text{NONWIDIC}_i + \beta_3 \text{MTRRi} \\ & + \beta_4 \text{NUMSOURC}_i + \beta_5 \text{FARM}_i + \beta_6 \text{SOLEPROP}_i + \beta_7 \text{MARJOINT}_i \\ & + \beta_8 \text{TAXADVIS}_i + \beta_9 \text{NOSCHD}_i + \beta_{10} \text{NOSCHE}_i + \mu_i , \end{aligned} \tag{2}$$

$$\begin{aligned} \text{UNONWID}_i = {} & \gamma_0 + \gamma_1 \text{WIDIC}_i + \gamma_2 \text{NONWIDC}_i + \gamma_3 \text{MTRR}_i \\ & + \gamma_4 \text{NUMSOURC}_i + \gamma_5 \text{FARM}_i + \gamma_6 \text{SOLEPROP}_i + \gamma_7 \text{MARJOINT}_i \\ & + \gamma_8 \text{TAXADVIS}_i + \gamma_9 \text{NOSCHD}_i + \gamma_{10} \text{NOSCHE}_i + \delta_i . \end{aligned} \tag{3}$$

Note that most of the explanatory variables in (1) are also included as right-hand side variables in (2) and (3). In order to analyze the response of compliance to changes in income, WIDC and NONWIDC are used instead of AGIC. Based on a theoretical model outlined by Kamdar [1993], underreporting of income from any source is expected to increase with income from either source. Hence, the coefficients of WIDC and NONWIDC are expected to be positive in (2) and (3). Estimation of the preceding equations will reveal whether these theoretical predictions are supported by the empirical evidence. Sample statistics for the variables in the above specifications are displayed in Table 2.

Data

Due to budgetary constraints, the 1971 TCMP examination cycle did not audit returns in all audit classes. Instead, this cycle concentrated on low-income business returns and low- and middle-income non-business returns. As part of a panel study the IRS was interested in undertaking, this examination cycle also selected for audit the 1971 tax returns of a random subsample of taxpayers whose returns were audited during the prior TCMP cycle. The data used in the paper draw from this TCMP panel study and contains 1971 tax return information for 2,047 of the 2,171 taxpayers who were subjected to TCMP audits in both 1969 and 1971. It is important to note, however, that within each

audit class the returns were selected independently of the extent of their noncompliance in 1969. Hence, there is no sample selection problem.[10]

TABLE 2

Sample Statistics

Variable	Mean	Standard Deviation
UTAXINC	535.695	1665.490
AGIC	9956.840	7609.480
WAGAGI	0.587	0.499
INTDAGI	0.117	0.769
NUMSOURC	3.072	1.358
MTRR	0.149	0.082
MTRC	0.154	0.080
FARM	0.180	0.384
SOLEPROP	0.270	0.444
TAXADVIS	0.730	0.443
MARJOINT	0.799	0.400
NOSCHD	0.775	0.417
NOSCHE	0.817	0.387
UWID	19.170	438.822
UNONWID	512.551	1834.040
WIDIC	7314.680	7703.480
NONWIDC	2738.040	5156.880

An obvious shortcoming of the sample described above is that it is not representative of the 1971 income tax filing population for two reasons. First, the sample does not contain information on high-income classes. Secondly, all returns in the sample were subjected to at least one prior TCMP audit, and the audit experience may have influenced subsequent compliance behavior. In spite of these limitations, these data are valuable, presenting a rare opportunity to academic researchers to work with micro data on tax compliance.

[10]The remaining 124 observations were omitted becuase information on some of the variables in (1)-(3) was not available. The omitted observations include taxpayers who used income-averaging, as it was not possible to compute a meaningful measure of their relevant marginal tax rates from the available information.

Estimation Issues

Estimation of (1) through (3) involves several econometric issues. First, estimation of these equations calls for the use of a two-stage least-squares approach, since the relevant measure of the marginal tax rate (the marginal tax rate based on reported income) is endogenous to the compliance decision. The equations are estimated using two-stage least squares (TSLS), where the marginal tax rate based on corrected income is used as an instrument for the marginal tax rate based on reported income.

Secondly, the use of cross-section data raises the specter of heteroskedasticity. Though OLS and TSLS estimates are not biased in the presence of heteroskedasticity, they are inefficient. Hence, heteroskedasticity was tested for using the White test, which does not require any assumptions about the source or form of the heteroskedasticty. In two of three equations estimated ((1) and (3)), the White test rejected the assumption of homoskedastic variances. Thus, for these equations, the appropriate standard errors and t- statistics were computed using the heteroskedasticity-consistent covariance matrix estimator designed by White. Finally, collinearity diagnostics of the type suggested by Belsley et al. [1980] were executed with no indication of severe collinearities.[11]

IV. Regression Results

The estimation results are presented in Tables 3 and 4 with the t-statistics in parentheses. Table 3 shows the results from the estimation of (1) where the dependent variable is UTAXINC. The TSLS estimates are reported in column two and, for purposes of comparison, the corresponding OLS estimates are provided in column three.

Consider the TSLS estimates presented in column two. In general, the model performs reasonably well; the coefficients are of the expected signs. The coefficient of AGIC is positive and significant, supporting the hypothesis that the amount of noncompliance increases with income. The results offer mixed support for the hypothesis of greater noncompliance among business returns. While the coefficients corresponding to FARM and SOLEPROP are both positive, only the latter is significant.

As previously discussed, the coefficient of NUMSOURC may be capturing the opposing compliance effects of an increased susceptibility to audit and the influence of higher compliance costs. The regression results indicate that noncompliance is inversely related to the number of sources of income, suggesting that the deterrence effect dominates the compliance burden effect.

WAGAGI and INTDAGI were used to proxy the impact of information reporting requirements. The coefficients of both variables are negative and significant, implying that noncompliance decreases as the percentage of income subject to information reporting increases. However, since information reporting also reduces the taxpayer's computational

[11] The condition numbers for the variables are less than 30. According to Belsey et al. [1980], condition numbers between 50 and 100 indicate severe collinearity. Since these numbers are arguably somewhat arbitrary, note for purposes of comparison that condition numbers for the variables included in the data set used by Dubin and Wilde [1988] ranged from 33 to 39. Dubin and Wilde used a subset of the 1969 IRS data set rather than use information on all of the 36 variables included in the data set, as Witte and Woodbury [1985] ranged from 370 to 400. For a brief explanation of the calculation and interpretation of condition numbers, see Dubin and Wilde [1988]. For a more detailed explanation, see Belsey et al. [1980].

burden, these estimates may be, as Long and Swingen [1989, p. 264] put it, "a composite of both these [information and deterrence] effects." The results also indicate, as expected, that noncompliance is smaller on returns that do not include a Schedule D or Schedule E.

TABLE 3

OLS and TSLS Estimates of Equation (1)
Dependent Variable: UTAXINC

Independent Variable	TSLS Estimates	OLS Estimates
Intercept	1325.450	1710.555
	(5.723)	(6.911)
AGIC	0.105***	0.138***
	(6.407)	(8.168)
MTR	-5327.464***	-11141.000***
	(-3.357)	(-6.836)
NUMSOURC	-171.485***	-128.570***
	(-4.343)	(-3.627)
FARM	118.923	-235.509**
	(1.069)	(-2.381)
SOLEPROP	653.021***	290.613***
	(4.731)	(2.707)
WAGAGI	-154.470**	-52.979
	(-2.339)	(-0.724)
INTDAGI	-68.916**	-81.102**
	(-2.065)	(-2.545)
MARJOINT	-350.913***	-513.578***
	(-3.225)	(-4.315)
TAXADVIS	133.031**	86.801
	(2.128)	(1.414)
NOSCHD	-330.875**	-164.232
	(-2.447)	(-1.323)
NOSCHE	-217.902*	-18.091
	(-1.816)	(-0.157)
ADJUSTED R^2	0.192	0.259
F-Value	45.135	66.038

Notes: n = 2047; * signifies $p < 0.1$; ** signifies $p < 0.05$; and *** signifies $p < 0.01$.

Contrary to popular perception, the empirical evidence suggests that noncompliance decreases as the marginal tax rate increases, a result reminiscent of Yitzhaki [1974]. Note that if the penalty is proportional to underreported taxes, an increase in the marginal tax rate leaves the relative price of noncompliance unchanged. An increase in the tax rate does, however, reduce expected net income. If taxpayers are risk averse and if risk aversion decreases with income, then taxpayers would respond to the decrease in expected net income by increasing reported income. Hence, under the assumption of decreasing absolute risk aversion, compliance would increase with the marginal tax rate as the empirical findings suggest.

Turning now to the coefficients of the dummy variables MARJOINT and TAXADVIS, note that the former is negative and significant, as expected. The results of the regression analysis would also appear to suggest that noncompliance is greater among those who seek the advice of tax practitioners.

However, in the absence of a theoretical foundation, the above result should be interpreted with caution. For example, Klepper and Nagin [1987] and Mazur and Nagin [1987] argue that tax preparers promote compliance on relatively unambiguous items but exploit grey areas of the tax code. If this is true, one may conjecture that noncompliance on wages, interest, and dividends will be negatively correlated with TAXADVIS and that the income underreported from all other sources will be positively correlated. An examination of the estimates in Table 4 will reveal whether the empirical results support this conjecture.

Column two of Table 4 summarizes the outcome of estimating (2) where the dependent variable, UWID, measures the magnitude of noncompliance on income from wages, interest, and dividends, and is henceforth referred to as wage noncompliance for expositional ease. It is clear that the model fails to explain variation in wage noncompliance. Not only does the set of independent variables explain less than 1 percent of the va2riation in wage noncompliance, but even when considered individually, all but two of the independent variables are insignificant.

One possible explanation for the poor performance may be that there is too little variation in the dependent variable. The results could, however, be interpreted as suggesting that there is no systematic explanation for wage noncompliance and that any observed variation is chiefly due to random reporting errors. In light of the fact that wages, interest, and dividends are subject to withholding and information reporting, the regression results appear to support the effectiveness of information reporting in reducing noncompliance.

The results of estimating (3) are reported in column three of Table 4. The dependent variable is the difference between the auditor-adjusted and reported sums of income from all sources other than wages, interest, and dividends, henceforth referred to as non-wage noncompliance. A comparison of the estimates in columns two and three reveals that the model clearly does much better at explaining the variation in non-wage noncompliance. In most cases, the explanatory variables have the expected sign and significance.

As expected, non-wage noncompliance increases with income from wages, interest, and dividends, as well as with income from all other sources. The estimation results suggest that noncompliance will increase by 5 cents in response to an additional dollar of income

from wages, interest, and dividends, but will increase by 17 cents in response to an additional dollar of non-wage income.[12]

TABLE 4

TSLS Estimates of Equations (2) and (3)

	Dependent Variable: UWID	Dependent Variable: UNONWID
Intercept	-24.582	1092.796
	(-0.403)	(4.671)
WIDC	0.002	0.052***
	(0.975)	(4.330)
NONWIDC	-0.001	0.168***
	(-0.596)	(6.707)
MTR	207.755	-4549.640***
	(0.905)	(-2.986)
NUMSOURC	5.063	-132.569***
	(0.522)	(-3.526)
FARM	53.085*	83.066
	(1.611)	(0.682)
SOLEPROP	28.724	346.763**
	(0.951)	(2.462)
MARJOINT	-40.155	-159.679
	(-1.504)	(-1.564)
TAXADVIS	53.397**	-17.152
	(2.362)	(-0.257)
NOSCHD	-36.797	-306.459**
	(-1.288)	(-2.307)
NOSCHE	-13.477	-79.765
	(-0.468)	(-0.623)
ADJUSTED R^2	0.005	0.2468
F-Value	1.992	70.115

Notes: n = 2047; * signifies $p < 0.1$; ** signifies $p < 0.05$; and *** signifies $p < 0.01$.

[12]These results are inconsistent with the theoretical model in Kamdar [1993], which predicted that non-wage noncompliance would increase in the same proportion in response to an additional dollar of income, irrespective of the source of income (i.e., $\gamma_1 = \gamma_2$).

The coefficient of the marginal tax rate is negative and significant, a result consistent with the hypothesis of decreasing absolute risk aversion. The empirical evidence indicates that sole proprietors appear to be less compliant relative to non-business taxpayers, as expected. Though the coefficient of FARM is also positive, it is not significant. Again, underreporting of income not subject to information reporting decreases as the number of income sources increase. These findings are qualitatively similar to the results obtained from the estimation of (1). (See corresponding estimates in column two of Table 3.)

The coefficients of NOSCHD, NOSCHE, and MARJOINT are also negative as expected, but only the first of these is significant. Finally, a comparison of the coefficient of TAXADVIS in columns two and three of Table 4 indicates, contrary to expectation, that the use of tax preparers decreases non-wage noncompliance but promotes wage noncompliance.

It is difficult to interpret the preceding result in the absence of a clear understanding of the reasons why people seek the assistance of tax professionals. If, for example, people seeking advise from professionals are motivated by the complexity of the tax issues facing them, then one may observe that the use of tax advisors promotes compliance, *ceteris paribus*, on more complex and ambiguous line-items. It should be noted, however, that the data set used in this study comprises of low- and middle-income taxpayers, while Klepper and Nagin [1987] and Mazur and Nagin [1987] were only able to find support for their hypothesis in audit classes with higher income and more complex returns.

One may conjecture that low income individuals with less education primarily seek return preparation services. If such individuals are also less likely to maintain good records, then tax preparers cannot entirely verify information provided by the client, particularly with regards to income not subject to information reporting. In this case, it is not clear what effect the use of tax advisors will have on compliance. The motives of individuals seeking tax assistance and the skills and incentives of the various kinds of tax preparers could be examined in future research (along the lines of Dubin et al. [1992]) in order to gain a better understanding of the impact of tax practitioners on compliance.

V. Conclusion

This paper uses micro data from individual tax returns to examine the determinants of income tax compliance and explore the impact of information reporting. The results are, in general, consistent with those obtained by other researchers. However, one of the most striking findings of the empirical work is that there exists an inverse relationship between tax rates and noncompliance. This is particularly surprising given the prevalent belief that high marginal tax rates lead to greater noncompliance. This result is consistent, however, with the theoretical predictions of models that embody decreasing absolute risk aversion and assume that the penalty for tax evasion is a function of taxes evaded (as is, indeed, the case in the U.S.). While this result must be interpreted with caution as the sample does not include high-income taxpayers (who also face the highest marginal tax rates), it does cast doubt upon the presumption that lower marginal tax rates will lead to improved compliance.

Secondly, this paper finds that taxpayer behavior is affected by noncompliance opportunities. One constraint on noncompliance opportunity is the existence of third-party information reporting requirements. The estimation results support the hypothesis that

compliance increases with the extent of information reporting, but it is not possible to sort out the deterrence effect of information reporting from the "compliance burden" effect. From a policy perspective, this may not be a significant drawback, as both effects act in the same direction. Indeed, the results in this paper suggest that information reporting may be the most effective weapon that the IRS wields in its war against noncompliance. It should be noted, however, that the expansion of information reporting requirements places an additional burden on the third parties who must file the requisite forms. Given the trend towards expanded information reporting requirements, research on attendant administrative and compliance costs would be particularly valuable from a tax policy perspective.

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