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3 Contributions by Individuals: Simulating the Effects of Tax Policies

One obvious use for the econometric models of charitable giving discussed in chapter 2 is to predict the effects of changes in tax rules, income, and effective tax rates on the level of contributions. By replacing actual values of price and tax liability by values implied by a given tax rule it is possible to use estimated equations to give "predicted values" of giving. Not only are such simulations useful in assessing the impact of projected changes on the nonprofit sector, they may also be used to estimate the revenue effects of tax proposals affecting the treatment of charitable giving. This chapter discusses simulation methods and results as applied to contributions by individuals. In its assessment of various tax policies, the chapter is positive rather than normative. Issues such as the comparative social worth of expenditures by charities and government are deferred to chapter 8. Section 3.1 describes various tax rules that have been proposed or discussed in recent years. Section 3.2 summarizes previous simulations showing likely effects of some of these rules on contributions. The next section discusses the major methodological issues confronted in performing simulations of charitable giving. Section 3.4 presents new simulations of individual giving in 1983 under a variety of possible tax regimes. The results are compared to previous simulations. The final section of this chapter presents two sets of simulations for contributions over time. The first of these is historical and focuses specifically on the effect of the expansion of the standard deduction on giving. The second is prospective, focusing primarily on the effect of inflationary bracket creep on real giving over time.

3.1 Policy Alternatives

Two kinds of tax policies can have a significant influence on individual giving. Most obvious are policies dealing directly with the charitable deduction or charitable giving. Also of potential importance, however, are general tax changes that affect incomes and tax rates.

3.1.1 Provisions Explicitly Related to Contributions

Before dealing with specific proposals to modify the itemized deduction for contributions, it is useful to note two principal pillars of support for this deduction. The first is the argument that since income contributed by a family cannot be consumed, contributions are a proper deduction in calculating taxable income. As put forth by Andrews (1972), this view supports the existence of a deduction but not a tax credit for contributions. A second argument takes the view that, while contributions are a discretionary use of income, they merit public support through some kind of tax incentive. By this view, deductions or credits may be desirable, depending on the incentive effects involved. According to Break (1977, p. 1523), the political support that the deduction has enjoyed over the years is due in large part to the combined appeal of these quite different justifications.

The variety of proposals that have been made to change the charitable deduction can be understood as efforts either to rectify perceived inequities or to increase incentives to give. Because the deduction tends to diminish the effective progressivity of the income tax as a whole (Pechman 1977, p. 72), those who view contributions as a consumption item often object to the deduction's distributional consequences. Those who favor incentives for giving, on the other hand, may favor increasing those incentives beyond what is created by the deduction. Not surprisingly, such extensions would imply revenue losses. Other proposals accept the role of incentives in the income tax but seek to restructure them by replacing the deduction with a tax credit.

Expansion of the Charitable Deduction

One of the most important alternatives for encouraging contributions is to expand the present deduction. For example, the Commission on Private Philanthropy and Public Needs (1977) proposed that itemizers at certain income levels be permitted to deduct a multiple of their actual contributions to provide an added incentive to give. Such a multiple or "amplified" deduction would have a significant impact on the price of giving and some income effect as well. The commission's proposal limited the coverage of this multiple deduction, allowing a double deduction for taxpayers with incomes less than $15,000 and a 150 percent deduction for taxpayers with $15,000 to $30,000 in income.[1] There is no limit, of course, to the variety of rate schedules that could be used for a multiple-deduction

1. An alternative sliding scale was also suggested. See Commission on Private Philanthrophy and Public Needs 1977, pp. 4–7.

plan. All such multiple deductions would tend to reduce tax revenue unless tax rates were increased, however.

Another possibility for expanding the charitable deduction is to extend the deduction to nonitemizers. Often referred to as the "above-the-line" deduction because it would take the form of an adjustment to gross income rather than a deduction in calculating taxable income, this plan was proposed and actively discussed beginning in the late 1970s.[2] Then, as a part of the 1981 tax act, a schedule for phasing in an above-the-line charitable deduction was adopted. Beginning with a deduction limited to 25 percent of the first $100 in 1982 and 1983, the provision is scheduled to take full effect in 1986.[3] This long phase-in period seemed designed to put off the inevitable revenue losses as far as possible into the future. By allowing all taxpayers to deduct charitable gifts, an above-the-line charitable deduction would nullify the effect of changes in the standard deduction on contributions. To the extent that the expansion of the standard deduction since 1941 has reduced contributions, such a plan thus would have the effect over time of returning contributions to the level they would have been if the standard deduction had not been introduced.

Limitation of the Charitable Deduction

Concern for equity in taxation has inspired the call for limiting, rather than expanding, the deduction. In the extreme, this view implies eliminating the deduction altogether. For example, the Treasury's model comprehensive income tax released in 1977 argued that contributions constitute a discretionary form of consumption and that no deduction should be allowed in an ideal income tax (U.S. Treasury Department 1977, p. 95). This view is also implicit in recent broad-based flat-tax proposals that would allow few if any deductions from gross income. Even groups interested in support for nonprofit organizations have raised questions about the charitable deduction's detrimental impact on overall tax progressivity. The Donee Group, a group opposed to many of the recommendations of the Commission on Private Philanthropy and Public Needs, implied that the charitable deduction should be eliminated or significantly altered as a part of "basic tax reform."[4] It is fair to add, however, that support for the

2. Bills sponsored by Representatives Fisher and Conable and by Senators Moynihan and Packwood were the subject of hearings and debate in 1979 and 1980. See U.S. Congress, Senate 1980.

3. The deduction was to increase to 25 percent of the first $400 in 1984 and 50 percent without limit in 1985.

4. In its report, the Donee Group (1977, pp. 71–72) stated:

> In discussing changes in the tax laws affecting charity, we must first state that the Donee Group favors basic tax reform to restore the progressivity of the income tax and to eliminate those preferences and other devices which allow great disparities to continue. We do not, however, believe that if tax reform is gradual and piecemeal, as it is first to go. We believe that there are far more unfair and costly tax preferences than the charitable deduction.

abolition of the charitable deduction is still quite limited. For the most part, the deduction is justified on the basis of its presumed incentive effect.[5]

While the deduction itself appears to retain strong support, incremental limitations on it have periodically been proposed and enacted. As described in chapter 2, percentage-income limitations have been adjusted from time to time, as has the deductibility of gifts of appreciated assets. One limitation that is currently applied to gifts to private foundations, and one that could conceivably be applied in the future to other contributions, is the constructive realization of capital gains in gifts of appreciated property. Such a provision would make it necessary for donors to include as income the capital gains associated with donated property. If 40 percent of long-term gains are included as taxable income, a taxpayer donating property worth $1000 of which $500 is capital gains would have to pay tax on $200. Since this treatment is equivalent to realization and contribution of proceeds, the effect would be to raise the price of contributions to that applying to gifts of cash.

Another method of limiting the deductibility of gifts of appreciated assets is to allow only the cost basis of such gifts to be deducted. As Break (1977, pp. 1525–7) shows, however, this would cause some taxpayers to prefer to make cash contributions, whereas constructive realization would leave donors indifferent between giving assets and giving the cash proceeds.

Finally, any charitable deduction may be limited by allowing only those contributions that exceed some floor to count in reducing taxable income. Floors may be stated as a percentage of income, as in the case of the medical deduction, or as an absolute amount. The primary reason for imposing a floor is to limit the revenue loss associated with a given provision, although floors may also offset adverse distributional effects of a deduction.

Tax Credit for Contributions

One widely proposed alternative to the charitable deduction is a charitable tax credit. Instead of subsidizing contributions at a rate that varies with a taxpayer's marginal tax rate, as under the deduction, a tax credit would subsidize all taxpayers at the same rate. In this connection Musgrave and Musgrave (1980, p. 362) comment on the current deduction, "A philosopher-economist might observe that the opportunity cost of virtue falls as one moves up the income scale." Citing the "great inequity" inherent in differing rates of subsidy, the Donee Group objected to the proposals of the Commission on Private Philanthropy and Public Needs calling for the preservation and augmentation of the charitable deduction. As an

5. The Treasury report noted this justification in listing a charitable deduction as one "optional method" of treating contributions (U.S. Treasury Department 1977, p. 95). Another justification, supported by Andrews (1972), is the argument that contributions are not properly counted in income.

alternative to the deduction, this group proposed a 30 percent tax credit (Donee Group 1977, pp. 72–73). Whether it is justified on the basis of equity in treatment of taxpayers at different income levels or on the basis of efficiency in the subsidization of all gifts, the idea of a tax credit appears to have sustained support as an alternative to the deduction as a means of encouraging charitable giving.[6]

3.1.2 Proposals Not Directly Related to Contributions

Tax changes not directly targeted at contributions may nevertheless have a sizable impact on giving. Any proposals that cause significant shifts in after-tax income, restructuring of marginal tax rates, or changes in the proportion of taxpayers who itemize deductions can influence the incomes and prices affecting donor contributions. Moreover, tax schedules that are not indexed to the rate of inflation generally will change over time in real terms, with much the same effect as legislated schedule changes. For example, an unindexed progressive tax schedule will yield increasingly progressive effective rate schedules in the presence of inflation.[7] Whether they are intentional or not, therefore, quite general changes in effective tax schedules can have important effects on charitable contributions.

Significant effects are most likely from two kinds of tax changes. First, movements in the real level of the standard deduction—due to legislation or inflation—will influence the number of itemizers and, accordingly, the number of taxpayers facing prices of giving less than one. As shown above in table 2.7, the proportion of taxpayers who itemize has tended to vary inversely with the constant dollar value of the maximum-allowed standard deduction. Second, any restructuring of the tax rate schedule itself will also affect prices and net incomes. Thus, the choice between a tax schedule that is indexed for inflation and one that is fixed in nominal terms is relevant to the prices and net incomes affecting giving. Other things equal, inflation will push taxpayers into higher tax brackets as well as increase the number of itemizers, thus lowering the price of giving for many taxpayers. The effects on giving of changes over time in tax rates, the standard deduction, and the price level are analyzed below in section 3.5.

3.2 Previous Simulations

Before discussing in detail some of the methodological issues confronted in simulating the effects of tax changes, it is useful to review some of the results of previous simulation exercises. The first full simulation based on

6. See chapter 8 for an analysis of the efficiency aspects of subsidy rates under a deduction and a credit.

7. See, for example, Clotfelter 1984.

an econometric model of charitable giving was presented by Feldstein (1975a). In it he estimated that the elimination of the deduction in 1968 would have caused giving to fall by 34 percent (p. 96). More elaborate simulations appear in Feldstein and Clotfelter (1976) and Feldstein and Taylor (1976).

Table 3.1 presents simulated changes in contributions and tax revenues for a wide variety of tax provisions, based on the Feldstein-Taylor model and the 1970 file of individual tax returns. In these simulations a price elasticity of -1.285 and an income elasticity of +0.702 were employed. As indicated by the simulated changes in tax revenues, no adjustment was made in tax rates to keep revenues constant. Tax credits of 25, 30, and 50 percent show increasingly large gains in giving compared to actual 1970 levels. According to these simulations, the 25 percent tax credit would yield contributions closest to the actual level, just 4 percent above actual contributions. Allowing taxpayers to choose between a tax credit or a deduction would retain the high rates of subsidies for upper-income taxpay-

Table 3.1 **Simulated Effects on Contributions of Alternative Tax Provisions, 1970**

	Change in Contributions		Change in Revenues
Tax Provision	$ Billions	Percentage	$ Billions
Tax credit			
25 percent[b]	+ 0.7	+ 4	− 0.7
30 percent[b]	+ 2.3	+13	− 2.1
50 percent[a]	+12.8	+74	−11.0
Optional tax credit			
25 percent[a]	+ 2.1	+12	− 1.8
30 percent[b]	+ 3.4	+20	− 3.0
30 percent (itemizers only)[b]	+ 1.5	+ 9	− 1.3
Extend deduction to nonitemizers[b]	+ 1.2	+ 7	− 1.0
Constructive realization of gifts of appreciated assets[b]	− 0.5	− 3	+ 0.3
Floor on deduction			
$100[a]	− 1.2	− 7	+ 0.9
$500[a]	− 3.0	−18	+ 2.4
2 percent of AGI[a]	− 3.0	−17	+ 2.3
3 percent of AGI[b]	− 3.5	−20	+ 2.7
Eliminate deduction[b]	− 4.6	−26	+ 3.5

[a]Simulations provided by Martin Feldstein using the 1970 tax file Break. 1977, pp. 1532, 1535,and 1537.

[b]Feldstein and Taylor 1976, p. 1218, table 6.

ers while providing the tax credit for nonitemizers and those with low marginal rates. At the 25 percent rate, making the credit optional would raise the predicted increase in contributions from 4 to 12 percent; at the 30 percent rate the increase in giving would rise from 13 to 20 percent. Of the 20 percent gain under the 30 percent optional credit, about half (9 percent) of the increase is attributable to increased giving by itemizers whose marginal tax rates are lower than the tax credit rate. Extending the charitable deduction to nonitemizers is predicted to increase total gifts by 7 percent, an amount that is less than the optional 25 percent credit because of the low marginal tax rates of most itemizers. In general, the simulations suggest larger changes in contributions than in revenues, as would be expected with an elasticity value greater than one in absolute value.

Among the simulations of proposals that would restrict the deductibility of contributions, the constructive realization of capital gains on asset gifts is predicted to reduce total gifts by 3 percent. Larger declines in giving would result from the imposition of floors of $100 or more in the deduction. The predicted reduction is 7 percent for a $100 floor and 18 percent for a $500 floor. There is little difference in effect between floors of 2 and 3 percent of gross income, for which contributions are predicted to fall 17 and 20 percent, respectively.

The least favorable simulation is the complete elimination of the deduction. The Feldstein-Taylor simulations for 1970 using micro data imply a reduction of 26 percent in contributions. This result compares to a predicted 34 percent reduction for 1968 based on pooled aggregate data (Feldstein 1975a, p. 96) and a 26 percent reduction for a sample of households in 1963 (Feldstein and Clotfelter 1976, p. 22) using similar models. While the first two simulations are for itemizers only, the last is based on a sample of all taxpayers. Not surprisingly, the biggest impact of eliminating the deduction is felt at upper income levels, where the increase in the price of giving is greatest. To indicate what this distributional effect implies for gifts to various donee groups, Feldstein and Taylor used the 1962 distribution of gifts to predict giving by organization type. Table 3.2 shows the simulation results for the elimination of the deduction. Giving to educational institutions and hospitals was predicted to fall the most, owing to the dependence of those organizations on gifts from upper income taxpayers.

3.3 Methodological Issues in Simulation

The starting point in simulation models of charitable giving is the basic single-equation model discussed at length in chapter 2. Using the log-linear form, this model can be written:

$$\ln G = a + b_1 \ln P + b_2 \ln Y + cX + u, \quad (1)$$

Table 3.2 **Simulated Effects of Eliminating the Charitable Deduction by Donee Type, 1970**

Donee Group	Percentage Change in Contributions
Religious organizations	−22
Other charitable organizations	−27
Educational institutions	−48
Hospitals	−46
Other organizations	−33
TOTAL	−26

Source: Feldstein and Taylor 1976, p. 1218 table 4. Note that the "health and welfare organizations" category used by the authors is renamed in accordance with the data source—U.S. Internal Revenue Service, *Statistics of Income—1962, Individual Income Tax Returns* 1964, p. 6, table E—"Other charitable organizations."

where G is contributions, P is price, Y is after-tax income, X is a vector of other variables included in the equation, u is an error term representing the effect of unmeasured characteristics and errors in model specification, and a, b_1, b_2, and the vector c are true parameters. For any given values of the independent variables (say P_0, Y_0, and X_0), the predicted value of the logarithm of giving is given by

$$(2) \qquad \ln \hat{G}_0 = \hat{a} + \hat{b}_1 \ln P_0 + \hat{b}_2 \ln Y_0 + \hat{c}X_0,$$

where $\hat{a}$, $\hat{b}_1$, $\hat{b}_2$, and $\hat{c}$ are estimated coefficients. Adding the error representing the deviation of the actual from the predicted value, denoted $\hat{u}$, yields

$$(3) \qquad \ln G_0 = \hat{a} + \hat{b}_1 \ln P_0 + \hat{b}_2 \ln Y_0 + \hat{c}X_0 + \hat{u}.$$

The basic relationship used in simulation models is obtained by combining an equation such as (3) with the corresponding equation using the price and net income variables that would be observed under an alternative tax regime. For example, suppose a given tax regime would yield first-dollar price and income values of P_1 and Y_1. Assuming there is no change in X_0, that equation is:

$$(3') \qquad \ln G^s_1 = \hat{a} + \hat{b}_1 \ln P_1 + \hat{b}_2 \ln Y_1 + \hat{c}X_0 + \hat{u},$$

where $\ln G^s_1$ is the predicted value for the logarithm of giving. Subtracting (3) from (3′) and rearranging yields:

$$(4) \qquad \ln G^s_1 = \ln G_0 + \hat{b}_1 (\ln P_1 - \ln P_0) + \hat{b}_2 (\ln Y_1 - \ln Y_0),$$

or

$$(5) \qquad G^s_1 = G_0 \left(\frac{P_1}{P_0}\right)^{\hat{b}_1} \left(\frac{Y_1}{Y_0}\right)^{\hat{b}_2}.$$

Only those variables whose simulation values differ from their base values—typically only those affected by tax rules—appear in this expression.[8] If only one tax-defined variable is affected by a tax change, the other term drops out. If a tax change affects neither the price of giving or net income, the simulated value $G^s{}_1$ would be equal to the base value G_0. It is useful to emphasize in this context that tax variables are the only ones to appear in the simulation equation only because they are the only variables assumed to change. It is unlikely that there are more than a few individuals, if any, for whom taxes constitute the most important reason for making charitable gifts. By focusing on changes in tax variables, the model seeks to predict the effects of a change in tax policy. Models such as this do not, as has been suggested, " ' [presume] that philanthropy is governed primarily or principally by tax considerations' " (Ketchum 1982, p. 2).

It is important to note that the estimated-error term $\hat{u}$ drops out of the expression for the simulated value of giving. Whatever omitted factors that cause an individual's contributions to diverge from the predicted value in the base period are assumed to operate in the same way if the alternative tax regime were adopted. The resulting simulated value thus differs from the actual value only in the combined predicted effects of independent variables that change as a result of a change in tax rules. The error with which any estimated equation predicts a given individual's contributions arising simply from the error term $\hat{u}$ is thus typically ignored for the purpose of simulation.[9]

As an application of prediction within the context of an estimated econometric model, this simple framework for simulating the effects of tax changes on charitable giving is relatively straightforward. It is important, however, to give attention to several methodological issues that arise. The first of these relates to the statistical error associated with all predictions. The other methodological issues relate more specifically to the case of charitable contributions.

3.3.1 Statistical Errors in Prediction

Two kinds of statistical errors are relevant to the prediction of charitable giving using an estimated econometric model. First, there is an error associated with each individual observation. As denoted by $\hat{u}$ in equation (3), this error measures the deviation of the actual observed value from the value that is predicted by the regression equation. It may reflect unmeasured individual characteristics or specification errors. As discussed above, this error is not considered in simulating the effect of tax changes; such individual error terms are assumed to operate the same under any tax regime. The second kind of error is the statistical sampling error associ-

8. See, for example, Feldstein and Clotfelter 1976, p. 20n.
9. See, for example, Feldstein and Taylor 1976, p. 1216.

ated with the parameter estimates. The coefficients $\hat{b}_1$ and $\hat{b}_2$ in equation (5) will inevitably be estimated with less than perfect precision. The standard errors of these estimates may be used to indicate the statistical precision of the predicted value. If coefficients are estimated with large errors, the predicted value correspondingly is imprecise; if coefficients are estimated with little error, predicted values are relatively precise. In his review of econometric studies of charitable contributions, Zellner (1977, pp. 1515–6) emphasizes the importance of providing measures of precision with predictions. Previously published simulations have not included such measures, however.

For the general linear regression of the form $Y = a + \Sigma b_i X_i + u$, the prediction error is given by:[10]

$$\text{(6)} \quad s^2_P = s^2/N + \sum_i (X'_i - X^0_i)^2 \operatorname{Var}(\hat{b}_i) + 2 \sum_{j<i} (X'_j - X^0_j)(X'_i - X^0_i) \operatorname{Cov}(\hat{b}_j, \hat{b}_i),$$

where s^2 is the estimated variance of the estimate, N is the sample size, X'_i is the value of X_i used for simulation, and X^0_i is the actual or base value of X_i. In general, the size of the error will vary with two factors. The larger the standard errors of the relevant coefficients (as indicated by Var $(\hat{b}_i)$), the less precise will be the resulting predictions. This fact is of course a major reason for the interest shown both in the academic literature and public debate regarding the reliability of the estimated price elasticities in econometric models of giving.[11] The second important element determining the prediction error is the degree to which the values posited for simulation (X'_i) differ from the observations that serve as the basis for the estimates. The more the hypothetical values used in simulation differ from observed values, the less reliable the prediction will be. For example, there would tend to be more error associated with a prediction regarding a major change such as the elimination of the charitable deduction than a minor change in the tax law. Variables for which no change is contemplated affect neither the prediction nor the prediction error.

3.3.2 Revenue Effects of Tax Changes

Virtually any change in tax law, including changes in the treatment of charitable contributions, will have some impact on revenues and thus net income. In order to eliminate any aggregate income effect, as well as to reflect the kind of changes that might conceivably be enacted, it is desirable to perform simulations under the assumption of constant tax revenues. Feldstein (1975a) and Feldstein and Clotfelter (1976) used a proportional

10. See, for example, Kmenta 1971, p. 375. The prediction error differs from the forecast error in that the latter also includes the variance of the individual error terms. The latter error terms drop out for the purpose of prediction (see (5)).

11. See, for example, Zellner 1977, p. 1517 or U.S. Congress, Senate, 1980, p. 227.

adjustment of tax rates to equalize revenues under various tax rules, a procedure followed in the present chapter.[12] Two other effects need to be accounted for in making revenue adjustments. First, proportional adjustment in tax rates will affect the price of giving if there is a deduction for contributions. If revenues are adjusted through a 2 percent increase in rates, for example, the price of donating under a deduction rule will fall, thus affecting donations. Second, the level of contributions will itself influence revenues under various tax rules. This interaction calls for an iterative procedure in which estimated contributions are used to recalculate tax variables, which in turn can be used to estimate contributions again.

In the model presented in the next section, the effect of changed tax rules, contributions behavior, and revenue adjustment are reflected in the recursive procedure summarized in expressions (7)–(15) where TAX is tax liability, as defined for any simulated tax regime, G is giving, P is the price of giving, R_0 is tax revenue under the actual or baseline tax regime, α is a proportional revenue adjustment parameter, and f, h, j are functions in the revenue adjustment process.

$$\text{TAX}_1 = \text{TAX}(G \mid G = O), \tag{7}$$

$$P_1 = P(G \mid G = O), \tag{8}$$

$$G_1 = G(\text{TAX}_1, P_1), \tag{9}$$

$$\text{TAX}_2 = \text{TAX}(G_1), \tag{10}$$

$$P_2 = P(G_1), \tag{11}$$

$$\alpha = f(\text{TAX}_2, R_0), \tag{12}$$

$$\text{TAX}_2^* = h(\text{TAX}_2, \alpha), \tag{13}$$

$$P_2^* = j(P_2, \alpha), \tag{14}$$

$$G_2 = G(\text{TAX}_2^*, P_2^*). \tag{15}$$

Initial values for tax liability and price in (7) and (8) are first-dollar amounts, calculated using actual values of all tax parameters except contributions. An intermediate value of contributions is calculated in (9) using TAX_1 to determine net income. This equation corresponds to the basic prediction equation given in (5). Equations (10) and (11) repeat the first two steps with this new value of contributions. In (12) an adjustment fac-

12. By contrast, Feldstein and Taylor (1976, p. 1215n) made no revenue adjustment, noting the relatively small percentage change in net income.

tor is calculated based on the total revenue generated under the simulated tax regime as compared to the original tax regime. In the simple case in which the simulated tax regime has no effect on tax credits, this adjustment function is simply

$$(12') \qquad \alpha = R_0/\mathrm{TAX}_2,$$

and tax liabilities in (13) are adjusted proportionally. In this case, (14) becomes

$$(14') \qquad P_2{}^* = 1 - \alpha(1 - P_2).$$

This adjustment process must be modified when tax credits are affected by any proposed tax change.[13] Finally, the adjusted values obtained in (13) and (14) are used in (15) to obtain a final estimate of giving.

3.3.3 Itemization Status

Needless to say, a taxpayer's itemization status is one of the most important pieces of information available in predicting the effect of a change in tax treatment. Before 1981 only itemizers were allowed to deduct gifts. General tax rate changes affected the price faced by itemizers, while a charitable tax credit or a deduction extended to nonitemizers might cause a significant decrease in the price faced by nonitemizers. In simulating contributions for some hypothetical tax regimes, therefore, it is necessary to determine whether a given taxpayer will be an itemizer or not. It is useful to distinguish between changes in itemization status that are largely independent of the tax treatment of contributions from those that occur because of changes in that tax treatment.

Exogenous Changes in Itemization

The more important reason for changes in itemization status is the change from year to year in the standard deduction (now the "zero-bracket amount") relative to the increase in the nominal value of households' deductible expenditures. When expenditures rise faster than the standard deduction—as, for example, when the standard deduction does not change during an inflationary period—more taxpayers find that their deductible expenditures exceed the maximum allowable standard deduction. Accordingly, the number of itemizers rises. Although contributions are one part of these deductible expenditures, taxes and interest represent the bulk of such items for most taxpayers. In simulating the tax changes over time or tax changes involving an adjustment of the standard deduction, it is necessary to provide for a change in itemization status for some taxpayers.

13. Where tax credits are affected, for example, the proportional adjustment is applied only to tax liability before credits so that credit rates and price are unchanged.

Modeling the itemization decision of a rational taxpayer involves a straightforward comparison between the allowable itemized deductions that he could report (ID_i) and the applicable standard deduction (SD_i). If $ID_i > SD_i$, the taxpayer has a smaller tax liability by itemizing deductions, and the simple model predicts that he would be an itemizer. If $ID_i < SD_i$, the taxpayer would not itemize. In a micro data set with information on all potential itemized deductions for all taxpayers, this simple model would be quite appropriate for use in simulations involving changes in itemization. Where deduction data are available only for itemizers, however, it is not possible to utilize this approach without first generating hypothetical deductions data for nonitemizers, a method necessarily dependent on arbitrary allocations.[14]

A model of itemization using aggregate data relates the ratio of gross income and the standard deduction to the probability of itemizing, using a logistic function. Where I is the probability of itemization, AGI is adjusted gross income, and SD is the maximum standard deduction, the function is

$$\frac{I}{1-I} = a\left(\frac{AGI}{SD}\right)^{\gamma} \tag{16}$$

The constant γ is the elasticity of the odds in favor of itemizing with respect to the income-standard deduction ratio. An equation of this form was estimated for a pooled time-series/cross-section sample of aggregate tax return data covering 1973 to 1980 and even years from 1948 to 1972.[15] Taking logarithms and adding a time trend yields the following equation, estimated by ordinary least squares:

$$\ln \frac{I}{1-I} = \underset{(0.02)}{1.24} \ln \frac{AGI}{SD} + \underset{(0.004)}{0.020} \text{ (Year-1947)}, \tag{17}$$

$$R^2 = 0.90, N = 483,$$

where AGI is mean income and I is the proportion of taxpayers who itemize by income class. As illustrated in table 3.3 for 1980, the regression's predicted values closely track the actual proportion of itemizers. For the purpose of predicting changes in the proportion of itemizers, it is useful to use equations (16) and (17) to write an expression relating new values of income, the standard deduction, and the itemization proportion (denoted by primes) to the observed values:

$$\frac{I'}{1-I'} = \frac{I}{1-I}\left(\frac{AGI'/SD'}{AGI/SD}\right)^{1.24}. \tag{18}$$

14. See Feldstein and Lindsey 1981 for simulations using data of this type.
15. See Appendix B for a description of this data set.

Table 3.3 **Actual and Predicted Percentage of Taxpayers Who Itemized in 1980, by Income Class**

Income	Percentage with Itemized Deductions: Actual	Predicted
$0 under 5,000	2.3	6.8
$5,000 under 10,000	7.3	21.4
$10,000 under 15,000	18.0	33.9
$15,000 under 20,000	32.4	43.9
$20,000 under 25,000	50.8	51.7
$25,000 under 30,000	65.0	57.8
$30,000 under 50,000	81.7	66.6
$50,000 under 100,000	93.3	79.9
$100,000 under 200,000	96.1	90.6
$200,000 under 500,000	98.1	96.1
$500,000 under 1,000,000	98.9	98.6
$1,000,000 or more	99.2	99.7

Source: Actual percentage: U.S. Internal Revenue Service, *Statistics of Income—1980, Individual Income Tax Returns* 1982, p. 41, table 1.3; p. 57, table 2.1. Predicted percentage: see text.

To illustrate the magnitude of the estimated itemization elasticity of 1.24, consider a 10 percent increase in the ratio of income to the maximum standard deduction, caused, for example, by a 10 percent increase in income with no change in the standard deduction. For a class with 40 percent of taxpayers itemizing, this change would imply an increase in the percentage itemizing to 45.5. For a class with 95 percent itemizing already, however, the percentage would increase only to 96.0. In summary, although the logistic relationship between the probability of itemization and the income-standard deduction ratio does not directly model a taxpayer's choice between allowable itemized and standard deductions, by accounting for the relationship between nominal income and the maximum standard deduction it does provide predictions regarding changes in itemization.

Endogenous Changes in Itemization and Deduction Floors

For the purpose of simulating the effects of most tax changes, a less important cause of changes in taxpayers' itemization status is the treatment of contributions itself. As outlined in chapter 2, the itemization decision is a function of contributions behavior for a relatively small group of taxpayers. For these taxpayers the standard deduction acts as a floor for the deductibility of contributions, and the taxpayer faces a nonconvex budget set. The choice of contribution level, and thus itemization status, depends on the shape of the individual's indifference curves. Similarly, an explicit floor for the deductibility of contributions (e.g., as a percentage of income or an absolute amount) also creates a nonconvex budget set with similar behavioral implications.

In order to simulate giving in the presence of nonconvex budget sets, Feldstein and Lindsey (1981, p. 14) employed an explicit direct utility function in the manner of Hausman (1981) and Reece and Zieschang (1982) to make comparisons among points on the budget line for individuals who might be either above or below the deduction floor. The functional form they chose implies constant price and income elasticities of μ and β, respectively:

(19)
$$V_i\ (P, Y) = -k_i\ \frac{P^{1+\mu}}{1+\mu} - \frac{Y^{1-\beta}}{1-\beta}$$

Substituting previously estimated price and income elasticities, they obtained a value of k_i for each individual as the value that made observed giving equal the utility-maximizing amount. From this they were able to allow for taxpayers switching itemization status. Their calculations imply that about 6 percent of itemizers would stop itemizing if charitable deductions were eligible for a separate deduction.[16] In the simulations presented in the section 3.4, such endogenous shifts in itemization are not considered. Only shifts due to changes in the income-standard deduction ratio are allowed for.

3.3.4 Dynamic Considerations

The effects of tax changes on charitable giving may vary over time. One possible dynamic pattern would result from the existence of lags in people's adjustment to tax changes. If such lags are at work, tax changes would tend to have less immediate impact than after the passage of time. Another possibility is that taxpayers may attempt to time their contributions so that their tax liabilities are minimized. It is well known that estimates obtained in regressions using cross-section data may not be appropriate for simulating changes through time.[17] As applied to the simulation of tax effects on contributions, it is useful to consider simulation models that deal specifically with dynamic effects of tax policy. The first model deals with lags in adjustment, and the second takes into account the possibility of timing gifts.

Lags in Adjustment

The incomplete-adjustment model discussed in chapter 2 provides an explicit form for distinguishing short-run and long-run effects of tax changes on giving. This model may be written:

(20)
$$G_t = G^{*\phi}\, G_{t-1}^{1-\phi},$$

16. See Feldstein and Lindsey 1981, pp. 14–16.

17. See, for example, Morgan, Dye, and Hybels 1977, p. 174; Nelson 1977a, p. 1505; or Zellner 1977, pp. 1518, 1520.

(21) $$G_{t+1} = G^{*\phi} G_t^{1-\phi},$$

(22) $$G_{t+k} = G^{*\phi} G_{t+k-1}^{1-\phi},$$

where ϕ is a constant coefficient of adjustment and G^* is the simulated, or long-run, value of contributions resulting from a given tax regime.[18] If the long-run level of giving G^* differs from the initial level G_t, and G^* does not change, actual giving will tend to approach but not reach long-run giving. The time path for giving in response to a hypothetical tax change is illustrated in table 3.4. The time path of charitable contributions by nonitemizers is simulated for the institution of a full charitable deduction in year 1, assuming initial contributions of $12.1 billion, an average marginal tax rate of 0.2 for nonitemizers, and a price elasticity of -1.2. The long-run level of contributions implied by the constant-elasticity model is $15.8 billion.[19] Based on the adjustment coefficient of 0.37 estimated in Clotfelter (1980b, p. 333), contributions by nonitemizers after one period are calculated to be $13.4 billion ($15.8^{0.37}\,12.1^{1-0.37}$), an increase of $1.3 billion. The revenue loss from the deduction, approximated as the marginal tax rate (0.2) multiplied by actual giving of $13.4 billion, is $2.7 billion. Given these parameters, the increase in giving due to the deduction would not exceed 90 percent of the long-run increase before the sixth year. In addition, the increase in giving would not exceed the revenue loss before the fifth year, even though the (long-run) price elasticity is greater than one in absolute value. If the parameter estimates are assumed to be valid, this suggests that the full effects of tax policy are unlikely to be felt immediately. This simulation casts little light, however, on the effect of tax rules that are phased in slowly or whose effective date is delayed after passage of legislation. For example, the 1981 Economic Recovery Tax Act, which was signed in August 1981, provided for a deduction for nonitemizers that would become fully available only in 1986.

Timing Effects

An itemizing taxpayer who expects to face different marginal tax rates in successive years can reduce his total tax liability by increasing the proportion of gifts he makes in the high-tax year. More generally, there is an incentive for making deductible expenditures in tax years in which the net-of-tax price is least. The potential for timing charitable contributions is especially great because giving tends to be more discretionary than most deductible expenditures. One obvious manifestation of timing behavior in charitable giving is the tendency for a major change in tax rates to be accompanied by an acceleration of giving to take advantage of low prices in the old law or a deceleration if the new law offers lower prices.

18. See equation (19) in chapter 2.
19. $G^* = (P_1/P_0)^{-1.2}G_0 = (0.8)^{-1.2}\,1.2 = 15.8.$

Table 3.4 **Simulated Time Path of Contributions and Revenue Losses, Ten-Year Period Following Enactment**

Year	Long-Run Giving Level (G^*)	Actual Giving ($ billions)	Increase in Giving from Year 0	Revenue Loss	Increase in Actual Giving as Percentage of Increase in Long-Run Giving (percent)
0	12.1	12.1	—	—	—
1	15.8	13.4	1.3	2.7	34
2	15.8	14.2	2.1	2.8	57
3	15.8	14.8	2.7	3.0	72
4	15.8	15.1	3.0	3.0	82
5	15.8	15.4	3.3	3.1	89
6	15.8	15.5	3.4	3.1	93
7	15.8	15.6	3.5	3.1	96
8	15.8	15.7	3.6	3.1	97
9	15.8	15.7	3.6	3.1	98
10	15.8	15.8	3.7	3.2	99

Note: Assumptions: (1) Long-run price elasticity is -1.2. (2) Where G_t and G^* are actual and long-run giving levels in year t, ϕ is a coefficient of adjustment equal to .37, $G^* = (0.8)^{-1.2}(12.1)$, $G_t = (G^*)^{\phi}(G_{t-1})^{1-\phi}$.

Timing behavior might also be important if a floor were placed under deductible contributions, giving taxpayers the incentive to "bunch" their gifts over time. For example, consider a $200 deduction floor. A taxpayer who faces a 25 percent marginal tax rate and who plans to give $1000 over two years would reduce his taxes by $200 if he made all his gifts in one year, compared to a saving of only $150 if he gave equal amounts each year. Feldstein and Lindsey (1981) analyze bunching behavior in a simulation of various deduction floors. Their basic model assumes that bunching occurs only within a two-year time horizon and that bunching is an all-or-nothing decision. The probability of bunching (PROB) is taken to be a function of the after-tax cost of giving if there is no bunching (*CG*) and the cost if there is bunching (*BCG*):

$$\text{PROB} = 1 - (BCG/CG)^{\rho}, \tag{23}$$

where ρ is a positive constant. Using the example given above, in which $CG = \$850$ and $BCG = \$800$, a value of 0.5 for ρ would imply a bunching probability of 0.03 while $\rho = 10$ implies a probability of 0.45. Because there exist no empirical studies of bunching for the case of contributions, Feldstein and Lindsey present results based on a range of values for ρ. Table 3.5 presents their simulations of extending deductibility for contributions to nonitemizers in 1977. Whereas they project an increase in giving of $4.5 billion and a revenue loss of $4.1 billion with no floor, the addition of floors reduces both changes.[20] The effect of bunching is to lessen the changes, but, as Feldstein and Lindsey note, wide variation in the bunching assumption makes little difference.[21]

3.3.5 Contributions by Nonitemizers

Because of the difficulty of obtaining data on contributions by nonitemizers, some researchers have employed a modification of the basic simulation model of giving. Feldstein and Lindsey (1981, p. 27) estimated the contributions made by a nonitemizing taxpayer by selecting an itemizing taxpayer with similar demographic characteristics and calculating the predicted quantity, taking into account only the difference in price and income between the taxpayers:

$$G_n = G_i\,(P_n/P_i)^a\,(Y_n/Y_i)^b \tag{24}$$

$$= G_i\,P_i^{-a}(Y_n/Y_i)^b,$$

where *n* refers to the nonitemizer and *i* to the itemizer. This approach is based on the assumption that the difference in contributions between

20. The principal reason why Feldstein and Lindsey's estimated $4.5 billion increase exceeds the $3.7 billion increase calculated for table 3.2 is their use of a price elasticity of -1.3.

21. A variant of the complete bunching model considered by Feldstein and Lindsey assumed that only a portion of gifts would be subject to bunching. The model and results are similar to those of the complete bunching model.

Table 3.5 **Feldstein-Lindsey Simulations of Changes in Contributions by Current Nonitemizers, 1977 (amounts in billions of dollars)**

	Full Deductibility		$300 Floor		3 Percent of AGI Floor		
	Changes in		Changes in		Changes in		
	Giving	Taxes	Giving	Taxes	Giving	Taxes	
No bunching	+4.506	−4.101	+3.608	−2.430	+3.039	−1.944	
Bunching[a]							
ρ = 0.5	—[b]	—	+3.617	−2.442	+3.051	−1.955	**
ρ = 2.0	—[b]	—	+3.645	−2.447	+3.089	−1.988	**
ρ = 10.0	—[b]	—	+3.763	−2.605	+3.246	−2.112	**
ρ = ∞	—[b]	—	+4.079	−2.818	+3.686	−2.347	**

Source: Feldstein and Lindsey 1981, p. 36, table 4.

[a]See text for explanation of bunching model.

[b]Bunching not relevant to full deduction.

itemizers and nonitemizers can be attributed entirely to differences in price and income. Because of the strength of this assumption and the availability of survey data on contributions by nonitemizers, estimates of contributions by nonitemizers in the present study are based directly on such survey information.

3.3.6 Gifts by Donee Type

Because of its great practical significance, it is quite useful to reflect in simulations the distribution of giving by type of organization. As discussed in chapter 2, however, there is considerably less information regarding the distribution of gifts than in giving in general. The studies attempting to measure separate price and income effects by type of donee typically have been subject to a large degree of uncertainty. An alternative approach taken by Feldstein and Taylor (1976, p. 1217n) and Clotfelter and Salomon (1982), is to simulate tax effects on total giving and then to allocate this total giving to various donee groups using proportions that vary by income level. This approach carries the implicit assumption that the price elasticity does not vary at any income level for gifts to different donee classes. In addition, the use of old distributions, such as those based on 1962 tax returns, is obviously flawed to the extent that the real distribution has changed over time. Despite these drawbacks, the simulations presented in the next section use past distributions modified for changes in the price level in order to suggest how tax policy may affect gifts to different types of nonprofit organizations.

3.3.7 Simulation and the Validity of Econometric Models of Giving

Finally, it is useful to note a more general methodological issue that relates to simulation using any estimated econometric model, including those estimated for charitable giving. The econometric model underlying a simulation exercise inevitably contains implicit maintained hypotheses that may limit the validity of the simulation results. The choices of which variables to include and how to define them affect the validity of the simulations in the same way they affect the validity of the estimates. For example, the incorporation of the effects of itemization and the marginal tax rate into a single price variable embodies the hypothesis that there is no itemization effect apart from the price effect, an issue discussed in chapter 2. Similarly, the inclusion of net income as a variable supposes that an increase of $100 in gross income will have the same effect as a $100 decrease in taxes. In much the same way, it is typically assumed that labor supply and thus earnings are independent of the tax provisions being examined. To the extent that such assumptions are incorrect, simulations based on them will also be flawed.

Some possible influences on giving are excluded from estimating models because little or no information or variation has been observed. For example, the basic model of charitable giving allows no role for charitable organizations' financial condition or solicitation activity. Charities are implicitly assumed to be passive recipients of contributions. As implied by Zellner (1977, p. 1518), as well as some of the discussion of charitable giving following the Reagan cuts in federal aid, individuals may respond to the financial plight of charities by increasing their contributions compared to what they would have given otherwise. According to Butler (1981, p. 9), "If the flexible patterns of the past are any guide, the structure of giving will shift in favor of these organizations hurt by the cuts and seen by the public as socially valuable." Charities themselves may respond to hard times by stepping up solicitation efforts.

It is therefore necessary to understand simulation results as being a ceteris paribus exercise in predicting outcomes in response to a hypothetical policy. They can reflect the effects of changes only in variables included in the model; other influences have to be assumed to be constant. Because estimated models have been unable to reflect some possible "systems responses," the resulting simulations obviously cannot take such effects into account. The simulations are thus predictions about the outcomes of certain policy changes, other things equal.

3.4 Simulations of Individual Giving for 1983

In order to provide current projections of charitable contributions under different tax regimes, a simulation model using aggregate data is presented. This section describes the data and special features of the simulation program and then presents a variety of simulations for 1983.

3.4.1 Basic Data

The primary source of data for this simulation exercise is the 1980 *Statistics of Income*, which gives aggregate tax return information by income class. While disaggregated data have a number of important advantages over aggregate data in estimation of charitable giving models, there are advantages to aggregate data in simulation. The identification of separate price and income effects is a central concern in estimation, and disaggregated data are usually better able to distinguish these effects by producing more precise parameter estimates. For most simulations of charitable giving, however, the effects of tax changes are proportional in nature. The result is that simulations of major policy changes using both kinds of data sets produce quite similar results. Only for behavior involving discontinuities such as "bunching" is disaggregated behavior clearly superior. As noted above, changes in itemization status could be simulated easily using an appropriate disaggregated data set, but existing data sets do not provide adequate information on potential itemized deductions by nonitemizers. Finally, the use of aggregate tax return data for the current study provided the most recent available data on income, taxes, and contributions as well as comparable data that could be analyzed over time.

In order to reflect important differences among taxpayers, four types of taxpaying units are defined for each income class given in the *Statistics of Income*: single itemizers, single nonitemizers, joint itemizers, and joint nonitemizers. The comparatively few returns that were not single or joint were allocated between one of these two tax-status groups.[22] Exemptions other than for dependents were allocated to single and joint returns in each class according to the distribution of adult taxpayers.[23] Dependent exemptions were allocated so that the number of dependents per return in joint households would be a constant multiple of that in single households.[24]

In order to obtain appropriate 1983 levels of variables, income, deduction, and tax-credit data were assumed to grow at the predicted rate of per capita national income. The number of taxpayers was assumed to grow at the average rate of population growth between 1980 and 1983.[25] In order to estimate the number of taxpayers at each income level who itemized their deductions, the 1980 proportions for each income class were adjusted to take into account the growth in nominal income in relation to the (stationary) zero-bracket amount. For this purpose, equation (8) was used with an itemization elasticity of 1.24.

The basic *Statistics of Income* data for 1980 provides information on charitable contributions by itemizers and income for all taxpayers as well as all information needed to calculate taxes and tax rates. Data on contributions by nonitemizers were based on modified tabulations from the National Study of Philanthropy, adjusted so as to correspond to the 1980 income brackets used for all other data.[26] The percentage distribution of

22. In 1980 42 percent of taxpayers filed single returns and 48 percent filed jointly, leaving only 10 percent who fell into other tax-status groups.

23. This includes the blind, over-65, and taxpayer exemptions. Where J and NJ are joint and nonjoint returns in an income class, the proportion of adult exemptions assigned to joint returns in that class was $(2J/(2J + NJ))$.

24. Joint returns in 1980 had an average of 1.34 dependent exemptions while single returns had 0.33, for a ratio of 4.1 (U.S. Internal Revenue Service, *Statistics of Income—1980, Individual Returns* 1982, p. 70 table 2.4). Where DJ and DNJ are dependents in joint and nonjoint returns, the assumption that the ratio of dependents per return in joint households is 4.1 that in single households can be written: $(DJ/J)/(DNJ/NJ) = 4.1$. This implies $DJ = D/((NJ/4.1J) + 1)$, where D is the total number of dependents in the class.

25. Nominal GNP was $2633 billion in 1980 and $3262 billion in 1983 (U.S. Council of Economic Advisers 1983, p. 163; U.S. Office of Management and Budget 1983, pp. 2–9), for a ratio of 1.293. Population grew at an expontential rate of 1.064 percent annually between 1978 and 1981; $P(t) = P(0) \exp (gt)$, where $g = 0.01064$. For 1980–83, this implies $P(1983)/P(1980) = 1.032$. Thus, per capita GNP growth was $1.239/1.032 = 1.201$.

26. See Morgan, Dye, and Hybels 1977, p. 193. Because of the small number of nonitemizers in higher income classes, averages in the top four income classes were smoothed. Average giving for nonitemizers by income class in 1973 dollars was assumed to be: under $4000: $69; $4000 under 8000: $89; $8000 under 10,000: $117; $10,000 under 15,000: $201; $15,000 under 20,000: $329; $20,000 under 50,000: $354; $50,000 under $200,000: $2003; $200,000 and over $6946. These figures were then inflated and prorated to correspond to 1980 income classes.

gifts to various kinds of donee organizations by income class is based on the 1962 *Statistics of Income* data used in previous studies. Again, the data were interpolated so as to yield the appropriate 1980 income classes.

3.4.2 Calculation of Taxes and Contributions

With four taxpayer types in each of twelve income classes, each simulation consists of separate calculations for forty-eight representative households, each representing a different number of actual taxpayers. In order to calculate taxes and tax rates, the actual or hypothetical tax law was applied to data on average income, exemptions, and deductions for each representative household. Tax liability calculated in this manner for 1980 using actual values of contributions yielded an estimate of total revenue of $250.2 billion, compared to actual revenues of $249.1 billion. For the purpose of simulating taxes or standard price and income effects on charitable giving, therefore, an aggregated model appears to perform quite adequately. Revenues calculated under the first-dollar assumption of zero contributions were $260.2 billion in 1980. Calculated tax revenues under this assumption using the 1983 law were $279.6 billion. In order to make comparisons among constant revenue alternatives, tax rates under other hypothetical tax laws were adjusted proportionally so as to yield that same revenue for 1983. In all cases, adjustments were made so that tax credits and tax-credit rates were unaffected. The adjustment process thus affects tax liabilities before credits as well as marginal tax rates.

Because it was the latest available year with data for contributions by itemizers, 1980 was used as the base year for simulating changes in contributions. The various price and income values implied by hypothetical tax policies were compared to the actual 1980 values of price and income according to the basic simulation expression:

$$G_{83} = G_{80} (P_{83}/P_{80})^a (Y_{83}/Y_{80})^b, \quad (25)$$

where both income measures and 1980 giving are expressed in 1983 dollars.

One special feature of the 1980 tax law that makes an important difference in calculation of P_{80} is the "maximum tax on earned income" that applied in that year. This feature had the effect of reducing the marginal tax rate applicable to deductions for most taxpayers in tax brackets over 50 percent. Thus the price difference brought about by the reduction in maximum rates from 70 to 50 percent in 1981 was not as great as it would first appear.

In order to calculate the effective marginal tax rate under the maximum tax, it is necessary to consider the provision's allocation of taxable income into "earned" and "unearned" portions. Under the maximum tax, the latter was "stacked" on top of the former so as to be taxed at the same rates that would have applied in the absence of this provision. Where ϵ is the proportion of adjusted gross income accounted for by earned income (salaries plus certain business income), TI_{50} is the maximum taxable income subject to the 50 percent tax rate, TI is total taxable income, and TAX ( ) is the income-tax-schedule function, the tax liability under the maximum tax was

$$\text{(26)} \qquad \text{TAX}(TI_{50}) + .50\,(\epsilon TI\text{-}TI_{50}) + [\text{TAX}(TI) - \text{TAX}(\epsilon TI)].$$

Differentiating (26) with respect to charitable contributions shows that the decrease in taxes due to an additional dollar of deductions—that is, the effective marginal tax rate—is:

$$\text{(27)} \qquad m - (m_e - .50)\epsilon,$$

where m is the marginal tax rate on total taxable income and m_e is the marginal tax rate on earned taxable income. This rate was calculated for applicable high-income taxpayers using the average proportion of earned income for the class.[27]

The price of giving is defined as a weighted average of the price of making cash gifts and the estimated price of giving appreciated assets:

$$\text{(28)} \qquad P_{ij} = \phi_i(1 - m_{ij}) + (1 - \phi_i)(1 - m_{ij} - 0.5\, mc_{ij}),$$

where ϕ_i is the proportion of contributions made in the form of cash by the income class, m_{ij} and mc_{ij} are the marginal tax rates on ordinary and capital gains income, respectively, and 0.5 represents the expected present value of the realized gains per dollar of asset value.[28]

Two alternative sets of estimated parameters are used in the simulations. The first, based on the constant-elasticity model estimated for the 1975 tax file, uses a constant-price elasticity of -1.27 and an income elasticity of 0.78. The second estimated model is the translog variable-elasticity form, which allows both the price and income elasticities to vary by income level. Calculated at the means of rather broad income classes, as shown in table 2.16, the price elasticity varies from -0.42 to -1.51 while the income elasticity varies from 0.55 to 0.91. The variation in incomes in the 1980 data base used in the current chapter is greater, resulting in a positive implied price elasticity at the very lowest income level. In the simulations based on this model, therefore, the price elasticity is constrained to have a maximum value of zero.

3.4.3 Simulation Results

Before presenting a comparison of alternative proposals, it is useful to begin by examining the base years used for comparison. Table 3.6 pre-

27. Using the maximum rates allowed by the provision, the model calculated earned income as wages plus 30 percent of the sum of income from small businesses. See Lindsey 1981 for a thorough treatment of the effect of this provision on tax rates.

28. For further discussion of the definition of the price of contributing appreciated assets, see chapter 2, especially equation (7).

Table 3.6 **Comparison of Itemization Rate, Price of Giving and Contributions between 1980 and 1983**

	1980 Actual	1983 Estimated	
Percentage itemizing	31.0	34.0	
Price of giving			
Itemizers	0.69	0.74	
Nonitemizers	1.00	1.00	
Total	0.90	0.91	
		Constant Elasticities	Variable Elasticities
Contributions ($ billions, 1983 dollars)			
Total	47.2 [a]	45.1	45.2
Top 5 income classes[b]	11.2	9.2	8.6

[a]$38.7 billion in 1980 dollars.
[b]Over $50,000 in 1980.

sents aggregate data on itemization, the price of giving, and contributions for 1980 and the corresponding simulated values for 1983. Three major changes occurred between these years to influence contributions: the proportion of taxpayers who itemized deductions went up, the top marginal tax rates were substantially cut, and real incomes fell. One major result was that the average price faced by itemizers increased from 0.69 to 0.74—reflecting sharp increases at upper incomes—and the overall average price rose from 0.90 to 0.91. Based on the projections of incomes and prices, total contributions measured in 1983 dollars are estimated using constant elasticities to fall from $47.2 billion in 1980 to $45.1 billion in 1983, a decline of 4 percent. The decline is slightly greater using the variable-elasticity model. Due to the steep price increases at upper income levels, contributions made by taxpayers in the top five income classes (over $50,000 in 1980) are projected to decrease by a substantially greater degree. Using the constant-elasticity model, the estimated decrease in giving by this group was 18 percent, to $9.2 billion; the decrease was 23 percent, to $8.6 billion, using variable elasticities. The simulation of changes in giving over time, including changes in the 1980–83 period, is discussed in more detail in the following section. The simulations discussed in the remainder of this section use 1983 values—corresponding to two sets of elasticity assumptions—as a basis for comparison among alternative tax rules.

Aggregate Giving

Table 3.7 presents the aggregate simulation results for 1983. For the 1983 law and each of nine proposed variants, the table gives estimated aggregate contributions under the alternative assumptions regarding price and income elasticities. The table also shows the adjustment factor necessary to obtain revenues equal to the 1983 tax law as well as the average price of giving faced by itemizers and nonitemizers under each proposal. As noted above, the average price of giving in 1983 was 0.74 for itemizers. Nonitemizers could deduct 25 percent of gifts up to $100, but the price of contributions above this level was 1.0. Since average contributions by nonitemizers would have exceeded $100 without the deduction even in the lowest income class, this limited deduction had very little effect at the margin. Thus the price for nonitemizers was set at 1.0.

Three proposals involve possible extensions of the basic charitable deduction. The most generous of these is a 150 percent multiple deduction. Because it would entail a significant drop in taxable incomes, it would require a 7 percent across-the-board increase in tax rates in order to raise revenue equal to the 1983 law. The estimated increase in giving, to $63.8 billion under the constant-elasticity assumption, indicates the strength of this price incentive, especially at upper incomes. A more likely multiple-deduction scheme would be one that extends the added incentive primarily to low- and middle-income taxpayers. The graduated multiple deduction shown in table 3.7, recommended by the Commission on Private Philanthropy and Public Needs, would allow a 200 percent deduction for those with incomes under $15,000 and a 150 percent deduction for those with incomes between $15,000 and $30,000. If applied in 1983 this deduction rule would cause an increase in contributions of $1.8 billion or $0.9 billion, depending on the elasticity assumption. Because the constant-elasticity model implies a larger price responsiveness for lower-income taxpayers, that model produces bigger changes for policies with their primary impact at lower levels. The third possible expansion of the deduction is its extension to nonitemizers, without limit, as provided in the 1981 tax act for 1986. This change reduces the average price of giving faced by nonitemizers from 1.0 to 0.86. The overall increase in giving is $5.7 billion or $3.4 billion, depending on the elasticity assumption used. In order to maintain the level of revenues, tax rates would have to be increased by about 1 percent under the graduated deduction and about 2 percent under the extension to nonitemizers.

Proposals to limit the charitable deduction range from the elimination of the special treatment of gifts of appreciated assets to the outright elimination of the deduction. The constructive realization of capital gains on donated assets would cause a small increase in the price of giving for itemizers (0.739 to 0.744) and a decline in total giving of less than $1 billion. Eliminating the deduction altogether would have a sizable impact on total giving, however. Under the constant-elasticity assumption, contributions would fall by $11.8 billion, from $45.1 to $33.3 billion. This 26 percent drop is the same percentage predicted by Feldstein and Taylor (1976) and

Table 3.7 Simulation Totals for 1983: Revenue, Price of Giving, Contributions

Tax Law or Proposal	Revenue Adjustment	Average Price of Giving[a]		Contributions (billions)	
		Itemizers	Nonitemizers	Constant Elasticities	Variable Elasticities
1983 law	—	0.74	1.00	$45.1	$45.2
Expansion of the charitable deduction					
150 percent multiple deduction	1.07	0.62	1.00	63.8	66.8
Graduated multiple deduction	1.01	0.69	1.00	46.9	46.1
Extension to nonitemizers	1.02	0.74	0.86	50.8	48.6
Limitation of the charitable deduction					
Constructive realization on gifts of appreciated assets	1.00	0.74	1.00	44.3	44.5
Elimination of deduction	0.97	1.00	1.00	33.3	36.1
Substitution of tax credit for deduction					
20 percent	1.00	0.81	0.86	43.3	42.2
30 percent	1.02	0.72	0.79	50.4	46.4
Flat-rate tax					
On taxable income (20.7%)[c]	—	0.80	1.00	39.8	40.7
On adjusted gross income plus excluded long-term gains (13.6%)[c]	—	1.00[b]	1.00	33.0	36.0

[a]Weighted by number of returns.

[b]There is no distinction between itemizers and nonitemizers under this proposal.

[c]Tax rates shown in parentheses are after revenue adjustment. Original tax rates were 19.5 and 11.8 percent for the last two simulations. Calculated revenue adjustment factors were 1.06 and 1.15.

Feldstein and Clotfelter (1976) using very similar models but disaggregated data. Using variable elasticities, however, the decrease is only $9.1 billion, or about 20 percent. While both declines are certainly large, the difference between these two simulations illustrates the importance of the underlying econometric model.

The results of substituting a general tax credit for the present deduction were simulated using tax-credit rates of 20 and 30 percent. Either change, of course, would reduce the price faced by nonitemizers paying some tax; unless the credit was refundable, the price for nontaxable returns would be one. The prices faced by an itemizer might increase or decrease, depending on his marginal tax rate. Under the 20 percent credit, contributions would fall about 4 percent to $43.3 billion using constant elasticities and 7 percent to $42.2 billion using variable elasticities. Giving under the 30 percent credit would rise, however, by 12 or 3 percent, depending on the model used. The relatively large difference between the two basic models for the tax credits illustrates the importance of the variation in assumed price responsiveness among income classes. The constant-elasticity model—based on an estimate from a sample heavily weighted with high-income taxpayers—implies considerable price responsiveness among low-income nonitemizers. The variable elasticity form, on the other hand, implies a much smaller price response at the lower end. The tax credit highlights this difference because of its effect on the price faced by low-income taxpayers.

The final two simulations shown are for more general tax changes, both in the direction of a "flat-rate" tax. The base for the first is taxable income as defined in 1983. Because this base excludes exemptions ($1000 each) and the zero-bracket amount, this tax would be progressive at lower income levels and nearly proportional at upper income levels. The second tax uses a much broader income base, adjusted gross income plus the excluded portion of long-term capital gains; it would be much closer to a truly proportional levy than the first variant. The flat-rate tax on taxable income would lower the price for those itemizers with marginal tax rates formerly below the new rate (about 21 percent) and would raise the price for taxpayers whose marginal tax rates were reduced.[29] The net effect in 1983 would be to raise the average price faced by itemizers from 0.74 to 0.80. Total contributions would fall to $39.8 billion, using the constant-elasticity assumption. The simulated effect on contributions would be much more extreme if gross income were the tax base, because contributions would lose their deductibility altogether. In this case, total contributions are projected to fall to $33.0 billion or $36.0 billion, depending on the parameter assumption.

29. The original rate multiplied by the adjustment rate was (.195) (1.06) = .207.

For each of the simulated totals for giving shown in table 3.7, there is an associated prediction error. Table 3.8 gives the 95 percent confidence intervals corresponding to predictions for three tax regimes. Where s_p^2 is the prediction error, defined in equation (6) and calculated using the variance-covariance matrix of the estimates underlying the simulations, the 95 percent confidence interval is 1.96 $\sqrt{s_p}$ above and below the point estimate calculated for each representative taxpayer. Since the equations were estimated in logarithmic form, the intervals are slightly asymmetric when converted to dollars. For example, the prediction interval corresponding to the estimate for the elimination of the deduction, based on constant elasticities, is $32.2 billion to $34.5 billion, implying a range about 7 percent the size of the point estimate. The interval corresponding to the variable-elasticity formulation is relatively larger—13 percent of the point estimate. Owing to the smaller changes in prices and incomes implied by the 20 percent tax credit and the graduated multiple deduction, the prediction intervals for these proposals tend to be smaller. Using the constant-elasticity form, the 95 percent confidence interval for the 20 percent tax credit is $41.9 to $44.6 billion, or 6 percent of the point estimate. The interval for the graduated multiple deduction is 4 percent of its point estimate. For comparison, the prediction intervals for the 1983 law are given also. These intervals are the smallest of all because of the similarity of the 1983 tax schedule to that of the base year, 1980.

Table 3.8 Prediction Intervals at 95 Percent Level for Selected Simulations

	Total Contributions (billions)			Interval as Percentage of Point Estimate
	Point Estimate	Lower Bound	Upper Bound	
Elimination of deduction				
Constant elasticities	33.3	32.2	34.5	6.9
Variable elasticities	36.1	33.9	38.6	13.0
20 percent tax credit				
Constant elasticities	43.3	41.9	44.6	6.2
Variable elasticities	42.2	39.9	44.6	11.1
Graduated multiple deduction				
Constant elasticities	46.9	45.9	47.9	4.3
Variable elasticities	46.1	44.7	47.5	6.1
1983 law				
Constant elasticities	45.1	44.2	46.0	4.0
Variable elasticities	45.2	44.1	46.4	5.1

Distributional Effects

The various proposals would influence contributions to different degrees throughout the distribution of income. In order to illustrate the potential variation in distributional impact, table 3.9 shows the changes in net income and giving by income class resulting from three proposals. The simulations shown assume constant income and price elasticities. The elimination of the deduction—with the accompanying overall rate reduction—would cause some redistribution of income away from high-income taxpayers. The contributions of all itemizers who pay tax would fall, with those in higher tax brackets having the largest reductions. So great is the implied increase in price at the upper end that contributions for taxpayers making more than about $60,000 would fall by over 50 percent in the long run. There is a similar, but less dramatic, redistribution in giving projected under a flat-rate tax on taxable income. Although this tax would substantially redistribute income from lower- to upper-income taxpayers, the price increases at the top would more than offset these income gains, resulting in decreases of over 35 percent in contributions for taxpayers in the top four brackets. These results, of course, are dependent upon the specific values used for price and income elasticities. A sufficiently large income effect combined with a smaller price effect could imply increases, rather than decreases, in contributions at the highest income levels.

The third policy simulated in table 3.9 is a graduated multiple deduction, allowing itemizers with incomes below $15,000 to deduct twice the amount of their contributions and those with incomes between $15,000 and $30,000 to deduct 150 percent. Of course there is little effect on taxpayers above $30,000, except for the small impact of the increased tax rates made necessary by the change. Increases in contributions for taxpayers making between $6000 and $30,000 are quite large, however. These simulations show that the distributional impact of tax policies may vary markedly. Because donors at different income levels differ in their giving patterns, such distributional effects are central in assessing the effect of tax changes on charitable support for different kinds of organizations within the nonprofit sector.

3.4.4 Contributions by Type of Donee

It is possible to combine the aggregate and distributional impact of tax changes to estimate the effect on contributions by type of organization. As discussed above, the patterns of giving to various types of organizations vary significantly by income level. In order to reflect such giving patterns, the percentage distribution of gifts observed in the National Study of Philanthropy, in real terms, was applied to the various simulated outcomes for 1983. Table 3.10 gives the estimated percentage change in total contributions to each donee group based on this distribution. Provisions

Table 3.9 **Distributional Effects of Tax Changes: Illustrations for Three Tax Proposals (percentage change compared to 1983 law)**

Income (thousands)	Elimination of Deduction		Flat Rate on Taxable Income		Graduated Multiple Deduction	
	Income	Giving	Income	Giving	Income	Giving
$0 under 6.1	0	0	0	0	0	0
$6.1 under 12.2	+0.2	−3.0	−3.8	−0.5	0	+3.0
$12.2 under 18.3	+0.2	−9.2	−3.8	−0.2	+0.2	+13.4
$18.3 under 24.3	+0.2	−13.0	−3.2	−2.1	+0.1	+7.9
$24.3 under 30.4	+0.1	−17.5	−2.7	−2.7	+0.2	+14.3
$30.4 under 36.5	0	−24.3	−1.6	−9.0	−0.1	−0.1
$36.5 under 60.9	−0.1	−33.6	+0.2	−14.3	−0.1	−0.1
$60.9 under 121.7	−0.2	−51.0	+5.7	−31.8	−0.1	−0.1
$121.7 under 243.4	−0.1	−59.5	+13.1	−38.0	−0.2	−0.2
$243.4 under 608.5	−0.3	−62.8	+17.7	−38.2	−0.2	−0.3
$608.5 under 1217	−1.0	−64.5	+19.7	−38.3	−0.2	−0.3
$1217 or more	−1.5	−65.4	+20.9	−38.2	−0.2	−0.3
TOTAL	0	−26.1	0	−11.8	0	+3.9

Note: Simulations use constant-price elasticity of −1.27 and income elasticity of 0.78.

Table 3.10 **Simulated Long-Run Changes in Giving by Type of Organization, as Percentage of 1983 Levels**

Percentage Difference from 1983 Law	Total	Religious	Educational: Higher	Educational: Other	Combined Appeals	Medical	Cultural	Other
150 percent deduction	+42	+23	+154	+117	+71	+73	+169	+74
Graduated multiple deduction	+4	+5	+1	0	+2	+3	0	+2
Extension to nonitemizers	+13	+14	+8	+8	+11	+11	+7	+11
Constructive realization on gifts of appreciated assets	−2	−1	−7	−6	−3	−3	−8	−3
Elimination of deduction	−26	−21	−50	−52	−36	−34	−58	−37
20 percent tax credit	−4	+2	−35	−37	−16	−14	−44	−18
30 percent tax credit	+12	+19	−24	−25	−1	0	−34	−4
Flat tax on taxable income	−12	−8	−30	−31	−19	−18	−36	−19
Flat tax on adjusted gross income plus excluded long-term gains	−27	−23	−46	−47	−34	−33	−51	−35

Note: Simulations use constant-price elasticity of −1.27 and income elasticity of 0.78.

that affect giving at lower incomes tend to have their major effect on support for religious groups; provisions with large impacts on giving by those at upper incomes show up primarily in support for educational and cultural institutions. For example, the graduated multiple deduction—shown in table 3.9 to produce large increases in giving at incomes below $30,000—increases religious giving by 5 percent, more than the change in any other category. In contrast, eliminating the deduction has its major impact at the top of the income scale. Consequently, giving to higher education is predicted to fall by 50 percent in the long run. These estimates show that the distributional character of tax changes are important, although aggregate effects on giving predominate. A rising tide of giving would tend to lift all boats, though by different amounts.

Needless to say, the assumptions concerning the distributional patterns of giving lie at the heart of such simulations. It is useful, therefore, to compare these results with a similar set using an alternative distribution—that based on the tabulation of contributions made on 1962 tax returns. As shown in table 3.2, these distributions are based on different methods and types of data and yield somewhat different conclusions. Table 3.11 summarizes their implications for the distribution of gifts in 1983 as well as the effects of three tax changes. The allocation of the $45 billion total of giving for 1983 based on the National Study of Philanthropy data shows quite a high estimate of religious giving, but its estimates for giving to educational institutions are much more in line with other estimates of receipts by nonprofit organizations. Considering the separate origins and dates of the two distributions, these distributions are remarkably comparable.[30] In any case, the percentage changes for comparable categories for the two distributions are quite close, which suggests that the general thrust of results like those in table 3.10 will tend to hold up under different specific distributional assumptions.

3.5 Simulations of Changes in Giving over Time

One useful application of the simulation techniques discussed in this chapter is to assess the effects on giving of inflation and tax changes over time. Any change that affects marginal tax rates, real net income, or the number of taxpayers who itemize their deductions will tend to affect giving behavior. Thus, contributions may be influenced by legislated revisions in the tax schedule or by inflationary bracket creep. In fact, the ef-

30. The estimates of religious giving differ by $5.7 billion. The lower estimate of $28.4 billion is close to the *Giving U.S.A.* estimate of religious giving for the previous year ($28.1 billion) and probably would be nearer the 1983 figure. The education figure based on the 1962 distribution ($1.6 billion) may be compared to the estimate of giving by individuals to higher education in 1981–82 ($2.3 billion). The latter includes a good portion of bequests, but does not include other education (*Giving U.S.A.* 1983, pp. 38, 54).

Table 3.11 **Estimates of Giving Implied by Two Distributions of Giving by Type of Organization**

	Level of Contributions, 1983 ($billions)	Percentage Change in Contributions from 1983 due to:		
		Extension of Deduction to Nonitemizers	20 Percent Tax Credit	Flat tax on Taxable Income
	Distribution Based on National Study of Philanthropy			
Religious	$32.89	+14	+2	−8
Educational				
Higher	1.98	+8	−35	−30
Other	0.66	+8	−37	−31
Combined appeals	2.56	+11	−16	−19
Medical	2.52	+11	−14	−18
Cultural	0.60	+7	−44	−36
Other	3.69	+11	−18	−19
TOTAL	45.09	+12	−4	−12
	Distribution Based on Tabulation of 1962 Tax Returns			
Religious	27.89	+13	+1	−9
Other charitable	6.47	+13	−6	−13
Educational	1.57	+9	−30	−27
Hospitals	0.64	+9	−30	−27
Other organizations	8.47	+12	−11	−16
TOTAL	45.09	+13	−4	−12

fects of such changes may be far more important than the potential impact of provisions specifically directed towards contributions. This section presents two applications of simulation techniques that highlight the effects of inflation and general tax changes. The first is a retrospective look at the period 1948 to 1980 focused on the effect of inflation and changes in the standard deduction on the proportion of taxpayers who itemize their deductions. The second uses the behavioral relationships discussed in this chapter with forecasts of inflation and income growth to predict future giving.

3.5.1 Inflation, the Standard Deduction, and Itemization, 1948-80

Since the first debates in Congress over its introduction in the 1940s, the standard deduction has been recognized as a potential threat to charitable contributions. Taxpayers who elect it receive no incremental tax reduction with increases in giving, making the net price of giving equal to one.[31] Concern over the effect of the standard deduction has reemerged in recent discussions of tax policy toward charitable giving. Spokesmen for the nonprofit sector have argued that the extensions of the standard deduction after 1970 and the conversion to a flat, zero-bracket amount in 1978 have significantly reduced the number of itemizers, thus discouraging charitable giving.[32] From 1970 to 1980 the maximum standard deduction for married couples was increased from \$1000 to \$3400, an increase of 74 percent after inflation. Over the same period the proportion of taxpayers who itemized fell from 48 to 31 percent.[33] What has been the effect of such changes on giving?

In order to assess the importance of changes in the standard deduction, actual rates of itemization and giving are compared to estimates of the corresponding rates that would have been observed had the standard deduction been indexed in real terms. Had the maximum standard deduction been indexed at its 1948 level (\$1888 in 1972 dollars), for example, the nominal maximum would have risen from \$1000 in 1948 to \$3372 in 1980. If the 1970 value (\$1093 in 1972 dollars) were the benchmark, however, the maximum-standard-deduction levels would be only 58 percent as large. These two values are used to produce two alternative simulations. For each alternative, the proportion of taxpayers who would have itemized was estimated using the logistical function given in equation (16), with an elasticity of 1.24. Since there is no change in the price and net-in-

31. This is of course true for those who owe no tax. Thus changes in exemption levels will affect contributions to the extent that the prices and tax liabilities of taxpayers are changed.

32. See, for example, the statement of Senator Daniel P. Moynihan, a cosponsor of a bill to extend the charitable deduction to nonitemizers. In part he stated: "The problem, of course, is that as fewer and fewer taxpayers 'itemize,' the purpose of the charitable deduction is steadily eroded and its incentive effect attenuated" (U.S. Congress, Senate 1980, p. 21).

33. See table 2.6.

come values facing itemizers and nonitemizers in a given income and family-status category, simulated changes in giving arise only from the proportion of itemizers.[34]

Table 3.12 presents the actual and simulated values for the percentage of itemizers and total giving for even years between 1948 and 1980.[35] The simulations based on the indexed 1948 value show that this large standard deduction would have reduced the number of itemizers in comparison with actual levels in most years. For example, only an estimated 37 percent of taxpayers would have itemized in 1970 had the 1948 standard deduction been maintained in real terms. As a result, contributions in most years would have been smaller than they were in fact. For the low 1970 standard deduction, the reverse is true. Had the 1970 real value been in effect, more taxpayers would have itemized and contributions would have been higher.

These calculations show two clear effects: contributions were stimulated by the erosion in the real value of the maximum standard deduction between 1948 and 1970 and contributions were discouraged by the large increases in the maximum after 1970. The year 1970 marked an historic low point in the value of the maximum standard deduction. If 1970 is used as the point of reference, the tax structure in 1980 appears to be relatively unfavorable toward charitable giving, as suggested by spokesmen for the nonprofit sector. If 1948 is used as the benchmark, however, it can be seen that the maximum standard deduction is virtually unchanged in real terms.

3.5.2 Inflation and the Impact of the 1981 Tax Act

In this section the basic behavioral model is used to make projections of giving. The model described here projects values of giving to 1986 based on 1980 basic data, projections of economic variables, and legislated changes in the income tax. This kind of model is probably the most perilous kind of simulation exercise because it produces values of future giving

34. Average contributions by year and income class for itemizers were obtained from reported tax deductions in the *Statistics of Income.* Average contributions by nonitemizers are based on means by income class taken from the National Study of Philanthropy, adjusted for price changes. While itemizers and nonitemizers are by no means homogenous groups, this simulation method recognizes no difference among these in every group. Lags in adjustment, for example, are not taken into account, and this is a drawback where changes in itemization status are particularly rapid.

The appropriate income class was determined by converting average income for the class into 1973 dollars. The average giving obtained in the 1973 survey for the coresponding class was then reconverted into the appropriate year's prices. The 1973 values of average giving for nonitemizers are a smoothed series based on Morgan, Dye, and Hybels (1977, p. 193, table 24). See Clotfelter and Salamon 1982, p. 186, table 3.

35. By way of comparison, the estimates of actual total giving tend to be somewhat higher than estimates of the trade publication *Giving U.S.A.* before 1974 and then slightly lower after that. The estimate of $39.1 billion for total giving in 1980 differs from the figure of $39.9 billion in that publication by about 2 percent (1983, p. 36).

Table 3.12 Individual Contributions and Itemization: Actual Levels and Simulations for Indexed Maximum Standard Deductions

				Simulated Levels Assuming Real Maximum Standard Deduction Fixed at:					
		Estimates of Actual Levels		1948 Level			1970 Level		
Year	Maximum Standard Deduction in 1972 Dollars	Percentage Itemizers	Total Giving	Percentage Itemizers	Total Giving	Percentage Difference from Actual	Percentage Itemizers	Total Giving	Percentage Difference from Actual
1948	1888	16.4	4.0	16.4	4.0	0	26.8	4.6	+ 14
1950	1867	18.8	4.5	18.6	4.5	0	29.8	5.1	+ 14
1952	1726	22.1	5.6	20.4	5.5	− 2	32.0	6.3	+ 12
1954	1679	27.1	6.3	24.6	6.1	− 3	37.1	7.0	+ 11
1956	1593	31.4	7.5	27.6	7.2	− 4	40.5	8.1	+ 9
1958	1514	35.5	8.3	30.3	7.9	− 4	43.4	8.9	+ 6
1960	1455	39.7	9.3	33.6	8.8	− 5	46.7	9.8	+ 5
1962	1416	42.5	10.1	35.7	9.6	− 5	48.7	10.5	+ 1
1964	1374	41.4	11.2	34.2	10.6	− 5	46.7	11.6	+ 4
1966	1303	40.9	12.5	32.8	11.8	− 5	44.9	12.8	+ 2
1968	1212	43.7	14.9	34.2	14.2	− 5	45.9	15.1	+ 1
1970	1093	48.0	16.4	36.9	15.4	− 6	48.0	16.4	0
1972	2000	35.0	19.0	36.1	19.1	+ 1	47.0	20.4	+ 7
1974	1738	35.7	21.8	34.1	21.7	− 1	44.6	22.9	+ 5
1976	2115	30.8	32.8	25.7	25.7	+ 1	42.7	27.5	+ 8
1978	2260	28.7	30.7	31.4	31.3	+ 2	40.4	33.2	+ 8
1980	1897	31.0	39.1	31.2	39.1	0	40.3	41.2	+ 5

simply on the basis of anticipated statutory and economic variables. No basic changes in behavior—by donors or charitable organizations—is reflected. The results therefore must be viewed as a conditional prediction—an estimate of the likely outcome of tax and economic changes, holding other things constant.

Two steps are involved in this calculation. First, basic data on income and number of taxpayers by tax status are "aged" using economic projections to yield likely levels for each succeeding year. For example, gross income is assumed to grow at the rate projected for per capita GNP. Based on these quantities and the actual or hypothetical tax schedules applying to each year, taxes and marginal tax rates can be calculated. If the price level rises at a faster rate than the growth in tax bracket limits, "bracket creep" will tend to raise marginal tax rates for taxpayers at a given real income. In addition, changes in the percentage of taxpayers itemizing their deductions are projected using the model summarized in (16) above. Based on marginal tax rates and projections of itemization status, the price of giving is calculated. The second basic step in the simulation is to estimate giving using a behavioral model embodying changes in net income and price. The model used is based on the assumption of incomplete adjustment and takes the form of equation (20), where the coefficient of adjustment is 0.37. Desired long-run giving takes the constant-elasticity form summarized in equation (21), where the price elasticity is -1.27 and the income elasticity is 0.78.

The basic data used for this projection model were tabulations for 1980 individual tax returns. Projections of inflation and income growth were taken from the 1984 federal budget. These assumptions are summarized in the first two columns of table 3.13.[36] Taxes and giving were calculated separately for twelve income classes, joint and nonjoint returns, and for itemizers and nonitemizers, resulting in forty-eight separate calculations for each year. The model's simulations reflect four major tax changes: the institution of a 50 percent top marginal tax rate in 1982, a 23 percent proportional reduction in other tax rates over three years, a phased-in charitable deduction for nonitemizers becoming a full deduction in 1986, and a general indexation of tax brackets beginning in 1985. Because the model

36. Gross national product projections were: 2938 (1981), 3058 (1982), 3262 (1983), 3566 (1984), 3890 (1985), and 4232 (1986). GNP deflator projections were: 195.5 (1981), 207.2 (1982), 218.1 (1983), 229.4 (1984), 240.6 (1985), and 251.7 (1986) (U.S. Office of Management and Budget 1983, pp. 2-9, 2-10). Over the period 1980 to 1986 these projections imply an average exponential growth rate of 7.9 percent for national income and 5.7 for prices. Where p_1 and p_t are price levels in period 1 and t, the exponential rate is r in the expression $p_t = p_0 \exp(rt)$.

An exponential rate of 0.01064 was calculated for population growth from estimates of U.S. population in 1978 and 1981 of 222.585 and 229.805 million, respectively (U.S. Bureau of the Census 1982, p. 2). Taken together, these economic assumptions imply growth in real per capita income of about 1 percent a year.

Table 3.13 **Simulations of Individual Giving, 1981–86**

Year	Assumed Increase from 1980 in		Percentage Itemizing	Total Contributions (billions)		Percentage Given by	
	Income	Prices		Current Dollars	1980 Dollars	Itemizers	Taxpayers with Incomes over $50,000 in 1980
1980	—	—	31.0	38.7	38.7	66.8	23.8
1981	11.6	9.4	32.6	42.9	39.2	67.9	22.6
1982	16.1	16.0	33.1	44.9	38.7	67.6	21.4
1983	23.9	22.1	34.0	47.2	38.6	67.9	20.3
1984	35.4	28.4	35.3	50.5	39.3	68.2	19.4
1985	47.7	34.7	35.7	54.6	40.6	67.4	18.6
1986	60.7	40.9	36.2	60.5	42.9	65.5	17.9

was designed to project actual levels of giving, no adjustment in revenues or tax rates were made as in the model described in section 3.4. The price of giving is a weighted average of the prices applying to gifts of cash and of appreciated assets, as given in equation (28). As in the previous models presented in this chapter, contributions by nonitemizers were based on data from the National Study of Philanthropy.

Table 3.13 summarizes the basic simulation results as well as the economic assumptions underlying them. The model implies that the percentage of taxpayers who itemize their deductions will rise from 31 percent in 1980 to over 35 percent in 1984, most of this being due to the erosion in the real value of the zero-bracket amount during this period. After 1984 this proportion continues to climb slightly due to growth in real per capita income. In order to reflect the effects of tax changes on the distribution of giving, the last column shows the percentage of gifts made by taxpayers with incomes over $50,000 in 1980—roughly the most affluent 3.4 percent of taxpayers.[37] In the estimates of giving for 1982 and 1983 the effect of the reduction in top marginal tax rates is evident. Total giving drops slightly in real terms, to about $39 billion in both years, and the proportion of gifts made by the top income group falls from 23 to 20 percent over two years.[38] Although the reduction in top rates became effective in 1982, the model's incomplete-adjustment mechanism tends to spread out the effect over several years. For the income groups below the top marginal tax rates, the legislated tax reductions are offset to varying degrees by inflation-induced bracket creep.[39] Beginning in 1984 contributions are projected to increase in real terms, corresponding to the expansion of the charitable deduction for nonitemizers. By 1986, when the full deduction is scheduled to become effective, total giving is projected to rise to $60.5 billion, some 11 percent above the 1983 level in real terms.[40]

In concluding, it is useful to compare these simulations with the most recent data on charitable contributions. Before doing so, though, the uncertain nature of estimates such as these bears reemphasizing. Not only are the estimates subject to the kind of statistical errors described in section 3.3, they are also vulnerable to errors in the projection of basic economic variables that underlie them. It is possible to make a partial assessment of the accuracy of these simulations by examining recent tax return data that became available after the simulations were carried out. According to official data for 1981 and preliminary data for 1982, contributions by itemizers increased from $25.8 billion in 1980 to $26.4 billion and $33.8

37. This group comprises the top six income brackets.

38. By comparison, the estimates of total individual contributions in *Giving U.S.A.* are $44.6 and $48.7 billion in 1981 and 1982, respectively (1983, p. 36).

39. See Clotfelter 1984 for a discussion of inflation, tax cuts, and marginal tax rates.

40. A deduction for 25 percent of the first $100 of contributions was allowed for nonitemizers in 1982 and 1983, but this has little effect at the margin since average giving for nonitemizers in every income class exceeded $100.

billion in 1981 and 1982, respectively (U.S. Internal Revenue Service, *Statistics of Income—1981, Individual Income Tax Returns* 1983 p. 54, table 2.1; Epstein 1983-84, p. 19). In comparison, the simulated totals for itemized giving in 1981 and 1982 were $29.2 billion and $30.3 billion, amounts that erred by about 10 percent in opposite directions. Analysis of the difference for 1982 shows that actual income growth was stronger than projected, and the simulated proportion and number of itemizers were about 7 percent lower than actual levels. The projections for contributions in 1982 thus understate the contributions by itemizers and overstate the contributions by nonitemizers, resulting in a probable understatement of the total. As for the pattern of giving by income class, the simulation model appears to have anticipated the effect of the 1981 tax cut quite well. Table 3.14 shows the change in average giving by income level between 1981 and 1982. In contrast to the modest increases in contributions at incomes below $50,000, the average giving rates above the $200,000 income level decreased sharply, revealing the impact of reducing the top tax rate from 70 to 50 percent. While some of this drop in high-income giving may be due to transitory price effects—with taxpayers making some gifts early in order to take advantage of the higher deduction rate—the econometric evidence on charitable giving suggests that the change in tax schedule will have a lasting effect on giving behavior.

Beyond the question of accuracy in projecting total contributions, therefore, simulation models such as that used here are useful in identifying major trends in future giving. The current simulation model suggests that individual contributions will likely increase in real terms between 1980 and 1986, due largely to an expansion in the number of itemizers and

Table 3.14 Average Contributions by Itemizers, 1981 and 1982

Income	Average Contributions 1981	1982	Percentage Change
Under $5,000	192	192	0
$5,000 under 10,000	490	516	+ 5
$10,000 under 15,000	574	583	+ 2
$15,000 under 20,000	595	617	+ 4
$20,000 under 25,000	613	646	+ 5
$25,000 under 30,000	643	685	+ 7
$30,000 under 50,000	885	918	+ 4
$50,000 under 100,000	1,709	1,689	− 1
$100,000 under 200,000	4,716	4,533	− 4
$200,000 under 500,000	14,483	12,099	−16
$500,000 under 1,000,000	50,125	33,834	−33
$1,000,000 or more	204,499	146,530	−28

Source: U. S. Internal Revenue Service, *Statistics of Income—1981, Individual Income Tax Returns,* 1983, pp. 53-54, table 2.1; Epstein 1984, p. 19, table 1.

the planned introduction of the charitable deduction for nonitemizers. Due to the latter provision as well as to the nature of the tax rate reductions, however, the distribution of giving will be altered with those in upper income classes giving a smaller share of the total. Based on past patterns of contributions by type of charity, these changes suggest that gifts to religious institutions and health and welfare agencies will rise relative to gifts to cultural and educational institutions.

3.6 Conclusion

This chapter discusses the application of econometric estimates of charitable giving in simulating the effects of alternative tax provisions. Models have been presented that simulate the effects of hypothetical tax provisions in a given year, the effects of past taxes on past giving, and the effects of legislated changes on future giving. A basic point made in the chapter is that contributions may be influenced either by tax provisions explicitly designed to affect giving or by general characteristics of the tax structure. The models discussed here focus on changes in the tax-defined price and net income of donors. By no means does this imply that taxes are the only or the most important influence on charitable giving, merely that they have some effect. The econometric studies discussed in chapter 2 yield the clear implication that taxes do in fact have a significant effect.

Two kinds of effects can be distinguished in the simulation results presented here. First, tax provisions may affect the level of total giving. For example, eliminating the charitable deduction would cause total giving to fall by about one quarter, assuming tax rates were adjusted to keep revenues constant and donors had sufficient time to adjust to their new levels of giving. A similar effect on total giving is the $1 billion increase in 1983 due to the limited charitable deduction for nonitemizers. A second and equally important effect of these tax provisions is on the distribution of contributions by the income class of donors and by the types of organizations supported. Although a 20 percent tax credit would have a limited impact on total giving, the simulations suggest that contributions to some types of organizations would fall by more than a third. Another case in point is the 1981 tax act. By cutting marginal tax rates of the taxpayers in the highest brackets and extending a deduction to nonitemizers, the law is projected to bring about a marked decrease in the share of contributions made by upper-income taxpayers.