LAURA SOUR

Gender Equity, Enforcement Spending and Tax Compliance in Mexico

CIDE

Abstract

Using experimental evidence, we show that gender is the most significant sociodemographic variable that explains tax compliance in personal income tax in Mexico. The results highlight the necessity to take into account gender when designing tax policy recommendations, especially those affecting wage earning women. This evidence also suggest that —if women are more compliant than men— fiscal authorities might increase the return of the enforcement spending if they audit more men than women. This policy eliminates the necessity of improving tax supervision or increase the amount of deterrence spending in the short run.

Keywords: gender, enforcement spending, tax compliance, experiments, Mexico.

JEL classification: H26, C91.

Resumen

A partir de evidencia experimental, se muestra que el género es la variable sociodemográfica más importante que explica el cumplimiento tributario en el impuesto sobre la renta en México. Los resultados destacan la necesidad de incluir una perspectiva de género en el diseño de recomendaciones de política fiscal, especialmente en aquellas que afectan a las mujeres asalariadas. Esta evidencia también sugiere que, si las mujeres son mejores contribuyentes que los hombres, la autoridad fiscal podría aumentar la rentabilidad del gasto empleado para la fiscalización si el programa de auditorías incluyera a más hombres que a mujeres. Esta política elimina la necesidad de mejorar la supervisión de las auditorías o aumentar el gasto de disuasión en el corto plazo.

Palabras clave: género, cumplimiento en el pago de impuestos, experimentos, México.

Clasificación JEL: H26, C91.

I. Introduction

Researchers have used the analysis of government expenditures as an important tool for addressing gender inequalities. Yet, only recently has a gender perspective been incorporated in the study of public revenues (Kathleen Barnett and Caren Grown, 2004). It is now recognized that, in order to fully understand the impact on gender of fiscal policy, one also needs to analyze the incidence of taxation. Thus, the relation between the tax burden and social benefits depends on the gender distribution of taxes paid and services received, but also on gender tax compliance. If, for example, there is a neutral tax policy but there is evidence that women comply more and receive a smaller salary than men working in the same activities, then efforts to integrate a gender perspective into the study of public finance become more important in order to fully achieve gender equality.

Gender revenue analysis seeks to identify the impact on women of tax alternatives. In developed countries, attention to tax impacts by gender has begun only recently. However, each country determines how it defines equity, and each country faces difficult tax policy decisions when seeking to reduce tax evasion and support public goods and services. Moreover, because the allocation of women's time between paid and unpaid work differs significantly from developed to developing countries, more research is required to understand the gender impact of fiscal policy in developing economies to reduce gender inequality.

Given the difficulties to do empirical work on tax compliance, laboratory experiments offer a good starting point to investigate the economic determinants and gender differences in this subject. This is particular important for developing economies, where there is little empirical evidence on which to base policy design and where attention to tax impacts by gender is incipient.

This paper presents the economic and the gender determinants of personal income tax compliance in Mexico based on experimental data, thereby supplementing scarce empirical research on this problem. The evidence shows that higher audit rates increase compliance, and that women are more compliant than men when complying with their income tax. These results highlight the necessity to take into account a gender perspective when designing tax policy recommendations, but also make one to think differently about deterrence theory in the case of Mexico. Instead of increase the rate of audits to encourage compliance, it might be more profitable to audit more men than women since they comply less. This policy allows maintaining constant the amount of resources devoted to enforce tax compliance constant increasing the return of the enforcement spending on tax compliance. This is particularly relevant in the case of developing countries, where the

opportunity cost of their resources to increase compliance is greater than in any industrialized country. To the extent that these results are compared with other national experiences, this information will help one to better understand the problems of tax compliance. The existence of factors other than detection and punishment in the taxpayer's decision in the Mexican case will allow researchers to design public policies that incorporate these factors into their analysis.

II. Theoretical framework

Tax compliance

In many developing countries, the low level of tax revenue has limited the capacity of governments to redistribute income, provide public goods and generate economic growth. The main cause for the fragile tax collection is the high level of tax evasion. According to the Organization for Economic Cooperation and Development (OECD), in 1999 the average tax revenue in developing countries was 18% of GDP, barely half of the tax revenue in the industrialized countries during the same year.[1] Estimates for various countries indicate that evasion is an extensive phenomenon (Phillip Sawicki, 1983: 159-172).

All the illegal and intentional actions that individuals take to reduce their legal and due tax obligations constitute tax evasion, such as underreporting income, sales or wealth; overstating deductions, exemptions or credits; or, simply, failing to file their tax returns. Evasion requires that governments spend resources to deter noncompliance, to detect its magnitude and to penalize its practitioners. Researchers have attempted to isolate in their models the nuances of motivations and intentions that people have when they fill out their tax forms and pay their taxes.

In the economic model of Michael G. Allingham and Agnar Sandmo (1972), tax evasion is the willful act of noncompliance with the tax law in order to reduce tax liability. According to this model, taxpayers must choose how much income x to declare to tax authorities so that she maximizes her expected utility. Shlomo Yitzhaki (1974) modified the Allingham-Sandmo model by imposing a penalty on tax understatement, as opposed to unreported income.

The utility for the taxpayer depends on his final level of income and on the income concealed from the tax authority. The true after tax income v equals to $y(1-t)$ where t is a uniform tax rate. The probability of being audited is p and the individual must pay a constant penalty s if he evades taxes and is audited. The individual must choose how much income x to declare to the tax authorities. If the individual is risk neutral, his level of utility is given by:

---

[1] The average tax revenue in the industrialized countries for 1999 was 37.3% of GDP. OECD, 2001, 77.

$$(1) \qquad U^E \;=\; \underset{\{x\}}{Max} \;\; \{(1-p)\;\; U[I_u]\;\; +(p)\;\; U\;\; [I_D]\}$$

If the individual chooses to undeclared and is not audited, her level of utility will be I_u.

$$(2) \qquad I_u \;=\; v \;+\; t(y-x)$$

Otherwise, when the individual decides to declare, her utility will be I_D, or:

$$(3) \qquad I_D \;=\; v \;-\; st(y-x)$$

Assuming that taxpayers maximize their expected utility, the first order condition is:

$$(4) \qquad (1-p)\;\; U'[I_u]\;\; -ps\;\; U'\;\; [I_D] \;=\; 0$$

Thus equation (4) determines the optimal level of reported income, given *p* and *s*. The level of reported income will be zero whenever

$$(5) \qquad p \;\langle\; \frac{1}{(1+s)}$$

Otherwise, nobody will evade. In other words, this economic model assumes that the level of compliance is determined by the probability of detection and the penalties for fraud. Consequently, the model predicts that if detection is likely and penalties are severe people will pay their taxes.[2] Michael G. Allingham and Agnar Sandmo recognize that, "to asses the efficiency of these tools [fines and audits] one would need empirical estimates of the effects discussed in this paper" (1972: 338). Up to now there are no unambiguous conclusions for many of the factors that determine the taxpayer's decision making process regarding compliance. James Andreoni, Brian Erard and

---

[2] A risk neutral individual is indifferent to reporting any level of income. Optimal individual decisions for any linear objective function will exhibit all-or-none behavior, in which the individual will either report all or zero income. In other words, a risk neutral individual tends to exhibit all-or-none behavior, and evasion will increase with a reduction in the tax rate.

Jonathan Feinstein (1998) have called for more work exploring the diverse influences on compliance behavior.

The most common way to fight evasion is with audits and fines. Dubin, *et al.* (1990) estimated the impact on the federal income tax revenue in the U. S. when there is an increase in the rate of audits. They concluded that an increase in the probability of an audit, substantially increases the marginal return of tax collection, thus increasing considerably tax revenues. Therefore, according to Dubin, *et al.* (1990), the reason for having high levels of tax evasion is due to weak monitoring —meaning that the rate of audits is low because there is a lack of equipment and personnel in the tax agencies. Consequently, if the government increases the enforcement spending, then tax revenues will increase.[3] However, increasing the number of audits is not always the best choice. Sometimes it might be better to increase the severity of the sanctions, since it accounts for minor costs. Therefore, only when we know the yield of the enforcement spending in terms of tax revenues we can decide to what extent it will be profitable to raise the amount of resources devoted to enforce tax compliance. This is particularly relevant in the case of developing countries, where the opportunity cost of their resources is greater than in any industrialized country.

Gender and taxes

The importance of the study of gender and taxes is that it can shed light on gender specific attitudes towards a particular law, which can help to discover a bias in the tax law, independent of the political outcome (R. Michael Álvarez and Edward J. McCaffery, 1999). This is particularly important in developing countries, such as Mexico, where the minority of women participate in the formal labor market and a high percentage of the government expenditure is allocated on a gender neutral basis.

The analysis of gender bias in taxation is a fairly new discussion. As a starting point, Kathleen Barnett and Caren Grown (2004) develop a hypothetical gender tax typology. They include gender and other socioeconomic variables, not included in economic models —such as economic activity and the country's level of development (see Table 1).

---

[3] There are other factors, besides enforcement forces, that can also explain low levels of tax compliance: i) lack of honesty ii) the perception that the tax system is unfair iii) the idea that the number of individuals in the economy who pay their taxes is low iv) the government wastes taxpayers money v) the regulatory framework is complex and is not very transparent. However, in this paper we only discuss the effect of the enforcement spending on the levels of tax revenues in the economy. For a complete revision of the literature see Andreoni *et al.* (1998).

TABLE 1. HYPOTHETICAL GENDER-TAX TYPOLOGY

LEVEL OF DEVELOPMENT	PRINCIPAL WOMEN'S ECONOMIC ACTIVITIES	PRINCIPAL TAXES AFFECTING WOMEN
Very Low	Agriculture Market selling Small trade Home-based production Unpaid domestic work	VAT Selective sales taxes Property taxes User fees
Medium Low	Agriculture Market selling Small trade Home-based production Unpaid domestic work	VAT Selective sales taxes PIT & corporate taxes Property taxes User fees
Medium High	Small trade Small services Public sector Factory work Unpaid domestic work	VAT Selective sales taxes PIT & corporate taxes Property taxes User fees
High	Full economic integration	VAT/Sales Selective sales taxes PIT & Corporate taxes Wealth & Inheritance taxes Property taxes User fees

Source: Barnett and Grown, 2004: 29.

Also, R. Michael Álvarez and Edward J. McCaffery (2000) point out that there are gender-based differences in attitudes towards specific aspects of taxation in developed economies. Moreover, Annika Suden and Brian Surette (1998) find significant gender differences in individual retirement savings. Thus, the literature and the data suggest that tax authorities should examine the incidence of taxation from the point of view of individual women and men, recognizing that they have different propensities for consumption, savings and tax compliance. Women tend to spend a higher proportion of their income on food, education and healthcare (Basu, 2006). Consequently, any policy that changes the relative prices of these goods by increasing the tax rate will affect women's consumption decisions more than men's.

Gender and tax compliance

Prior tax research provides support for gender differences in tax compliance. Jonathan C. Baldry (1987) in an experimental setting found women to be more compliant than men. Lars Fallan (1999) reports gender differences in tax attitude changes influenced by better tax knowledge. Fallan (1999) concludes that gender has a predictive power in explaining attitude changes in tax

ethics, but no changes in the perception of tax fairness. Even though this research supports gender differences in tax compliance, it leaves open the question as to what drives these differences in tax compliance.

Taxpayers' decision is based upon beliefs about the probability of detection and penalties. Consequently gender differences on risk aversion might be an important factor to explain gender tax compliance empirically. In most field studies, women are found to be more averse to risk than men, however the findings from laboratory experiments are somewhat less conclusive. Even though there is plenty evidence, it is mixed in nature and inconclusive. Consequently the results does not offer consistent evidence to support that the gender differences in tax compliance can be explain based on risk aversion differences (Catherine C. Eckel and Philip J. Grossman, 2005).

Various demographic characteristics are also related to tax compliance behavior. Jonathan C. Baldry also reports that age is positively associated with compliance (see also Benno Torgler and Friedrich Schneider, 2006). However, Nehemiah Friedland, *et al.*, 1978 finds evidence that supports the opposite relation between age and compliance. The absence of conclusive evidence about gender differences in tax compliance makes laboratory methods a good starting point to investigate tax paying behavior among women and men, and to determinate whether —and to what extent— gender differences affect tax compliance in Mexico.[4]

III. Tax structure in Mexico

In Mexico public policies designed to achieve gender equity are commonly directed through program whose beneficiaries are vulnerable groups such as indigenous women, single mothers, and unemployed women. In spite of the obvious importance of the programs focused on these social groups, there are others whose vulnerability is more difficult to recognize. This is the case of wage-earning women.

Among the independent variables, gender is the main factor to explain the different labor supply patterns between men and women. For example, the gender gap between married men and women is very large: 93% of married men are employed but only 21% of married women are employed. Another important gap is the one related to earnings. Female-owned small businesses

---

[4] Only the American case has been extensively analyzed in this respect. The most reliable empirical evidence about tax compliance in the US is the Taxpayer Compliance Measure Program (TCMP) of the Internal Revenue Service (IRS). The TCMP intensively audits individual tax returns on a stratified random national sample. Even though the TCMP fails to detect certain income sources that are exempt from reporting requirements —such as self-employed people and those whose main income is cash— it is recognized as the best "hard" data available for the developed economies. For some international studies see J. Graetz and L.L. Wilde, 1985; James Alm, Roy Bahl and Matthew N. Murray,1990 on Jamaica; Dick J. Hessing *et al.*,1992 on the Netherlands; and Ana De Juan, Miguel A. Lasheras and Rafaela Mayo, 1994 on Spain.

in rural and urban areas represent 26 to 44% of all firms in Mexico while women earn 36 to 50% of the earnings their male counterparts receive.

Female labor force participation is estimated to be about half that of male participation: 37% of women are either employed or looking for work, compared to 79% of men. This is a situation that has been during the past 25 years, even though human capital levels of the employed are about equal for men and women.

In the Mexican case, two considerations make wage-earning women an important group of attention for policy decision makers. On the one hand, the structure of the income tax is highly disproportionate according to salary (Fausto Hernández, Andrés Zamudio and Juan Pablo Guerrero, 2000). On the other, recent World Bank studies indicate that women still perceive a smaller salary than men working in similar, or even the same activities. Thus, after surpassing the socio-cultural and economic barriers to enter the formal labor market, wage-earning women gain less and pay the same tax rate in relation to men.

Policymakers should consider address gender equity issues in Mexico in terms of the tax obligations of the women working in the formal economy. In the current Mexican tax system individuals employed in the public or private sector are subject to tax on personal income, but there is no difference based on gender for the fiscal treatment of join income, nor a penalty for secondary earners within the same household, for instance.

IV. Experimental economics

The lack of "hard" empirical data on compliance has forced researchers to generate their own data via surveys of taxpayers or experimental simulation of income tax assessment. In the surveys, the taxpayers are asked to report their own compliance activities, or other activities from which compliance can be inferred. However, this data is very difficult to interpret, since both complete honesty and perfect recall are required if an answer is to reflect the activities that are of interest. An alternative method of data generation requires the design of an experiment which replicates the income tax assessment, and in which individuals have the same type of incentive to declare their taxes as if they were in the real process. These experiments generally consist of a game that requires participants to make their declarations, pay taxes, experience audits and pay penalties for detected noncompliance in sequences of multiple periods.

The experimental method is very attractive to empirically test theoretical predictions. The design of the experiment can be such that it generates data of special relevance to the analysis and excludes irrelevant variables. The experiment can be designed in such a way that it unambiguously determines which variables are endogenous and which are exogenous. The experiment

can also be such that it avoids problems of multicollinearity in the independent variables.

The experimental approach has some obvious criticisms: the magnitude of gains and losses facing subjects can be different from those associated with the actual compliance decisions. Also, participants may act differently in the experiment than they would in the real economic activity of compliance. However, it cannot either be automatically presumed that participants act differently in the experiment from the way they would act in the real decision of tax compliance, which some individuals may treat, in fact, as a game. A reasonable view is that if experimental results can be shown to be consistent with the results derived using "hard" data, the former can claim to be a reasonable representation of the actual process.

V. Neutral terms in the experimental design

An important feature of the experimental design is that the instructions use "neutral" terminology. That is, all references to taxes, audits, declared income, and the like are replaced with such neutral words as payments, checks, reported income and so on. It is a basic tenet of the experimental paradigm that neutral terms be given in instructions in order context effects or framing effects that may bias subjects' choices predictably.[5] Previous research in this area has inadequately induced subject preference because the instructions given to the subjects have placed the experiment in the context of tax evasion. That is, the terminology used in previous works may have provided an undesirable context to the experiments, and so the decision of the subjects may have reflected the values that they associate with such terms as "tax compliance" or "tax evasion", rather than with the rewards or penalties that they face in the experiment *per se.*[6]

When designing the experiment, one has to be careful in given subjects complete information about the situation that they will face in the laboratory. In this way, subjects make decisions only on the basis of the institution in the laboratory such as payments, rewards and instructions.[7] In this case, sheets of cardboard were placed around each of the computer terminals to prevent the subject from viewing a terminal other than their own and to enhance each subject's sense of privacy.

---

[5] See Charles R. Plott (1987) and L. Vernon Smith (1982) for further discussion on experimental design.

[6] For instance see Bosco, Luigi and Luigi Mittone (1997) and Nehemiah Friedland, Shlomo Maital and Aryen Rutenberg (1978).

[7] L. Vernon Smith (1982) identifies four sufficient conditions for creating a microeconomic system in the laboratory: *i)* nonsatiation —subjects always prefer more to less, *ii)* saliency –subject's decisions have prominent effects on rewards, *iii)* dominance —the reward structure dominates any subjective cost associated with the participation in the activities of the experiment, and *iv)* privacy —each subject in an experiment is given information only about his own payoff alternatives.

VI. Experimental design

Experimental economics involve the creation of a microeconomic system in the laboratory. The essence of such a system is to control the alternatives that individuals can chose in order to capture the nuances of voluntary income reporting. In this case, the main objective of the experiment is to test whether a high probability of an audit and penalties make people pay their taxes, and to determine if gender differences exist in compliance behavior in a controlled environment under a very simple tax system.

Individuals in a controlled laboratory environment are given income, randomly selected by the computer, and must decide how much income to report. Taxes are paid at some rate in voluntary reported income, and they are unpaid on underreported. They know that there is a fixed probability of audit, and if they are detecting cheating, they will pay a penalty on unpaid taxes. For instance, a penalty rate of 2 implies that subjects will pay back taxes plus a penalty equal to back taxes if caught cheating. At the completion of each round the subjects are individually shown their new balances. This process will be repeated for a fixed number of rounds but individuals will not know the total number of rounds, in order to avoid end-of-treatment effects. However, each session was repeated 30 times. The purpose of each round is to represent a fiscal year.

The experiment was conducted in a computer laboratory, where the computer performed all calculations. The experiment is made up of nine sessions, each consisting of three parts. After the first ten rounds (Part I), individuals face another level of parameter for another ten rounds. Then, compliance is compared in the presence and in the absence of that specific change. Sessions one to three test the effect of three different levels of probability of audit: 5, 30 and 50%. Sessions four to six change the fine rate on underreported taxes from level two to four and, finally, to level six, but leave the probability of audit and the tax rate constant. The last three sessions capture the response of the compliance rate to changes in the tax rate (10, 30 and 40%). Individuals are organized in groups of eight, and each individual is assigned an identification number.

Before each session starts, the computer gives an income varying from 25 to 200 tokens to every individual. The individuals read their own copy of the instructions, and are permitted to keep the instructions during the experiment for reference.[8] Table 2 presents the experimental design.

Some of the parameter values in the experiment design are chosen to approximate the values actually faced by individuals in Mexico. For instance, a tax rate of 30% in the experiment is comparable to the one faced by taxpayers in the top marginal tax bracket. However, recall that one of the

---

[8] The instructions were originally written in Spanish. They are available upon request.

main objectives of the present work is to test theoretical predictions and to observe unpredicted regularities under a controlled environment. In this manner, predictions are interpreted in relation to the theory. Consequently, the main importance of the parameter values in the experiment is the series of predictions they generate in terms of observed behavior.

TABLE 2. EXPERIMENTAL DESIGN

SESSION	AUDIT RATE	FINE RATE	TAX RATE
1	5%,30%,50%	2	30%
2	30%,50%,5%	2	30%
3	50%,5%,30%	2	30%
4	30%	2, 4, 6	30%
5	30%	4, 6, 2	30%
6	30%	6, 2, 4	30%
7	30%	2	10%,30%,40%
8	30%	2	30%,40%,10%
9	30%	2	40%,10%,30%

The 72 participants in the experiment were recruited in class on voluntary basis. They were undergraduate students at the Centro de Investigación y Docencia Económicas (CIDE) in Mexico City; 47% were women and 53% were men. Although 59% had working experience, only 1% was working at the time. They were told that each would be paid according to his or her performance.[9] The exchange rate was 50 tokens per Mexican peso.

The use of students is nearly universal in experimental economics. Availability and cost play a role in this practice. More important, properly designed experiments evaluate individual decision making, and there is no reason to doubt that students have accesses the same cognitive processes as non-students. Those studies comparing student and non-student responses have generally found no significant differences (Charles R. Plott, 1987). Also, the main interest of this work is to test the theory which only assumes that agents are motivated to bid so as to maximize expected utility, any sample of agents not likely to be saturated in money, such as college students, is sufficient to conduct the experiment (L. Vernon Smith, 1982: 937).

---

[9] Individual earnings ranged from seven to eleven dollars depending on the individual's performance in the experiment.

VII. Results

The analysis of the experimental results is based on the income declared for each treatment. Consequently, this variable is censored at zero. To accommodate the structure of the dependent variable, we used a Tobit model to estimate the coefficients of the independent variables.

The economic model indicates that higher probability of audit and penalties make people pay their taxes. Thus, the percentage changes of the declared income with respect to a percentage change of the audit rate or the fine rate should tell us why people pay taxes. Furthermore, since gender was included as an explanatory variable, the experiment also showed the influence of gender differences in tax compliance. Age, another sociodemographic variable was included, and also shed light on who complies more. The results indicate that gender and age are important and significant to explain tax compliance in Mexico (see Table 3).

TABLE 3. TOBIT ESTIMATES
DEPENDENT VARIABLE DECLARED INCOME

	Coefficient	Elasticity
constant	7.296	--
	(3.41)	
income	0.548	1.1172
	(0.02)	
audit rate	6.389	0.373
	(1.08)	
fine rate	0.156	-0.0082
	(0.09)	
tax rate	-5.016	-0.2872
	(1.55)	
age	-.437	-1.704
	(0.10)	
gender	0.418	--
	(0.24)	
N	2160	
log-likelihood	-5901.49	
LR	593.66	

*The dependent variable is the declared income. Each elasticity is calculated at the mean values of the variables. Standard error values are in parentheses.

First, the estimation results show that an increase in the audit rate increases tax revenues. This result confirms the predictions of the Allingham-Sandmo model, and is consistent also with the empirical work of Jeffrey Dublin, Michael J. Graetz and Louis L. Wilde (1990).

Second, although the low administrative costs of increasing penalty rates make this policy very popular among the majority of tax authorities, the estimation results show that this coefficient is close to zero and non-significant. This fact is consistent with most reviews in the literature that conclude that there is little evidence that fine severity reduces the non-compliance behavior (Anthony Doob and Cheryl M. Webster, 2003).[10]

Third, the experimental results also show that the compliance rate decreases when the tax rate increases. This result refutes the theoretical results of the Shlomo Yitzhaki (1974) model, but is consistent with various empirical studies that support the idea that tax savings from noncompliance are a function of the tax rate.[11] Consequently, the incentives for noncompliance increase as the tax rate increases.

But the most important result of the experiment is that age and gender are important and significant determinants of compliance in Mexico. On the one hand, even though there is no much variation in age among students who participate in the experiement, age can negatively change compliance, and its effect is larger than the positive effect of an audit in the case of Mexico.[12], This result reinforces the findings of Nehemiah Friedland *et al.*, 1978, but goes against Jonathan C. Baldry, 1987. This is important, particularly in Mexico, where young people are the majority among taxpayers. On the other, gender is the most significant sociodemographic variable, even more than the economic variable of audit rate. Consistent with almost all works that relate gender to offending, women also cheat less in Mexico. This result supports the findings of Michael J. Hindelang, 1971 and Jonathan C. Baldry, 1987, and highlights the importance of obtaining sex-disaggregated data in order to make gender revenue analysis, since —for instance— US data suggests that the effect of gender is uncertain. Since US evidence is specific to conditions of high-income countries, in this case it does not provide helpful information about gender bias in lower income countries (see Table 1).

Finally, authorities in Mexico need to analyze in depth the efficiency of the administrative spending, before recommend an increase in the enforcement spending to increase tax revenues. It seem that the Mexican Tax Administration System (SAT) can increase the return of the enforcement spending if the audit program in biased towards men. This change in policy might increase the administrative efficiency, without the necessity of improving tax supervision or increase the amount of deterrence spending.

---

[10] The evidence indicates that higher audit rates —but not higher penalties— increase compliance. Tax authorities should take into account the administrative costs of increasing the probability of audit when designing enforcement policy. For instance, the results suggest that the enforcement agency can increase compliance by changing its enforcement strategy, but there are limits to strategies based only on greater enforcement. In particular, if the impact appears to be nonlinear, the deterrent effect of a higher audit rate eventually diminishes (James Alm *et al.*, 1992). Consequently, policymakers should interpret the experimental results with caution.

[11] C. T. Clotfelter, 1983; Joel Slemrod, 1985; S. E. Crane and F. Nourzad, 1986; Jonathan C. Baldry, 1987; J. M. Poterba, 1987; and Nehemiah Friedland, Shlomo Maital and Aryen Rutenberg, 1978.

[12] The coefficient is significant at the 10% level.

Conclusions

The main lesson from this work is that the tax systems are not gender neutral. Since the main technical difficulty to do tax compliance analysis from a gender perspective is that governments do not collect gender-disaggregated data, laboratory experiments seem to be a good starting point for the study of taxpayer reporting decisions. Experiments allow analyzing the impact of factors not amenable to theoretical work. They also generate data under different settings in which there is control over extraneous influences. Therefore, experimental studies can contribute to expand enormously our understanding of the fiscal and the gender factors that affect public finance recommendations.

To better understand gender differences in tax compliance in Mexico further research is needed to analyze the gender structure of the labor market. The structure of the fiscal system influences directly in the labor participation decision of women and in the remunerated labor hours. In order to understand gender differences in tax compliance it might be useful to further investigate the distribution of women working in the different economic sector (public and private), the division of work and power in the family and its impact on labor participation and career decisions. If women are more compliant and there are gender differences in the impact of taxes on labor supply, then a differentiated fiscal policy between men and women can equalize gender differences in the country.

The evidence presented here shows that the impact of taxes on income distribution and gender equity requires more study in a wide range of variables in order to bring empirical evidence to inform policy decision makers. Fiscal policy must be redesigned based on behavioral responses according to gender, to taxation, as well as on asset structure inequalities.

The experimental data regarding higher tax rates shows that the incentives for evasion increase with the tax rates. However, since there is also evidence about gender differences in expenditure across a wide range of cultures (Lawrence Haddad, J. Hoddinott and H. Alderman, 1997), gender differences in household decision-making regarding consumption and savings are also an important variable to fully understand the impact of taxation . Consequently, the study of gender dimensions of taxation in the future should include the primary economic activities of women, the principal types of taxes that affect women engaged in these activities, and the country level of income.

The literature and the data show significant gender differences in individual retirement savings and in attitudes towards specific aspects of taxation in developed economies. Therefore, policy makers should examine the incidence of taxation from the point of view of individual women and

men, recognizing that they have different propensities for consumption and saving.

The results of this study suggest that younger women are more compliant. Both, sociologists and psychologists should provide a richer explanation for these phenomenons. Until then, further experiments are needed to examine whether different or similar models explain gender and age differences in compliance behavior in developing countries.

These factors are only some of the elements in the compliance decision. Various other factors seem to affect this decision: uncertainty about the fiscal system, the role of tax practitioners, endogenous audit selection rules, tax withholding, tax amnesties, the joint choice of tax avoidance and tax evasion, the influence of social norms, the quality of public goods, and so on. Nevertheless, the evidence presented here should contribute to the discussion of gender issues in the budget analysis literature, since both taxes and expenditure policies affect income and gender equity. Policymakers should consider seriously all of this evidence to address income and gender equity issues in Mexico. In the mean time, fiscal authorities can increase the return of the enforcement spending if they audit more men than women. This policy eliminates the necessity of improving tax supervision or increase the amount of deterrence and it contributes to increase the efficiency of the tax administration.

Appendix

INSTRUCTIONS

The following instructions were originally written in Spanish. The instructions were adapted accordingly to the different sessions. They are available upon request.

This is an experiment in the economics of decision making. The instructions are simple and, if you follow them carefully, you will have an opportunity to earn A CONSIDERABLE AMOUNT OF MONEY that will be paid to you in cash at the end of the session.

You have been organized in groups of eight people. Each group will consist of the same eight persons for the duration of the session. The specific identities of the other persons in your group will not be revealed to you. YOU MAY NOT COMMUNICATE WITH ANYONE ELSE IN THE ROOM DURING THE SESSION. If you do not follow the rules, we will have to exclude you from the experiment and you will not receive any payment.

The session will last for several rounds, each one is independent from the others. In each round, you will be required to make a decision and your total earnings will depend on these decisions. You will not know the total number of rounds. At the beginning of the session each individual will be given 2000 tokens. You will have the opportunity to add to these tokens in each round. At the end of the session, the tokens you have accumulated will be converted to cash at the rate of 50 tokens per pesos. For example, if at the conclusion of the experiment your balance on the computer is 5000 then you will receive 100 pesos. YOU SHOULD FEEL FREE TO TRY TO MAKE AS MUCH MONEY AS YOU CAN.

At the beginning of each round, the following input-screen will appear on your computer. On the top left corner, the session number, participant and round will appear. In each round, you will be given a new amount of tokens (actual tokens). The exact quantity you an the others in your group receive will be randomly drawn by the computer from the range of 25 to 200 tokens in increments of 25 tokens. All values are equally likely and only you will know the quantity you have received. You have the choice of keeping your tokens or disclosing them in the input-field "reported tokens". Move the mouse to enter in this input-field. You may disclose any amount of tokens between zero and the amount of tokens that you actually receive.

You will pay 30% of the tokens you disclose. For example, if you receive 100 tokens and disclose 70 tokens, you will pay 21 tokens (0.3 times 70). You do not pay on money your do not disclose, and only you know the true amount of money that you receive at the start of each round. After you have decided the number of tokens that you want to disclose, please copy this number in

the report sheet (yellow sheet), as well as the round number. In the above example, you will fill the report sheet with the following numbers:

ROUND	REPORTED TOKENS
1	70

Now, WAIT FOR THE INSTRUCTION TO PRESS THE BUTTON "ACCEPT". Please check the number of tokens that you disclose, because once you click on the "Accept" button, you will not be able to change your mind. After everyone has disclose his or her tokens, some individuals may be selected for a check. In this check, the computer will compare the person's true quantities of tokens for the current round with the actual levels disclosed. If you are checked, any tokens received but not disclosed will be discovered. You will pay the shortfall (30% of over the tokens received but not disclosed) plus a penalty. In this session, you pay the shortfall plus an amount equal to one time the shortfall. In the above example, you would pay 18 additional tokens, that is, the shortfall (30 tokes times 0.3), plus fine of 9. The computer will calculate the shortfall payments and subtract it from your balance. Only you will know the result of your own check.

The procedure for selecting the person for a check is as follows. Each person has an ID number that appears on your computer screen and these go from 1 to 8. In the bingo cage that appears on the top right corner are balls numbered 1 through 20. After everyone as disclosed his or her tokens, a ball will be drawn from the cage. If the number of the ball is from 1 to 8, the person with that ID will be checked. If the number is from 9 through 20, no one will be checked in that round. Once the ball has been drawn from the bingo cage, WAIT FOR THE INSTRUCTION TO CLOCK ON THE BUTTON "ARE YOU READY TO CONTINUE?". Once you have click the button, you can continue to the next round.

You will face different probabilities of being check. In the beginning of the session, each person has a change in 20 (5%) of being checked, At a certain point, the probability will change.

We will begin with two practice rounds to familiarize you will the payment, disclosure, and check process. These practice rounds will not be count to calculate your payment. At the end of the two practice rounds, your balance will be reset to 2000 tokens as the biding or real rounds begin.

Are there any questions? Please, raise your hand, DO NOT MAKE THE QUESTION AT LOUD.
When you finish reading these instructions, please place them face down on your own desk.

References

Andreoni, James, Brian Erard and Jonathan Feinstein. 1998. Tax Compliance. *Journal of Economic Literature* 36:818-60.

Allingham, Michael G. and Agnar Sandmo. 1972. Income Tax Evasion: A Theoretical Analysis. *Journal of Public Economics* 1:323-38.

Alm, James, Roy Bahl and Matthew N. Murray. 1990. Tax Structure and Tax Compliance. *The Review of Economics and Statistics* 72(4):603-13.

Alm, James, Betty Jackson and Michael McKee. 1992. Estimating the Determinants of Taxpayer Compliance with Experimental Data. *National Tax Journal* 45(1): 107-14.

Álvarez, R. Michael and Edward J. McCaffery. 1999. Gender and Tax. *USC Law School, Olin Working Paper* 99(11):1-30.

_____ 2000. Is there a gender gap in fiscal political preferences? *University of Southern California Law, Law and Economics Research Paper Series* 00(5):1-23.

Baldry, Jonathan C. 1987. Income Tax Evasion and the Tax Schedule: Some Experimental Results. *Public Finance* 422:357-83.

Barnett, Kathleen and Caren Grown. 2004. *Gender impacts of government revenue collection: the case of taxation.* Commonwealth Secretariat, London.

Basu, Kaushik. 2006. Gender and Say: a Model of Household Behaviour with Endogenously Determined Balance of Power. *The Economic Journal* 116(511):558–80.

Bosco, Luigi and Luigi Mittone. 1997. Tax Evasion and Moral Constraints: Some Experimental Evidence." *Kyklos* 50(3):297-24.

Clotfelter, C.T. 1983. "Tax Evasion and Tax Rates: An analysis of individual returns. *The Review of Economics and Statistics* 65:363-73.

Crane, S. E. and F. Nourzad. 1986. Inflation and Tax Evasion: An Empirical Analysis*. The Review of Economics and Statistics* 68:217-23.

De Juan, Ana, Miguel A. Lasheras and Rafaela Mayo. 1994. Voluntary Tax Compliance Behavior of Spanish Income Taxpayers. *Public Finance* 49:90-05 (Supplement).

Doob, Anthony and Cheryl M. Webster. 2003. Sentence Severity and Crime: Accepting the Null Hypothesis. *Crime and Justice: A Review of Research* 30:143-95.

Dubin, Jeffrey A., Michael J. Graetz and Louis L. Wilde. 1990. The Effects of Audit Rates on the Federal Income Tax 1977-1986. *National Tax Journal* 90(43):395-09.

Eckel, Catherine C. and Philip J. Grossman. 2005. Men, women and risk aversion: experimental evidence. In *Handbook of Results in Experimental Economics*, eds. C. Plott and L. Vernon Smith. New York: Elsevier.

Fallan, Lars. 1999. Gender, exposure to tax knowledge, and attitudes towards taxation: An experimental approach. *Journal of Business Ethics* 18:173-84.

Friedland, Nehemiah, Shlomo Maital and Aryen Rutenberg. 1987. A simulation study of income tax evasion. *Journal of Public Economics* 10:107-16.

Graetz, Michael J. and Louis L. Wilde. 1985. The Economics of tax compliance: Fact & fantasy. *National Tax Journal* 38(547):355-63.

Haddad, Lawrence, J. Hoddinott and H. Alderman (eds.). 1997. *Intrahousehold Resource Allocation in Developing Countries: Methods, Models and Policy*. Baltimore, MD.: The Johns Hopkins University Press.

Hernández, Fausto, Andrés Zamudio and Juan Pablo Guerrero. 2000. Los impuestos en México: ¿Quién y cómo se pagan? Programa de Presupuesto y Gasto Público, CIDE 1-18.

Hessing, Dick J. 1992. Does Deterrence Deter? Measuring the Effect of Deterrence in Field Studies and Experimental Studies. In *Why People Pay Taxes?* ed. Joel Slemrod, Ann Arbor. MI.: University of Michigan Press.

Hindelang, Michael J. 1971. Age, sex, and the versatility of delinquent involvements. *Social Problems* 18:522-35.

OECD. 2001. *Revenue Statistics of OCDE Member Countries* 1965-2000. Paris.

Plott, Charles R. 1987. Dimensions of parallelism: some policy applications of experimental Methods. In *Laboratory Experimentation in Economics: six points of view*, ed. Alvin E. Roth. NY: Cambridge University Press.

Poterba, J. M. 1987. Tax Evasion and Capital Gains Taxation. *American Economic Review* 77:234-39.

Sawicki, Phillip (ed.). 1983. *Income Tax Compliance: A Report of the ABA Section on Taxation.* International Conference on Income Tax Compliance. Washington, D.C.: American Bar Association 159-72.

Slemrod, Joel. 1985. An Empirical Test for Tax Evasion. *The Review of Economics and Statistics.* 67:232-38.

Smith, L. Vernon. 1982. Microeconomic Systems as an Experimental Science. *American Economic Review* 72:923-55.

Suden, Annika and Brian Surette. 1998. Gender Differences in the Allocation of Assets in Retirement Savings Plans. *American Economic Review* 88(2): 207-11.

Torgler, Benno and Friedrich Schneider. 2006. What shapes attitudes towards paying taxes? Evidence from multicultural European countries. *Johannes Kepler University of Linz Department of Economics, Working Paper* 0608:1-44.

Yitzhaki, Shlomo. 1974. A Note on Income Tax Evasion: A Theoretical Analysis. *Journal of Public Economics* 3:201-02.

Novedades

DIVISIÓN DE ADMINISTRACIÓN PÚBLICA

Laura Sour, *Correspondencia entre las políticas públicas del PND y el gasto ejercido de la CHPF en México*, DTAP-213

José Ramón Gil, Judith Mariscal y Fernando Ramírez, *Gobierno electrónico en México*, DTAP-214

Judith Mariscal, José Ramón Gil y Armando Aldama, *Políticas de acceso a tecnologías de la información: El caso de e-México*, DTAP-215

Laura Sour y Miguel Ángel Gutiérrez, *Extrinsic Incentives and Tax Compliance*, DTAP-216

Laura Sour y Fredy Girón, *The Flypaper Effect in Mexican Local Governments, 1990-2006*, DTAP-217

Judith Mariscal y Fernando Ramírez, *Retos para el desarrollo del sector de las telecomunicaciones en México*, DTAP-218

Alejandra Ríos y Juan E. Pardinas, *Hacia la reforma constitucional: Las entidades de fiscalización superior en México*, DTAP-219

Laura Sour, *Regional Differences in Infrastructure Investment at the State Level in Mexico*, 1998-2005, DTAP-220

José Felipe Martínez *et al.*, *Exploring the Links Between Immigration and Educational Quality and Opportunity in Mexico*, DTAP-221

Judith Mariscal, *Oportunidades móviles: Pobreza y acceso telefónico en Latinoamérica y el Caribe. El caso de México*, DTAP-222

DIVISIÓN DE ECONOMÍA

Rodolfo Cermeño y Huver Rivera, *La demanda por importaciones y exportaciones: evidencia de cointegración para México, 1991-2005*, DTE-449

Juan Manuel Torres, Octavio S. Magaña y Francisco Moreno, *Determinantes del cambio de uso/cobertura arbolada en México*, DTE-450

Juan M. Torres, David B. Bray y Octavio S. Magaña, *The Role of Scale in Mexican Community Forest Management*, DTE-451

Richard H. Adams, Jr. and Alfredo Cuecuecha, *Remittances, Consumption and Investment in Ghana*, DTE-452

Alejandro Villagómez y Juan Ignacio Hernández, *Impacto de la reforma al sistema de pensiones en México sobre el ahorro*, DTE-453

Alejandro Villagómez y Juan Ignacio Hernández, *Monetary Policy Rules in a Small Open Economy: An Application to Mexico*, DTE-454

Alfredo Cuecuecha, *The Effect of Remittances and Migration on Human Capital: Evidence from Mexico*, DTE-455

Arturo Antón, *Efectos del ciclo económico en EE. UU. sobre la producción y el empleo en México*, DTE-456

María José Roa *et al.*, *Preferencias sociales, cooperación y desarrollo financiero: un experimento de campo*, DTE-457

María José Roa *et al.*, Desarrollo financiero y capital social: un estudio empírico de la caja popular Mixtlán, DTE-458

DIVISIÓN DE ESTUDIOS INTERNACIONALES

Alejandro Anaya, *Free Trade, "Spillover" and Human Rights Foreign Policies in North America*, DTEI-176

Alejandro Anaya, *Security and Human Rights in Mexico: Do Pressure from Above and Argumentation Have Anything to Do With It?*, DTEI-177

Jorge Chabat, *The International Role of Latin America After September 11: Tying the Giant*, DTEI-178

Jorge Chabat, *The Bush Revolution in Foreign Policy and Mexico: The Limits to Unilateralism*, DTEI-179

Jorge Chabat, *Franchises for Crime: "Maras" and North American Security*, DTEI-180

Jorge Schiavon, *Migración México-Estados Unidos: Intereses, simulaciones y realidades*, DTEI-181

Ferrán Martínez y Robert Duval, *Hostility Towards Immigration in Spain*, DTEI-182

Guadalupe González *et al.*, *Mexico, The Americas and the World 2008. Foreign Policy: Public and Leader Opinion*, DTEI-183

Guadalupe González *et al.*, *México, Las Américas y el Mundo 2008. Política exterior: opinión pública y líderes*, DTEI-184

Guadalupe González *et al.*, *Las Américas y el Mundo 2008. Política exterior y opinión pública en Colombia, Chile, México y Perú*, DTEI-185

DIVISIÓN DE ESTUDIOS JURÍDICOS

Ana Laura Magaloni, *Arbitrariedad e ineficiencia de la procuración de justicia: dos caras de la misma moneda*, DTEJ-26

Ana María Ibarra, *Los artificios de la Dogmática Jurídica*, DTEJ-27

Ana Elena Fierro y Adriana García, *Responsabilidad patrimonial del Estado. Interpretación de la SCJN del artículo 113 constitucional*, DTEJ-28

Adriana García y Dirk Zavala, *El análisis económico del derecho como herramienta para el diseño normativo…*, DTEJ-29

Carlos Elizondo y Luis Manuel Pérez de Acha, *¿Un nuevo derecho o el debilitamiento del Estado? Garantía de audiencia previa en la expropiación*, DTEJ-30

Ana Elena Fierro y Adriana García, *Guía de las decisiones del PJF en materia de competencia económica: Cómo generar una cultura de la competencia*, DTEJ-31

Carlos Elizondo y Ana Laura Magaloni, *La depuración de las corporaciones policiacas y el juicio de amparo*, DTEJ-32

Marcelo Bergman y Hernán Flom, *Policía y comunidad: una comparación…*, DTEJ-33

Gustavo Fondevila, *"Madrinas": Informantes y parapolicías. La colaboración ilegal con el trabajo policial en México*, DTEJ-34

Gustavo Fondevila, *Costumbres sociales y moral judicial*, DTEJ-35

María Mercedes Albornoz, Choice of Law in International Contracts in Latin American Legal Systems, DTEJ-36

DIVISIÓN DE ESTUDIOS POLÍTICOS

Julio Ríos Figueroa, *Judicial Institutions and Corruption Control*, DTEP-204

Allyson Benton, *The Effect of Electoral Rules on Indigenous Voting Behavior in Mexico's State of Oaxaca*, DTEP-205

Andreas Schedler y Cas Mudde, *The Quantitative Skeleton of Comparative Politics*, DTEP-206

Joy Langston y Francisco Javier Aparicio, *The Past as Future: Prior Political Experience and Career Choices in Mexico, 1997-2006*, DTEP-207

Francisco Javier Aparicio y Sandra Jessica Ley, *Electoral Institutions and Democratic Consolidation in the Mexican States, 1990-2004*, DTEP-208

Joy Langston, *Las reformas electorales de 2007*, DTEP-209

Carlos Elizondo, *La industria del amparo fiscal*, DTEP-210

María de la Luz Inclán, *Threats and Partial Concessions in the Exhaustion of the Zapatista Wave of Protest*, 1994-2003, DTEP-211

Andreas Schedler, *Inconsistencias contaminantes. Gobernación electoral y conflicto postelectoral en las elecciones presidenciales de 2006*, DTEP-212

Andreas Schedler, *Academic Market Failure. Data Availability and Quality in Comparative Politics*, DTEP-213

DIVISIÓN DE HISTORIA

Rafael Rojas, *José María Heredia y la tradición republicana*, DTH-48

Rafael Rojas, *Traductores de la libertad: el americanismo de los primeros republicanos*, DTH-49

Mónica Judith Sánchez, *History* vs. *the Eternal Present or Liberal Individualism and the Morality of Compassion and Trust*, DTH-50

Luis Medina, *Salida: los años de Zedillo*, DTH-51

Michael Sauter, *The Edict on Religion of 1788 and the Statistics of Public Discussion in Prussia*, DTH-52

Michael Sauter, *Conscience and the Rhetoric of Freedom: Fichte's Reaction to the Edict on Religion*, DTH-53

Jean Meyer, *El celibato sacerdotal en la Iglesia Católica*, DTH-54

Jean Meyer, *El celibato sacerdotal católico en los siglos XIX y XX*, DTH-55

Mauricio Tenorio, *Around 1919 and in Mexico City*, DTH-56

Michael Sauter, *Between Outer Space and Human Space: Knowing Space as the Origin of Anthropology*, DTH-57

Ventas

El **CIDE** es una institución de educación superior especializada particularmente en las disciplinas de Economía, Administración Pública, Estudios Internacionales, Estudios Políticos, Historia y Estudios Jurídicos. El Centro publica, como producto del ejercicio intelectual de sus investigadores, **libros**, **documentos de trabajo**, y **cuatro revistas especializadas:** *Gestión y Política Pública*, *Política y Gobierno*, *Economía Mexicana Nueva Época* e *Istor*.

Para adquirir cualquiera de estas publicaciones, le ofrecemos las siguientes opciones:

VENTAS DIRECTAS:	VENTAS EN LÍNEA:
Tel. Directo: 5081-4003 Tel: 5727-9800 Ext. 6094 y 6091 Fax: 5727 9800 Ext. 6314 Av. Constituyentes 1046, 1er piso, Col. Lomas Altas, Del. Álvaro Obregón, 11950, México, D.F.	Librería virtual: **www.e-cide.com** Dudas y comentarios: **publicaciones@cide.edu**

¡¡Colecciones completas!!

Adquiere los **CDs de las colecciones completas** de los documentos de trabajo de todas las divisiones académicas del CIDE: **Economía**, **Administración Pública**, **Estudios Internacionales**, **Estudios Políticos**, **Historia** y **Estudios Jurídicos**.
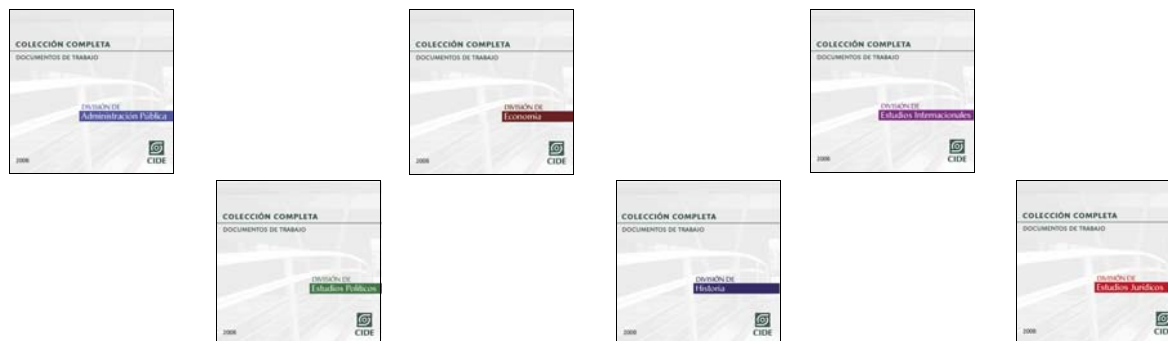
¡Nuevo! ¡¡Arma tu CD!!

Visita nuestra Librería Virtual www.e-cide.com y selecciona entre 10 y 20 documentos de trabajo. A partir de tu lista te enviaremos un CD con los documentos que elegiste.