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The Estate Tax and After-Tax Investment Returns

by

James Poterba
MIT and NBER

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James Poterba

MIT and NBER

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Contact Address:

Professor James Poterba
Department of Economics E52-350
MIT
50 Memorial Drive
Cambridge MA 02142-1347
phone: 617 253 6673
fax: 617 258 7804
email: poterba@mit.edu

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ABSTRACT

This paper explores the effect of estate and gift taxes on the after-tax rate of return earned by savers. The estate tax affects only a small fraction of households -- taxable decedents represented only 1.4 percent of all deaths in 1995 -- but the affected households account for a substantial fraction of household net worth. The estate tax can be viewed as a tax on capital income, with the effective rate depending on the statutory tax rate as well as the potential taxpayer's mortality risk. Because mortality rates rise with age, the effective estate tax burden is therefore greater for older than for younger individuals. The estate tax adds approximately 0.3 percentage points to the average tax burden on capital income for households headed by individuals between the ages of 50 and 59. For households headed by individuals between the ages of 70 and 79, however, the estate tax increases the tax burden on capital income by approximately 3 percentage points. The effects are even larger for older households. The paper also explores the fraction of the net worth held by households that are subject to the estate tax that could be transferred to the next generation with a program a "planned giving," using the $10,000 per donor per donee exemption from gift tax. While roughly one quarter of potentially taxable assets could be transferred in this way, actual levels of inter vivos giving are much lower than the levels that would one would expect if households were taking full advantage of this tax avoidance strategy.

Federal estate and gift taxes collected $17.5 billion in 1996, and state and local taxes on gifts and estates raised another $5.6 billion (National Income and Product Accounts, Table 3.4). Just over thirty thousand taxpayers filed federal estate tax returns for the most recent year (1995) for which data are available, so average estate taxes per taxpayer average several hundred thousand dollars. The top marginal estate tax rate is 60 percent, one of the highest statutory tax rates in the federal tax code.

To place the estate tax in perspective, it can be compared with another tax on capital income, the capital gains tax. In 1993, federal revenues from the individual income tax on capital gains totalled $33.1 billion. The Congressional Budget Office (1997) indicates that 17.7 million taxpayers reported capital gains income. Thus the estate and gift tax raised half as much revenue as the capital gains tax, with much higher per-taxpayer burdens on a much smaller set of taxpayers.

Despite the high marginal tax rates that apply to taxable estates, there has been relatively little research on the economic effects of the estate tax. Aaron and Munnell (1992) provide a recent survey of the literature in economics. There is a larger legal literature concerning the rationale for estate taxation, illustrated for example by Graetz (1983) and McCaffery (1994). With a few notable and recent exceptions, including Auten and Joulfaian (1997), Joulfaian (1991), and McGarry (1997), there are few theoretical studies of the incentive effects associated with estate taxation or of the empirical effect of estate taxation on the saving and portfolio allocation decisions of wealthy households. In part, this reflects the difficulty of obtaining survey data on the high-income, high-net-worth households who are affected by the estate tax. In part, it also reflects the lack of professional consensus, discussed for example by

Kaplow (1997) and Masson and Pestieau (1997), on why households leave bequests. Some models postulate that bequests are accidental, others specify that they are intentional and motivated by intergenerational altruism, while still others view bequests as intentional but motivated by a "joy of giving." The efficiency cost associated with estate taxation will depend on which of these models is the best description of transfer decisions by high-net-worth households.

Many analysts hold the view that the estate tax can be avoided by the use of sophisticated tax planning. Cooper (1979) described some of these strategies, and recent articles in the popular press, such as Drew and Johnston (1996), have contributed to this perception. If the tax is easily avoided, however, it is not clear why it does raise substantial revenue, and why there was substantial political outcry in recent Congressional debates to increase the floor below which estates are exempt from taxation.

This paper presents an exploratory analysis of how the estate tax affects after-tax returns to capital accumulation. It attempts to place the estate tax in context, so that it could be considered, along with taxes on interest, dividends, and capital gains, as an investor-level tax on capital income. The paper is divided into four sections. Section one begins with a description of the pre-1997 structure of the U.S. estate tax as well as the changes that were enacted in the Taxpayer Relief Act of 1997. It also presents summary information on the characteristics of estate tax returns in recent years, and the concentration of estate tax payments.

Section two sketches a simple framework for evaluating the effect of the estate

tax on expected returns from asset-holding. It views the estate tax as a random tax on both the principal and the income associated with individual investments. The effective tax rate facing a given potential taxpayer depends on the statutory estate tax rate as well as the potential taxpayer's mortality risk. Because mortality rates rise with age, the effective estate tax burden is greater for older than for younger individuals.

The third section uses data from the 1992 and 1995 Surveys of Consumer Finances to evaluate the effective estate tax burden on households of different ages. The estate tax adds 0.3 percentage points to the average tax burden on capital income for households headed by individuals between the ages of 50 and 59. For households headed by individuals between the ages of 70 and 79, however, the estate tax increases the tax burden on capital income by approximately three percentage points. The effects are even larger for older households. This section also compares the flow of taxable estates that are recorded on estate tax returns with the flow that one would expect to observe given mortality rates and the current age-specific distribution of wealth in the U.S. population. This calculation provides an estimate of the degree to which end-of-life estate tax avoidance strategies, such as under-estimation of the value of assets for estate tax purposes, are used to reduce estate tax burdens.

Section four explores the extent to which a simple estate tax avoidance strategy -- making gifts to children and grandchildren -- can reduce household estate tax burdens. While households that are potentially liable for estate taxes could

transfer roughly one quarter of their net worth to their heirs through a systematic program of planned giving, the observed flow of inter vivos giving is substantially smaller than such a tax avoidance program would imply. This suggests the need for further study of the factors that determine inter vivos giving. A brief concluding section suggests several directions for additional research.

1. The Estate Tax in the United States: Current Rules and Summary Statistics

The federal estate tax has been integrated with the federal gift tax since 1977. This means that tax is levied on value of assets transferred at the taxpayer's death, plus the value of taxable gifts that were made during the decedent's lifetime. There are two significant exemptions to these general rules. First, inter-spousal gifts and bequests are exempt from estate taxation. In married couples, this means that the transfers that occur when the first spouse dies are often untaxed, while estate taxes are due when the surviving spouse dies. Given the progressive structure of the estate tax, one strategy used by estate planners working with high-net-worth households involves avoiding the higher taxes that may be associated with passing all of a couples assets to the surviving spouse, and then to the next generation. Second, each individual may make a tax-free gift of $10,000 per year per recipient. This means that a married couple can transfer $20,000 per year to each child, grand-child, or other beneficiary. The $10,000 annual exemption will be indexed for inflation beginning in 1999.

In addition to the two exemptions described above, each household receives

a credit against lifetime estate and gift taxes. Under pre-1997 law, each taxpayer received a tax credit of $192,800 against estate and gift tax liability: this was precisely the amount of estate tax liability on an estate of $600,000.[1] TRA97 gradually raises the threshold on the size of estates to which estate tax liability applies. The unified credit rises to increase the effective exempt amount to $625,000 in 1998, to further increase the threshold in intermittent increments to $700,000 in 2000, and then to $1,000,000 in 2006.[2] This increase in the exempt amount is recaptured in the form of a surcharge on estates valued at between $10,000,000 and $21,040,000, so that estates valued at more than $21,040,000 will not experience any reduction in taxes paid as a result of TRA97. TRA97 also includes a special provision for estates that include family-owned businesses and farms. Family-owned businesses valued at up to $1.3 million will be exempt from estate taxation effective January 1, 1998.

Table 1 reports the tax rates that apply to taxable estates and gifts for tax year 1996. Although the schedule shows tax rates for estates valued at less than $600,000, decedents whose estates and cumulated lifetime taxable gifts are valued at less than $600,000 do not pay any estate tax. The value of the Unified Estate and Gift Tax Credit exceeds the estate tax liability for such decedents. For decedents whose taxable estates were valued at more than $600,000, the marginal estate tax rate on the 600,001st dollar of taxable estate is 37 percent. The highest statutory marginal estate tax rate is 55 percent. As a result of a surcharge that phases out the Unified Estate and Gift Tax Credit as well as the infra-marginal estate tax rates of less

than 55 percent, however, the highest effective marginal estate tax rate is 60 percent. This rate applies on estates valued at between $10 million and $21.04 million.

In addition to federal estate taxes, many states levy taxes on estates or inheritances. These taxes raised roughly one third as much revenue as federal taxes. State death taxes are usually creditable against federal estate tax liability for those taxpayers with federal estate tax liability, but not all decedents whose estates pay state death taxes pay federal estate taxes. State death tax credits against federal estate tax liability are roughly half of the value of state estate tax revenues. In calculating the burden of estate taxes, however, it is important to recognize that state taxes raise the total revenue collected on transfers at death.

The 1997 legislative changes are the latest in a long history of changes, described in Pechman (1987), in the real value of the threshold below which estates are not subject to federal tax. These movements have been associated with time series fluctuations in the fraction of estates that are subject to estate taxation. Table 2 shows how the variation in the real value of the estate tax exemption, or the combined estate and gift tax exemption since the estate and gift taxes were unified in 1976, has corresponded to changes in the fraction of deaths that are subject to the estate tax. While roughly 1.5 percent of decedents in the mid-1990s can expect to pay estate tax, this percentage was as high as 7.7 percent in the late 1970s, before the Tax Reform Act of 1976 raised the estate tax exemption.[3]

Forecasts made prior to the 1997 tax reform suggested that the fraction of

decedents paying estate taxes would rise in the next decade, as the entries in the bottom rows of Table 2 suggest. The TRA97 reforms will reduce the fraction of future decedents who will pay estate tax relative to pre-TRA97 law.

Table 3 provides descriptive information on the estate tax base, and the deductions that may be claimed against estate tax liability. The table relates the total value of assets held in estates for which estate tax returns were filed in 1995 with the federal estate tax revenue collected from these estates. The first row, "gross estates," indicates the gross value of the assets in estates with a gross value of greater than $600,000. The total value of these assets was $117.7 billion. Because the estate tax is unified with the gift tax, the relevant tax base also includes $3.3 billion in taxable gifts. Bequests to surviving spouses, which are not subject to estate tax, reduce the estate and gift tax base by $35.7 billion. Other deductions from the estate tax base, notably those for charitable deductions and outstanding debts, reduced the estate tax base by another $17.8 billion. The resulting value of taxable estates was $68.9 billion.

Tentative estate tax on the base of $68.9 billion is $27.01 billion, which suggests an average estate tax rate of 39.2 percent. This value is calculated by applying the tax rates shown in Table 1 to the taxable estate and gift tax base for each estate. There are several credits that reduce federal estate tax collections, however. The most important is the unified estate and gift tax credit, which reduces tax collections by $13.29 billion and removes a substantial number of estates with gross value of more than $600,000 from the category of "taxable estates." Federal

credits for state death taxes reduce estate tax revenue by another $3.02 billion, and other credits lead to a further reduction of $0.79 billion. The result is a federal estate tax liability of $11.84 billion, or 17.1 percent of the value of taxable estates. It is noteworthy that federal credits for state death taxes are only about half as great as the value of these taxes, which suggests that state taxes do affect the total tax burden on estates.

Many of the decedents who face estate taxation have estates that are close to the current estate tax thresholds, although most of the estate tax is paid by decedents with gross estates well above the threshold. Table 4 presents relevant information drawn from estate tax returns filed in 1995. Of the 31,564 taxable estate tax returns filed, 43.8 percent (13,830) had gross estates valued at between $600,000 and $1 million. If TRA97 had been fully phased-in in 1995, these decedents would not have been liable for estate tax. Some decedents have very high net worth, and this leads to substantial concentration in estate tax payments. The 231 estate tax returns filed for estates valued at more than $20 million, which represented only 0.7 percent of the estate tax returns (and roughly one ten-thousandth of all deaths) accounted for 17 percent of all estate tax payments. By comparison, the 44 percent of estate tax returns with gross estates between $600,000 and $1 million in 1995 accounted for only 5.5 percent of total estate tax revenue. Estate tax liability is highly skewed because the underlying distribution of net worth is highly skewed, and because the progressive tax schedule accentuates this skewness.

The estate tax exemption for inter-spousal transfers implies that estate tax is

often deferred until the death of the longest-surviving partner in a married couple. Table 5 reports information on the age distribution for 1992 decedents whose estates paid estate tax.[4] The table shows that 16,805 (62%) of the 27,243 taxable estate tax returns were for decedents who were over 80 years of age, and that these tax returns accounted for 66 percent of the estate taxes paid. In contrast, decedents who were less than 70 years of age accounted for only 13 percent of estate tax liability. This concentration of estate tax liability at extreme ages will be reflected in the age-specific pattern of effective tax rates that will be shown below.

2. Estate Tax and the Expected After-Tax Return to Saving: A Framework

Estate taxes are taxes on capital. An individual who earns labor income and consumes this income over the course of his lifetime will not be liable for estate taxes, while an individual who saves part of his labor income, and accumulates a stock of capital assets, may face estate tax liability. This could occur if the individual dies unexpectedly, thereby leaving assets that he planned to consume if he had lived longer, and it could also be the result of a planned decision to transfer some assets to succeeding generations.

Most research on capital income taxation does not consider estate taxes as part of the capital tax burden. Estate taxes are typically omitted in formulating the user cost of capital for corporations and in estimating the total tax burden on corporate capital income, as in Feldstein and Summers (1979) or Poterba (1997). Yet even though estate taxes are small by comparison to household net worth, they are not

trivial by comparison to total capital income. In recent years, federal estate tax payments have been between two and three percent of the sum of personal interest receipts, dividends, capital gains, trust income, partnership and S-corporation income, rent, and royalties. Adding state death taxes would raise this value to more than three percent. Thus estate taxes are large enough to represent a substantial component of the capital income tax burden. Their concentration among a small set of taxpayers, moreover, raises the possibility of substantial incentive effects on taxpayer behavior.

One way to address the effective tax burden associated with the estate tax is simply to divide estate tax revenue by a measure of pretax capital income in the United States economy. As Table 4 showed, federal estate tax returns that were filed in 1995 yielded $11.8 billion in federal estate taxes, and were credited for another $3.0 billion in state death taxes. Total state death taxes in 1995, as reported in the national income and product accounts, were $5.5 billion. To estimate the flow of capital income, I start with a stock of assets, and apply a rate-of-return measure. I assume a two year lag between the date of death and the date at which an estate tax return is filed. The Federal Reserve Balance Sheets of the U.S. Economy estimate that the net worth of taxable individuals, defined as net worth of the household sector as shown in Table B.100 less net financial assets of nonprofit institutions as shown in Table L.100a, to be $22.6 trillion at the end of 1992. If the real rate of return on assets was 6 percent per year, then the capital income flow generated by household net worth would be $1.36 trillion. Estate taxes of $17.3 billion would therefore equal

1.27 percent of the capital income flow. If the real return on assets was greater, the effective tax burden due to the estate tax would be lower, and vice versa.[5]

This simple calculation does not provide any information on the effective tax burden on different asset classes, or on different types of households. With respect to asset classes, the portfolios of decedents who face estate tax differ in important ways from the portfolio of the household sector as a whole. Eller (1996) reports that on estate tax returns filed in 1995, 32.7 percent of the gross value of taxable estates was accounted for by closely held stock or other corporate stock investments. At the end of 1992, however, the Federal Reserve Balance Sheets data suggest that closely-held and traded equities accounted for 26.5 percent of net worth for the household sector. Personal residences correspondingly figure more prominently in household net worth than in the portfolios of decedents who face estate tax. These disparities suggest that the burden of the estate tax may fall more heavily on some asset classes than on others. However, the potential endogeneity of household portfolio structure makes it difficult to model this effect.[6]

It is more straightforward to explore differences in estate tax burdens across households, at least those that may be due to exogenous factors such as household age. I now consider a simple model of the effect of estate taxation on an investor's expected after-tax return; in the next section I apply this model to data from the Survey of Consumer Finances. To fix ideas, the analysis begins with a two-period setting, in which mortality is random. Let p denote the probability that a dynastic family "head" dies between periods 1 and 2, W_1 the initial dynastic wealth, r the

pretax return on investment assets, τ the income tax rate that applies to capital income flows, τ_e the estate tax rate, and C_1 the dynastic head's consumption in period 1. Let S_1 denote saving by the dynastic head ($W_1 - C_1$) in period 1. Dynastic wealth in period 2 depends on whether or not the family "head" dies before period 2. The analysis implicitly assumes an altruistically-linked dynasty, for which the value of dynastic wealth is a summary statistic for dynastic utility. The expected value of period 2 wealth is given by:

$$(1) \quad E(W_2) = (W_1 - C_1)*\{[1+r(1-\tau)](1-p) + (1-\tau_e)[1+r(1-\tau)]p\}.$$

The presence of the estate tax reduces the expected value of dynastic wealth in period 2 for any level of saving in period 1.

If there were no taxes on estates or capital income, then the return to saving, measured as the change in the expected value of period 2 wealth per dollar of saving in period 1, would be:

$$(2) \quad d\{E(W_2)\}/dS_1 = 1 + r.$$

With a capital income tax as well as an estate tax, the effect becomes

$$(3) \quad d\{E(W_2)\}/dS_1 = [1+r(1-\tau)](1-p) + (1-\tau_e)[1+r(1-\tau)]p$$

$$= 1 + r - r\tau - p\tau_e[1+r(1-\tau)].$$

The third term on the right hand side of (3) is the standard effect of capital income taxation in reducing the rate of return to savers. The last term is the estate tax term, which generates a further reduction in the after-tax return to saving. This term is proportional to p, the saver's mortality probability.

To illustrate the potential importance of the estate tax effect, consider a simple

example in which $\tau = .40$, $r = .10$, $\tau_e = .50$, and $p = .05$. This would correspond to an elderly household, since the one-year mortality rate for men does not reach five percent until their mid-70s, and for women, their early 80s. The marginal estate tax rate of 50 percent would correspond to an estate of more than two million dollars. In this example, the return to saving in the absence of any capital income taxes or estate taxes would be 10 percent. With the capital income tax, the return declines to 6 percent, and with the estate tax and the capital income tax, it declines to 3.4 percent. Thus the estate tax raises the effective tax rate in this example by 26 percentage points, from 40 percent to 66 percent. Even if the marginal estate tax rate is set at 10 percent, rather than 50 percent, as a possible "correction" for taxpayer opportunities to avoid the tax, the effective tax rate rises from .40 to .45.

This analysis simply describes the potential impact of the estate tax on the rate of return. To evaluate its impact on saving, one would need estimates of the interest elasticity of saving on the part of affected households. It is widely recognized that changes in after-tax returns have income, substitution, and wealth effects, and that the net effect of such changes on consumption and saving decisions can be theoretically ambiguous.[7] One particular difficulty with respect to the estate tax is that the key saving elasticities are those that apply to high-net-worth households, a population subgroup that is often not represented in any substantial way in the randomly-drawn cross-sectional and panel data bases that are used to estimate the behavioral effects of tax policy.[8]

3. Estimated Estate Tax Burdens: Evidence from the Survey of Consumer Finances

This section uses the 1992 and 1995 Surveys of Consumer Finances to estimate the effective estate tax burden described in the last section. The Surveys of Consumer Finances are stratified random samples of households in the U.S. population. The surveys include a random population sample, as well as a sample that is drawn from information on tax returns and that over-weights households with high levels of capital income. The SCF is generally regarded as the best data available on the asset and liability positions of U.S. households, and the best information on the high-net-worth segment of the population.

To perform calculations regarding the effective estate tax rate on capital income, one needs information on mortality probabilities as well as on the cross-sectional distribution of wealth holdings. There are two "life tables" that one might use for these calculations. The first is the population life table, reported by the Social Security Administration Office of the Actuary. It describes the probability of death at various ages for individuals chosen randomly from the population at large. The potential limitation of the population life table is that it is well-documented that high-income, high-wealth individuals have lower mortality rates than low-income, low-wealth individuals: see Attanasio and Hoynes (1995) and Guralnik et al. (1993). Because the estate tax only affects households with substantial net worth, calculations about estate tax burdens may be more revealing if they are based on mortality tables that might apply to this segment of the population.

A second mortality table that may better describe the mortality rates facing the

high-net-worth households is the Individual Annuitant Life Table, which is described in Mitchell, Poterba, and Warshawsky (1997). The annuitant life table describes the mortality experience of individuals who purchase single-premium annuities from life insurance companies. These individuals typically have sufficient accumulated resources to purchase policies with initial premiums of between $50,000 and $100,000, so they are from the upper tail of the wealth distribution. Age-specific mortality rates in the individual annuitant table are between 25 percent and 35 percent lower than those in the population life table.

To compute the effective burden of the estate tax, the SCF data can be used to evaluate the following expression, which is the sum over all households of their expected estate tax liability:

(4) $E(\text{Estate Tax}) = \Sigma_h \, q_h * \tau_e(NW_h)$.

The term q_h denotes the probability that the older generation in a household "dies off" during the year, NW_h denotes the net worth of household h, including the face value of any life insurance policies, and $\tau_e(NW)$ denotes the estate tax function, which determines estate tax liability as a function of household net worth. For single households, q_h is just the probability of dying during the year: it depends on the age and sex of the household member. For married couples, q_h is the probability that both spouses die within the year.

Given an estimate of the expected value of estate tax payments, this can be compared with an estimate of the rate of return on household net worth ($\Sigma_h \, r_h * NW_h$ where r_h denotes the rate of return earned by household h) to estimate the effective

estate tax burden. Alternatively, in the framework developed in equations (1) through (3), the effective estate tax burden is $p\tau_e[1+r(1-\tau)]/r$. The numerator of this expression is the expected estate tax payment, and the denominator is the pretax return on each unit of capital.

The treatment of term life insurance in computing net worth in equation (4) deserves comment. Many young and middle-aged households have net worth that would not place them above the threshold for estate tax liability, but they also have substantial amounts of term life insurance. Consider the case of a married couple with $400,000 of net worth but $1,000,000 of term life insurance in force. If both spouses were to die, at least under simple assumptions about the structure of their will and estate plan, their estate would pay estate taxes. The foregoing calculations therefore include the face value of term life insurance in estimating the expected value of estate tax payments. Because most wealth is held by older households, however, most of which have modest holdings of life insurance, this assumption is not central to the analysis.

The first column of Table 6 reports the estimated net federal estate tax liability for households in the 1995 Survey of Consumer Finances. This estimate assumes that each estate claims the average level of charitable deductions and funeral expense deductions for estates in its gross estate value category.[9] This leads to an estimate of gross federal estate tax liability for each estate, which is then reduced by the average level of state death tax credits for estates in the decedents gross estate valuation class. The estimate of net federal estate taxes is sensitive to the mortality

table that is used. With the annuitant life table, estimated federal estate taxes are $15.7 billion, compared with $23 billion with the population life table. These estimates are of the same order of magnitude as federal estate tax collections.

The second column of Table 6 presents the effective federal tax rate calculation under the assumption that households can earn an average real return of six percent on assets in their portfolios. The effective estate tax rate varies from an average value of 1.3 percent in the case that assumes that wealth-holders face the annuitant mortality table to an average of 1.9 percent using the population mortality table.

The calculations in the first two columns of Table 6 focus on net federal estate taxes, but they do not include state death taxes. In 1996, the National Income and Products Accounts show that state estate taxes (S) collected $5.6 billion, when net federal estate taxes were $17.5 billion ($F_N$).[10] To compute the total tax burden on decedents I therefore multiply the effective net federal estate tax burdens in column two of Table 6 by 1.32, which equals $(S + F_N)/F_N$, to obtain total effective tax burdens. These are shown in the last column of Table 6. The combined federal and state effective estate tax rate ranges from an average value of 1.7 percent, using the annuitant mortality table, and 2.5 percent, using the population life table.

Table 6 also shows that there is substantial heterogeneity in the effective estate tax burden across age categories, with those aged 80 and above facing the most substantial burdens. Even in the most conservative case, the total effective estate tax burden on households with 80+-year-old heads is 18.4 percent; in the less conservative case, it rises to 25 percent. These high rates simply reflect the higher

mortality rates faced by households headed by those aged 80 and above.[11] For households headed by individuals between the ages of 60 and 69, the estimates suggest an effective estate tax rate of 0.7 and 1.4 percent. These effective tax rates are net-worth-weighted-averages over all households in a given age category. As such they recognize that most of the households headed by persons in each age category will not face estate tax liability, but that a small fraction of households, with a substantial fraction of the age group's net worth, will face estate taxation.

The estimate of a effective estate tax rate of between 1.7 and 2.5 percentage points is somewhat larger than the estimate of a tax burden of 1.3 percentage points that resulted from dividing total estate taxes by an estimate of total capital income. This may reflect a somewhat smaller total asset base in the Survey of Consumer Finances than in the Federal Reserve Balance Sheets, or it could reflect the use of discounted asset valuations in filing estate tax returns. If the values of assets reported in the Survey of Consumer Finances are higher than the values that would be reported for the same assets if they appeared on an estate tax return, this could explain the pattern of results.

The estimates in Table 6 provide new information on an issue raised by Wolff (1996), namely the relationship between taxable estates in a given year and the expected value of taxable estate wealth that would be generated by applying standard mortality tables to age-specific wealth data. The expected value of intergenerational wealth transfers and the associated estate taxes can be compared with observed transfers and estate taxes, and the difference between the two can be attributed to

estate tax avoidance at death.[12] This is an imperfect measure of estate tax avoidance, because successful tax planning would transfer resources from the older generation to younger heirs so that the reported net worth of the older households, those with substantial mortality probabilities, would be reduced.

The estimated estate tax liability in Table 6 corresponds quite closely to the actual estate tax liability in recent years. This stands in contrast to Wolff's (1996) claim that projected estate tax liability based on the 1992 SCF was $44 billion, compared with $10.3 billion in estate tax collections for 1993. There are a number of potential explanations for this divergence. One is that Wolff uses the population mortality table, which yields a higher estimate of intergenerational transfers and estate tax liability than the annuitant mortality table. A second is that Wolff (1996) relies on a re-weighted version of the 1992 Survey of Consumer Finances, with weights that generate a larger total wealth stock than the public use weights, particularly among high-net-worth households. Further analysis of the source of these differences is left to future research.

4. The Potential For Estate Tax Avoidance: Planned Giving

Estate tax avoidance is one of the most complicated aspects of tax planning. Many of the tools that high-net-worth households use to avoid estate taxes are not advertised to the general public, in part out of concern for IRS action that might limit their use. Yet there are some estate-planning tools that are widely recognized and understood: the most prominent of these is the use of inter vivos giving. The extent

to which inter vivos giving reduces estate tax collections depends on the age at which those with wealth begin to make such gifts, the size of such gifts, and the number of beneficiaries who are the recipients of such gifts. Even taking full advantage of such gifts, many very-high-net-worth households may be unable to avoid estate tax liability.

This point can be illustrated as follows. Consider a married couple, both of whom are currently forty. They currently have two children, each of whom will marry and bear two grandchildren when the couple is sixty-five. The current forty-year-olds are only interested in transferring wealth to their children and grandchildren. How much can they expect to transfer? Assume that each of the 40-year-olds faces the "life table" for which $S_{b,j}$ denotes the probability that both spouses are alive when they are aged $40+j$, $S_{h,j}$ denote the probability that only the husband is alive at age $40+j$, and $S_{w,j}$ the probability that only the wife is alive. Further assume that the children and grand-children are certain to survive both spouses, and that the real interest rate is constant at r. In this case, assuming (as it will be after 1999) that the $10,000 annual limit is specified in real terms, the present value of the transfer that the married couple can make is given by:

$$EPDV = \sum_{j=1}^{25} \frac{S_{b,j}*20 + (S_{h,j}+S_{w,j})*10}{(1+r)^j} + \sum_{j=26}^{\infty} \frac{S_{b,j}*60 + (S_{h,j}+S_{w,j})*30}{(1+r)^j} .$$

By comparing this expected present discounted value to the amount of wealth that the household currently holds, we can obtain an estimate on the fraction of wealth that can potentially be transferred to the next generation through inter vivos gifts.

This calculation focuses on the fraction of current wealth ($Wealth_0$) that can be

transferred with a program of planned giving, i.e., on PDV_0(Transfers)/$Wealth_0$. This is not necessarily the same as the fraction of a household's net worth at the time of death, inclusive of the present value of past gifts, that will have been transferred (this would equal PDV_T(Transfers)/[PDV_T(Transfers) + $Wealth_T$].

The latter calculation may seem like the more natural way to measure the potential estate tax avoidance associated with inter vivos gifts, but it is also problematic for several reasons. The most important is that to calculate the second ratio, one must project the wealth that will be accumulated (or decumulated) in the decedent household's remaining years. If the household is likely to accumulate substantial additional assets by saving out of labor income, then the measure proposed here will be greater than the ratio measured at the time of death. On the other hand, if the household is likely to decumulate a substantial fraction of its assets through nursing home expenses, medical costs, or other outlays, then the calculation presented here will yield a "transfer ratio" that is smaller than the ratio that would be computed at the decedent's death. As an extreme example of this, it is possible that some households that have enough wealth at the time of the survey to be classified as potential "estate tax households" will have drawn down their wealth to finance their own consumption in the years before their death, and that they will no longer be affected by the estate tax.[13]

The ideal data base for performing these calculations would combine information on the value of the taxable estate at the time of the decedent's death, along with a lifetime record of gifts that the decedent made. With such data it would

be straightforward to compute the ratio of the present discounted value of past gifts (i.e., past gifts would have their value increased to reflect the value of subsequent returns on these gifts) to the value of the decedent's estate. Unfortunately, the data to perform such calculations does not appear to exist in any public-use data file.

The Survey of Consumer Finances data can be used to develop a crude estimate of the prospective power of planned giving to reduce estate tax burdens. In addition to data on household net worth, the SCF contains information on the ages of the household head and other household members, the number of children who live both inside and outside the household. There is unfortunately no information on the total number of grandchildren who are related to household members, and there is only crude information on the ages of children who no longer live in the household. The SCF does provide information on grandchildren who live in the respondent's household, but that is likely to represent only a small fraction of the grandchildren who might receive inter vivos gifts.

By making several additional assumptions about family structure and household behavior, one can use the SCF data to estimate the present discounted value of the inter vivos transfers that households can make over the remainder of their lifetimes. The auxiliary assumptions include the following: (i) The mortality rates of husbands and wives are independent, and they are described by the Annuity 2000 mortality table, "backcast" to apply to 1995. (ii) Single individuals make gifts of $10,000 per year to each of their children and grand-children each year; married couples make gifts of $20,000 to each potential recipient. The amount of these gifts is indexed for the

calculations that consider the $1 million threshold for estate tax liability, since the Taxpayer Relief Act of 1997 raised this threshold and also indexed the $10,000 gift limit. (iii) Children (grandchildren) always outlive their parents (grandparents). (iv) The real discount rate is three percent per year.[14] (v) Children of the household head who live outside the household and are at least 18 years old are assumed to have 1.8 children. These "grandchild imputations" are based on average family sizes as reported in the Statistical Abstract of the United States, 1996 (Table 106). The assumption that all children outside the household have this average number of children may overstate the opportunity for inter vivos transfers, so I report estimates of transfers with and without the grandchild imputation. The limitation to lineal descendants, however, is an offsetting bias that may understate the extent to which high-net-worth households can transfer resources to younger generations.

The results of calculations based on these assumptions are shown in Table 7. The first three rows present summary tabulations based on the 1995 SCF. They show that roughly ninety percent of household net worth, which totals $20.7 trillion, is held by households in which the household head is over the age of forty. (Note for comparative purposes that at the end of 1994 the Balance Sheets reported household net worth, exclusive of financial assets held by nonprofits, of $23.7 trillion.) In the SCF, the total of net worth and the face value of life insurance is $29.6 trillion.

The next set of tabulations in Table 7 present information on households whose net worth plus outstanding life insurance policies totalled more than $600,000 in 1995. There were 9.5 million such households, with net worth of $13.4 trillion or

approximately two thirds of outstanding net worth. These are the households that would potentially be liable for estate tax. Their taxable net worth, which equals net worth and life insurance in excess of $600,000 per household, is $11.9 trillion.

The next three rows in the table consider the reductions in taxable net worth that follows from various tax reduction strategies. The first is a policy of immediate inter vivos giving to children. The present discounted value of these gifts is $2.7 trillion; this represents a 23 percent reduction in the taxable net worth of these households. If the household head does not begin to make inter vivos gifts until he or she turns 60, then the corresponding wealth transfer is smaller: the expected present discounted value is $1.9 trillion, or 16 percent of initial wealth. If transfers to grand-children are allowed and grand-children are imputed according to the algorithm described above, then the present value of inter vivos gifts rises to $3.9 trillion, or 33 percent of taxable net worth.

The lower panel of Table 7 presents similar information for the case in which the threshold for estate tax liability is $1 million, as it will be after 2006, rather than $600,000. Raising the estate tax threshold reduces taxable net worth and the face value of life insurance from $11.9 trillion to $9.3 trillion. The share of net worth that can be transferred with an immediate planned giving program targeted only to the household's children would allow the transfer of $2 trillion (in present discounted value), or 22 percent of taxable net worth.

The foregoing calculations suggest the substantial power of inter vivos gifts to reduce the value of taxable estates, but they also raise a question about the extent

to which households take advantage of such gift opportunities. If each of the 9.5 million households with current net worth plus life insurance in excess of $600,000 made $10,000 transfers ($20,000 transfers in the case of married couples) to all of their children, the annual transfer flow would be approximately $443 billion.[15] Data on actual transfers from the Survey of Consumer Finances suggest much smaller financial transfers from the old to the young. The magnitude of such transfers depends on whether one uses reports by donors or recipients as the basis for estimation; Gale and Scholz (1994) note that in the 1983 SCF, as well, donors report larger transfers than recipients. The aggregate value of transfers, as reported by donors, is $62.3 billion. SCF gift recipients report average inter vivos transfers received over the 1993-1995 period of $18.9 billion per year. This may understate actual transfer receipts because an addition $41.4 billion of "gifts" over this three year period are coded ambiguously, either as "other" or without information on whether they were inheritances or inter vivos gifts. Even including these transfers as representing inter vivos gifts would raise the annual reported flow of receipts to only $32.7 billion per year. Nevertheless, whether one takes $62.3 billion, $18.9 billion, or some value in between as the best estimate of inter vivos gifts, it is clear that transfers are much lower than one would predict if estate tax avoidance were the only objective of these households.

These findings comport with results from special Treasury tabulations of estate tax returns in 1945, 1951, 1957, and 1959, as reported in Pechman (1987, p.244). These data show that among millionaire decedents in these years, the fraction of

wealth transferred with lifetime gifts ranged from 9 percent (1957) to 24 percent (1945). Although these special tabulations suggest a decline in the importance of gifts between 1945 decedents and 1959 decedents, subsequent tabulations have not revisited this question.

The cross-sectional data in the Survey of Consumer Finances do provide some support for the hypothesis that households that are more likely to face estate taxes are more likely to engage in inter vivos giving. The 1995 SCF shows, for example, that among households with heads aged 65 or over, the probability of making any financial transfer to persons not in the household was 9.8 percent for households with net worth of less than $600,000, compared with 24.2 percent for those with net worth above $600,000, and hence potentially subject to the estate tax. McGarry (1997) presents additional evidence on greater use of $10,000 per year gifts by households in the AHEAD data file who have net worth greater than the threshold at which they would face estate taxation. Whether the higher probability of transfers at net worth levels above the estate tax threshold can be attributed to the incentive effects of the estate tax, or whether it is simply the result of a positive net worth elasticity of transfer-making, is unclear. What is clear is that nearly three quarters of the households elderly households for whom the estate tax may loom as a potential burden are not making transfers. This suggests the need for further attention to the issues raised in Bernheim, Shleifer, and Summers (1985) about the reluctance to use inter vivos transfers rather than transfers-at-death.

5. Conclusion and Future Directions

This paper suggests that the effective tax burden that estate taxes impose on capital income recipients average between one and two percentage points, but that the effective tax rates are much higher for very old households. Because estate taxes are a nontrivial source of revenue, they should be included in future attempts to calculate the average tax burden on corporate, and other types, of capital income. The analysis further suggests that although inter vivos giving can substantially reduce estate tax burdens for many households, especially those with net worth near the estate tax liability threshold, the actual pattern of planned giving suggests that households do not take full advantage of this estate planning tool.

One important limitation of the analysis presented here is that it does not explore a range of other estate tax avoidance strategies that might be pursued by high-net-worth households. These include transferring control rights in family businesses at estimated values that may fall below true market value, creative use of trusts, and a host of other mechanisms. There may be substantial heterogeneity across households in the extent to which they can use such strategies, and there is little data that can be used to gauge their importance.

The analysis presented here has considered the estate tax in isolation, even though there can be important interactions between the estate tax and other parts of the tax system. One reason for holding appreciated assets until death is the avoidance of capital gains tax on unrealized gains. In the 1986-1996 period, when the federal capital gains tax rate was 28 percent, holding appreciated assets until

death could reduce the combined decedent and heir's capital gains tax burden substantially. Transferring the same assets as inter vivos gifts would lead to carry-over basis and therefore to potentially higher income tax liabilities, if the recipients realized these gains. If the marginal estate tax rate is, say, 45 percent, the net tax cost of bequeathing rather than transferring while alive is therefore 17 percent rather than 45 percent.

Another example of the interaction between the estate tax and other aspects of the tax system is Bernheim's (1987) discussion of the relative capital income tax rates on donors and recipients of inter vivos gifts. Such gifts can transfer assets from taxpayers with high marginal tax rates on capital income (prospective decedents) to those with lower capital income tax rates (prospective recipients). Such estate tax induced transfers may reduce federal income tax receipts.

This paper has also considered implicit taxes, defined and discussed in Scholes and Wolfson (1992), only in passing. When households follow strategies that divide the control of family businesses, or place assets in trusts, there may be distortions to the pretax return that they earn.[16] These distortions can be large before they outweigh the tax benefits associated with estate tax avoidance. Further recognition of implicit taxes associated with estate tax avoidance, and of the potential non-tax costs associated with estate planning strategies, could result in estimates of effective estate tax burdens that are greater than those reported here.

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Table 1: Federal Unified Estate & Gift Tax Rates, 1997

Taxable Transfer ($000)	Marginal Tax Rate
0 - 10	18.0
10 - 20	20.0
20 - 40	22.0
40 - 60	24.0
60 - 80	26.0
80 - 100	28.0
100 - 150	30.0
150 - 250	32.0
250 - 500	34.0
500 - 600	37.0
600 - 750	37.0
750 - 1000	39.0
1000 - 1250	41.0
1250 - 1500	43.0
1500 - 2000	45.0
2000 - 2500	49.0
2500 - 3000	53.0

3000 - 4000	55.0
4000 - 5000	55.0
5000 - 10000	55.0
10000 - 21040	60.0*
> 21040	55.0

Source: Luckey (1995) and author's calculations. The 60 percent marginal tax rate on estates valued at between $10 million and $21.04 million is the result of the phase-out of the Unified Estate and Gift Tax Credit and infra-marginal tax rates of below 55 percent for estates in this valuation range.

Table 2: Taxable Estates as a Percentage of Deaths

Year	Taxable Estates/Deaths (%)
1935	0.74%
1940	1.04
1945	1.12
1950	1.33
1961	2.93
1970	5.20
1977	7.65
1982	1.81
1991	1.15
1995	1.37
2005 (projected, pre-TRA97)	2.64
2005 (projected, post-TRA97)	1.63*

Source: Joint Committee on Taxation (1997), Tables 13 and 15. The estimate of the fraction of deaths that will lead to taxable estates in 2005 is based on the author's estimate, multiplying the JCT estimate under pre-1997 law by the fraction of estates with net value of more than $600,000 in 1995 that were valued at more than $950,000. This fraction was estimated from data reported in Eller (1996) as the

fraction of estate with estates valued at more than $1 million, plus one eighth times the fraction of estates valued at between $600,000 and $1 million.

Table 3: Distribution of Taxable Estate Tax Returns by Size of Gross Estate: 1995 Estate Tax Filings

Size of Gross Estate ($ million	Number of Taxable Returns	Net Estate Tax ($ billions)
0.6 - 1.0	13830	0.65
1.0 - 2.5	12710	3.00
2.5 - 5.0	3298	2.75
5.0 - 10.0	1105	2.05
10.0 - 20.0	390	1.38
> 20.0	231	2.00
TOTAL	31564	11.84

Source: Eller (1996), Table 1d.

Table 4: Relationship Between Gross Estate Value, Deductions, and Federal Estate Tax Revenue for Estate Tax Returns for Estate Tax Returns Filed in 1995

Accounting Concept	Magnitude ($ billion)
GROSS ESTATES	$117.74
Adjusted Taxable Gifts	3.31
(Bequests to Surviving Spouse)	(35.73)
(Charitable Deductions)	(8.71)
(Debts & Mortgages)	(6.10)
(Other Deductions)	(2.99)
ADJUSTED TAXABLE ESTATES	68.92
Tentative Estate Tax	27.01
(Gift Tax)	0.62
(Allowable Unified Credit)	13.29
(State Death Tax Credits)	3.02
(Other Tax Credits)	0.17
NET ESTATE TAX	11.84

Source: Eller (1996).

Table 5: Age Distribution, 1992 Decedents Whose Estates Filed Estate Tax Returns

Age	Number of Returns	Gross Estate ($bil)	Taxes Paid ($bil)
MEN:			
< 50	390	2.59	0.10
50 - 60	534	4.96	0.14
60 - 70	1468	11.96	0.52
70 - 80	2859	19.10	1.14
> 80	6351	25.53	2.83
Total Men	11602	64.14	4.73
WOMEN:			
< 50	132	0.61	0.04
50 - 60	307	1.49	0.09
60 - 70	1241	4.71	0.48
70 - 80	3507	8.73	1.10
> 80	10454	24.48	4.07
Total Women	15641	40.01	5.78
TOTAL (Men & Women)	27243	104.15	10.51

Source: Eller (1996), pages 60-64.

Table 6: Estimated Estate Tax Liability and Effective Tax Rates, 1995 SCF

Age of Household Head	Estimated Estate Tax	Effective Federal Tax Rate	Effective Total Tax Rate
A: Population Life Table			
< 50	$0.4	0.1%	0.1%
50-59	0.9	0.3	0.4
60-69	2.8	1.0	1.4
70-79	5.1	2.7	3.5
> 80	13.8	19.0	25.0
TOTAL	23.0	1.9	2.5
B: Annuitant Mortality Table			
< 50	$0.2	0.1	0.1
50-59	0.5	0.2	0.2
60-69	1.5	0.5	0.7
70-79	3.3	1.7	2.3
> 80	10.2	13.9	18.4
TOTAL	15.7	1.3	1.7

Notes: Calculations include the face value of life insurance policies in the estimate of net worth for estate tax purposes, but not in the calculation of net worth in column

two. The effective tax rate calculation assumes that households earn a six percent real return, on average, on their net worth. To compute effective tax rates at other rates of return (say X), multiply the last column by .06/X. The net worth held by households in the various age categories is $6.9 trillion (< 50), 4.9 (50-59), 4.5 (60-69), 3.2 (70-79), 1.2 (>80), for a total net worth of $20.7 trillion.

Table 7: Impact of Inter Vivos Giving on Estate Tax Liability

	Population	Age 40+	Age 50+	Age 60+	Age 70+
Number of Households	99.0	63.1	41.3	28.1	15.4
Net Worth	20.7	18.6	13.8	8.9	4.4
Net Worth + Face Value of Life Insurance (LI)	29.6	24.2	16.1	9.8	4.7
Households with Net Worth + Life Insurance > $600K					
Number	9.5	7.9	4.9	2.8	1.2
Net Worth	13.3	12.6	9.4	5.7	2.7
Taxable Net Worth Including Life Insurance	11.9	11.1	7.9	4.6	2.1
Taxable Wealth Reduction From Program of Giving to Children					
- Starting Immediately	2.7	2.5	1.6	0.9	0.3
- Starting at Age 60	1.9	1.8	1.4	0.9	0.3
Taxable Wealth Reduction From Program of Immediate Giving to Children and Grandchildren	3.9	3.6	2.7	1.6	0.6
Households with Net Worth + Life Insurance > $1000K					
Number	4.6	4.1	2.5	1.5	0.6
Net Worth	10.9	10.4	7.9	4.8	2.2
Taxable Net Worth Including					

Life Insurance	9.3	8.8	6.4	3.8	1.8
Taxable Wealth Reduction From Program of Giving to Children					
- Starting Immediately	2.0	1.9	1.3	0.7	0.2
- Starting at Age 60	1.6	1.5	1.1	0.7	0.2
Taxable Wealth Reduction From Program of Immediate Giving to Children and Grandchildren	3.0	2.9	2.2	1.2	0.5

Source: Author's calculations using 1995 Survey of Consumer Finances. See text for further discussion.

ENDNOTES

1. The exempt amount of estates and gifts was set, in the Tax Reform Act of 1976, at $120,667 for 1977. This amount was phased up to $175,625 by 1981 under the 1976 law. The Economic Recovery Tax Act of 1981 raised the unified credit to exempt estates and lifetime gifts of less than $225,000 in 1982, and it phased in increases in the exemption that reached $600,000 in 1987.

2. The exemption rises to $625,000 in 1998, then to $650,000 in 1999, $675,000 in 2000 and 2001, $700,000 in 2002 and 2003, $850,000 in 2004, $950,000 in 2005, and $1,000,000 in 2006.

3. In the 1930s, even though the fraction of decedents paying estate taxes was only half that in 1995, estate taxes represented more than five percent of federal tax receipts.

4. Information from estate tax returns is typically presented in one of two forms: for all estate tax returns filed in a given year, and for all decedents who died in a given year. Because there are inherent time lags in the probate and estate valuation processes, the estate tax returns for decedents who die in a given year will typically be filed over a span of several years.

5. The procedures that are used in Feenberg, Mitrusi, and Poterba (1997) and the Joint Committee on Taxation (1993) to allocate estate taxes across households for the purposes of "distribution tables" are closely related to this aggregate calculation. Those studies use various measures of a household's capital income flow, as well as information on whether any taxpayers filing a given return are over the age of 65, to

allocate aggregate federal estate tax payments to individual tax returns.

6. Because capital gains tax liability is extinguished through basis-step-up at death, one would expect to find a higher concentration of capital-gain-generating assets in the portfolios of decedents than in the portfolios of randomly selected households. This factor may contribute to some of the differences observed between the estate tax returns and the Balance Sheets.

7. Wolff (1995), in discussing expanded wealth taxes, notes that such taxes would reduce the rate of return to savers, but that the impact of such rate-of-return changes is difficult to quantify.

8.This discussion also presumes that the ultimate incidence of the estate tax falls on capital. Stiglitz (1978) and others have developed models in which some of the burden of the estate tax is shifted to labor through a reduced level of capital accumulation.

9. The average deduction and average state estate tax credit on estate tax returns with different gross estate values are shown below:

Gross Estate Value	Average Deduction ($M)	Average State Credit ($M)
$0.6 - 1 million	$0.047	$0.009
$1 - 2.5 million	0.111	0.027
$2.5 - 5 million	0.263	0.099
$5 - 10 million	0.737	0.265
$10 - 20 million	1.437	0.655
> $20 million	12.458	2.269.

10. Although the SCF data are for 1995, deaths that occur in 1995 would in all likelihood result in estate tax filings in 1996 or 1997, so it is natural to use the 1996 NIPA data. I am grateful to William Gale for substantial help in clarifying the interaction of state and federal estate taxes.

11. These results suggest that when searching for evidence of behavioral distortions associated with the estate tax, it is essential to focus on portfolio and other behaviors of the very old, since this is the group for whom this tax looms largest.

12. Estate tax avoidance is only one of the explanations for divergences between these two magnitudes. Under-reporting of wealth data in sample surveys would tend to bias the estimated ratio of paid to projected estate taxes up, while lower mortality rates for very wealthy individuals than for middle-income households would bias this ratio in the opposite direction.

13. To project future wealth accumulation or decumulation profiles for the households in the Survey of Consumer Finances that are likely to face estate taxation, one would need a model of saving and consumption behavior for high-income, high-net-worth households. Unfortunately, such models are difficult if not impossible to estimate from existing household surveys.

14. One could also perform these calculations using a discount rate of 6 percent, the assumed rate of return to capital elsewhere in this paper. The present discounted value of lifetime inter vivos transfers will be somewhat smaller in this case.

15. This calculation assumes that all households with current net worth, including the face value of life insurance, make $10,000 per child gifts. This may overestimate the actual gifts that might be made in a program of planned giving, because some

households with current net worth above the estate tax threshold might plan to decumulate assets before death. For other households, however, with current net worth below the threshold, but who expect to have net worth above the estate tax threshold by the time they die, this algorithm will understate tax-minimizing transfers.

16. One of the common arguments for raising the estate tax threshold is that the tax may force a sale of family farms and other closely-held businesses. Burman (1997) presents some evidence on the empirical importance of this issue.