Charitable Bequests and Estate Taxes

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ABSTRACT

This paper examines the effects of the estate tax on charitable bequests using estate tax records for decedents in 1986 filed during the years 1986 through 1988. It focuses on the pattern of aggregate charitable bequests, bequests to six categories of charitable organizations, as well as the effect of the estate tax deduction on the number of categories of charitable bequests. The findings suggest that higher tax rates induce more giving and increase the number of categories of bequests. The results also indicate that the pattern of bequests is influenced by the terminal wealth and its composition, and by marital status, age, and gender.

I. Introduction

CHARITABLE bequests are an important source of philanthropic support. About 700 of the estates of decedents in 1986 alone, for instance, contributed over $175 million to the arts and humanities, or over one-half the combined budgets of the National Endowment for the Arts (NEA) and the National Endowment for the Humanities.[1] Despite their importance, relatively little attention has focused on the pattern and determinants of charitable bequests and the role of the estate tax.

The estate tax provides a deduction for charitable bequests. While there is some consensus regarding the effects of the personal income tax on charitable contributions[2], the evidence on the effects of the estate tax on charitable bequests is scant and mixed. There are three major questions that need to be addressed. First, what is the impact of the estate tax on the level of giving? Given that the Federal government provides a tax subsidy of over $1.5 billion in the form of an estate tax deduction for charitable bequests,[3] it is important to evaluate whether the deduction induces additional giving. Second, how does the tax affect the pattern of giving to different types of charitable organizations? Finally, how does the tax system affect the number of categories of charitable bequests? This last question is particularly important in light of the striking empirical fact documented below that most bequests involve at most one or two types of organizations.

In this paper I analyze recent patterns of charitable bequests with an emphasis on its determinants and the observed incompleteness in giving. I focus on the estates of decedents in 1986 while the most recent studies focused on decedents in 1976 (Clotfelter 1985, p. 241) and Connecticut decedents in the 1930s and 1940s (Barthold and Plotnick 1984). Furthermore, I study the pattern of six categories of bequests. These include bequests to (1) the arts and humanities, (2) religious, (3) education, medical, and scientific research, (4) social welfare, (5) foundations, and (6) other types of donees. I also evaluate the effects of the estate tax on the number of categories of bequests.

The results support the view that the estate tax deduction stimulates charitable bequests. All categories of charitable bequests are found to be responsive to the estate tax. However, the results suggest that bequests to the arts and humanities, social welfare, and foundations are the least price responsive. Furthermore, the estate tax deduction also reduces the incompleteness in bequests in that the number of donees rises as the tax price declines. In addition, the results also show that bequests rise with wealth and age, and that women bequeath more than men.

II. Estate Tax and Other Determinants of Bequests

In a model of lifetime utility maximization, an individual's utility, with appropriate discounting, is determined by his

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own lifetime consumption (C_L), the consumption or endowment of relatives and heirs (C_H) which is determined by gifts (G) and inheritances (B) from parents, and the own-endowment of such relatives (W_H)[4], charitable contributions (CC), and charitable bequests (CB).[5]

The parent's lifetime preferences can be presented by the following utility function:

$$U(C_L, C_H, CC, CB). \quad (1)$$

The individual faces a budget constraint which requires that the sum of consumption, gifts (G) and bequests to relatives (B), and charitable contributions and bequests not exceed the individual's lifetime wealth (W), or

$$P_L C_L + P_G G + P_B B + P_{CC} CC + P_{CB} CB \leq W. \quad (2)$$

The individual selects the amounts of consumption and transfers to relatives and charity by maximizing (1) subject to (2) and the heirs' budget constraint:

$$C_H \leq W_H + G + B. \quad (3)$$

Solving for the first-order conditions and invoking the implicit-function theorem yields the following equation for charitable bequests:[6]

$$CB = CB(P_L, P_G, P_B, P_{CC}, P_{CB}, W, W_H). \quad (4)$$

Given income tax rate t and estate and gift (unified transfer) tax rate e, and after setting the price of consumption to 1, the price variables are:

$$P_L = 1$$

$$P_G = 1 + e$$

$$P_B = (1 + \pi)[(1 - e)(1 + i)]^{-1}$$

$$P_{CC} = 1 - t$$

$$P_{CB} = (1 + \pi)(1 + i)^{-1}$$

where π is the inflation rate defined as $(1 + p)^L - 1$, i is the interest rate also defined as $(1 + r)^L - 1$, with p and r being the annual inflation and discount rates respectively, and L is life expectancy. Note that the above formulation and prices are similar to those in Boskin (1976) except for the price of lifetime gifts (P_G).[7]

In principle it would be desirable to estimate (4) with all the appropriate right-hand-side variables. However, our data do not capture all of the explanatory variables. Consequently, the demand function (4) for charitable bequests would have to be reduced to the form

$$CB = f(P_{CB}, W) \quad (5)$$

where P_{CB} is the price of charitable bequests defined as 1 − e with the price of gifts at death (P_B) normalized at 1, and W is "bequeathable" wealth held at death. The implications of (5) are somewhat different from those of (4) since the focus is on how one allocates terminal and not lifetime wealth between bequests to family and charitable bequests.

Four previous econometric studies have attempted to estimate (5) and gauge the effect of the estate tax. McNees (1973), using the Internal Revenue Service 1957–59 estate tax file for decedents with gross estate over $60,000, found taxes to be a significant factor determinant of bequests. McNees used ordinary least squares in evaluating the determinants of bequests and the tax rate (not price) was used as a right-hand-side variable. Furthermore, all returns showing no bequests were dropped from the sample used to estimate the parameters.

Using the same data as in McNees, Boskin (1976) estimated Tobit regressions of contributions. Using a linear functional form, Boskin found an elasticity of giving with respect to the tax price of −1.2, calculated at the mean. Boskin also studied the pattern of giving using 1969 estate tax data and reported a price elasticity of −2.0. When Boskin distinguished bequests by type of donee on the 1957–1959 file, the price elasticity ranged from −0.7 to −2.0 for bequests to religious, education-scientific, and health and social welfare organizations, and −1.8 to −5.2 for other categories. The wealth

elasticity ranged from 0.2 to 0.7 depending on the type of donee. Wealth was defined as the adjusted disposable estate.

Using a pooled sample of grouped data available by estate class for the period 1948 to 1963, Feldstein (1977) reported great variance in the estimated elasticities, which ranged from −4.0 to −0.1. Wealth was measured in terms of gross estate before debts and other offsets. Recently, Barthold and Plotnick (1984) analyzed Connecticut probate records for decedents during the 1930s and 1940s. They estimated Tobit regressions in logarithmic specification. Their findings challenged the conventional view in that they found the estate tax price to have no significant effect on charitable bequests. Gross estate or total assets were used as a measure of wealth and the tax rate reflected both federal and state tax laws.

In the latest study, Clotfelter (1985, p. 241) used 1976 estate tax return data for decedents with gross estates over $60,000 but limited to net estates over $5,000. Using logarithmic specification, he reported an elasticity with respect to the tax rate of −2.79 and −1.67, and with respect to the size of wealth of 0.18 and 0.42, depending on the definition of wealth. The results also show that charitable bequests rise with the age of the decedent and that they are greatest for the never-married single, followed by separated and divorced, and widowed, respectively. Clotfelter also studied the determinants of giving using different population strata and specifications.

This paper complements the existing literature and overcomes some of its limitations in several ways. First, it uses recent data on bequest patterns (1986), which are more relevant to tax policy. Second, and for the first time ever, the paper employs combined data from estate tax returns (Form 706) and returns filed by life insurance companies (Form 712) for decedents, which provide broader measures of bequeathable wealth. This is especially true when compared to wealth from probate records, which may understate wealth reported on tax returns by over 25 percent (mainly Schedule G and Form 712 information). Third, the data employed provide greater detail on categories of bequests and allow for the study of the tax effects on the level of giving to individual categories and the number of categories as well.

III. Data Sources and Construction of Variables

A. Data

This paper uses data on decedents in 1986 provided by the Statistics of Income Division of the Internal Revenue Service. The data for 1986 decedents are compiled by combining three random samples of estate tax returns (Form 706) filed during the years 1986 to 1988. The samples for each of the three years are stratified by size of estate, age, and whether the individual died in 1986.[8]

The data contain information on 12 categories of assets held at death and lifetime transfers, debts, funeral expenses, attorney fees and executor commissions, life insurance policy loans, and other estate administration expenses, among others. It also includes information on jointly-owned property, community property, and life insurance owned by others and excluded from the estate,[9] among others. All assets are reported, regardless of whether they were held directly, in trusts, or subject to a power of attorney. Demographic information is also available on the file. These include age, marital status, sex, state residency, date of death of spouse for widowed decedents, among others.

The individuals in this sample, after adjusting for inflation, are somewhat wealthier than those with gross estates over $60,000 studied in Boskin (1976) and Clotfelter (1985, p. 241), but comparable to those in Barthold and Plotnick (1984). Only estates with assets over $500,000 were required to file in 1986. Few returns below this threshold were filed. Since the Paperwork Reduction Act does not require complete reporting of information on such returns, they were dropped from the sample. Other returns dropped are those with unknown age or those age 30 or under (mostly minors). I also dropped

those with bequeathable wealth under $5,000, as well as those who bequeathed their entire estate to charity (about 50 estates). The resulting sample consists of 13,492 returns, or 218 less than the original sample of 13,710 returns.[10]

B. Tax Price

The price per dollar of charitable bequest is defined as one minus the marginal tax rate. The marginal tax rate is constructed as follows. For each estate, the tax liability is computed using 1986 tax law. First, the total estate tax liability is computed in the absence of charitable bequests. Second, $1,000 in charitable bequests are assumed for all estates, and the estate tax liability is recalculated. Next, the marginal rate is computed as the change in tax liability divided by 1000. This procedure, which is consistent with that followed in earlier papers (see McNees 1973, Boskin 1976, and Clotfelter 1985, p. 241) leads to an exogenous tax price variable. State and local taxes are ignored.[11]

The estate tax Code effective in 1986 is drastically different from provisions effective during the years studied by Clotfelter, Boskin, and McNees, as well as Barthold and Plotnick. First, the 1976 Act, effective for decedents dying after 1976, unified the estate and gift taxes. As a result, all lifetime gifts—directly or through trusts—are aggregated with taxable estate to determine a tentative estate tax. The tentative estate tax is computed using a unified tax rate schedule, and a credit is provided for any gift taxes on the lifetime transfers.

Second, the 1981 Act reduced the maximum tax rate from 70 percent to 55 percent. It raised the exemption level to $500,000 in 1986 ($600,000 in 1987 and thereafter) from $60,000 in 1976. Third, after 1976, certain real property used in a farm or other trade or business can be valued based on its actual use rather than the market value. The value of a farm based on its crop yield can be considerably lower than its market value based on development potential. The valuation difference, however, is limited to $750,000.

Fourth, the 1981 Act provided for a marital deduction equal to the spousal bequest—also referred to as the unlimited marital deduction. Under previous law, the deduction for such bequests was limited to the greater of one-half of the adjusted gross estate or $250,000. For such returns, spousal bequests were assumed to remain unaltered in computing the tax liability in the absence of charitable bequests. Implicitly, this treatment assumes that such transfers would be taxed at the spouse's death in any event (see Clotfelter 1985, p. 249). Fifth, the 1984 Act repealed the $100,000 exclusion for the value of interests under qualified and individual retirement (IRAs) plans.[12]

C. Categories of Bequests

In previous research, Boskin (1976) and Barthold and Plotnick (1984) studied the determinants of giving to four categories of beneficiaries. These included bequests to (1) religious, (2) education-scientific, (3) health and social welfare, and (4) other organizations. In this paper six categories of giving are studied: (1) arts and humanities, (2) religious, (3) education, medical, and scientific, (4) social welfare, (5) foundations, and (6) other categories of bequests. The breakdown into these categories provides greater insights into patterns of giving and also reduces aggregation bias.

In select instances, the sum of the bequests or the gross contributions may exceed the actual deduction. This situation arises when a non-profit organization assumes the estate tax liability of the decedent. When an individual bequeaths a fraction of his estate to charity with the stipulation that the non-profit organization assume the estate tax liability, the actual (net) charitable bequests (gross bequest less estate tax) will fall short of the gross bequest. As a result, and when appropriate, the six categories of bequests are scaled down in order to sum to the net contribution or actual deduction.

D. Wealth Measure

Wealth is defined as the adjusted disposable estate. In many ways, this is

identical to Clotfelter's (1985, p. 241) definition of net estate, defined as total assets less debts, estate expenses, and the tax liability in the absence of bequests. Two categories of lifetime transfers are recognized in defining wealth. The first includes transfers with certain retained interests or powers (revocable trusts and others). These transfers are treated as part of the decedent's estate, although such assets are not part of the "probate" estate.[13] The second category of transfers generally includes outright gifts such as irrevocable trusts or direct gifts and are not included in the decedent's estate. It should be noted that lifetime transfers can be essential to the computation of tax liability under the current unified transfer tax structure.[14] Our measure of wealth is also defined to include proceeds from life insurance policies not owned by the decedent and not included in the gross estate (reported on Form 712 by insurance companies). It is not unusual for a person to pay the premiums on policies owned by the spouse, children, or trusts formed to their benefit.

Table 1 provides a summary of selected statistics for all observations in the sample as well as those with charitable bequests. The average disposable wealth of decedents is about $1.9 million. About 31 percent are widowed and slightly over 50 percent are married. Almost 10 percent are age 90 or over, and those in their 80s, 70s, and 60s each make up 20 percent of the sample. The average charitable bequest is about $190,000. The average is greatest for foundations and lowest for social welfare organizations and the arts and humanities. The average number of categories of bequests is 0.341. Individuals in this sample face a first-dollar tax price of 0.75. The second column in Table 1 provides mean statistics conditional on giving. It shows that an individual with charitable bequests is on average wealthier, older, is female, and faces a lower tax price with a mean of 1.8 categories of bequests.

IV. Empirical Estimates of Bequests

Fewer than 20 percent of the individuals in the sample made bequests to charity. In the case of certain categories of bequests, fewer than two percent gave anything (arts and humanities). Hence, limited dependent variable methods are appropriate. Following standard practice, it is assumed that the observed bequest, Y, takes the form:

$$Y = \beta_i' x_i + u_i \quad | \text{ if } \beta_i' x_i + u_i > 0 \qquad (6)$$

$$= 0 \quad | \text{ if } \beta_i' x_i + u_i \leq 0 \qquad (6')$$

where x_i represents explanatory variables with β_i' coefficients, and u_i is a censored normally distributed error term. Given these assumptions, (6) can be estimated using the Tobit model. This is done for total bequests as well as bequests to six categories of donees.

The dependent variable is defined as the natural logarithm of bequests (plus 1). The right-hand-side variables x_i include the log of wealth, dichotomous variables for marital status, age, and gender, as well as the log of the tax price (1 minus the tax rate). While other variables such as the income of survivors (see Becker and Tomes 1979, p. 1156) and their relationship to the decedent, religious affiliation, education, and occupation among others, may significantly influence the amount of giving, the SOI data do not contain such variables for all filers.[15] Conceivably, age and marital status may act as proxy for the number of survivors, while additional variables used, such as the shares of life insurance and family businesses (non-corporate business and farms) in "bequeathable" wealth, along with the demographic variables, may capture the endowments or the dependence of the survivor on the decedent's lifetime income, especially in the case of the spouse.

Table 2 presents the estimates from Tobit regressions. It reports the regression coefficients and their respective t-tests as well as other relevant statistics at the bottom of each table. The following is a summary of the results:

Wealth: As measured by the disposable estate, wealth has positive effects on total bequests. Wealth also influences bequests to the arts and humanities, education-scientific organizations, social welfare or-

TABLE 1
SUMMARY STATISTICS FOR SAMPLE OF ESTATE TAX RETURNS

Item	Mean	Conditional Mean
Wealth	1905900	2582600
ln Wealth	14.018	14.220
Widow	0.305	0.514
Single	0.072	0.148
Separated	0.002	0.002
Divorced	0.051	0.045
Age over 90	0.095	0.217
Age 80 to 90	0.239	0.390
Age 70 to 80	0.207	0.221
Age 60 to 70	0.216	0.103
Sex (male)	0.639	0.486
Insurance Share of Wealth	0.094	0.027
Business Share of wealth	0.056	0.030
First-dollar Price	0.748	0.584
Last-dollar Price	0.767	0.680
ln First-dollar Price	-0.333	-0.559
ln Last-dollar Price	-0.307	-0.429
Bequests:		
Total	189910	1003200
Arts & Humanities	10876	57456
Religious	15127	79914
Research	45804	241970
Social Welfare	9316	49214
Foundations	76436	403790
Other	32347	170880
ln (Bequests):		
Total	2.078	10.975
Arts & Humanities	0.197	1.039
Religious	0.991	5.236
Research	1.101	5.817
Social Welfare	0.294	1.551
Foundations	0.317	1.676
Other	0.602	3.179
Number of Categories	0.341	1.800

ganizations, foundations, and other categories of giving. Interestingly, wealth does not significantly influence bequests to religious organizations but greatly influences giving to education-scientific organizations followed by foundations and other categories. The elasticity of bequests with respect to wealth is 0.23, toward the lower end of the 0.18 to 0.42 range reported in Clotfelter (1985, Table 6.9). It is lower than the 0.4 estimate in Barthold and Plotnick as well as Boskin's estimates of 0.52 to 1.1 using 1957–59 data and 0.4 using 1969 data.[16]

Marital Status: Consistent with previous findings, single decedents leave larger bequests to charity than their married counterparts. In the case of social welfare, divorced and separated decedents are also found to leave greater bequests to charity. The bequests of widowed decedents are about the same as those of married decedents. The expected bequests of single decedents exceed those of married decedents by a factor of 2.3. The expected bequests of separated and divorced decedents are about the same as those of married individuals, except for giving to other categories.[17] Generally, these results are consistent with those in Clotfelter (1985), partially consistent with those in Barthold and Plotnick (1984), and different from those in Boskin (1976).

Age: Again consistent with the existing

literature, charitable bequests rise with age. Those in their 90s gave 40 percent more than those in their 80s; those in their 80s gave 36 percent more than those in their 70s; and those in their 70s gave 76 percent more than those in their 60s.[18] These results are consistent with those in Clotfelter (1985). Boskin (1976) reported that those under the age of 65 contributed less to charity, while Barthold and Plotnick (1984) failed to find a significant relationship.

Sex: Women bequeath more to charity than men.[19] This is true for total bequests as well as bequests to individual categories. An exception is bequests to foundations, where sex is found to be insignificant. The expected total bequests of male decedents are about 17 percent below those of female decedents. This result is similar to that in Clotfelter (1985) but different from that in Barthold and Plotnick (1984). Boskin (1976, p. 39) found that sex was not an important determinant of bequest behavior.

Price: The coefficient on the price variable is negative and significant in all the regressions. The elasticity for total bequests is estimated at −3.00, slightly larger (in absolute value) than that of −2.79 in Clotfelter (1985). For the various categories of bequests, I find giving to the arts and humanities, social welfare, and foundations to be the least price sensitive.[20] Overall, these results confirm the earlier findings in McNees (1973), Boskin (1976), and Clotfelter (1985) on the tax-induced effects of bequests, and contradict the findings in Barthold and Plotnick (1984). The findings on foundations also contradict the conjecture of a high elasticity in Boskin (1976, p. 44)[21] The 1969 Act, of course, changed the tax treatment of foundations, which could explain some of the difference.

Other variables: The expected bequest declines with the life insurance and family business shares of wealth. Insurance policies are purchased to provide for the well-being of the surviving spouse and other heirs, and, as such, the greater the relative proceeds from life insurance policies the smaller is the charitable bequest. Similarly, individuals with family businesses and farms have a strong affinity to keep such entities within the family and, as a result, leave less to charity.

V. Bequest Incompleteness

Undoubtedly, the congressional intent for allowing a deduction for charitable bequests, coupled with the tax-exempt status of recipient organizations, is to promote giving to all such entities. Yet, our data show a lack of diversification in the categories of bequests. Of the 13,492 estates in our sample, 2,554 estates had bequests. Of these, 1,307 reported one category of beneficiary, 693 reported two categories, 365 reported three categories, 142 reported four categories, 41 reported five categories, and 6 reported six or more categories.

This section focuses on the observed incompleteness of giving (or lack of diversity in bequests). The data show that most bequests benefit at most one or two categories of charitable organizations. This is not only puzzling but has interesting implications given congressional intent. The central issue that needs to be addressed is whether the number of categories of bequests is responsive to the tax price and the deductibility of charitable bequests. Another issue, of course, is why there is so little diversification to begin with, and why altruism is limited to one or two types of charities.

The only study to come close to addressing this issue is Barthold and Plotnick (1984) based on probate data from the 1930s and 1940s for Connecticut decedents. They presented a model of "categorical choice" (pp. 231–233) and estimated multinomial logit equations for five groups giving to zero, one, two, three, or four categories of bequests. Barthold and Plotnick's results (Table 5) indicate that while the estate tax and size of estate may increase the odds of giving, the tax price and wealth are not significant determinants of the number of categories of bequests.

To address determinants of the number of categories of bequest and validate the

TABLE 2
TOBIT ESTIMATES OF CHARITABLE BEQUESTS
DEPENDENT VARIABLE = ln (1 + BEQUESTS)

	Total	Arts and Humanities	Religious	Ed., Med. Research	Social Welfare	Foundations	Other
Constant	-48.405 *	-122.292 *	-27.321 *	-59.646 *	-85.951 *	-157.842 *	-78.563 *
	12.557	8.893	5.129	10.318	7.596	11.848	9.773
ln Wealth	1.610 *	4.541 *	-0.412	1.735 *	1.972 *	6.296 *	2.259 *
	5.870	5.020	1.075	4.245	2.562	7.394	4.045
Widow	0.897	-0.567	0.739	0.894	1.317	0.603	1.930
	1.649	0.305	1.015	1.106	0.863	0.341	1.743
Single	8.507 *	12.395 *	6.804 *	8.789 *	11.103 *	11.778 *	9.004 *
	12.473	5.709	7.475	8.828	5.967	5.438	6.569
Divorced	0.809	0.343	0.054	0.125	4.279	5.323	4.118 *
	0.929	0.111	0.045	0.095	1.749	1.917	2.405
Age Over 90	11.246 *	8.387 *	12.873 *	10.158 *	16.339 *	13.778 *	12.362 *
	14.372	3.113	11.649	8.830	6.128	4.927	7.386
Age 80 to 90	8.703 *	6.832 *	10.617 *	7.564 *	14.227 *	11.634 *	10.177 *
	12.485	2.743	10.554	7.321	5.645	4.518	6.600
Age 70 to 80	6.511 *	3.407	8.059 *	5.325 *	10.885 *	7.107 *	6.671 *
	9.305	1.332	8.009	5.110	4.292	2.721	4.274
Age 60 to 70	2.460 *	1.310	3.035 *	1.342	5.997 *	2.280	3.261 *
	3.485	0.489	2.956	1.257	2.290	0.834	2.038
Sex	-1.292 *	-5.794 *	-1.301 *	-1.938 *	-2.324 *	-0.753	-1.629 *
	3.261	4.245	2.496	3.307	2.150	0.573	2.075
Insurance	-5.023 *	-14.197	-7.361 *	-4.354	-22.808 *	-5.626	-12.608 *
	2.998	1.611	2.766	1.763	2.347	0.825	2.677
Business	-4.349 *	-13.548 *	-4.827 *	-8.270 *	-6.428	-1.858	-6.490 *
	3.308	2.225	2.557	3.742	1.552	0.486	2.253
ln Price	-21.416 *	-27.143 *	-17.881 *	-23.009 *	-21.256 *	-30.933 *	-23.371 *
	20.791	6.467	12.560	14.420	6.516	8.002	10.235
Sigma	13.275 *	20.832 *	14.881 *	16.544 *	20.048 *	23.035 *	18.404 *
	59.194	17.806	42.345	42.123	21.903	20.929	31.125
Log-Likelihood	-13368	-1942	-8185	-8224	-2818	-2594	-5111
Z	-1.08	-2.46	-1.49	-1.49	-2.26	-2.30	-1.88
F(Z)	0.1401	0.0069	0.0681	0.0681	0.0119	0.0107	0.0301
Observations	13492	13492	13492	13492	13492	13492	13492
Number Positive	2554	267	1401	1383	401	364	781

* Significant at least at the 5% level. Absolute t-statistics are reported below coefficients.

Elasticities:							
Wealth	0.23	0.03	-0.03	0.12	0.02	0.07	0.07
Price	-3.00	-0.19	-1.22	-1.57	-0.25	-0.33	-0.70
Ratios:							
Widow	13.4%	-0.4%	5.2%	6.3%	1.6%	0.6%	6.0%
Single	229.3%	8.9%	58.9%	81.9%	14.1%	13.4%	31.1%
Divorced	12.0%	0.2%	0.4%	0.9%	5.2%	5.9%	13.2%
Age 90 over 80	42.8%	1.1%	16.6%	19.3%	2.5%	2.3%	6.8%
Age 80 over 70	35.9%	2.4%	19.0%	16.5%	4.1%	5.0%	11.1%
Age 70 over 60	76.4%	1.5%	40.8%	31.2%	6.0%	5.3%	10.8%
Sex	-16.6%	-3.9%	-8.5%	-12.4%	-2.7%	-0.8%	-4.8%

congressional intent, I estimate a multinomial logit model. Since seven outcomes are possible, the bivariate logit model, of course, is not appropriate. Table 3 provides results from multinomial logit regressions on the number of categories of giving. The number of donees ranges from one to six or more, with the coefficients for no bequests set to zero. The results show that the tax price variable is highly significant and has a negative sign consistent with the Tobit results earlier. Furthermore, the coefficient on the price increases in absolute value as one moves from column 1 to column 6 of Table 3. Apparently, the estate tax by inducing bequests also leads to an increase in the number of donees. Generally, and consistent with the Tobit results above, the number also rises with wealth and age as evident from the size and sign of their respective coefficients. Furthermore, women (up to four categories) as well as single (up to five categories) individuals seem to give to a larger number of donees.

A reasonable alternative to the multinomial logit model is to apply econometric methods associated with count data such as the Poisson model. Here, the dependent variables Y_1 through Y_7, with

TABLE 3
DETERMINANTS OF THE NUMBER OF CATEGORIES OF CHARITABLE BEQUESTS

	Multinomial Logit Model						
	Number of Categories						Poisson
	1	2	3	4	5	6	Model
Constant	-5.146 *	-7.410 *	-10.825 *	-13.536 *	-35.378	-29.505	-4.579 *
	7.349	7.723	8.972	6.770	0.006	0.006	13.731
ln Wealth	0.070	0.147 *	0.337 *	0.414 *	0.517 *	0.076	0.096 *
	1.374	2.095	3.876	2.797	2.070	0.104	3.948
Widow	-0.031	0.225	0.131	0.142	0.301	-1.112	0.077
	0.317	1.675	0.727	0.471	0.571	0.969	1.601
Single	0.890 *	1.329 *	1.301 *	1.943 *	2.301 *	0.806	0.815 *
	7.400	8.356	6.005	5.921	4.127	0.580	14.696
Divorced	-0.192	0.409 *	0.218	0.466	0.735	-17.589	0.143
	1.163	1.974	0.701	0.983	0.859	0.002	1.784
Age Over 90	1.517 *	1.835 *	2.540 *	2.321 *	20.192	17.896	1.478 *
	11.379	9.653	8.636	4.640	0.003	0.003	20.246
Age 80 to 90	1.130 *	1.617 *	1.877 *	2.224 *	19.991	17.026	1.294 *
	9.441	9.261	6.581	4.635	0.003	0.003	18.728
Age 70 to 80	1.017 *	1.063 *	1.574 *	1.179 *	19.489	17.257	1.004 *
	8.400	5.780	5.408	2.285	0.003	0.003	14.054
Age 60 to 70	0.444 *	0.488 *	0.372	0.831	18.178	-0.249	0.434 *
	3.419	2.454	1.088	1.524	0.003	0.000	5.499
Sex	-0.141 *	-0.147	-0.444 *	-0.898 *	-0.296	-1.130	-0.215 *
	2.024	1.611	3.552	4.403	0.840	1.153	6.475
ln Price	-2.913 *	-2.998 *	-2.803 *	-3.847 *	-5.179 *	-9.135	-2.482 *
	15.298	10.480	7.338	5.081	3.332	1.920	23.675
Log-Likelihood	-8203						-9066
Observations	13492						13492
Number Positive	1307	693	365	142	41	6	2554

* Significant at least at the 5% level. Absolute t-statistics are reported below coefficients.

values ranging from 0 through 6 types of donees, are assumed to have independent Poisson distributions with parameters λ_1 through λ_7. The probability of Y_i equal to some value j, is given in (7):

$$Prob(Y_i = j) = e^{-\lambda i} \cdot \lambda_i^j / j! \quad (7)$$

Further assuming that the lambda's are log-linearly dependent on x_i, the right-hand-side variables, then

$$ln\ \lambda_i = \beta_0 + \Sigma \beta_i x_i. \quad (8)$$

The results from this Poisson regression reported in Table 3 are qualitatively similar to those obtained from the multinomial logit. The number of categories of bequests rises with wealth and declines with price. The elasticity of the expected number of categories is 0.1 with respect to wealth and about −2.5 with respect to price. The expected number is also higher for single as well as female individuals, and rises with age. Similar results were obtained when censored Poisson and binomial regressions were estimated (not reported).

Both the multinomial logit and the poisson models provide evidence on the effects of the estate tax price on diversity in bequests. The coefficients in the logit model are significant except for the number of donees being equal to six or more (only 6 such cases exist). Similarly, the tax price coefficient from the Poisson model again suggests that the estate tax deduction reduces the degree of incompleteness in giving and leads to greater diversity in bequests.

VI. Conclusion

This paper examined the role of the estate tax in influencing the amount as well as the diversification of charitable bequests for wealthy individuals. It used estate tax data for decedents in 1986 with returns filed during the years 1986 through 1988. It studied the determinants of bequests in the aggregate as well as by type of donee. The paper also addressed the effects of the estate tax on the diversity of charitable bequests.

The results suggest that higher estate tax rates raise the size of charitable bequests of all categories. Furthermore, results from multinomial logit and Poisson models indicate the estate tax and the deductibility of bequests lead to a diversification in giving. These indicate that the tax price is a significant determinant of the number of categories of bequests.

ENDNOTES

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[1]See Johnson (1990, p. 56), Office of Management and Budget (1987, I-Z73-77) and U.S. Department of Commerce (1988, p. 225).

[2]See Clotfelter (1985, Table 2.12) and Fullerton (1990, p. 18–22) for a review of the literature.

[3]See Office of Management and Budget (1991, A-75).

[4]See Becker and Tomes (1976 and 1979). Also see Kotlikoff (1988, p. 53).

[5]His utility may also be determined by donations by others (R) as well government spending (G). See Kingma (1989) for a review of the literature on the crowding-out effect of government spending, the effect of donations by others, and the various models of giving. It should be noted that since a portion of government spending is in the form of matching grants, G may operate through the price of giving as well.

[6]Both W and W_H are held constant. Estate taxes, however, may affect the labor supply behavior of both parents and children.

[7]Since the gift tax is exclusive, the proper price should be 1 + e and not 1/(1 − e) as in Boskin. Consider a parent with e = 0.50 making a gift of $1.00 to his daughter. In this case the tax is $0.50 and is paid by the parent. The daughter receives $1.00 and Treasury receives $0.50. The total transfer is actually $1.50, but the tax is based on $1.00, in sharp contrast to the way tax liability is computed under the income and estate taxes. In this example, the price of a $1.00 gift is $1.50 and not $2.00 as it would be under Boskin's measure. Another potential adjustment may capture the differential in the income tax rates between parent and children subjected to income streams from gifted assets. See Bernheim (1987). A further adjustment may involve the tax treatment of capital gains, since step-up in basis is provided for bequeathed property but denied for liftetime transfers.

[8]See Johnson (1990) for further detail.

[9]Life insurance proceeds excluded from estate are obtained from Form 712 reported by insurance companies to the IRS.

[10]Note that the empirical results presented below are robust with respect to these deletions.

[11]Unlike the income tax, the federal estate tax provides dollar-for-dollar credit for state death taxes and smooths out (eliminates in most cases) cross-state differences in tax burdens. In any event, computing state tax liabilities is an extremely difficult task. For states with a "pick-up" tax only, the computation is straightforward and essentially redundant. For the remaining states, however, one does not only have to consider the diverse tax treatment of wealth transfers but also has to identify the location of the property. The state tax liability reflects the size of wealth, the relationship to heirs (in case of inheritance taxes), and the state in which the property is located and whether it is tangible or intangible, since states tax property located within their borders. It should be noted that 24 states and the District of Columbia have a "pick-up" tax only, 7 have estate and "pick-up" taxes, and 19 have inheritance and "pick-up" taxes (or allowable federal credit for state death taxes). See Advisory Commission on Intergovernmental Relations (1988). For the less wealthy, especially those not required to file federal tax returns, state taxes may influence bequest behavior since the federal tax credit may not be available.

[12]Interestingly, this treatment is ignored in studies investigating the determinants of IRA contributions and effects on savings. See Skinner and Feenberg (1990) for a review of the literature.

[13] Aside from excluding certain assets such as those in trusts, probate data also suffer from valuation deficiencies necessary to computing estate tax liabilities.

[14]If the unified credit is fully used in reducing an individual's gift taxes, then wealth held at death will not benefit from the exemption.

[15]Select information on heirs is available for estates with assets of $5 million or more.

[16]Elasticity coefficients are estimated as F(z)*b, where F(z) computed as $\Sigma B_i X_i/\text{Sigma}$ is the cumulative normal distribution representing the probability of observing a bequest > 0, b is the Tobit regression coefficient for the right-hand-side variable of interest, B_i represents each of the reported coefficients, and each X_i is the value of the right-hand-side variables at the mean. See McDonald and Moffitt (1980).

[17]These ratios are reported at the bottom of Table 2 and are computed as $e^{F(z)b}$.

[18]These ratios are computed as $e^{F(z)(b_i - b_{i-1})}$, where i is an age class and i − 1 is the previous (younger) class.

[19]A possible explanation for this outcome is that women on average have fewer (dependent) heirs since they tend to outlive their spouses.

[20]Since the regressions are specified in nonlinear form, the elasticities from the separate regressions cannot be aggregated to the total. We have explored the estimation of a system of demand equations for the six categories (the 7th missing equation is bequests to heirs) to constrain the regressions. Such endeavor has proven very difficult given the number of categories and the severe censoring nature of the data (see Deaton 1986, p. 1808, for instance). When we used a linear specification, the following price elasticities for total bequests and the six separate categories were obtained:

$$-0.70 - 0.49 \; -1.22 \; -1.18 \; -0.61 \; -0.26 \; -0.80$$

where the elasticity coefficients of the separate categories roughly aggregate to that of the total. Note that the wealth elasticity under the linear specification, though significant, is about 0.02. Also see Clotfelter (1985, p. 245). Results from semi-log specified regressions were not dramatically different from those reported in Table 2.

[21]Bequests to foundations were combined with "other" bequests in the 1957–1959 data used in Boskin (1976). The finding of a high elasticity (−1.8 to −5.20) for the "other" category was implicitly attributed to private foundations.

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