CHARITABLE CONTRIBUTIONS UNDER THE ALTERNATIVE MINIMUM TAX*

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INTRODUCTION

THE DESIGN OF THE INDIVIDUAL ALTERNATIVE minimum tax (AMT) in the United States was primarily intended to affect the few high-income taxpayers who paid relatively low taxes because of certain tax deductions, exclusions, or credits and who, consequently, were not paying their fair share of taxes. Depending on how aggressively they use tax deductions, exclusions, or credits, taxpayers with the same taxable income may fall either into the AMT or the regular tax bracket and thus face quite different marginal tax rates. For example, in 1985 the AMT marginal tax rate was equal to 20 percent, but the highest regular marginal tax rate was as high as 50 percent in that year. Although the individual AMT affected only 287,000 taxpayers and raised revenue by only $1.4 billion in 1992, the number of individual AMT taxpayers had increased to 2.6 million and individual AMT revenue had totaled 13 billion in 2002 (Harvey and Tempalski, 1997; Burman, Gale and Rohaly, 2003). Under current law, it is even projected that about 36 million taxpayers will be paying the AMT by 2010, almost 14 times as many as in 2002 (Burman, Gale, and Rohaly, 2003).

Burman, Gale, and Rohaly (2003) note that, without reform, all upper middle-class families with two or more children will be paying the AMT by 2010. Besides the United States, other countries such as Taiwan have adopted or are planning to implement various systems of minimum tax.[1] Despite the acceptance of a minimum tax in more countries and the impact of a minimum tax on a growing number of taxpayers, there have been few studies on the behavioral responses to a minimum tax, and taxpayers paying the minimum tax have usually been ignored in previous empirical studies of taxation effects. For example, Feldstein (1995), Auten and Carroll (1999) and Duquette (1999) excluded tax returns of AMT taxpayers because of the low percentage of AMT taxpayers in the total tax returns and the complexity of the AMT.

The AMT has been discussed more recently, but most of the studies concern a projected sharp increase in the numbers of AMT taxpayers in the near future (see, e.g., Harvey and Tempalski, 1997; Burman et al., 2002; Burman, Gale, and Rohaly, 2003). One of the neglected aspects of the AMT is the influence of the likelihood of paying the AMT on the taxpayers' behavioral responses to a tax rate change. Taxpayers' behavioral responses to a tax rate change are influenced by the likelihood of paying the AMT if the uncertainty of tax statuses associated with paying the regular tax or the AMT affects the cost of a tax rate change. This uncertainty of tax statuses bears both academic and policy implications as an increasing number of taxpayers are facing various minimum tax systems.

This study investigates the impact of the uncertainty of tax statuses associated with the AMT on the price elasticity of charitable contributions by incorporating the uncertainty into the econometric specifications of charitable decisions. The second section of this paper discusses possible reasons for the impacts of the AMT on taxpayers' behavioral responses and then proposes a stochastic approach to estimating the price elasticity of charitable giving and compares it with the conventional deterministic framework. The third section utilizes the stochastic framework from the second section to estimate the AMT taxpayers' price elasticities of charitable giving. Implications from the estimates are also evaluated. Finally, the fourth section concludes.

THE ALTERNATIVE MINIMUM TAX AND CHARITABLE CONTRIBUTIONS

The AMT and Tax Status Uncertainty

According to Harvey and Tempalski (1997) and Burman, Gale and Rohaly (2003), although the AMT affected only 700,000 taxpayers in 1997 and 2.6 million taxpayers in 2002, the projected number

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of AMT taxpayers will rise to 36 million in 2010 under the current law. The increase in coverage will occur in all but the very lowest incomes. In particular, middle-income taxpayers are the most likely to be affected by exemption preferences and the AMT, because a variety of exemption preferences such as personal exemptions, the standard deduction, and itemized deductions for miscellaneous expenses for the regular income tax are not allowed in the AMT. Burman, Gale, and Rohaly (2003) note that 3 percent of filers with income ranging between $75,000 and $100,000 faced the AMT in 2002 while 79 percent of filers in the same range of income will pay the AMT by 2010.

Taxpayers can just ignore the possibility of paying the AMT when the AMT is limited to very high-income taxpayers.[2] However, most taxpayers can no longer underestimate the influence of the AMT when the likelihood of falling into the AMT is increasing. Moreover, the AMT differs from the regular tax in several respects and taxpayers fall into the AMT because of a number of preference items and various adjustments to regular taxable income. Consequently, taxpayers may feel uncertain about whether they will fall into the AMT or not and uncertain about their applicable marginal tax rates. The increasing likelihood of falling into the AMT thus gives rise to various impacts on taxpayers' decisions in regard to charitable giving.

First, taxpayers may account for the probabilities of falling into different tax statuses in their decisions, and thus the expected tax rates — instead of the tax rates from their tax returns — will affect their behavioral responses. When the probability of falling into the AMT is negligible and the impact of uncertainty on taxpayers' behaviors is insignificant, it may not be necessary to account for the uncertainty of tax statuses in empirical estimations.[3] However, as noted earlier, the percentage of AMT taxpayers is increasing and the probability of falling into the AMT is substantial.

Second, the probabilities of falling into different tax statuses may increase taxpayers' risk in deciding on their charitable giving since the amount of giving affects the relative probabilities of different tax statuses. Consequently, the risk cost of charitable contributions increases with the variation in the probabilities of different tax statuses.

As more taxpayers face the AMT, the estimates of taxpayers' behavioral responses based on a deterministic framework and utilizing exclusively regular taxpayers would be misleading if these estimates were utilized to represent the whole body of taxpayers. Therefore, a stochastic approach to estimating taxpayer's behavioral responses is needed to account for taxpayers' uncertainty regarding their tax statuses in relation to regular income tax versus the AMT and their applicable tax rates.

Decisions under Uncertain Tax Statuses

We first investigate the case in which taxpayers' charitable contributions do not affect the probability of falling into different tax statuses. Because charitable contributions are deductible for itemizers under both the regular tax and the AMT, taxpayers maximize their utility and face the following problem:

(1) Max EU,

subject to

$c = (y - d)(1 - t_r)$ if the taxpayers face regular tax and
$c = (y - d)(1 - t_a)$ if the taxpayers face the AMT,

where d and c denote the charitable contributions and other consumption while t_r and t_a represent the regular tax rate and the AMT tax rate. If the probability of falling into the AMT equals π, the above maximization problem results in the following first-order condition:

$$\textbf{(2)} \quad U_d / U_c = (1-\pi)(1-t_r) + \pi(1-t_a) .$$

The above condition implies that the marginal rate of substitution between charitable giving and other consumption should equal the ratio of the expected price of charitable giving to the price of other consumption.

Nevertheless, charitable contributions affect the probabilities of falling into the AMT. We account for this effect and obtain the following first-order condition:

$$\textbf{(3)} \quad U_d + \pi'\{U[(y-d)(1-t_a), d] - U[(y-d)(1-t_r), d]\} = (1-\pi)U_c(1-t_r) + \pi U_c(1-t_a) .$$

The left-hand side represents the marginal effect of charitable spending on utility, which includes not only the marginal utility from charities but also the marginal effect of these charities on the

probabilities of different tax statuses. Therefore, the product of the marginal effect on the probability of facing the AMT and the gap in utility between facing the AMT and the regular tax is also accounted for. Alternatively, the first-order condition can be expressed as:

$$\textbf{(4)} \quad U_d / U_c \cong [(1-\pi)(1-t_r) + \pi(1-t_a)] + \pi'[(t_a - t_r)(y-d)].$$

We denote the first term on the right-hand side as *the price effect* and the second term as *the risk effect*. Since the expected tax payment equals $(1 - \pi)[t_r(y - d)] + \pi[t_a(y - d)]$, the risk effect results from the increase in the expected tax payment. The term $(t_a - t_r)(y - d)$ is greater than zero because the reason why taxpayers pay the AMT is that their alternative minimum taxes are greater than their regular taxes, namely, $t_a(y - d) > t_r(y - d)$.

In a stochastic environment, an additional dollar of charitable spending will cost a taxpayer $(1 - \pi)(1- t_r) + \pi(1- t_a)$, plus the change in the expected tax payment. In a deterministic framework, the risk effect is not accounted for and equation (4) becomes $U_d/U_c = (1 - t_r)$ for a regular taxpayer, and becomes $U_d/U_c = (1 - t_a)$ for an AMT taxpayer. If the probability of paying the AMT and the effect of charitable giving on the probability are negligible, then the taxpayers' decision under uncertainty can be well approximated by a deterministic framework. However, if the probability of paying the AMT and/or the effect of charitable giving on the probability of paying the AMT is significant, a deterministic framework may lead to biased estimates and misleading implications.

Empirical Implementation

Based on equation (4), the uncertainty regarding the tax statuses is accounted for by the following econometric specification:

$$(5) \quad \ln(D) = \beta_0 + \beta_1 \ln(p) + \beta_2 \ln(y) + \beta_3(\Delta ET) + \beta\tilde{X} + \eta.$$

where $p = (1 - \pi)(1 - t_r) + \pi(1 - t_a)$ denotes the expected price of charitable contributions, y denotes the income and ΔET represents the increase in the expected tax payment $\pi'[(t_a - t_r)(y - d)]$. The cost of charitable contributions under uncertain tax statuses is higher than that in the deterministic case owing to the cost associated with a higher probability of facing the AMT. Therefore, the sign of β_3 is expected to be negative.

In order to estimate equation (5), we need to find the expected price, $p = (1 - \pi)(1 - t_r) + \pi(1 - t_a)$, and the increase in the expected tax payments, ΔET. We thus estimate a Probit equation of a taxpayer's probability of falling into the AMT by utilizing tax returns from previous years:

$$\textbf{(6)} \quad Pr(AMT) = \gamma\tilde{Z} + \mu,$$

where the vector $\tilde{Z}$ represents the determinants of a taxpayer's paying the AMT, which include a taxpayer's adjusted gross income (AGI), charitable giving, and marital status. Based on the estimates from equation (6), we then calculate the expected probability, π, and the marginal effect of charitable contributions on the probability, π', for each taxpayer in the current year. Given the estimated π and π', and the information regarding tax rates, taxable income, and charitable contributions from tax returns, we are able to calculate the expected price and the increase in the expected tax payments in equation (5).

RESULTS AND DISCUSSION

Data and Variables

We utilize the 2000 cross-sectional Individual Tax Model Files (IMF) from the Internal Revenue Service to estimate the above econometric model. The estimate of the price elasticity is very sensitive to the inclusion of tax returns for which no taxes are paid. Since they do not need to pay any tax, they are likely to underreport their contributions. The negative correlation between the price and the reporting of contributions would thus give rise to an upward bias in the estimates (in absolute value terms). Clotfelter (1985) suggests excluding borderline taxpayers, whose status regarding itemized deductions would have changed had they not contributed, to correct the selection bias associated with the status of deduction. For these borderline itemizers, contributions will tend to be large to make taxpayers' itemized deductions greater than the standard deductions. The result of including all itemizers would then be a positive correlation between the first-dollar price and the error term (Clotfelter, 1985). We thus have a final sample of 13,193 alternative minimum tax returns after we exclude returns for which no taxes are paid,

borderline itemizers, regular tax returns, prior-year returns, taxpayers claimed as dependents in other returns, and returns with non-positive disposable income.

The measurement of each variable is described in what follows. Charitable giving is represented by the amount of taxpayers' current-year giving. To avoid taking the log of zero, the standard practice is to upwardly adjust reported giving by some nominal amount, in this case $1. When taxpayers give $1 to charity and itemize, they deduct $1 from regular taxable income.[4] The net-of-tax price of giving for taxpayers who itemize deductions and pay the AMT is equal to one minus the marginal tax rate, $(1 - t_a)$.[5] The first-dollar tax rates are calculated by adding the amount of charitable giving to taxable income to find the corresponding tax rates from the tax schedule. AGI alone provides an incomplete account of pretax income. To make the variable comparable to previous studies, pretax income is equal to AGI plus certain forms of income, including pension income, Social Security income, unemployment compensation, and IRA and Keogh plan contributions (see Duquette, 1999). This pretax income is then reduced by the amount of federal income taxes, assuming there were no contributions to make disposable income exogenous to charitable giving. To avoid taking the logarithms of zero or negative numbers, tax returns with non-positive disposable income are excluded from the analysis. Other demographic variables included in the regressions have to do with whether the taxpayer is married, and the number of dependents.[6]

Table 1 provides summary statistics for the data. AMT taxpayers generally have more charitable contributions and larger disposable income than regular taxpayers. The amount of the AMT varies substantially among AMT taxpayers.

Estimates Using the Stochastic Approach

Table 2 presents the regression results of equation (5) for AMT taxpayers from the 2000 IMF. The estimates based on the deterministic framework are listed in columns (1) and (2), while those based on the stochastic framework are listed in columns (3) and (4). In the deterministic framework, we first utilize the applicable AMT tax rates to calculate AMT taxpayers' net-of-tax prices and obtain the estimates in column (1). We then reestimate the coefficients by assuming that AMT taxpayers misperceive their applicable tax rates as the regular income tax rates and provide the estimates in column (2).

We obtain an estimate of the price elasticity of -5.606 in column (1). Clotfelter (1985) suggests that the estimates of a price elasticity of -1.27 and an income elasticity of 0.78 are representative. The price elasticity estimate of -5.606 for AMT taxpayers is most likely to be biased. Alternatively,

Table 1
Descriptive Statistics for AMT Taxpayers in 2000

	Mean[b]	*S.D.*[a]	*Minimum*	*Maximum*
Charitable giving	161,021	1,124,795	0	5.78e7
Last-dollar regular price	0.6558	0.0979	0.604	1
First-dollar regular price	0.6574	0.0959	0.604	1
Last-dollar AMT price	0.7361	0.0500	0.720	0.948[c]
First-dollar AMT price	0.7423	0.0610	0.720	0.948
Disposable income	1,973,517	6,551,517	436	2.45e8
Married	0.8226	0.3820	0	1
Dependent	2.6566	1.3278	1	11
Alternative minimum tax	58,554	274,479	5	1.03e7
Observations		13,193		

Source: The 2000 Individual Tax Model File (IMF), Internal Revenue Service.

Notes:

[a]S.D. denotes standard deviation. All averaged numbers are unweighted.

[b]The dollar values are in 2000 current dollars.

[c]The maximum price for AMT taxpayers equals 0.948 because the itemized deduction limitation reduces the effective deduction of charitable contributions to 20 percent of actual contributions, making the price equal to (1-0.2*marginal tax rate).

Table 2
Estimates of Charitable Contributions for AMT Taxpayers in 2000

	Deterministic framework				*Stochastic framework*			
	Based on actual AMT tax rates (1)		*Assuming misperception of tax rates (2)*		*Without the risk effect (3)*		*With the risk effect (4)*	
Variables	*Coefficient*	*t-value*	*Coefficient*	*t-value*	*Coefficient*	*t-value*	*Coefficient*	*t-value*
Price	-5.606***	-11.40	-2.764***	-11.58	-2.550***	-9.95	-2.205***	-8.66
Income	0.813***	45.59	0.717***	38.26	0.742***	40.46	0.767***	42.07
Married	0.873***	12.46	0.851***	11.95	0.865***	12.14	0.684***	9.56
Dependents	-0.009	-0.45	0.005	0.25	0.001	0.05	0.025	1.21
Risk effect							-2.8e09***	-15.56
Intercept	-4.448***	-14.59	-2.642***	-10.66	-2.839***	-11.28	-4.995***	-17.50
Observation	13,193							

Source: The 2000 Individual Tax Model File (IMF), Internal Revenue Service.

Note: ***, ** and * indicate significance at the 0.01, 0.05 and 0.10 levels, respectively.

we assume that AMT taxpayers misperceive the applicable tax rate and obtain a smaller estimate of price elasticity in column (2). However, the assumption of AMT taxpayers' misperceptions of applicable tax rates cannot be justified; although misperceptions of the actual price of charitable giving partially reduce the magnitude of the estimate of the price elasticity of charitable giving for AMT taxpayers. Among AMT taxpayers in the final sample, as many as 88.6 percent of AMT tax returns are prepared by paid tax preparers. AMT taxpayers might anticipate the possibility of falling into the AMT if the service of paid tax preparers indicates that taxpayers feel uncertain about their tax statuses and need more tax information with regard to their tax reporting.

The estimates based on the stochastic approach of equation (5) are provided in columns (3) and (4). We use the expected price instead of the actual price of the charitable contributions to estimate the price elasticity of chartable contributions. Moreover, we include the risk of uncertain tax statuses, namely, the increase in the expected tax payment, in the regression.

The term, $[(t_a - t_r)(y - d)]$, corresponds to a taxpayer's projected AMT. Because we do not find any appropriate measure for the projected AMT, we instead use the marginal increase in the probability of AMT participation, π', to proxy for the increase in the expected tax payment. If the marginal increase in probability is correlated with the increase in the expected tax payment but orthogonal to the net-of-tax price, the replacement of π' for $\pi'[(t_a - t_r)(y - d)]$ will not bias the price elasticity estimate. The coefficient estimate of the risk effect based on this proxy can provide implications although it is difficult to utilize the estimate to quantify the magnitude of the risk effect.

We first discuss the estimates from the regression without accounting for the risk effect (column (3) of Table 2). The price elasticity estimate for AMT taxpayers is smaller than those obtained using the conventional deterministic approach. The results are not especially surprising in that the expected prices are the weighted averages of regular prices and AMT prices, and thus a higher predicted probability of regular tax causes the expected prices to be close to the regular net-of-tax prices. Consequently, the estimates of price elasticity are much smaller than in the case where AMT tax rates are utilized but close to those where regular tax rates are used.

As for the estimates from the regression including the risk effect (column (4) of Table 2), we find the coefficients of the risk effect to be significantly negative, suggesting that the uncertainty of tax statuses raises a taxpayer's cost of charitable contributions and thus reduces his or her contributions. The risk effect implies that the tax uncertainty from dual tax systems exerts a cost on taxpayers' charitable contributions in addition to the net-of-tax price of the contributions. Moreover, we find that the coefficient estimating the price elasticity substantially declines compared to that where the risk effect is excluded (column (3)). The decline in the coefficient estimates implies that higher estimates of price elasticity may result from omitted variable

bias. When the risk is negligible, the omission of the risk effect will not give rise to substantial variation in the price elasticity estimate. However, when the uncertainty affects most taxpayers' decisions regarding charitable contributions, the omission will bias the estimate of the price elasticity of charitable contributions.

The income elasticities are around 0.8 and are similar to the representative estimate of 0.78 from previous studies. The status of being married is found to increase taxpayers' charitable giving. However, the number of dependents does not affect the taxpayers' decisions regarding charitable contributions.

To sum up, our estimates based on the stochastic approach suggest that the uncertainty of tax statuses raises the cost of charitable contributions and reduces a taxpayer's contributions. Moreover, the estimates of the price elasticity of charitable contributions may be biased if we do not account for the uncertainty of tax statuses because of omitted variable bias. Nevertheless, one caveat for the probit approach to predicting a taxpayer's probability of falling into the AMT in this study is that it is only one of various approaches to approximating a taxpayer's expected AMT probability. For example, the TAXSIM model from the NBER would provide alternative projections of AMT participation rates (e.g., Burman, Gale, and Randolph, 2003; Feenberg and Poterba, 2004).

CONCLUDING REMARKS

The heterogeneity of elasticity is one of the ongoing concerns in empirical studies of tax effects. Taxpayers may respond to a tax rate change differently because of their uncertainty regarding whether they will fall into the AMT or the regular tax. However, AMT taxpayers have usually been excluded from previous empirical studies owing to its small percentage in total returns and the complicated aspects of the AMT in spite of its impact on a growing number of taxpayers worldwide. This study incorporates taxpayers' uncertainty regarding tax statuses into econometric specifications and estimates the price elasticity of charitable giving in a stochastic framework.

This study makes use of the 2000 IMF tax returns to estimate AMT taxpayers' charitable contributions under the uncertainty of tax statuses and finds a significantly negative coefficient of the risk effect. This result suggests that the uncertainty of tax statuses exerts a cost on taxpayers' charitable contributions in addition to the net-of-tax price of contributions. Moreover, the results suggest that the price elasticity estimate may be biased if we do not account for the uncertainty of tax statuses. Nevertheless, alternative approaches to projecting taxpayers' probabilities of AMT participation are needed to provide a better understanding of the effect of uncertain tax statuses on taxpayers' behavioral responses.

Notes

[1] For example, a minimum alternative tax was levied at the rate of 7.5 percent of the adjusted profits of the companies whose regular taxes were less than 7.5 percent of their book profits in India, while corporations were subject to the 2 percent minimum corporate income tax if the minimum corporate income tax was greater than the ordinary corporate income tax in the Philippines (KPMG, 2004).

[2] Except in 1985 and 1986, the number of AMT returns is less than 400 thousand for each year before 1995 (Harvey and Tempalski, 1997). For example, the percentage of AMT tax returns among all tax returns was 0.3 in 1992.

[3] For example, the percentage of returns with the AMT was only 0.3 in 1992.

[4] Although the deduction of charitable contributions was limited to one-half of the taxpayers' AGI, the calculation of the net-of-tax price in this paper is based on the assumption that the taxpayers' actual contribution does not exceed this limit. Nevertheless, we account for the effect of the itemized deduction limitation, which a taxpayer may face if he is married and filing separately and had an AGI greater than $64,475 or an AGI greater than $128,950, on the price of charitable contributions.

[5] A more comprehensive measure of the tax price of charitable giving can be derived by including state tax rates (Feenberg, 1987). However, the data set used in this analysis does not make the state of residence available for all taxpayers. This study also does not take into account the different treatments of tax law on gifts in the form of appreciated property because of a lack of relevant information, nor does it account for the phasing out of the AMT exemption, which can make the effective tax rate as high as 35 percent.

[6] Though the IMF datasets from earlier years contain the information about whether a taxpayer is aged 65 or over, the 2000 IMF does not provide it.

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