

**ECONOMIC AND BEHAVIORAL
DETERMINANTS OF TAX COMPLIANCE:
EVIDENCE FROM THE 1997
ARKANSAS TAX PENALTY AMNESTY PROGRAM**

Presented at the 2003 IRS Research Conference, June 2003

by

Christina M. Ritsema
Department of Economics, Management and Accounting
Hope College
Holland, Michigan 49422
ritsemac@hope.edu

Deborah W. Thomas
Department of Accounting
Walton College of Business
University of Arkansas
Fayetteville, AR 72701
dthomas@walton.uark.edu

Gary D. Ferrier
Department of Economics
Walton College of Business
University of Arkansas
Fayetteville, AR 72701
gferrier@walton.uark.edu

**ECONOMIC AND BEHAVIORAL
DETERMINANTS OF TAX COMPLIANCE:
EVIDENCE FROM THE 1997
ARKANSAS TAX PENALTY AMNESTY PROGRAM**

ABSTRACT

For decades, tax researchers have investigated why some people pay taxes and others do not. Through experiments, random surveys, and available tax databases, researchers have identified characteristics of noncompliant taxpayers and factors that motivate tax compliance.

We add to this stream of research on the motivations of noncompliant taxpayers in a straightforward way. We identified a group of tax evaders – participants in the 1997 Arkansas Tax Penalty Amnesty Program. And we asked them: why didn't you pay taxes when you should have and what motivated you to come forward during the amnesty.

In line with previous research, we study the characteristics of this group of noncompliant taxpayers by investigating the effects of age, education, marital status and income on the level and amount of noncompliance. Confirming previous research, we find that filing status, income and the opportunity to evade are positively related to the tax owed.

We also present the effects of self-reported reasons for failure to pay tax owed and for participation in the amnesty. We find that the lack of available funds is a primary factor related to their failure to report and pay taxes when due, but only for taxpayers who owe a higher percent of their income in tax. We also find that a sense of morality is not reported as a motivating factor for their participation in the amnesty.

We expand these results by comparing subgroups of amnesty participants. We identify intentional noncompliant taxpayers – those who admitted they were not ignorant of their original tax liability – and unintentional noncompliant taxpayers – those who stated that ignorance was a reason for nonpayment of taxes. A third group is comprised of those who were neutral as to this motivating factor.

We find differences across these groups, both in their characteristics and motivators. For intentionally noncompliant taxpayers, we find that the lack of money is a strong motivator related to the amount of tax owed and that friends and family influenced those who owe a higher percentage of income in tax to come forward during the amnesty. For the neutral group, the perception of unfairness in the tax system is positively related to the amount and percentage of their tax liability, while lack of money and complexity of the tax system is negatively related to the amount and level of tax. Few factors proved to be significant for the unintentionally noncompliant group. We can only conclude that those who owe a higher percentage of income in tax are not motivated to come forward by sense of morality.

These results confirm that taxpayers are not all alike in their motivation for failure to report or pay taxes. Prior research may be misleading if only one type of taxpayer is included in the study. Tax administrators should also be aware that enforcement techniques are likely to be received by taxpayers differently.

ECONOMIC AND BEHAVIORAL DETERMINANTS OF TAX COMPLIANCE: EVIDENCE FROM THE 1997 ARKANSAS TAX PENALTY AMNESTY PROGRAM

I. Introduction

For decades, tax researchers have investigated why some people pay taxes while others do not. Through experiments (Boylan and Sprinkle 2001), random surveys (Fisher et al., 1989), and available tax databases (Erard and Ho 2001), researchers have identified characteristics of noncompliant taxpayers and what is likely to motivate tax compliance.¹ We add to this stream of research on the motivations of noncompliant taxpayers by first identifying a group of tax evaders – participants in the 1997 Arkansas Tax Penalty Amnesty Program—and then asking them: “Why didn’t you pay taxes when you should have?” and “What motivated you to come forward during the amnesty?”

In line with previous research, we study the characteristics of this group of noncompliant taxpayers by investigating the effects of age, education, marital status and income on the level and amount of noncompliance. Further, we present the effects of their self-reported reasons for failure to pay tax owed and for participation in the amnesty.

We expand these results by comparing subgroups of amnesty participants. We identify intentional noncompliant taxpayers – those who admitted they were not ignorant of their original tax liability – and unintentional noncompliant taxpayers – those who stated that ignorance was a reason for nonpayment of taxes. We find that the overall results are influenced by the attitudes of these subgroups.

¹ Prior research is summarized in Jackson and Milliron (1986), Roth et al. (1989), Roth and Scholtz (1989), Slemrod (1992), Andreoni et al. (1998), and Franzoni (2000).

Our results suggest that taxpayers are not all alike in their motivation for failure to report or pay taxes. Prior research may be misleading if taxpayers are treated as being homogenous.. Tax administrators should also be aware that enforcement techniques are likely to be received by taxpayers differently. Our results suggest enforcement methods that may be more effective in bringing nonfilers into the tax system.

The details of our study are presented below as follows: In Section II, we explain our data collection methods and provide the descriptive statistics of the sample. Section III sets forth our methodology, regression variables and sorting criteria. Section IV presents the results of the regression analysis. We comment on the limitations of the study in Section V. In Section VI, we discuss the implications of the results.

II. Data Collection

The 1997 Arkansas Tax Penalty Amnesty Program. The Arkansas State Legislature enacted a Tax Penalty Amnesty program during its 1997 legislative session. The amnesty waived all penalties and relieved the taxpayer from criminal prosecution if tax and interest accrued before January 1, 1997, were paid within twelve months of the filing of the amnesty tax form. The amnesty period ran from September 1 through November 20, 1997, for individual income taxes, corporate income taxes, sales and use taxes and employee withholding taxes. The amnesty was publicized by brochures inserted into drivers' and motor vehicle license renewal form mailings and other correspondence from the Arkansas Department of Finance and Administration (DFA) in the month prior to the amnesty, as well as in newspapers and other news media.

Data Sources. We accessed data for this study through three sources:² (1) the tax forms filed during the amnesty period, (2) federal tax data-sharing list and (3) a survey of amnesty participants. All data were matched and coded to maintain taxpayer confidentiality.

Amnesty Tax Forms. Data collected from the tax forms filed during the amnesty period include total Arkansas income, the tax year for which the form was filed, reported withholding amount, and the amount of tax due.³ All of the returns processed through the amnesty program were received from taxpayers who had not previously filed Arkansas returns for the years reported.⁴

Federal Data-Sharing List. Arkansas participates in the Federal data-sharing program. Under this program, states are given a list of taxpayers who file Federal income tax returns from addresses within the state of Arkansas. In the months prior to the amnesty, the DFA mailed approximately 65,000 letters to taxpayers on the Federal data-sharing lists for the years 1990 through 1995 who failed to file an Arkansas tax return. These letters contained a strong warning that the recipient should contact the DFA to avoid individual income taxes being assessed and liens being levied.

Taxpayer Surveys. Under the procedures of the 1997 Arkansas amnesty program, every taxpayer who inquired about the amnesty was sent an application form. To be granted amnesty, a taxpayer was required to return this completed form stating his or her intention to participate in the program. The DFA responded with a confirmation letter. With the cooperation of the DFA, a survey requesting demographic and behavioral information was included as an insert with the

² All data collection was coordinated by the Arkansas Department of Finance and Administration. The authors extend their heartfelt thanks to the amnesty staff in the Little Rock office for their efforts and commitment to this project.

³ Some returns filed during the amnesty reported a zero tax balance or refund due. Because this study focuses on taxpayers who owed taxes, these returns were omitted from the analysis.

⁴ The State received twelve amended returns during the amnesty period but these returns were not processed through the amnesty program.

confirmation letters. The survey instructions stated that completion of the survey was voluntary and confidential. A second request was mailed to non-respondents one month after the initial mailing.⁵ After omitting surveys with incomplete information, those received from taxpayers who did not owe taxes and outliers,⁶ 2,097 individuals remain in the sample. Table 1 offers an accounting of the number of participants in the amnesty and the final number of observations used in this study.

[Insert Table 1]

Sample Characteristics. Descriptive statistics for the sample are presented in Table 2.

Highlights are noted below:

- The average reported annual income for the amnesty participants who owed tax was \$35,323, ranging from a low of \$128 to a high of \$690,653.
- Amnesty participants in arrears owed an average of \$529 in tax, ranging from \$1 to \$37,182.
- Eighty-two percent of the amnesty participants received a notification letter from the state through the Federal data-sharing program.
- Individuals in their 40's comprise the largest group of the amnesty participants.
- The median level of education was some college courses taken.
- The most delinquent tax return was 13 years overdue.
- Married individuals filed more returns during the amnesty than single taxpayers.
- Neither complexity nor perceived unfairness of the tax system was reported as a pervasive excuse for failure to file tax returns.

⁵ To test for selection bias a comparison was performed between first and second responses. No differences were noted.

⁶ The Bonferroni inequality R-student critical value test (Miller, 1965) was used to identify 21 outliers from the data set.

- Taxpayers reported that fear of being caught and morality were motivating factors in their decision to participate in the amnesty.

[Insert Table 2]

III. Research Variables and Methods

Using the data from the 1997 Arkansas Tax Amnesty Program, we investigate the effect of demographic and behavioral influences on tax compliance. Two research questions are addressed:

Question 1: What are the effects of taxpayer demographic and behavioral characteristics on the total amount of tax noncompliance?

and

Question 2: What are the effects of taxpayer demographic and behavioral characteristics on the level of tax noncompliance relative to income?

We perform ordinary least-squares regression analysis using the following variables:

Dependent Variables. Two dependent variables are investigated in separate regression models, capturing both the amount and level of tax noncompliance. These measures are derived from the amnesty tax return data.

Tax due. Tax due is the amount of tax due as reported on the tax return.

Tax due as a percent of reported income. In the second regression model, the dependent variable is tax due scaled by reported Arkansas net income (tax due/total Arkansas income).

Independent Variables. Variables used in the analysis are grouped into three main categories: Tax-related variables, Demographic variables, and Behavioral variables. Behavioral variables are further categorized in two groups: excuses for noncompliance and reasons for amnesty participation.

Tax-related Variables. Tax-related information was collected from all three data sources.

Total Arkansas income and scaled total income: Prior research presents conflicting evidence of the association between income and noncompliance. Early analytical models developed by Allingham and Sandmo (1972) and revised by Yizhaki (1974) show that noncompliance varies directly with income when the taxpayer utility function displays decreasing risk aversion. The empirical evidence on this relationship, however, has been ambiguous. Clotfelter (1983), using IRS data from the 1969 Taxpayer Compliance Measurement Program (TCMP), and Young (1994), using data from the 1987 Michigan Tax Amnesty Program, both found a positive association between income and noncompliance. In contrast, Alm et al. (1992) found noncompliance to be negatively related to income. A third conclusion, that middle-income taxpayers are most compliant, was reached by Witte and Woodbury (1985) in a study that also using the 1969 TCMP data. Finally, Feinstein (1991), using 1982 and 1985 TCMP data, found no conclusive relation between income and noncompliance. From these studies, it is unclear as to the effect of income level on noncompliance. We include a measure of income, as reported on the amnesty tax return in our models. To test whether a curvilinear relation exists between income and noncompliance, we also include total income squared.

Opportunity to evade: Research has shown that noncompliance increases with the opportunity to underreport taxes. Taxpayers with a greater the amount of tax prepaid or withheld have less opportunity to underreport their tax liability (Young, 1994). We proxy the opportunity to evade, calculated as:

$$1 - [(\text{withholdings} + \text{prepayments}) / \text{total Arkansas income}]$$

Higher ratios indicate a greater opportunity to evade.

Prior State Contact: We include a variable to indicate whether the taxpayer received a letter from DFA from the Federal data-sharing lists. This is included in the model as a dichotomous variable with a “1” entered if the taxpayer received a letter and a “0” if not. In prior investigations, Young (1994) found a negative relation between prior state contact and the level of noncompliance, while Blumenthal et al. (2001) failed to detect any relationship.

Knowledge of Tax Due: Taxpayers indicated the number of years they knew they owed additional tax on the written survey. This variable is measured on a scale of 1 to 4 with 1 indicating that the taxpayer knew he was noncompliant for less than one year, 2 indicating knowledge for one to four years, 3 indicating knowledge for five to ten years, and 4 indicating the taxpayer knew that taxes were owed for over ten years.

Multiple amnesty returns filed: Some taxpayers filed returns during the amnesty period for more than one tax year. To control for the possible effects of these taxpayers a variable is included to indicate whether the taxpayer filed returns for only one year, indicated with a 0, or for more than one year, coded as a 1.

Filing status: Filing status, as reported on the tax return, is included in the models. Taxpayers were classified as either married (0) or single (1). Married taxpayers include both those filing jointly, filing separately or filing separately on the same return.⁷ All other taxpayers are classified as single. Prior research indicates that single taxpayers evade more than married taxpayers (Clotfelter 1993, Young 1994).

Demographic Variables. Information about age and education was collected from the taxpayer survey.

⁷ Arkansas tax law allows married taxpayers to file separately on the same return. This often results in tax savings over filing jointly, reducing the impact of a marriage penalty.

Age: Prior research supports both a negative relation between age and noncompliance (Mason and Calvin 1978, Witte and Woodbury 1985, Baldry 1987, Dubin and Wilde 1988, and Feinstein 1991) and a curvilinear relation with middle-aged taxpayers as the least compliant (Clotfelter 1983). We compare other age groups to taxpayers in their 40's by including indicator variables for age measured in ten year increments.

Education: Both a positive relation (Witte and Woodbury 1985, Beron et al. 1992) and a negative relation (Dubin and Wilde 1988) has been found between education level and noncompliance. We include a measure of education as indicated on the taxpayer survey as follows: 1 indicates less than a high school education, 2 indicates completion of high school, 3 indicates some college courses have been taken, 4 indicates completion of college, and 5 indicates a graduate degree.

Behavioral Variables--Excuses for Noncompliance. There is longstanding and overwhelming evidence from many disciplines, including psychology, sociology, accounting and economics, that behavioral factors influence noncompliance (e.g., Spicer and Lundstedt 1976, Song and Yarbrough 1978, Westat 1980, Scott and Grasmick 1981, Mason and Calvin 1984, Yankelovich et al. 1984, Baldry 1987, Cowell 1990, Kinsey 1992, Sheffrin and Triest 1992, Smith 1992, Alm et al. 1992, de Juan et al. 1994, Erard and Feinstein 1994). Erard and Feinstein (1994) state that the standard compliance model fails to explain compliance behavior due to the exclusion of taxpayer motivations. Andreoni et al. (1998) argue that researchers need to explore the psychological, moral, and social influences on compliance behavior and integrate these factors into economic models of compliance.

Arkansas amnesty participants who completed the survey indicated their reasons for originally failing to comply with the tax laws. They indicated their agreement or disagreement

with a series of statements on a Likert-type scale of –2 (strongly disagree) to 2 (strongly agree), with 0 indicating neutrality. These “excuse” variables include:

Lack of money: Taxpayers may fail to report taxes when due because they lack the funds owed at that time. Survey responses to this question are included in the model.

Unfairness: Taxpayers’ perceptions of the fairness of the tax system likely influence their willingness to evade payment. Previous research on the influence of perceptions of fairness on tax compliance has produced mixed results. McEwen and Maiman (1986) found evidence that the perception of fairness was directly associated with compliance, while Porcano (1988) and Yankelovich et al. (1984) found no association between compliance and perceptions of fairness.

Complexity: Research focusing on perceptions of complexity indicates that complexity is associated with compliance, but the impact remains unclear. Clotfelter (1983) found that the complexity of the return was associated with noncompliance. However, Westat (1980), Witte and Woodbury (1985) and Slemrod (1989) find that the impact of complexity on compliance varies with individual taxpayer characteristics such as perceptions of fairness, opportunity to evade and education. Whether noncompliance was caused by complexity is included in our model.

Ignorance: The Internal Revenue Service (IRS, 1994) has stated that unintentional noncompliance likely represents a significant amount of total noncompliance. Survey respondents told us whether they failed to pay their tax because they were not aware that any tax was owed.

Behavioral Variables--Reasons for Amnesty Participation. We are also interested in the motivating factors that caused taxpayers to come forward during the amnesty period. A

series of questions concerning amnesty participation were also presented in the survey, with answers given on a Likert scale of -2 (strongly disagree) to 2 (strongly agree).

Family and friends: Grasmick and Bursik (1990) investigated the influence of family and friends on compliance behavior. We include a measure of this influence on taxpayer compliance.

Fear of being caught: Evidence based on judgments of small claims court cases supports that fear motivates compliance (McEwen and Maiman 1986). This factor is included in our survey and model as a possible motivator for amnesty participation.

Morality: A significant amount of research investigates the influence of morality on tax compliance behavior. In general, research supports a positive association between a sense of morality and compliance, but the relationship varies depending on other taxpayer characteristics such as perceptions of fairness and tax rates (Gordon 1989, Clotfelter 1983 and Erard and Feinstein 1994).

Avoidance of penalties: Prior research supports that the threat of penalties is indirectly related to the noncompliance decision (Schwartz and Orleans 1967). Avoidance of penalties could be a reason for coming forward during an amnesty and is included in our model.

Subgroups – Intentional and Unintentional Evaders. To test further, the sample is divided into three subgroups based upon their answer to one question in the amnesty participant survey. Those who agreed or strongly agreed that ignorance motivated their failure to pay their taxes when due are classified as unintentional evaders. The group of intentional evaders answered this question negatively. A third subgroup is comprised of the respondents who were neutral on this motivating factor. Descriptive statistics for these three subgroups are presented at Table 3. The intentional and neutral subgroups report that lack of money was a motivating

factor in their original noncompliance decision. These two subgroups also indicated that fear and avoidance of penalty were more important in their amnesty participation than did the unintentional subgroup.

[Insert Table 3]

The same two questions will be investigated for the segmented sample. The independent variables will be regressed against the total tax due and tax due as a percentage of income to determine the affect of the tax variables, the demographic variables and the behavioral variables on the amount and level of noncompliance.

IV. Results

Determinants of Tax Due. The regression results⁸ for the first research question, the effects of taxpayer characteristics on the total amount of tax noncompliance, are presented in Table 4. For these regression equations, the amount of tax due is the dependent variable.

[Insert Table 4]

Tax-related variables. For the unintentional evaders it appears that tax due is a simple linear function of income, while for the overall sample and for the neutral group tax due is an increasing function of income (i.e., the coefficient on $income^2$ is positive and statistically significant). However, for intentional evaders tax due is a decreasing function of income (i.e., the coefficient on $income^2$ is negative and statistically significant). Beyond some point, tax due

⁸ Tests for multicollinearity and heteroscedasticity were performed to verify the assumptions of the regression model. None of the variables had variance inflation factors of greater than ten, indicating that multicollinearity is

begin to decline with income. Previous research has found that middle-income taxpayers are more likely to evade tax. We found this to be true only for the subgroup of intentional evaders. As expected, the opportunity to evade is also positively related to tax due.

Receiving a letter under the Federal data-sharing program was not found to be a significant factor in the amount of tax due for most groups. Only for intentional evaders was prior state contact positively related to tax owed. This is consistent with economic theory and previous empirical studies that have shown that compliance is related to the probability of detection. In this case, a letter from the State indicates to intentionally noncompliant group that they have been “caught.”

Whether a taxpayer filed for amnesty for more than one tax year is negative and significant only for the intentionally noncompliant group. Amnesty participants filing for only one tax year owed higher amounts of tax.

As in previous research, we found that single taxpayers owed more in delinquent taxes. However, this is not true for all groups. With unintentional tax evaders, marital status is not related to the amount of tax due.

Demographic variables. Our results for age and education do not confirm previous research for all groups. Only in the group of intentional evaders do we find that age is related to tax due. Older and younger taxpayers owe more in tax. However, this could be a function of total income, with these age groups earning less.

Education is inversely related to the amount of tax reported only for the complete sample and for the neutral group. For those taxpayers who took a position on whether they knew or did not know they owed tax, education was not a determining factor.

not a problem. Plots of standardized residuals were made against the standardized predicted dependent variables, indicating that no heteroscedasticity problems exist.

Behavioral variables. At least one behavioral variable proved to be significant for three of the four taxpayer groups. For the complete sample, amnesty participants owing higher taxes reported that a sense of morality was not what caused them to come forward during the amnesty period. Intentional taxpayers blamed the lack of money for their failure to pay tax when due. This was not the case for the neutral group, for whom lack of money was inversely related to tax due. Instead, those owing higher amounts of tax in this group reported that the unfairness of the tax system influenced their failure to file. No trends were detected in the behavioral variables for the unintentionally noncompliant group.

Determinants of Tax Due as a Percentage of Income. The regression results for the second research question, the effects of taxpayer characteristics on the level of tax noncompliance, are presented in Table 5. For these regression equations, the amount of tax due as a percent of income is the dependent variable.

[Insert Table 5]

Tax-related variables. Consistent with the results of the first research question and prior research, income and the opportunity to evade are positively related to tax due as a percentage of income. For the overall sample and all three subsamples, the percent of income owed in tax increases with income, but at a decreasing rate. It is worth noting that relative to the other two subgroups, intentional evaders have their percent of income owed as tax increase with income faster (compare the coefficients on *income* in Table 5) and this rate of increase declines more slowly (compare the coefficients on *income*² in Table 5)..

For those taxpayers who owe a higher percentage of their income in tax, prior state contact has a broader influence. We find a significant and positive relationship between the receipt of a Federal data-sharing letter and the percentage of income in tax for all but the neutral group.

For intentional evaders, the length of time the taxpayer knew about his tax liability is again negatively related to the dependent variable. In addition, we find that those owing a higher percentage of income in tax in the overall sample and the neutral group also knew about their tax liability for a shorter period of time.

As with the first research question, filing status is significant for three of the four groups. Single taxpayers owed a higher percentage of their income in tax for all but the unintentional group.

Demographic variables. Age and education do not have a significant impact on the level of tax owed for most groups. Using percentage of tax owed as a measure of noncompliance, age is a factor for the complete sample and for intentional evaders, with younger taxpayers less compliant. Education is negatively related to tax owed as a percentage of income only for the neutral group.

Behavioral variables. Again, at least one behavioral variable was found to be significant in each group. For all taxpayers in the sample, lack of money was reported by those with higher percentage of tax owed to be a reason for failure to originally file tax returns and morality did not cause this group to come forward during the amnesty period. Morality was also not a determinant for the unintentionally noncompliant group. Intentional evaders owing a higher percentage of income tax report that family and friends influenced their participation in the amnesty program. We again find that bigger evaders in the neutral group report that their

noncompliance was influenced by the perception that taxes are unfair. In addition, the complexity of the tax system is not a factor in the nonfiling decision for the neutral group.

V. Limitations

This study provides evidence of the economic and behavioral characteristics of noncompliant taxpayers. Data are collected from objective sources through the Arkansas Department of Finance and Administration and the more subjective surveys of amnesty participants. Survey data may not be reliable. First, not all amnesty participants volunteered to complete the survey instrument, resulting in possible selection bias.⁹ Second, taxpayer responses on the survey are self-reported and cannot be verified. The length of time between the failure to file and the completion of the survey may distort answers to questions about reasons for the original noncompliance. As with any mailed survey, the environment in which the survey was completed could not be controlled and others may have influenced the respondent. Any conclusions drawn from survey data are subject to these limitations.

VI. Conclusions

This study provides evidence of the characteristics of noncompliant taxpayers focusing on nonfilers. The results provide some guidance to tax administrators who wish to bring nonfilers owing higher amounts of tax into the system. First, appealing to a sense of morality that paying tax is the right thing to do may not be effective. Amnesty participants reported that morality was not a significant reason for coming forward during the amnesty period. Second, tax authorities should consider more broadly publicizing tax payment programs. For some groups of

nonfilers, the lack of funds at the time taxes were due was a significant factor in the decision to evade.

These results also reveal that taxpayer motivations may differ across groups and that all taxpayers will not respond to the same motivating factors. Tax administrators should use multiple enforcement measures to appeal to a broader spectrum of taxpayers. Further, inconsistencies in tax compliance research are possibly related to the failure to include behavioral variables in the noncompliance model and to control for differences across taxpayer groups.

⁹ To test for selection bias a comparison was performed on the tax return variables between participants who completed the survey and participants that did not. Additional comparison tests were performed between first and second survey responses. No significant differences were noted in any of the tests.

REFERENCES

- Allingham, M. and A. Sandmo (1972). Income Tax Evasion: A Theoretical Analysis. *Journal of Public Economics*, 1, pp. 323-338.
- Alm, J., B. Jackson, and M. McKee (1992). Estimating the Determinants of Taxpayer Compliance with Experimental Data. *National Tax Journal*, 45 (1), pp. 107-14.
- Andreoni, J., B. Erard, and J. Feinstein (1998). Tax Compliance. *Journal of Economic Literature*, 36 (3), pp. 818-860.
- Baldry, J., (1987). Income Tax Evasion and the Tax Schedule: Some Experimental Results. *Public Finance*, 42 (3), pp. 357-383.
- Beron, K. J., H. V. Tauchen, and A. D. Witte (1992). The Effects of Audits and Socioeconomic Variables on Compliance in Joel Slemrod, ed. Why People Pay Taxes. Tax Compliance and Enforcement, pp. 67-89.
- Boylan, S. and G. Sprinkle (2001). Experimental Evidence on the Relation between Tax Rates and Compliance: The Effect of Earned vs. Endowed Income. *Journal of the American Taxation Association*, 23 (1), pp. 75-90.
- Blumenthal, M., C. Christian, and J. Slemrod (2001). Do Normative Appeals Affect Tax compliance? Evidence from a Controlled Experiment in Minnesota. *National Tax Journal*. 54 (1), pp. 125-136.
- Clofelter, C. (1983). Tax Evasion and Tax Rates: An Analysis of Individual Returns. *Review of Economics and Statistics*, 65 (3), pp. 363-373.
- Cowell, F. (1990). Cheating the Government: The Economics of Evasion, Cambridge, MA: The MIT Press.
- de Juan, Ana, Miguel A. Lahseras, and Rafaela Mayo (1994), Voluntary Tax Compliant Behavior of Spanish Income Tax Payers. *Public Finance*, 49 (supplement), pp. 90-105.
- Dubin, J., and L. Wilde (1988). An Empirical Analysis of Federal Income Tax Auditing and Compliance. *National Tax Journal*, March, 41 (1), pp. 61-74.
- Erard, B. and C. Ho (2001), Searching for Ghosts: Who Are the Nonfilers and How Much Tax Do They Owe? *Journal of Public Economics* 81, 25-50.
- Erard, B. and J. Feinstein (1994). Honesty and Evasion in the Tax Compliance Game. *Rand Journal Economics*, 25 (1), pp. 1-19.

- Feinstein, J. (1991). An Econometric Analysis of Income Tax Evasion and Its Detection. *Rand Journal of Economics*, 22 (1), pp. 14-35.
- Fisher, R., J. Goddeeris, and J. Young, (1989). Participation in Tax Amnesties: The Individual Income Tax. *National Tax Journal*, 42 (2), pp. 15-27.
- Franzoni, L.A. (2000). Tax Evasion and Tax Compliance. Encyclopedia of Law and Economics, Volume IV. The Economics of Public and Tax Law, Cheltenham, Edward Elgar.
- Gordon, P. (1989). Individual Morality and Reputation Costs as Deterrents to Tax Evasion. *European Economic Review*, 33, pp. 797-805.
- Grasmick, H. and R. Bursik (1990). Extending the Deterrence Model. *Law and Society Review*, 24 (3), pp. 837-861.
- Internal Revenue Service (1994). Tax Compliance. Tax Gap. GAO/GGD-94-123.
- Jackson, B. and V. Milliron (1986). Tax Compliance Research: Findings, Problems, and Prospects. *Journal of Accounting Literature*, 5, pp. 125-165.
- Kinsey, K. (1992). Survey Data on Tax Compliance: A Compendium and Review, ABF Working Paper 8716.
- Mason, R., and L. Calvin (1978). A Study of Admitted Income Tax Evasion. *Law and Society Review*, 13, pp. 73-89.
- Mason, R., and L. Calvin (1984). Public Confidence and Admitted Tax Evasion. *National Tax Journal*, 37 (4), pp. 489-496.
- McEwen, C., and R. Maiman (1986). In Search of Legitimacy: Toward an empirical response Analysis. *Law and Policy*, 8, pp. 257-273.
- Miller, R. (1965). Simultaneous Inference. New York: McGraw Hill.
- Porcano, T., (1988). Correlates of Tax Evasion. *Journal of Economic Psychology*, 9, pp. 47-67.
- Roth, J., J. Scholtz, and A. Witte, eds. (1989). Taxpayer Compliance, Vol. 1: An Agenda for Research, Philadelphia: University of Pennsylvania Press.
- Roth, J., J. Scholtz, eds. (1989). Taxpayer Compliance, Vol. 2: Social Science Perspective. Philadelphia: University of Pennsylvania Press.
- Schwartz, R., and S. Orleans (1967). On Legal Sanctions. *University of Chicago Law Review*, 34, pp. 274-300.

Scott, W., and H. Grasmick (1981). Deterrence and Income Tax Cheating: Testing Interaction Hypotheses in Utilitarian Theories. *The Journal of Applied Behavioral Science* 17, pp. 395-408.

Sheffrin, S., and R. Triest, (1992). Can Brute Deterrence Backfire? Perceptions and Attitudes in Taxpayer Compliance. In Joel Slemrod, ed. Why People Pay Taxes: Tax Compliance and Enforcement. Ann Arbor, MI: University of Michigan Press.

Slemrod, J. (1989). Complexity, compliance costs, and Tax Evasion In Taxpayer Compliance, ed. Jeffrey A. Roth and J.T. Scholz, Vol. 2, pp. 156-181. Philadelphia: University of Pennsylvania Press.

Slemrod, J. (1992). Why People Pay Taxes: Tax Compliance and Enforcement. Ann Arbor, MI: University of Michigan Press.

Smith, K. (1992). Reciprocity and Fairness: Positive Incentives for Tax Compliance, in Joel Slemrod, ed. Why People Pay Taxes: Tax Compliance and Enforcement. Ann Arbor, MI: University of Michigan Press.

Song, Y., and T. Yarbrough (1978). Tax Ethics and Taxpayer Attitudes: A Survey. *Public Administration Review*. 38, pp. 442-52.

Spicer, M. and Lundstedt, D.B. (1976). Understanding Tax Evasion. *Public Finance*. 31 (2) pp. 295-305.

Westat Inc. (1980). Individual Income Tax Compliance Factors Study Qualitative Research, Prepared for the Internal Revenue Service.

Witte, A., and D. Woodbury (1985). The Effect of Tax Laws and Tax Administration on Tax compliance: The Case of the U.S. Individual Income Tax. *National Tax Journal*, 38, pp. 1-13.

Yankelovich, Skelly, and White, Inc. (1984). Survey of Taxpayer Attitudes. Prepared for the Internal Revenue Service, December.

Yitzhaki, S. (1974). A Note On Income Tax Evasion: A Theoretical Analysis. *Journal of Public Economics*, 3 (2), pp. 201-202.

Young, J. (1994). Factors Associated with Noncompliance: Evidence from the Michigan Tax Amnesty Program. *Journal of the American Taxation Association*, 16 (2), pp. 82-105.

Table 1
The Number of Usable Observations

Total Useable tax returns filed during amnesty	10,934 ^a	
Less: Returns without a tax due balance	3142	
Usable tax returns		7,792
Returned Surveys	3,448	
Less:		
Surveys from taxpayers owing no tax	733	
Incomplete information	596	
Usable Surveys		2119
Less: Outliers ^b		22
Observations used in analysis		<u>2097</u>

^a A total of 11,367 individual income tax returns were filed during the amnesty. Certain observations were excluded because they had negative income, missing data, or were determined to be outliers.

^b Outliers were identified using the Bonferroni inequality R-student critical value test (Miller, 1965).

TABLE 2
Descriptive Statistics: Complete Sample Size = 2097

	Min	Max	Mean	Median	Std Dev.
<u>Tax-related variables:</u>					
<i>Tax year</i>	1984	1995	1993.6	1994	1.52
<i>Tax due</i>	\$1	\$37,182	\$528	\$232	\$1297
<i>Total Arkansas income</i>	\$128	\$690,653	\$35,324	\$30,887	\$31,396
<i>Filing status</i> ^a	0	1	.3424	0	.4746
<i>Opportunity to evade</i> ^b	-.0192	1	.4507	.2752	.3972
<i>Time known taxes were due</i> ^c	0	4	1.6290	2	.6702
<i>Prior state contact</i> ^d	0	1	.8250	1	.3801
<u>Demographic variables:</u>					
<i>Age:</i>					
<i>Less than 30 years</i>			9%		.2837
<i>30's</i>			29%		.4534
<i>40's</i>			32%		.4669
<i>50's</i>			16%		.3670
<i>Older than 59 year</i>			14%		.3488
<i>Education</i> ^e			3.0467	3	1.1573
<u>Behavioral variables - Excuses for noncompliance:</u> ^f					
<i>Lack of money</i>			.1021	0	1.6641
<i>Unfairness of tax system</i>			-.7792	-1	1.1510
<i>Complexity of tax system</i>			-.9137	-1	1.1067
<i>Ignorance of tax due</i>			-.1111	0	1.5640
<u>Behavioral variables – Reasons for amnesty participation:</u> ^f					
<i>Family and friends</i>			-.8956	-1	1.2248
<i>Fear of being caught</i>			1.1178	2	1.2255
<i>Morality</i>			1.0262	1	1.179
<i>Avoidance of penalties</i>			-.4630	0	1.3485

^a Filing status – reported as 1, if single and 0, if married.

^b Opportunity to evade - calculated as $1 - [(\text{withholdings} + \text{prepayments}) / \text{total Arkansas income}]$

^c Time known back taxes due – reported scale of 1 (less than 1 year) to 4 (greater than 10 years)

^d Prior state contact – reported as 1, if contact and 0, if no contact.

^e Education – reported scale of 1 (not completed high school) to 5 (earned a graduate degree).

^f Behavioral variables – reported scale of -2 (strongly disagree) to 2 (strongly agree).

TABLE 3
Descriptive Statistics: Subgroups

	Intentional mean (std) n=981	Unintentional Mean (std) n= 758	Neutral Mean (std) n=358
<u>Tax-related variables:</u>			
<i>Tax due</i>	476 (.677)	513 (1,336)	705 (2,191)
<i>Total Arkansas income</i>	35,5595 (20,584)	33,548 (37,115)	38,341 (41,073)
<i>Filing status^a</i>	.34 (.47)	.34 (.47)	.35 (.48)
<i>Opportunity to evade^b</i>	.41 (.38)	.51 (.42)	.45 (.38)
<i>Time known taxes were due^c</i>	1.90 (.63)	1.19 (.45)	1.82 (.68)
<i>Prior state contact^d</i>	.80 (.40)	.84 (.36)	.85 (.36)
<u>Demographic variables:</u>			
<i>Age:</i>			
<i>Less than 30 years</i>	.09 (.29)	.08 (.28)	.09 (.29)
<i>30's</i>	.31 (.46)	.28 (.45)	.24 (.43)
<i>40's</i>	.33 (.47)	.28 (.37)	.31 (.48)
<i>50's</i>	.16 (.37)	.16 (.37)	.14 (.35)
<i>Older than 59 year</i>	.10 (.31)	.18 (.39)	.15 (.36)
<i>Education^e</i>	2.99 (1.15)	3.13 (1.19)	3.02 (1.09)
<u>Behavioral variables - Excuses for noncompliance:^f</u>			
<i>Lack of money</i>	.77 (1.52)	-1.00 (1.34)	.60 (1.43)
<i>Unfairness of tax system</i>	-.90 (1.07)	-.93 (1.18)	-.14 (1.10)
<i>Complexity of tax system</i>	-.93 (1.14)	-1.16 (1.01)	-.35 (1.01)
<i>Ignorance of tax due</i>	-1.59 (.49)	1.74 (.44)	
<u>Behavioral variables – Reasons for amnesty participation:^f</u>			
<i>Family and friends</i>	-.98 (1.21)	-.99 (1.23)	-.47 (1.16)
<i>Fear of being caught</i>	1.25 (1.13)	.87 (1.39)	1.29 (.99)
<i>Morality</i>	1.11 (1.15)	1.02 (1.22)	.81 (1.15)
<i>Avoidance of penalties</i>	-.30 (1.42)	-.89 (1.23)	-.002 (1.13)

^a Filing status – reported as 1, if single and 0, if married.

^b Opportunity to evade - calculated as 1 – [(withholdings + prepayments) / total Arkansas income]

^c Time known back taxes due – reported scale of 1 (less than 1 year) to 4 (greater than 10 years)

^d Prior state contact – reported as 1, if contact and 0, if no contact.

^e Education – reported scale of 1 (not completed high school) to 5 (earned a graduate degree).

^f Behavioral variables – reported scale of –2 (strongly disagree) to 2 (strongly agree).

Table 4
Summary of Results: Dependent Variable = Tax Due
 Parameter estimates for variables significant at the .05 level

	Complete Sample n=2,097 Adj. R ² =.73	Intentional Evaders n=981 Adj. R ² =.68	Unintentional Evaders n=758 Adj. R ² =.64	Neutral n=358 Adj. R ² =.95
Tax-Related Variables:				
Income	0.02333	0.03022	0.02819	0.02742
Income ²	2.225422 ⁻⁸	-6.39386 ⁻⁸		4.007426 ⁻⁸
Opportunity to evade	1163.08123	1161.45909	1179.82033	1335.06278
Prior state contact		73.71449		
Length of time knew tax was due				
Multiple amnesty years		-1.57850		
Filing Status	122.75456	143.60520		182.64718
Demographic Variables:				
Age: Less than 30		96.48315		
Over 60		90.72835		
Education	-38.997919			-99.51724
Behavioral Variables: Excuses for Noncompliance				
Lack of money		26.58281		-53.52705
Complexity				
Perception of fairness				81.50266
Ignorance of tax due ^a				
Behavioral Variables: Reasons for amnesty participation				
Friends and family				
Avoidance of penalties				
Morality	-29.90478			
Fear of being caught				

^a The ignorance variable is included only in the regressions for the complete sample and is used as a sorting variable for the other tests.

Table 5**Summary of Results: Dependent Variable = Percent of Income Owed in Tax**

Parameter estimates for variables significant at the .05 level

	Complete Sample n=2,097 Adj. R ² =.67	Intentional Evaders n=981 Adj. R ² =.72	Unintentional Evaders n=758 Adj. R ² =.60	Neutral n=358 Adj. R ² =.77
Tax-Related Variables:				
Income	1.799995 ⁻⁷	3.795215 ⁻⁷	1.574677 ⁻⁷	2.238754 ⁻⁷
Income ²	-2.1617 ⁻¹³	-1.673 ⁻¹²	-1.973 ⁻¹³	-2.427 ⁻¹³
Opportunity to evade	0.02971	0.02980	0.02950	0.03138
Prior state contact	0.00303	0.0226	0.00317	
Length of time knew tax was due	-0.00087615	-0.00109		
Multiple amnesty years				
Filing Status	.00150	0.00240		0.00279
Demographic Variables:				
Age: Less than 30	.00140	0.00298		
Over 60				
Education				-0.00130
Behavioral Variables: Excuses for Noncompliance				
Lack of money	0.00031541			
Complexity				-0.00085306
Perception of fairness				0.00111
Ignorance of tax due ^a				
Behavioral Variables: Reasons for amnesty participation				
Friends and family		0.00044366		
Avoidance of penalties				
Morality	-0.00059085		-0.00091869	
Fear of being caught				

^a The ignorance variable is included only in the regressions for the complete sample and is used as a sorting variable for the other tests.