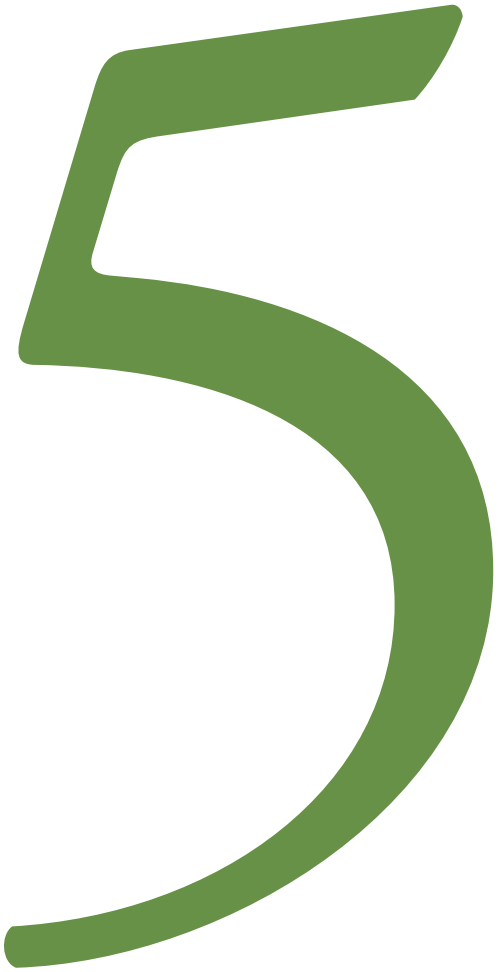
Chapter 5: Behavioral Responses to Transfers and Taxes



The Behavioral Response of Wealth Accumulation to Estate Taxation: Time Series Evidence

Abstract *- This paper explores the behavioral response of taxable bequests to estate taxation. To gauge its effects, the estate tax is converted to an equivalent income tax. This highlights the importance of expected rates of return, and also makes it possible to compare effective tax rates on saving over time. Using data on federal revenues from the estate tax over the past 50 years, and employing the equivalent income tax rate measure, the findings suggest that estate taxes have a dampening effect on the reported size of taxable estates. Estate taxation seems to depress taxable bequests by almost ten percent.*

INTRODUCTION

Taxes on capital, by reducing rates of return, may influence saving decisions. As with income taxes that apply to capital gains, interest, and dividends, estate and inheritance taxes may also reduce rates of return (Poterba, 2000). How this reduction in returns affects saving is theoretically ambiguous, and, a priori, depends on the offsetting substitution and income effects.

More specifically, the effects of the estate tax on saving depend on the preferences of the potential saver. In the presence of altruistic bequests, for instance, Caballe (1995) and Laitner (2001) simulate the estate tax to have a depressing effect on the capital stock. Similarly, Gale and Perozek (2001) argue that the effects on saving depend critically on the underlying transfer motives. Ultimately, however, the effect of estate taxation is an empirical question. One is tempted to rely on the findings in the literature on the effects of income taxes.[1] But because bequest taxes apply to the stock of terminal wealth, they may not be directly comparable to the income tax that applies to the return to saving or annual income flows during the life cycle.

The scarcity of data on the size and distribution of wealth spanning different tax regimes, particularly for the wealthiest segment of society, has limited the thorough study of

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[1] For the taxable income response, see Feldstein (1995), Auten and Carroll (1999), Carroll (1998), Gruber and Saez (2002), and Kopczuk (2005). For the effects on savings, see Bernheim (1999).

the effects of estate taxation. Chapman, Hariharan, and Southwick (1996), hereafter CHS, explore how estate taxes affect post–war federal government estate tax revenues. In modeling the effects of estate taxes on wealth accumulation, CHS make creative use of annual time series data on federal estate and gift tax revenues. Lacking individual level data, they regress these annual collections on an imputed contemporaneous measure of the estate tax rate. They report tax rates to have a sizeable negative effect on this source of revenues to the government.[2] A major limitation of this paper is that the dependent variable is the combined sum of estate and gift taxes, two variables that do not always move in tandem and are governed by different tax regimes. Indeed the sharp increase in revenues reported by CHS in fiscal year 1977 has little to do with estate taxes; it is explained by the acceleration of gifts in 1976 with gift taxes paid in 1977 (Joulfaian, 2004).[3]

Moving away from time series data, Holtz–Eakin and Marples (2001) employ the Health and Retirement Survey panel data, where the wealthy are underrepresented, to explore the effect of estate taxes on wealth accumulation. They find estate and inheritance taxes to have a depressing effect on wealth accumulation.

In the most recent study on the effects of the estate tax on wealth accumulation in the US, Kopczuk and Slemrod (2001), hereafter KS, resort to estate tax data for the pre–war period with its frequent law changes, and augment them with limited data for the post–war years.[4] KS pursue two strategies in examining the effects of the estate tax on wealth. First, they expand on CHS and employ time series analysis using aggregate wealth reported on estate tax returns for the years 1916 through 1945, and select post–war years. Using three measures of the tax rate—the maximum, and those imputed for 40 and 100 times per capita wealth—KS report a negative correlation between the share of top wealth–holders and the estate tax rates. This contemporaneous relationship holds controlling for a number of other influences. A similar sentiment is expressed in Kopczuk and Saez (2004) as they contrast the share of household wealth held by the wealthiest estates with contemporaneous estate tax rates.

In the second strategy, KS resort to pooled cross–sectional analyses that make use of individual estate tax returns. Unlike their time series analysis, the effects of the contemporaneous estate tax rate on the size of reported wealth is weak. However, they find much stronger effects when the tax rate is measured using laws that prevailed at age 45 or ten years before death. The estimates from their preferred specification imply that a tax rate of 50 percent reduces reported wealth by about 10.5 percent.

The cutting edge work of KS in exploring pooled data is quite formidable, particularly when compared to their time series analysis as well as that of CHS. Indeed, it is not clear how to interpret the findings on the effects of contemporaneous tax rates. How does the tax regime in effect at death explain wealth accumulated during life? After all, if the focus is on wealth accumulation, the behavioral response

[2] Tax collections usually lag the liability year. Much of the collections in fiscal year 1977, for instance, reflect wealth and tax liabilities in calendar year 1976. Hence, their specification generally tests whether the tax rate, say, in 1977 affected wealth reported in 1976. In effect, their estimates reflect a forward–looking process, and not a measure of the contemporaneous effects.

[3] The maximum gift tax rate increased from 57.75 in 1976 to 70 percent in 1977. The increase in revenues in fiscal year 1977 predates the reduction of the maximum estate tax rate from 77 to 70 percent.

[4] Generally reliable cross sectional estate tax data are available for deaths in 1982 and most of later years. Reliable data is also generally available for the years 1962, 1969, 1972, and 1976. For prior years, data is available for the period 1917 through 1945.

and estate planning must have preceded the date of death. Thus, KS's analysis of the effects of lagged tax regimes should be viewed as a significant contribution to the literature.

While the analysis in KS represents a significant improvement over the earlier two studies, the reliance on pre–war data should give the reader a reason to pause. Indeed, contrasting trends in wealth accumulation over different periods is quite challenging, in particular as gift taxes did not apply prior to mid 1932.[5] The easiest way to avoid estate and inheritance taxes is through tax–free lifetime gifts, unless this is checked by the imposition of gift taxes. It is noteworthy that during the congressional deliberations in 1932 to increase the maximum estate tax rate from 20 to 45 percent, and the introduction of a gift tax regime, one individual is reported to have made about $100 million in gifts, and another to have made gifts of about $50 million (Roosevelt, 1938, 313–4). Considering that the entire yield of the estate tax in 1932 was $400 million, the tax–free inter–vivos transfers of $150 million by these two individuals alone, not to mention likely gifts by scores of others, demonstrate the sizeable leakages from the estate tax in the absence of the gift tax. These leakages make intertemporal comparisons a challenging undertaking, and may produce biased behavioral estimates when periods with and without gift tax regimes are included in the same sample (Joulfaian, 2005).

In addition to the gift tax regime, and as noted in Auerbach (2001), relying on pre–war data to aid in gauging the effects of the estate tax can be problematic given the marked difference in economic activity commonly observed in the pre– and post–war periods. Also, and as argued in Clotfelter (1985, p. 240), given the frequent pre–war changes in tax laws, it is not clear which tax regime is driving behavior. Changes in the definition of residency as well as in the tax base only add to this challenge.[6]

More importantly, and notwithstanding the adequacy of the data or the period examined, the appropriateness of the use of the estate tax rate that applies years into the future—at death—to explain lifetime wealth accumulation has yet to be addressed. Poterba (2000), for instance, demonstrates how the estate tax is potentially more burdensome for the elderly given their mortality risk, and adds to the burden of the income tax.[7] This comparison to the income tax is important in the context of measuring the effects of taxes on saving during life. To expand on this, and formally gauge its effect, this paper develops a measure of the estate tax equivalent income tax rate. This equivalent income tax rate is defined as the rate that applies to the annual return on an asset, which leaves the size of inheritances unaffected. For a given estate tax rate, the equivalent income tax rate is low during periods of high rates of return expectations, and vice versa. The reported evidence using data for the past five decades is suggestive of a stronger estate tax effect when using the equivalent income tax measure instead of the estate tax rate itself.

This paper is organized as follows. The second section provides an overview of trends in estate tax collections by the federal government, and the evolving tax regimes. The third section discusses how the estate tax can be analyzed as an

[5] The federal government introduced a gift tax in 1924 that was repealed in 1926.

[6] The introduction of the US Treasury Liberty Bonds, and, subsequently, Flower Bonds, which may be viewed as a prepayment, albeit at a discount, of estate taxes (bonds as a form of life insurance), further complicates intertemporal comparisons. Similar complications are introduced by the treatment of pensions and annuities.

[7] Poterba employs the 1992 and 1995 Surveys of Consumer Finances and, by applying mortality rates, computes the tax burden among different households.

equivalent income tax. It also describes the data sources and explains the construction of variables. The paper employs data on federal government revenues from the estate tax for the fiscal years 1951 through 2001. The fourth section presents empirical evidence on the effects of the estate tax. A concluding comment is provided in the fifth section.

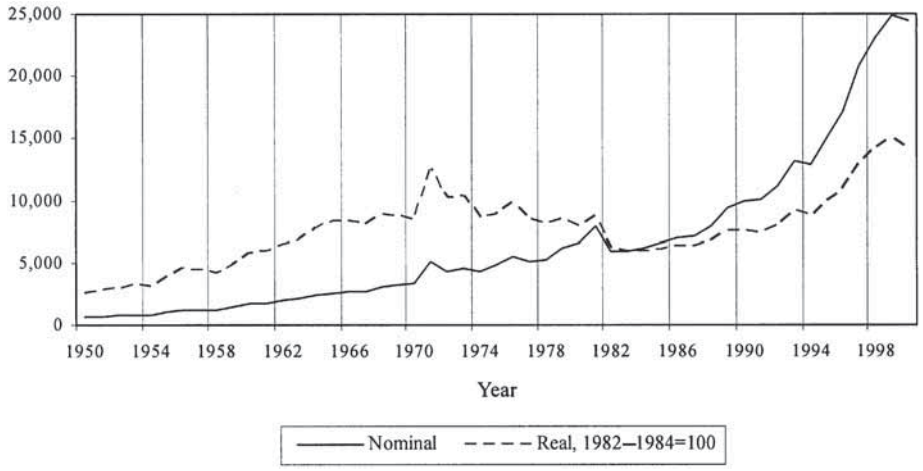
BACKGROUND

Federal estate tax revenues grew steadily in the post–war period. As shown in Figure 1 and Table 1, estate tax revenues grew from less than a billion dollars in 1950 to $25 billion in 2000.[8] Real tax revenues grew through the early 1970s, and precipitately declined in the following years. It was not until the late 1990s that the levels experienced in the early 1970s were attained. When stated relative to GDP in Figure 2 or relative to household net worth as in Figure 3, revenues grew over the years but never regained the peak collections of the late 1960s and early 1970s. On average, estate taxes represent one quarter of one percent of GDP, and less than one tenth of one percent of the Flow of Funds household wealth.

The spike in revenues observed in 1971 is noteworthy, and can be explained by a number of factors. First, the S&P index appreciated by some 18 percent over the previous year. Second, and perhaps even more importantly, the filing requirement of estate tax returns was shortened from 15 to 9 months. This invariably had the effect of accelerating revenues from the future into 1971.[9]

Examining the revenue streams depicted in Figures 1 through 3 is not directly helpful in gauging the effects of taxes on accumulated wealth. In particular, economic growth and the evolving structure of the estate tax make it rather difficult

Figure 1. Federal Estate Tax Revenues ($millions)



[8] Again, these actually refer to fiscal years 1951 and 2001. Tax collections usually lag liabilities, reflecting filing requirements. Estate tax collection data is obtained from the IRS *Annual Report of the Commissioner* (various years a) as well as the IRS *Data Book* (various years b).

[9] A third change, albeit with possibly modest effects, is that estates were made to choose to value assets at death or from six months from such date, down from one year. These changes were introduced by the Excise, Estate, and Gift Adjustment Act of 1970. The number of returns filed also dramatically increased; 131,870 returns were filed in fiscal year 1970, 149,432 in 1971, 192,833 in 1972, 201,975 in 1973, and 211,540 in 1974.

TABLE 1
ESTATE TAX REVENUES, 1950–2000

Year*	Nominal ($millions)	Real** ($millions)	Year*	Nominal ($millions)	Real** ($millions)
1950	616.8	2,559	1976	5,551.1	9,756
1951	735.4	2,829	1977	5,145.6	8,491
1952	774.3	2,922	1978	5,236.1	8,031
1953	862.2	3,229	1979	6,172.9	8,503
1954	836.2	3,109	1980	6,571.3	7,975
1955	1,047.6	3,909	1981	7,883.0	8,672
1956	1,240.1	4,559	1982	5,904.3	6,118
1957	1,259.1	4,481	1983	5,858.3	5,882
1958	1,215.8	4,207	1984	6,145.7	5,915
1959	1,418.9	4,876	1985	6,577.5	6,113
1960	1,725.1	5,828	1986	6,990.0	6,378
1961	1,777.0	5,943	1987	7,167.6	6,309
1962	1,951.2	6,461	1988	7,915.5	6,691
1963	2,088.7	6,826	1989	9,371.8	7,558
1964	2,424.8	7,822	1990	9,903.1	7,577
1965	2,619.0	8,314	1991	10,099.3	7,415
1966	2,692.2	8,309	1992	11,140.5	7,940
1967	2,679.3	8,022	1993	13,136.3	9,091
1968	3,097.6	8,901	1994	12,965.0	8,748
1969	3,205.2	8,734	1995	14,975.0	9,826
1970	3,303.4	8,514	1996	17,136.0	10,922
1971	5,072.6	12,525	1997	20,787.0	12,951
1972	4,280.1	10,239	1998	23,136.0	14,194
1973	4,594.2	10,347	1999	24,926.0	14,962
1974	4,235.6	8,591	2000	24,441.0	14,193
1975	4,784.3	8,893			

*Correspond to fiscal years 1951–2001, proxy for calendar year liabilities.
**Computed using CPI 82–84=100.
Source: Internal Revenue Service (various years a and b).

Figure 2. Estate Tax Revenues as Percent of GDP

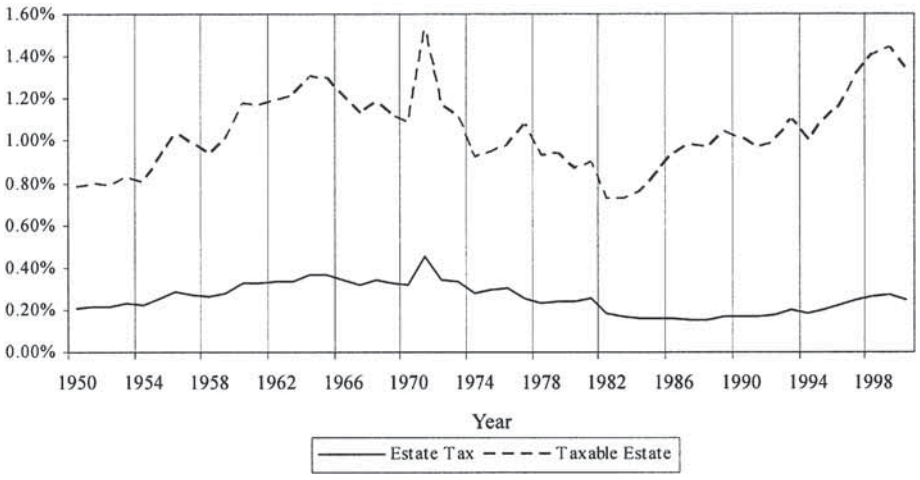
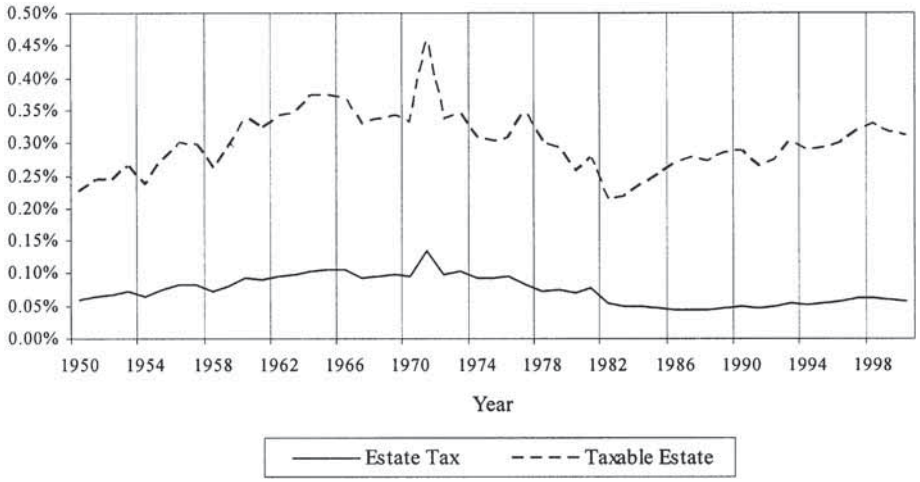


Figure 3. Estate Tax Revenues as Percent of Household Net Worth



to gauge such effects. While estate tax revenues grew 42 fold in this period, for instance, the S&P index grew even faster by 80 fold.

As for the estate tax structure, major changes took place in 1977, 1982 through 1987, and to a lesser extent in 1998 and beyond.[10] The size of exempted estate from estate taxation remained at $60,000 through 1976. The exemption was replaced by a tax credit, which effectively doubled the exemption in value in 1977, and greatly expanded it between 1982 and 1987 to $600,000. In real terms, however, the exemption fell in value in the early years, expanded from 1977 through 1987, and then fell again as shown in Figure 4. Other things equal, this had the effect of expanding the tax base in the earlier as well as later years.

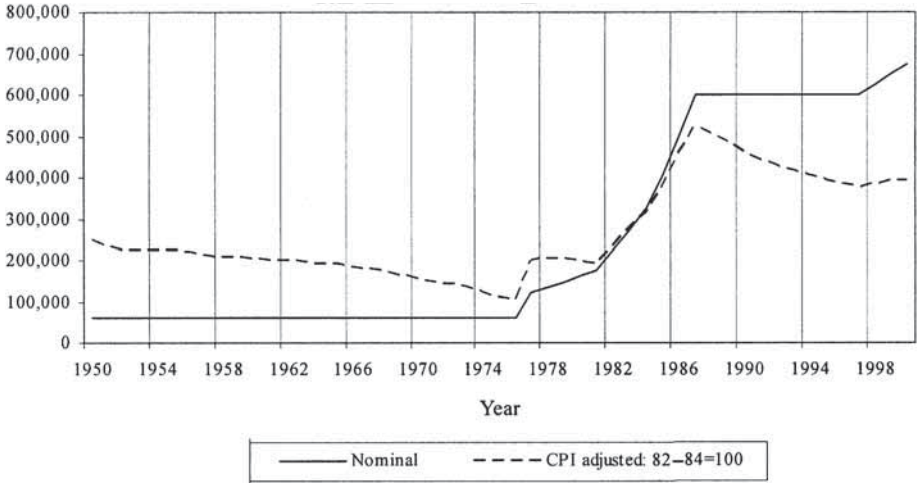
In the period under study, the maximum estate tax rate was reduced from 77 to 70 percent in 1977. It was further reduced to 55 percent, but leaving much of the schedule for lower brackets intact. The expansion of the size of exempted estates, however, effectively reduced the marginal tax rates in the lowest brackets to zero. The rate schedule for credit for state death taxes remained unchanged.

Another significant tax reduction took place in 1982, when spousal transfers became exempt from tax. Prior to 1982, the deduction for spousal bequests was limited to 50 percent of the estate as first introduced by the Revenue Act of 1948, and later modified to the greater of $250,000 and 50 percent between 1977 and 1981 by the Tax Reform Act of 1976. This change led to a surge in spousal bequests (Bernheim, 1987). But because spousal transfers may potentially enlarge the estate of the surviving spouse, they do not necessarily escape taxation.[11] This, at least in part, may explain the growth in revenues in the late 1980s and 1990s, reported in Figure 1, as more and more of the estates of surviving spouses became subject to the estate tax.

[10] These include the Tax Reform Act of 1976 (TRA76), the Economic Recovery and Tax Act of 1981 (ERTA81), and the Taxpayer Relief Act of 1997 (TRA97). Joulfaian (1998) provides a detailed description of the changes.

[11] Throughout this period, state Elder Laws, which dictate pre–set amounts or shares of estates to be set aside for the surviving spouse, were also changing, further confounding the measurement of the effects of estate taxation.

Figure 4. Estate Tax Exemption



The timing of the "recapture" of taxes on spousal bequests depends on the longevity of the surviving spouse. Table 2, which reports information on the mortality risk of surviving spouses, illustrates the potential pattern for the recapture of the expanded marital deduction. Assuming no change in the behavior of the surviving spouse, 4.2 percent of the transfers made in 1982 will be reported in the estate of the spouse in 1982, 6.3 percent in 1983, 6.4 percent in 1984, and so on. For transfers in 1983, the second year of the introduction of the unlimited marital deduction, the process repeats itself, and again in 1984 and so on. Again absent any change in behavior and in the values of assets transferred, m percent—the cumulated mortality risk—of past transfers will be recaptured in any given year. For widowed decedents in 1983, for instance, 10.5 percent of transfers will be recaptured—4.2 percent from transfers in 1983, and 6.3 percent from transfers in 1982. In 1984, this will rise to 16.9 percent, all the way up to 100 percent as illustrated in the last column of Table 2. Using the cumulated mortality rates across the years, m, and again holding constant behavioral changes on the part of the surviving spouse, the marital deduction rate in effect post 1981 becomes $0.5+0.5*(1 - m)$ when contrasted with the deduction rate in effect in 1981 and prior years. Figure 5 depicts the effective rate for the unlimited marital deduction pre and post ERTA81.

MODELING THE EFFECTS OF ESTATE TAXATION

Much of the wealth held by the very wealthy becomes subject to the estate tax at death. In many ways, the tax can be viewed as an excise tax on large bequests or future consumption. This tax, which applies once to accumulated savings, is not directly comparable to the income tax, which may apply annually to the return on saving. More specifically, the burden of the estate tax, unlike that of the income tax, may vary with the rate of return and the age of the bequest—motivated saver.

To facilitate comparisons, this "excise" tax on bequests can be restated as an equivalent income tax that applies to annual accruals of the return to saving.

TABLE 2
LIFE EXPECTANCY OF SURVIVING SPOUSES

Years*	Relative Frequency	Cumulative Relative Frequency
<1	0.042	0.042
1	0.063	0.105
2	0.064	0.169
3	0.054	0.223
4	0.066	0.289
5	0.059	0.348
6	0.054	0.402
7	0.058	0.459
8	0.047	0.506
9	0.033	0.539
10	0.034	0.573
11	0.031	0.604
12	0.026	0.630
13	0.027	0.656
14	0.025	0.681
15	0.025	0.706
16	0.022	0.729
17	0.020	0.748
18	0.021	0.770
19	0.016	0.785
20	0.016	0.802
21	0.013	0.815
22	0.017	0.832
23	0.019	0.851
24	0.012	0.863
25	0.014	0.877
26	0.015	0.892
27	0.010	0.903
28	0.013	0.916
29	0.007	0.923
30	0.013	0.936
30+	0.064	1.000

*Distance between deaths of first and second spouse.
Obtained from estate tax returns of decedents in 1995

Assume that the bequest motive is the sole purpose for saving, say, as in the joy of giving model of bequests. Then, a saver is indifferent between an estate tax that applies to bequests at death and a lifetime annual equivalent income tax on the return to accumulated wealth that leaves the size of transfers to the heirs unaltered.

Algebraically, with a marginal estate tax rate e, estate tax equivalent income tax rate τ, expected rate of return r, and life expectancy or holding period n, the estate equivalent income tax rate τ solves the equation:

$$[1] \quad E[(1+r)^n(1-e)] = E[(1+r(1-\tau))^n],$$

where E is the expectations operator, and r, e, and n are stochastic. Using expected rather than stochastic values for r, e, and n, [1] simplifies to:

$$[1'] \quad (1+r)^n(1-e) = [1+r(1-\tau)]^n.$$

An individual may save \$1 today and leave $(1+r)^n(1-e)$ to his heirs in period n. Under an equivalent income tax regime, the heirs receive $[1+r(1-\tau)]^n$. Equation [1′] yields an income tax rate τ of:

$$[2] \quad \tau = \frac{(1+r)-(1-r)(1-e)^{1/n}}{r}.$$

It follows then that, for a given estate tax rate, the equivalent income tax rate declines with life expectancy and the expected rate of return. Alternatively stated, older individuals face a higher equivalent income tax rate, while those expecting high rates of return face low tax rates.

Figure 6 illustrates the influence of age and rates of return on the measured equivalent income tax rate. Consider a male individual subject to an estate tax rate of 55 percent. For an individual age 21, with a rate of return of ten percent on assets and life expectancy of 54.6 years, the equivalent income tax rate on annual earnings is 16 percent. This declines to seven percent when a rate of return of 25 percent is expected. The respective tax rates become 68 and 31 percent in the case of a 71 year old with a much shorter life expectancy of 12.5 years. For older wealth holders, where life expectancies are short, the equivalent income tax rate is likely to exceed 100 percent as the estate tax applies to principle as well as the return to an asset.

In order to derive equivalent income tax rates, some measure of the rate of return expected over the remaining life expectancy is needed. In any given year, this measure is defined as the ten–year moving average rate of return to equity, measured as the growth rate of the S&P index. The

Figure 5. Marital Deduction

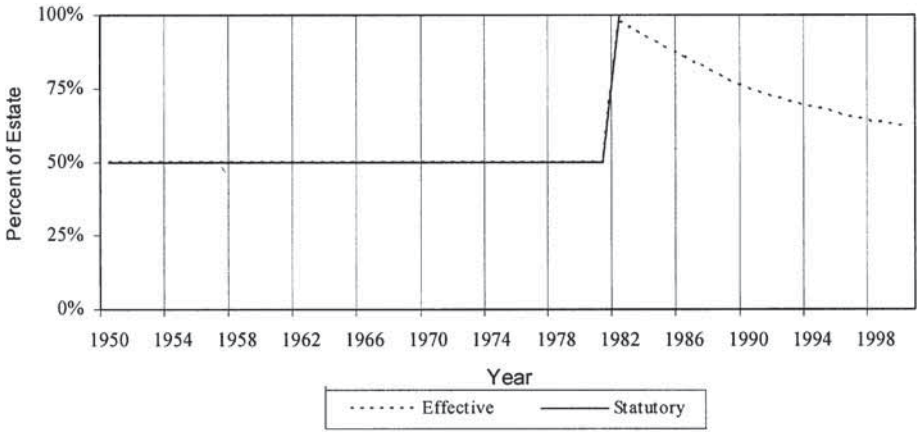
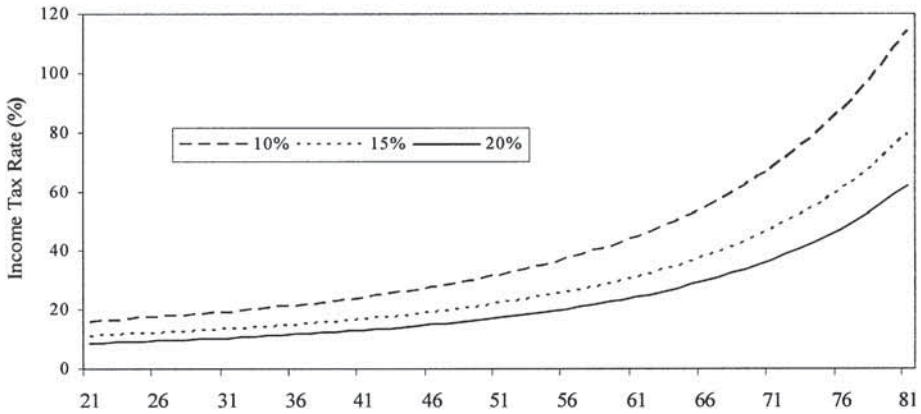


Figure 6. Estate Tax Equivalent Income Tax Rates (by Age and Rate of Return)



average rate of return is 8.4 percent (sd = 0.046), as reported in Table 3. In down markets, or when the expected rate of return is "too" low, investors are assumed to flee to the safety of cash (or its equivalent). Hence, the expected after–tax bond yield, also measured as a ten–year moving average, becomes a floor. This raises the average expected rate of return from 8.4 to to 9.4 percent (sd = 0.032).[12] Figure 7 plots this expected rate of return.

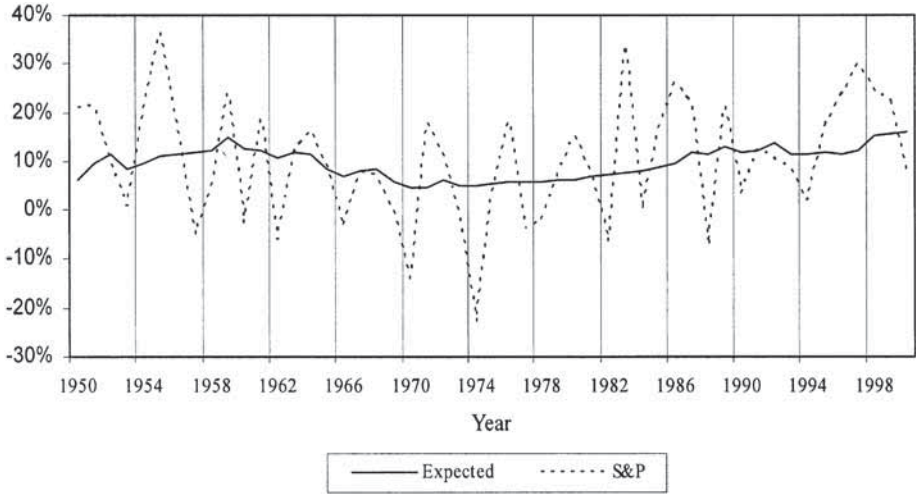
Identifying the tax regime in effect for estate planning purposes is critical. I start with a ten–year lag, but also consider a number of other lags as well. The taxable estate weighted age for decedents in 1998 was about 81.7 years. The life expectancy of each individual is determined using age

[12] The bond yield is proxied by the municipal bond yield. Much of the return on equity can be avoided by the step–up in basis at death. Replacing municipal bonds with taxable corporate bonds has little effect on the findings.

TABLE 3
DESCRIPTIVE STATISTICS

Variable	Mean	Std Dev	Min	Max
Year	1975	14.866	1950	2000
Estate Tax ($millions)	6,582	6,289	1,617	24,926
Real Estate Tax ($millions)	7,670	2,920	2,559	14,962
Taxable Estates ($millions)	32,339	35,495	2,293	133,437
Real Taxable Estates ($millions)	33,568	16,815	9,514	80,094
Percent of GDP (%)	1.042	0.189	0.722	1.530
Percent of Household Net Worth (%)	0.300	0.046	0.215	0.458
Marginal Estate Tax Rate	0.391	0.030	0.315	0.454
Net Average Estate Tax Rate	0.245	0.050	0.154	0.312
Equivalent Income Tax Rate	0.316	0.128	0.175	0.588
Exemption Amount	247,729	242,864	60,000	675,000
Real Exemption	267,798	116,638	105,448	528,169
Marital Deduction	0.596	0.144	0.500	0.979
S&P Index	237	319	18	1,427
S&P Moving Average Growth Rate t–10	0.084	0.046	0.005	0.159
Expected Rate of Return t–10	0.096	0.032	0.045	0.159
Real GDP ($billions)	4,831	2,277	1,777	9,817
Household Net Worth ($billions)	10,960	11,616	1,017	42,332
Inequality Measure	0.068	0.019	0.051	0.120
CPI	86.88	49.03	29.60	172.20

Figure 7. Rates of Return



and gender reported on the estate tax return. Life expectancy, also weighted by the size of taxable estates, but evaluated at ten years before death, is 15 years.[13] Thus, the equivalent income tax rate in equation [2] is derived using $n = 15$. Given that the wealthy experience lower mortality rates than those of the general population (Poterba, 2001),[14] as well as the five–year differential above, the life expectancy is more likely to be closer to 20 years. Hence, a tax rate computed using $n = 20$ is also considered.

[13] This is computed using the general population life expectancy. See http://www.cdc.gov/nchs/data/nvsr/nvsr52/nvsr52_14.pdf.

[14] For mortality rates of annuitants, which are much lower than those of the general population, see http://library.soa.org:8080/xtbml/tableList.zip.

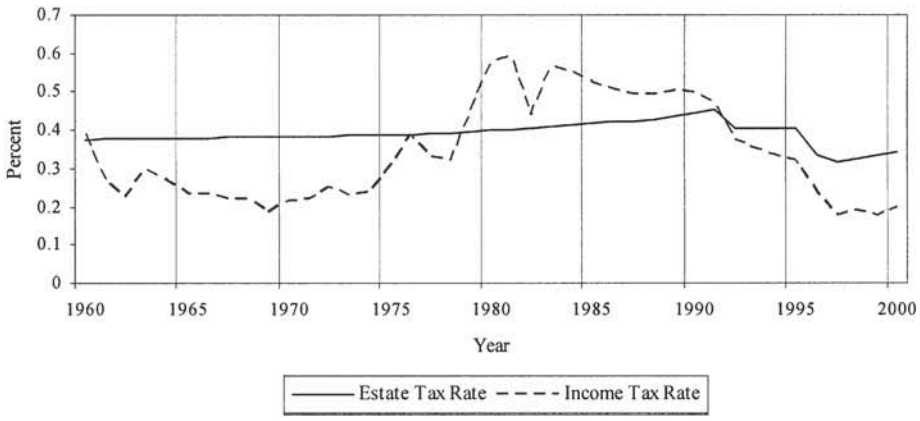
To generate the income tax rates, I first derive a representative measure of the estate tax rate. Using a sample of estate tax returns for decedents in 1998, the average and marginal tax rates are computed at laws and real levels for the years 1950 through 2000. Wealth and estate expenses are adjusted for inflation and the law in effect each year is simulated. The average tax rate is computed as the tax liability, net of the credit for state death taxes, divided by total taxable estates. Marginal tax rates are computed by adding $1,000 to the estate, and computing the change in tax liability before the credit for state death taxes.[15] The marginal tax rate for each estate is then weighted using its share of total taxable estates. Figure 8 plots the expected estate tax rates at period t–10, along with the derived measures of the expected equivalent income tax rates, using the rates of return in Figure 7.

EMPIRICAL FINDINGS

To gauge the effects of estate taxation, I employ data on federal government estate tax collections for the fiscal years 1951 through 2001. These years correspond to transfers or tax liability in calendar years 1950 through 2000. This stream of revenues is converted to taxable estates, a rough measure of intergenerational transfers, by dividing by the computed average tax rate. The resulting measure of taxable estates is then divided by the Flow of Funds household net worth, and represented by the dashed line in Figure 3. The pattern that emerges is similar to that observed for the ratio of estate taxes to net worth—the solid line in Figure 3; revenues grow through the late sixties, spike in 1971, and spiral downward afterwards.

To gain insights into the pattern observed in Figure 3, I regress the wealth share of taxable estates on the equivalent income tax rate as defined in [2]. This tax rate is computed using the derived wealth–invariant marginal estate tax rate, and reflects fully phased–in law. In other words, for estates in 1981 through 1983, it is the marginal estate tax rate schedule in 1985 stipulated in ERTA81 that matters.[16]

Figure 8. Expected Estate and Equivalent Income Tax Rates (Expected at t–10)



[15] The average (and marginal) tax rate was 0.55 in 2000 for very large estates. But because the federal tax provides a state death tax credit of up to 16 percent of the taxable estates, these estates paid about 39 percent of the taxable estate in federal taxes.

[16] ERTA81 phased in estate tax rate reductions from a maximum of 70 percent in 1981, to 65 percent in 1982, 60 percent in 1983, 55 percent in 1984, and 50 percent in 1985 and thereafter. Legislation enacted in 1984 froze the rate at 55 percent.

Also included are a number of control variables. The latter include the real size of the exempted estate. Expansions in the exemption amount, which reflects the filing threshold, should reduce the size of the dependent variable. I also control for the amount of spousal bequests accorded a marital deduction, measured as a fraction of the estate. The greater the fraction of the estate allowed as a marital deduction, the smaller is our dependent variable, an effect that declines over time as more of past transfers are recaptured in the estates of widowed decedents. The effects of the marital deduction on the estates of the surviving spouses have generally been ignored in all studies using longitudinal estate tax data.

Other variables include the S&P index to control for stock market appreciation. This index also controls for the effects of corporate and personal capital gains taxes in as far as they affect the return to holding corporate equity. A ten–year lag in the index is also considered as in KS. Given the spike in revenues in 1971, a dummy equal to one is also considered for that year. Table 3 provides descriptive statistics.

The regression estimates are reported in Table 4. Beginning with the equivalent income tax rate, lagged ten years, the estimated coefficient is –0.060, with a standard error of 0.029. It implies an elasticity of –0.0945 for the taxable estate with respect to the estate tax rate, and suggests that bequests are smaller by almost ten percent in the presence of the estate tax.[17]

Surprisingly, the sign on the size of exempted estate is positive rather than the expected negative, with an estimated coefficient of 0.18 (se = 0.06).[18] The marital deduction enters with the expected negative sign with an estimate of –0.14 (se = 0.03), highlighting its adverse effects on the reported taxable estates. Both the log of real S&P index and its ten–year lag enter with positive coefficients as the value of the index is reflected in the corporate equity held in the estates.

A measure of income inequality—which is defined as the share of the top one percent of wage earners—is also considered.[19] This is introduced to capture any underlying trends in income inequality, and enters with a ten–year lag to avoid endogeneity. The estimated coefficient is not significantly different from zero.[20] Trend, or year, enters with a negative and significant coefficient. In contrast, and not surprisingly, the coefficient on a dummy indicator for 1971 is positive and highly significant.

The estimated coefficient on the equivalent income tax rate becomes smaller in absolute value, but remains significant when a life expectancy of 20 instead of 15 is employed (not reported). The coefficient is estimated at –0.079 (se = 0.039), but the implied elasticity with respect to the estate tax rate remains unchanged at –0.0941. However, the estimates lose precision when shorter lags are employed. In the case of a five–year lag, for instance, the coefficient becomes –0.012 (se = 0.012).[21]

[17] Using (2), the elasticity is computed as:

$$-0.06\frac{(1-e)^{1/n-1}(1+r)}{nr}\frac{1}{\omega}e,$$

where ω is the inverse of the wealth share, and all variables are evaluated at their mean values.

[18] However, the coefficient becomes –0.167 (se = 0.051) when all the other regressors are omitted.

[19] This is obtained from http://www.nber.org/data–appendix/w8467/, Figure 15; 1999 and 2000 are linearly extrapolated from earlier years.

[20] The coefficient becomes negative and significant when the trend or year variable is eliminated.

[21] The expected rate of return is calculated using five–year moving average, and five–year life expectancy. The estimated coefficient also loses precision when the equivalent income tax rate is derived using the return on equity only or when a portfolio of equity and bonds (three to one ratio) is considered.

TABLE 4
THE DETERMINANTS OF THE RATIO OF TAXABLE ESTATES TO HOUSEHOLD WEALTH
(Standard errors reported in parentheses)

	Taxable Estate / Net Worth			*ln* Estate Tax[a]
Variable	(1)	(2)	(3)	(4)
Intercept	0.185**	–0.038	0.013	8.423*
	(0.108)	(0.157)	(0.117)	(0.630)
Estate Tax Rate	—	—	0.049	0.377
	—	—	(0.178)	(0.371)
Estate Tax Rate$_{t-10}$	—	0.106	—	—
	—	(0.191)	—	—
Equivalent Income Tax Rate$_{t-10}$	–0.060*	—	—	—
	(0.029)	—	—	—
ln (Real Exemption)	—	—	—	–0.183*
	—	—	—	(0.041)
Real Exemption 10^{-6}	0.179*	0.143*	0.169*	—
	(0.059)	(0.065)	(0.085)	—
Marital Deduction (%)	–0.143*	–0.148*	–0.148*	–0.629*
	(0.025)	(0.027)	(0.027)	(0.061)
ln Real S&P Index	0.027**	0.050*	0.050*	0.371*
	(0.016)	(0.013)	(0.014)	(0.036)
ln Real S&P Index$_{t-10}$	0.023*	0.031*	0.028	0.159*
	(0.014)	(0.06)	(0.015)	(0.039)
Inequality Measure$_{t-10}$	0.160	0.429	0.072	–1.835
	(0.638)	(0.829)	(0.750)	(2.049)
Time	–0.003*	–0.003*	–0.003*	0.012
	(0.001)	(0.001)	(0.001)	(0.002)
Dummy 1971	0.120*	0.121*	0.122*	0.310*
	(0.015)	(0.015)	(0.015)	(0.042)
Adjusted R^2	0.908	0.897	0.897	0.981
Observations	41	41	41	41
Elasticity wrt estate tax rate	–0.094	0.134	0.062	—

*Significant at the 5% level.
**Significant at the 10% level.
[a]Estimates corrected for autocorrelation with AR(2).

The estimates change considerably when the equivalent income tax rate is replaced directly with the estate tax rate. The coefficient on the tax rate lagged ten years is now positive but not precisely measured, with an estimate of 0.11 (se = 0.19). In contrast, the estimates on the coefficients for the control variables change very little. The coefficient on the real exemption is slightly smaller (0.14 with se = 0.7), while that on the real S&P index is larger (0.05 with se = 0.01). The coefficient on the inequality measure is also larger, but again not precisely measured (0.43 with se = 0.83).

Next, the estate tax rate with a 10–year lag is replaced with its contemporaneous value. The estimated coefficients on all the regressors virtually remain unaffected by this change. The estimated coefficient on the tax rate is smaller, but continues to be measured imprecisely (0.05 with se = 0.18). Similarly, the coefficient on the inequality measure is smaller, but also

not significantly different from zero (0.07 with se = 0.75).

Virtually identical estimates are obtained when the contemporaneous tax rate is added to the regressors in column (2), using the ten–year lagged tax rates. Similarly, the estimated coefficient on the income tax rate is unaffected when column (1) is augmented with the contemporaneous estate tax rate. The coefficient remains at –0.060 (se = 0.030), while that on the contemporaneous tax rate is 0.055 (se = 0.170). The estimates also change very little when column (1) is augmented with both the contemporaneous and the ten–year lagged estate tax rates. The coefficient is now estimated at –0.068 (se = 0.03), with estimated coefficients of 0.219 (se = 0.206) and 0.307 (se = 0.225) for the contemporaneous and ten–year lagged estate tax rates, respectively.

Moving to a specification similar, at least in spirit, to that of CHS, the estimates in column (4) replicate those of column (3), but using the log of real estate tax revenues as the dependent variable. Here the estimated coefficient on the estate tax rate is positive, but not precisely measured. This is in sharp contrast to the sizeable negative coefficient reported in CHS. Note, however, that a positive coefficient does not necessarily mean that the estate tax does not affect the reported size of taxable estates. But given the nonlinear structure of the tax schedule, an elasticity measure is difficult to derive.

The estimated effect of the income tax reported in column [1] of Table 4 is somewhat sensitive to the period under study. The coefficient grows in size and significance, in absolute value, when some of the earlier years are dropped, but not so for the estate tax rate coefficients, which remain unaffected. In contrast, the estimate loses precision when the dependent variable in column (1) is not normalized by household wealth, and is defined as the log of real taxable estates (–0.087 with se = 0.112). Again, the coefficients in columns (2) and (3) remain unaffected.

CONCLUSION

This paper explores the effects of estate taxation on bequests using time series data on federal estate tax revenues over a period of 50 years. It derives an income tax equivalent measure of the estate tax rate, which allows for the effects of estate taxes to vary with the expected rate of return, and attempts to empirically gauge its effects.

Using the equivalent income tax rate, an elasticity of the taxable estate with respect to the estate tax rate of –0.094 is estimated. In other words, and with the usual caveats, taxable estates are ten percent smaller because of the estate tax. In contrast, no discernable effect is detected using the estate tax rate directly. The determination of long–run expectations on the rate of return on assets, however, remains a major source of uncertainty in modeling the effects of estate taxation.

As with much of the work on the taxable income elasticity, it is not clear whether the findings measure the effects on saving and wealth accumulation or reflect tax avoidance (Slemrod, 2001). As one example, minority discounts claimed on estate tax returns filed in 2001 reduce taxable estates by about three percent.[22] In the absence of the estate tax, there will no longer be a need to engage in estate planning and employ strategies designed to reduce the reported value of assets. Nevertheless, and as pointed out by Feldstein (1999), both types of response reflect a welfare cost of estate taxation.

[22] Also note that some of the reduction in taxable estates may be recaptured under the income tax. Inflated executor commissions paid to a relative, for instance, are taxed under the income tax as compensation. Similarly, undervaluation of estates may lead to greater capital–gains realizations by the heirs.

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INHERITANCE AND SAVING

David Joulfaian

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ABSTRACT

This paper explores the effects of inheritances on the saving of recipients. Information on inheritances and heirs is obtained from estate tax records of decedents which are linked to the income tax records of beneficiaries. The observed pattern of wealth mobility within two years of the receipt of inheritances and multivariate analyses show that wealth increases by less than the full amount of the inheritance received. Similarly, and consistent with previous findings, large inheritances are found to depress labor force participation.

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I. INTRODUCTION:

Whether inheritances influence the saving behavior of recipients has important implications for the debate on the contribution of bequests to accumulated wealth.[1] While there is little consensus on the estimated size of their contribution to wealth accumulation, the potential effects of inheritances on the consumption and labor supply of the heirs may in part determine the size of this contribution. Ignoring these potential effects may bias upward estimates of this contribution (Blinder, 1988). Indeed, while inheritances raise the recipients wealth, they may also reduce the heirs life-cycle saving and work effort.

Inheritances also have policy implications for the ongoing debate on the taxation of bequests. Ricardo (1821), for instance, hints that reductions in inheritances brought about by inheritance taxes do not affect the heir's savings.[2] Others, most notably Andrew Carnegie (1891/1962, p. 56), pointed to the deleterious effects on the heirs' labor supply.[3] The effects of inheritances on the recipient's behavior, however, have been the subject of very little empirical investigation.

[1] See Kotlikoff and Summers (1981, 1988), Modigliani (1998a, 1988b), Gale and Scholz (1994), and Brown and Weisbenner (2004).

[2] More specifically, and referring to inheritance taxes, Ricardo, in his Principles of Political Economy and Taxation (ch. 8), stated that "… such taxes fall on capital… If a legacy of £1,000 be subject to a tax of £100, the legatee considers his legacy as only £900 and feels no particular motive to save the £100 duty from his expenditure, and thus the capital of the country is diminished."

[3] Andrew Carnegie, a staunch supporter of progressive inheritance taxation, and one of the richest men of his times, argued at the turn of the twentieth century that "… The parent who leaves his son an enormous wealth generally deadens the talents and energies of the son, and tempts him to lead a less useful and worthy life than he otherwise would."

In generationally-linked families, where all generations are assumed to operate under a common intertemporal budget constraint, the timing of transfers should not have a material effect on the behavior of recipients.[4] However, the degree of uncertainty surrounding the size and timing of the receipt of inheritances may influence the pattern of life cycle saving (Weil, 1996). Even when fully anticipated, bequests may influence the pattern of consumption in the presence of precautionary saving and liquidity constraints.[5] Some households may not be able to borrow against and collateralize their future inheritances. Thus, the magnitude and sign of the effect of inheritances on saving remains an empirical question.

The potential effects of inheritances on the behavior of the recipients have only recently been addressed in the empirical literature. Labor supply effects of inheritances, for instance, have been addressed in Holtz-Eakin, et al. (1993) who examine labor force participation pre and post the receipt of inheritances. Using estate tax records, inheritances are found to depress participation. However, using data on the elderly, Holtz-Eakin, et al. (1999) find inheritances to have little effect on retirement decisions. Joulfaian and Wilhelm (1994), using PSID panel data, explore the effects of inheritances on the recipient's hours of work. They report inheritances to have a small effect on hours of work.[6]

Similarly, the effects on consumption of receiving bequests have been addressed in Joulfaian and Wilhelm (1994), Weil (1994), and more recently in Brown, Coile, Weisbenner (2004). Joulfaian and Wilhem (1994), using PSID data, examine the effects of inheritances on food consumption,

[4] See Barro (1974) and Bernheim (1987) for opposing views.

[5] See Carroll and Kimball (1996 and 2001), as well as Carroll (2001) for a general discussion.

the only consumption item captured in the PSID panel data. Inheritances are reported to have a small effect on consumption; consumption increases by $2-14 for every $10,000 in transfers received. Weil (1994), using pooled Consumer Expenditure Survey (CEX) data, explores the effects on consumption. Most recently, Brown et al. (2004) revisit the PSID data with its longer panel and broader consumption imputations, and report the receipt of inheritances to have a small effect on consumption.

In this paper I employ administrative records to explore the effects of inheritances. More specifically, I employ data on estate (inheritance) tax returns of donors linked to the income tax returns of recipients. From such administrative records, we are able to observe the circumstances of the heirs before and after the receipt of inheritances. From the income tax records, for instance, we observe pre and post-inheritance interest, dividends, and employment status. The findings suggest that wealth increases by only a fraction of the inheritances received, and imply a marginal propensity to consume (*mpc*) significantly higher than that predicted within the perfect foresight or consumption smoothing frameworks. These results also show labor force participation to decline with the size of inheritances.

The paper is organized as follows. Section II addresses modeling issues and describes the available administrative data. Section III summarizes the empirical findings. Basic statistics on the wealth mobility before and after the receipt of an inheritance are reported, followed by findings from multivariate analyses on reported wealth and labor force participation. A concluding comment is provided in Section IV.

[6] The effects on entrepreneurship are addressed in Holtz-Eakin, et al. (1994a, 1994b) and Blanchflower and Oswald (1998).

II. MODELING AND DATA ISSUES

To motivate the analysis, consider a household that lives for T periods and leaves no bequests. In each period t the household earns income y_t and consumes c_t. The household has initial wealth of zero, and receives inheritances B in period n. The household maximizes lifetime utility:

$$U(c)=\sum_{t=1}^{T}\beta^{t-1}u(c_t) \qquad (1)$$

where β is the household intertemporal discount rate. This lifetime utility is maximized subject to the constraint that the present discounted value of lifetime consumption ($c_1, \ldots, c_T$) equals the present value of lifetime earnings ($y_1, \ldots, y_T$) plus inheritance B, which is received in period $n<T$, or:

$$\sum_{t=1}^{T}\frac{c_t}{(1+r)^{t-1}}=\frac{B_n}{(1+r)^{n-1}}+\sum_{t=1}^{T}\frac{y_t}{(1+r)^{t-1}} \qquad (2)$$

Making the very simplifying assumption that $\beta=1/(1+r)$, then the special case Euler equation yields:

$$c_1=\ldots c_n=\ldots c_T \qquad (3)$$

Assuming earnings are exogenously predetermined, and the amount of inheritances is known with certainty (with no borrowing constraints), then inheritances are consumed over T periods,

and the timing of their receipt does not alter the consumption path. At the end of period *n*, wealth W is changed by the full amount of inheritance received. More specifically:

$$W_n = y_n + (1+r)W_{n-1} + B_n - c_n \qquad (4)$$

Given that earnings and consumption in period *t* are predetermined, then wealth *W* increases by the amount of inheritance *B*. Alternatively stated, the *mpc* of inherited wealth is about zero.

If inheritances are completely unanticipated, or that liquidity constraints are binding, then the consumption path becomes:

$$c_1 = \ldots = c_{n-1} < c_n = \ldots = c_T \qquad (5)$$

Here there is an abrupt shift in the consumption path, and inheritances, with appropriate discounting, are consumed uniformly over the periods *T-n*. At the end of period *n*, wealth increases by the amount of the inheritance less *B/(T-n)*, again assuming consumption smoothing. The *mpc* out of inherited wealth is *1/(T-n)>0*. This value, of course, will change once we let $\beta \neq 1/(1+r)$.

Of interest is how saving or wealth evolves in the aftermath of inheritance receipt. If $\partial W_t / \partial B_t = 1$, implying an *mpc* of zero as in (3), then inheritances are likely to have been fully anticipated and liquidity constraints may not be binding. If, on the other hand, $\partial W_t / \partial B_t < 1$, then wealth increases by less than the full amount of inheritances for an *mpc* greater than zero, as in (5). Of

course, if consumption smoothing does not explain consumer behavior (Carroll, 2001), the behavioral response may also vary, but either way, the effect of inheritances remains an empirical question.

The Data

I employ administrative data to explore how inheritances influence the saving behavior of recipients. The data consist of a sample of matched estate tax returns of donors and income tax returns of heirs. The starting point is a sample of estate tax returns for decedents in 1989, where the wealthy are over represented, linked to the income tax returns of heirs for the years before and after the receipt of an inheritance. More specifically, the income tax returns are for tax years 1988 through 1991.[7] From estate tax returns we obtain information on the amount of bequests to heirs. We also obtain information on lifetime gifts made by donors. Using beneficiary information reported on the estate tax return, more specifically social security numbers, the heirs' income tax returns are obtained. The latter provide information on the various sources of labor and capital income. The data is further augmented by age from social security records. In many ways this is similar to the data on 1982 decedents employed in Holtz-Eakin, et al. (1993, 1994a, 1994b) and Joulfaian and Wilhem (1994).

A number of observations are excluded from the sample. Heirs under the age of 21 or over the age of 59 in 1989, for instance, are excluded from the sample to control for the effects of normal

[7] Given delays in closing an estate, much of the inheritances are likely to have been received in late 1989 and 1990.

labor force entry and retirement decisions. Similarly, individuals with partnership income and losses are excluded from the sample.[8]

Administrative records such as income tax returns have many advantages over survey data. But their primary shortcoming is that consumption and wealth information are not reported on tax returns. What is available is information on the flow of income or return to such assets. Information is available on wages, self-employment income, interest, and dividends among others. As such, wealth is constructed as the capitalized value of interest and dividend income. Interest income is capitalized using interest rates of 0.0826 in 1988, and 0.0682 and 0.0826 for the years 1990 and 1991. Similarly, dividends are capitalized using dividend yields of 0.0364 in 1988 and 0.0361 and 0.0324 for 1990 and 1991.[9] Wealth is defined as the sum of these capitalized values. Because inheritances are stated in $1989, the wealth measures are also stated in $1989.

The resulting sample consists of 819 observations of matched estate and income tax returns pairing donors and heirs. Table 1 provides a summary of sample attributes. The mean pre-inheritance wealth is $171,500 (sd=649,300) compared to a post-inheritance wealth of $443,100 (sd=1,555,000), both measured in $1989. The average increase in wealth is $271,600 (sd=1,280,000), compared to a mean inheritance of $327,000 (sd=1,183,800). The unconditional mean earnings are $36,300 (sd=55,500) prior to receiving an inheritance compared to $34,000

[8] These are individuals who file Schedule E of the US income tax return. Holtz-Eakin et al (1994a) demonstrate the uniqueness of individuals with partnership income.

[9] Interest rates reflect the yield on 3-year Treasury bonds, while the dividend yield reflects the S&P dividend price ratio.

(sd=54,500) in the aftermath of an inheritance.[10] About 91 percent are in the labor force prior to the receipt of an inheritance, compared to 87 percent post-inheritance. The average age of the primary taxpayer is 38 years (sd=10), and about 44 percent of the recipients are married. The average number of dependents is 0.64 (sd=1.02).

Roughly a third of the observations received inheritances of less than $25,000. Another third received inheritances of between $25,000 and $150,000, and the remainder received transfers in excess of $150,000. For those in the lowest inheritance group, the mean pre- inheritance wealth is $67,200 (sd=165,700), compared to a post inheritance wealth of $131,600 (sd=466,200). The average wealth increase is $64,400 (sd=411,600), several times the mean inheritance of $9,400 (sd=5,000). The pre and post-inheritance mean earnings are $32,900 (sd=51,600) and $36,800 (sd=47,600), respectively.

Turning to the middle inheritance group, the mean pre-inheritance wealth is $165,500 (sd=929,100), compared to a post inheritance wealth of $317,500 (sd=1,401,900). The average wealth increase is $152,000 (sd=732,700), slightly over twice the average inheritance received of $71,700 (sd=37,300). The pre and post inheritance earnings are $34,500 (sd=43,400) and $30,000 (sd=34,700), respectively. The average age of recipients is 37.9 year (sd=10.32), about the same as the low inheritance group.

For the highest inheritance group, pre and post-inheritance wealth are $275,100 (sd=570,600) and $861,300 (sd=2,150,000), respectively. The average change in wealth is $586,200

[10] Earnings are defined as the sum of wages and net income (or loss) from proprietorships and farms, all stated in $1989.

(sd=1,995,900), much smaller than the mean inheritance received of $881,900 (sd=1,150,100). The pre and post- inheritance earnings are $41,300 (sd=68,300) and $35,500 (sd=73,500), respectively. This group is slightly older with mean age of 40.06 (sd=9.97).

III. EMPIRICAL FINDINGS

Basic Statistics

The figures reported in the last three columns of Table 1 show that the average change in wealth, relative to the size of inheritance received, declines with the size of the transfer. As noted earlier, the wealth increased by an average of $586,200 for the high inheritance group which received an average inheritance of $881,900, compared to the low inheritance group which received an average inheritance of $9,400 but experienced an average increase in wealth of $64,400. Similarly, we observe a reduction in the labor participation rate and a concomitant reduction in earnings, as we move from the low to the high inheritance group.

In order to further explore the effects of inheritance, next I examine the wealth mobility in the sample and contrast the observed pattern for the three inheritance groups. For each inheritance group in Table 1, the sample is divided into three wealth classes: (1) under $25,000 for the low wealth group, (2) $25,000 to $150,000, (3) and over $150,000 for the high wealth group. For period two, post-inheritance wealth is reduced by the amount of inheritance received to allow for intertemporal comparisons.

Table 2 reports transition matrices which summarize the wealth mobility in the sample for each of the three inheritance groups. The top panel, for instance, examines the mobility of those in the low inheritance group. Each row shows the number of observations in the pre and post-inheritance period for each wealth class. The cell in row one and column one shows that 122 individuals, with inheritance under $25,000, enjoyed the same wealth (under $25,000) in the two periods. Another 28, or 18 percent migrated to the next wealth class, and another 8 (five percent) moved to the wealthiest class. Of those in wealth class 2, i.e. the middle wealth group, 25 percent moved to the lower wealth category and another 16 percent moved up. Little mobility is observed in the third group; 96 percent remain in the top class.

Moving to the mid level inheritance group in the middle panel of Table 2, those receiving inheritances between $25,000 and $150,000, we observe a greater wealth mobility. The middle panel of Table 2 shows that only 86 percent (36 observations) of those in the wealthiest group maintained their position in the post-inheritance period. For those in the middle, only 40 percent (32 observations) maintained their position, with 31 percent moving down and 29 percent moving up.

The greatest mobility is observed for those in the high inheritance group and receiving over $150,000. The bottom panel of Table 2, shows that 79 percent (96 observations) of the least wealthy maintained their position over the two periods (those in row one column one). This is virtually identical to those in the top and middle panels. For those in the middle wealth category, 67 percent (45 observations) moved to the lower wealth class. Only 58 percent (52 observations) of the wealthiest group maintained its position, down from 86 and 96 percent in the middle and

top panels, respectively. Some 31 percent, or 28 observations, migrated to the least wealthy group, compared to the 3.85 percent (inheritance<$25,000) and 2.30 percent ($25,000≤inheritance≤$150,000) observed for the smaller inheritance groups.

Multivariate Analysis

The discussion surrounding Tables 1 and 2 suggests that large inheritances depress saving. To better gauge the effects of inheritances, next I employ multivariate analysis. Column 1 of Table 3 reports results from a simple regression of the change in pre and post-inheritance wealth on inheritance received.[11] The estimated coefficient on the latter is 0.79 with a standard error of 0.03. This suggests that wealth increases by only $0.79 for every dollar in inheritance received. Alternatively stated, individuals consume 21 percent of the inheritance received. With an adjusted R squared of 0.53, inheritances seem to explain quite a bit of the observed change in wealth.

Column 2 adds a number of control variables. These include demographic variables such as age, marital status, and number of dependents. They also include other variables, such as lagged wealth and an indicator for past lifetime gifts by the donor, to control for preferences for saving and inheritance expectations. With the expanded specification, the estimated coefficient on inheritances remains invariant to the addition of these control variables. The estimated coefficient becomes 0.77 (se=0.03) in column (2), virtually unchanged from the value reported in column (1). The estimated coefficient on lifetime gifts by the donor is negative but not precisely

[11] Unlike the definition employed in Table 2, wealth here is not reduced by inheritances.

measured. The coefficients on the quadratic age term are also not precisely measured. Neither are they jointly significant (χ^2 =1.1359 with 0.5667 significance). The coefficient on the number of dependents is negative and significant. On the other hand, the coefficient on being married is positive and significant. The adjusted R squared slightly increases from 0.527 to 0.553 when control variables are added. With the estimated coefficient on inheritance under one, these findings suggest that for every additional dollar of inheritance received, recipients consume more than $0.20.

Given that the sample over represents the wealthiest of estates, and, hence, recipients of large inheritances, columns (1) and (2) are re-estimated with the observations re-weighted to reflect the estate tax filing population. The revised estimates are reported in columns (3) and (4). Beginning with the simple regression of the change in wealth on the amount of inheritance received, the estimated coefficient declines to 0.60 (se=0.03), from the earlier estimate of 0.79 (se=0.03). The new estimated coefficient retains its value when the control variables are considered, with a value of 0.59 (se=0.03). The implied *mpc* from the weighted regressions is about 0.40.

The above results, particularly those in column (2), point to a potential difference in the change in wealth experienced by single and married households. To further gain insights into the behavior of married and single households, Table 3 is reproduced and the estimates separately reported in Tables 4A and 4B for each of the two groups. Beginning with singles in Table 4A, the estimated coefficients vary little between the two specifications; the implied *mpc* is about 0.30. The estimated coefficient in the linear regression is 0.6927 (se=0.0341). Adding the

control variables in column (2) has little effect, and the coefficient is estimated at 0.6836 (se=0.0336). Also weighting the sample to reflect the population filing estate tax returns has little effect on the estimates. Heirs seem to consume some 30 percent of the inherited wealth.

Moving to Table 4B, and using the un-weighted observations, inheritances seem to have little if any depressing effects on savings. Both columns (1) and (2) report estimated coefficients of slightly greater than one on the inheritance variable. However, when the sample is weighted to reflect the population filing estate tax returns, the estimated coefficients become much smaller; 0.46 (se=0.04) in column (3), and 0.48 (0.05) in column (4). The latter imply an *mpc* of about 0.50.

Labor Force Participation

Given the noisy measure of wealth employed in this paper, and its reliance on financial wealth, one may attribute the above findings to measurement error. As such, I also explore the effects on labor force participation as well, as earnings may not be exogenous to the receipt of inheritances. Here another limitation of the data is that only household and not individual earnings are observed. Thus, for married households we are unable to observe whether one or two are in the labor force. Thus, by necessity, the focus is on single household labor force participation.

Table 5 reports findings from Logit estimates for labor force participation for singles. Column (1) includes the effects of inheritances only. The estimated coefficient on the latter is -0.289 (se=0.10), and implies a marginal effect of -0.048 (se=0.017). In column (2) a number of control

variables are considered. These include lagged participation, lagged earnings, and demographic variables. The coefficient on inheritance becomes -0.310 (se=0.097), consistent with the findings in column 1; the marginal effect is -0.045 (se=0.015).[12] The coefficient on pre-inheritance participation is 2.141 (se=0.328) with marginal effect of 0.311 (0.051). Similarly, lagged earnings have a positive effect on participation with an estimated coefficient of 7.014 (se=3.6701). The coefficients on age, entered in quadratic form, are not significant. However, they are jointly significant (χ^2 =7.89 with 0.019 significance). The coefficients on both pre-inheritance wealth and the presence of indicator for lifetime gifts are negative, but imprecisely measured.[13]

When the observations are weighted, the estimated effects of inheritances change little as shown in column (3). The estimated coefficient on inheritances becomes -2.66 (se=0.85), with an estimated marginal effect of -0.035 (se=0.018).[14] An inheritance of $1 million, other things equal, reduces labor force participation by about 11 percent.

IV. CONCLUSION

This paper employed administrative records to explore the effects of inheritances on wealth accumulation. The findings suggest that the wealth of the recipient increases by less than the full

[12] Replacing the level of inheritance with its natural log yields a coefficient of -0.302 (se=0.065), with marginal effects of -0.048 (se=0.01), in column (1), and a coefficient of -0.251 (se=0.074), with marginal effects of -0.0359 (se=0.01), in column (2).

[13] The mean values for the regressors are: inheritance 0.3821 (sd=1.3745), age 36.98 (sd=10.80), lagged wealth 0.1896 (sd=0.8015), earnings 0.0206 (sd=0.0424), number of dependents 0.1725 (sd=0.5443), presence of lifetime gifts 0.3908, and percent employed in 1988 of 0.8603, and 0786 in 1991.

amount of the inheritance received. Basic statistics show that those with wealth over $150,000 are about 10 times more likely to experience a reduction in pre-inheritance wealth when they inherit more than $150,000 (mean $881,900) compared to inheriting less than $25,000 (mean ($9,400).

Multivariate analyses reinforce the observed pattern of wealth mobility for various inheritance sizes. Findings from such analyses show that on average, wealth increases by much less than the full inheritance received. Inheritances are also demonstrated to have labor supply effects.

The findings are subject to a number of limitations. The estimate of wealth may suffer from measurement error. Households may invest their wealth in assets that reflect different liquidity preferences and maturities. Thus it may not be appropriate to apply one rate of return to all recipients of interest (and dividend) income. Furthermore, the wealth measure includes only financial wealth, even though individuals may hold real estate, business interests, or other types of assets in their portfolios. However, findings on labor force participation are less susceptible to such measurement errors and provide further support to the above findings.

[14] The mean values for the weighted regressors are: inheritance 0.125 (sd=0.343), age 38.78 (sd=10.77), lagged wealth 0.058 (sd=0.223), earnings 0.022 (sd=0.045), number of dependents 0.095 (sd=0.346), presence of lifetime gifts 0.072, and percent employed in 1988 of 0.907, and 0.914 in 1991.

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Table 1

Descriptive Statistics for Select Variables
(Sample mean followed by the standard deviation in parentheses)

Variable	All	Inheritance < $25,000	$25,000≤ Inheritance ≤$150,000	Inheritance > $150,000
Age	38.4298 (10.3899)	37.2308 (10.7197)	37.9181 (10.3204)	40.0683 (9.9681)
1988 Wealth	0.1715 (0.6493)	0.0672 (0.1657)	0.1655 (0.9291)	0.2751 (0.5706)
1991 Wealth	0.4431 (1.5500)	0.1316 (0.4662)	0.3175 (1.4019)	0.8613 (2.1500)
Change in Wealth	0.2716 (1.2801)	0.0644 (0.4116)	0.1520 (0.7327)	0.5862 (1.9959)
Inheritance	0.3269 (1.1838)	0.0094 (0.0050)	0.0717 (0.0373)	0.8819 (1.1501)
1988 Earnings	0.0363 (0.0555)	0.0329 (0.0516)	0.0345 (0.0434)	0.0413 (0.0683)
1991 Earnings	0.0340 (0.0545)	0.0368 (0.0476)	0.0300 (0.0347)	0.0355 (0.0735)
Dummy Lifetime Gifts	0.3687	0.4115	0.3701	0.3273
In Labor Force in 1988	0.9096	0.9385	0.9075	0.8849
In Labor Force in 1991	0.8681	0.9192	0.8790	0.8094
Married	0.4408	0.4385	0.4342	0.4496
Dependents	0.6386 (1.0200)	0.6077 (0.9903)	0.6014 (0.9661)	0.7050 (1.0978)
Observations	819	260	281	278

Wealth, inheritance, and earnings, are stated in $1989 millions. Sample restricted to those age 21 to 59 in 1989.

Table 2

Wealth Mobility and Size of Inheritance
(Each cell contains number of observations, row percent and its standard deviation)

Year		1991		
Low Inheritance Group: Inheritance < $25,000				
1988	Wealth*	<$25,000	$25,000 ≤ ≤ $150,000	>$150,000
	<$25,000	122 0.7722 (0.0334)	28 0.1772 (0.0304)	8 0.0506 (0.0174)
	$25,000 ≤ ≤ $150,000	19 0.2500 (0.0497)	45 0.5921 (0.0564)	12 0.1579 (0.0418)
	>$150,000	1 0.0385 (0.0377)	-- -- --	25 0.9615 (0.0377)
Middle Inheritance Group: $25,000 ≤ Inheritance ≤ $150,000				
1988	Wealth*	<$25,000	$25,000 ≤ ≤ $150,000	>$150,000
	<$25,000	119 0.7484 (0.0344)	16 0.1006 (0.0239)	24 0.1509 (0.0284)
	$25,000 ≤ ≤ $150,000	25 0.3125 (0.0518)	32 0.4000 (0.0548)	23 0.2875 (0.0506)
	>$150,000	1 0.0230 (0.0231)	5 0.1190 (0.0500)	36 0.8571 (0.0540)
High Inheritance Group: Inheritance > $150,000				
1988	Wealth*	<$25,000	$25,000 ≤ ≤ $150,000	>$150,000
	<$25,000	96 0.7869 (0.0371)	10 0.082 (0.0248)	16 0.1311 (0.0306)
	$25,000 ≤ ≤ $150,000	45 0.6716 (0.0574)	8 0.1194 (0.0396)	14 0.2090 (0.0497)
	>$150,000	28 0.3146 (0.0492)	9 0.1011 (0.0320)	52 0.5843 (0.0522)

* Wealth is stated in $1989, and the 1991 level is reduced by inheritances in this table.

Table 3

Inheritance and Change in Wealth: OLS Estimates
(Standard Errors in Parentheses)

Variable	(1)	(2)	Weighted (3)	Weighted (4)
Intercept	0.0148 (0.0319)	0.0721 (0.4454)	0.0122 (0.0101)	-0.1451 (0.1484)
Inheritance	0.7855* (0.0260)	0.7738* (0.0257)	0.5967* (0.0295)	0.5856* (0.0304)
Lagged Wealth	-- --	0.2896* (0.0472)	-- --	0.2054* (0.0543)
Dummy Lifetime Gifts	-- --	-0.0255 (0.0633)	-- --	0.0015 (0.0303)
Age	-- --	-0.0028 (0.0235)	-- --	0.0106 (0.0077)
$Age^2 . 10^{-2}$	-- --	-0.0005 (0.0291)	-- --	-0.0150 (0.0094)
Dependents	-- --	-0.0902* (0.0363)	-- --	-0.0062 (0.0114)
Married	-- --	0.1778* (0.0718)	-- --	-0.0334 (0.0215)
R^2	0.5272	0.5480	0.3335	0.3478
Observations	819	819	819	819

Dependent variable is change in wealth between 1988 and 1991. Inheritance, wealth, and earnings, are in millions of $1989.

* Significant at the 5 percent level.

Table 4A

Inheritance and Change in Wealth: Estimates for Single Households
(Standard Errors in Parentheses)

Variable	(1)	(2)	Weighted (3)	Weighted (4)
Intercept	0.0225 (0.0486)	-0.1384 (0.6009)	0.0202 (0.0145)	0.0016 (0.1843)
Inheritance	0.6927 (0.0341)	0.6836* (0.0336)	0.7066* (0.0397)	0.6796* (0.0397)
Lagged Wealth	-- --	0.3110* (0.0580)	-- --	0.2854* (0.0605)
Dummy Lifetime Gifts	-- --	-0.0622 (0.0950)	-- --	0.0029 (0.0521)
Age	-- --	0.0139 (0.0323)	-- --	0.0028 (0.0098)
$Age^2 . 10^{-2}$	-- --	-0.0240 (0.0409)	-- --	-0.0058 (0.0122)
Dependents	-- --	-0.1708* (0.0868)	-- --	-0.0797* (0.0387)
R^2	0.4741	0.5028	0.4104	0.4467
Observations	458	458	458	458

Dependent variable is change in wealth between 1988 and 1991. Inheritance, wealth, and earnings, are in millions of $1989.

* Significant at the 5 percent level.

Table 4B

Inheritance and Change in Wealth: Estimates for Married Households
(Standard Errors in Parentheses)

Variable	(1)	(2)	Weighted (3)	Weighted (4)
Intercept	-0.0250 (0.0347)	0.1163 (0.6571)	0.0134 (0.0139)	-0.3067 (0.2490)
Inheritance	1.0777* (0.0378)	1.0638* (0.0384)	0.4616* (0.0428)	0.4781* (0.0465)
Lagged Wealth	-- --	0.1494 (0.0920)	-- --	-0.1386 (0.1181)
Dummy Lifetime Gifts	-- --	0.0312 (0.0712)	-- --	0.0055 (0.0367)
Age	-- --	-0.0073 (0.0335)	-- --	0.0163 (0.0128)
$Age^2 . 10^{-2}$	-- --	0.0109 (0.0400)	-- --	-0.0191 (0.0154)
Dependents	-- --	-0.0522 (0.0317)	-- --	-0.0051 (0.0125)
R^2	0.6929	0.6948	0.2427	0.239
Observations	361	361	361	361

Dependent variable is change in wealth between 1988 and 1991. Inheritance, wealth, and earnings, are in millions of $1989.

* Significant at the 5 percent level; ** at the 10 percent level.

Table 5

Inheritance and Labor Force Participation: Logit Estimates for Singles
(Standard Errors in Parentheses)

Variable	(1)	(2)	Marginal Effects	Weighted (3)	Marginal Effects
Intercept	1.4256* (0.1220)	3.0205 (1.8489)	0.4393 (0.2647)	17.2650* (6.8043)	0.2278* (0.0830)
Inheritance	-0.2887* (0.0996)	-0.3070* (0.0995)	-0.0446* (0.0147)	-2.6623* (0.8461)	-0.0351** (0.0184)
Lagged Participation	-- --	2.1414* (0.3282)	0.3114* (0.0508)	2.2999* (0.4957)	0.0303** (0.0172)
Lagged Earnings	-- --	7.0138** (3.6711)	1.0200** (0.5347)	62.8530* (19.5580)	0.8292* (0.4148)
Lagged Wealth	-- --	-0.1629 (0.1732)	-0.0237 (0.0252)	3.4014* (1.2927)	0.0449** (0.0252)
Dummy Lifetime Gifts	-- --	-0.2053 (0.2709)	-0.0298 (0.0393)	-0.2485 (0.8281)	-0.0033 (0.0111)
Age	-- --	-0.1558 (0.0955)	-0.0227 (0.0138)	-0.7398* (0.3006)	-0.0098* (0.0037)
$Age^2 . 10^{-2}$	-- --	0.1627 (0.1194)	0.0237 (0.0173)	0.7595* (0.3269)	0.0100* (0.0040)
Dependents	-- --	0.5398* (0.2373)	0.0336* (0.0138)	0.9839 (1.2401)	0.0130 (0.0169)
Log Likelihood	-231	-190		-75	
Observations	458	458		458	

Dependent variable is one when wages, proprietorship, and farm earnings in 1991 are ≠ 0, zero otherwise. Inheritance, wealth, and earnings are in millions of $1989.

* Significant at the 5 percent level; ** Significant at the 10 percent level.

BEYOND ANDREW CARNEGIE: USING A LINKED SAMPLE OF FEDERAL INCOME AND ESTATE TAX RETURNS TO EXAMINE THE EFFECTS OF BEQUESTS ON BENEFICIARY BEHAVIOR

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Key Words: non-response, stratified sample, post stratification, intergenerational transfers

The accumulation of wealth in America and the ways in which that wealth is transferred at death are sources of research and debate. In both 1988 and 1989, more than one-third of the 400 wealthiest Americans listed their primary source of wealth as inheritance, according to the widely reported annual studies of the wealthy by *Forbes* magazine. However, attention is often focused on who the wealthy are and how their wealth is taxed at death, with little regard to intergenerational transfers and their effects on beneficiaries.

The purpose of this paper is to shed light on transfers of wealth from affluent parents to their children at death and the ways by which those children are affected. To accomplish this research, estate tax data have been linked with income tax data to determine the effect that bequests have on child beneficiaries and their labor force participation, both before and after the bequest. In addition, the final section of this paper will include a comparison of the results in this paper to similar work presented in 1993.

Background

Since the wealthy are in a position to determine who will receive vast sums of money, attention is frequently, and rightly, paid to their philosophies or giving and its effects. Andrew Carnegie, one of the most well known American industrialists and philanthropists, addressed this topic in an essay published in 1891. He felt that "the parent who leaves his son enormous wealth generally deadens the talents and energies of the son, and tempts him to lead a less useful and less worthy life than he otherwise would…" (Carnegie, 1891/1962). In his book *The Gospel of Wealth*, Carnegie also stated that giving more to charity than to children was important for two reasons. First, it insured that children of the wealthy would use and develop their talents in the labor force. Second, in giving large amounts to entities other than their own children, Carnegie felt that the wealthy could produce "an ideal state in which the surplus wealth of the few will become, in the best sense, the property of many" (Carnegie, 1891/1962).

Carnegie was not alone in his convictions. A 1986 *Fortune* magazine article profiled many wealthy Americans and their thoughts on giving to children (Kirkland, 1986). Of the 30 multimillionaires surveyed by *Fortune*, six said that their children would be better off with minimal inheritances, and almost half planned to split their wealth equally between charitable organizations and heirs. Many wealthy individuals, including Warren Buffet, Gordon Moore, and Ross Perot, were in favor of both restricted inheritances to children and more wealth passed to charities.

Subsequent work has validated Carnegie's early hypothesis about the effects of parental bequests on children. One such paper by Holtz-Eakin, Joulfaian, and Rosen (1993) stated that there seemed to be an inverse relationship between the size of bequest and the labor force participation of the person receiving the bequest. If proven, this hypothesis could have great implications for tax policy regarding intergenerational transfers of wealth.

As research in this paper probes the issue of bequests and their effects, it is important to keep in mind possible intangible transfers from parent to child that are frequently hard to measure and could, in many cases, influence various factors. One type of possible transfer is "human wealth" (Brittain, 1973). Human wealth is derived from favorable educational and environmental opportunities, as well as "connections" due to family background and marriage. For example, wealthy parents who are successful at creating and maintaining businesses, managing financial assets, and fostering professional contacts are often in better positions to model ways of accumulating and managing wealth for their children.

Return Information

The research in this paper draws on information collected from two Federal tax returns. The Federal estate tax return, Form 706, is filed for estates of decedents whose total asset values meet or exceed the filing requirement in effect for the year of death. The executors of qualifying estates are required to file the Form 706 nine months after the decedents' date of death; however, a six-month extension approved by the IRS is common. These returns contain data about the decedent's wealth, as well as their beneficiaries and bequests. Next, the Federal individual income tax return, Form 1040, is filed annually for personal income received during a calendar year. These returns furnish filer information such as marital status, number of children, and source of income.

Data Description

The data in this paper are estimates based on a stratified random sample of Federal estate tax returns filed for the estates of decedents who died in 1988 and 1989 with gross estates of at least $600,000. Returns were chosen before audit examination and on a flow basis using a stratified random probability sampling method (Bernoulli sampling). Sample rates were preset based on a desired sample size and an estimate of the population. In the design there were three stratification variables: year of death, age at death, and size of gross estate. Design-based weights were computed for this sample by using the sample rates.

The next step in the formation of the data set was making the 1989 Collation Study[1]. The Collation Study is a sub-sample of the 1988 and 1989 estate tax data. The stratifiers for this collation study included size of gross estate and age. Also included in the study were estate tax decedents for whom the last four digits of their Social Security Number (SSN) corresponded to the one percent Social Security Administration Continuous Work History Sample. A total of 4,071 decedents were included in the Collation Study sample. As reported by these decedents, 21,699 beneficiaries received bequests of at least $5,000[2].

Once the beneficiaries of these sub-sampled estates were identified, they were linked, by SSN, to individual income tax data, for returns filed in two periods. The first period was the decedent's year of death, either 1988 or 1989, and the second period was three years after the decedent's year of death, either 1991 or 1992. Beneficiary income data for 1988 and 1989 came from the Internal Revenue Service (IRS) Returns Transaction File (RTF). These data were collected during the course of normal IRS processing for revenue purposes, and thus, only data necessary for tax administration purposes were collected. Income data for 1991 and 1992 were provided by the Statistics of Income Division (SOI) of the IRS; these data were collected for statistical purposes, such as estimating revenue and evaluating proposed tax law changes, making them more detailed than their RTF counterparts.

Form 1040 data for both periods were available for only 34.8 percent of all beneficiaries in the Collation Study sample. There are a number of possible reasons for this low linkage rate. First, some beneficiaries may have been children, too young to file a tax return. Second, to link the 1040 tax returns the beneficiary's Social Security Number was used, but not all estate tax returns listed SSN's for each beneficiary, especially for those beneficiaries who were not close relatives. Third, if a beneficiary did not receive a bequest outright, but rather through a trust, the executor may have listed the Entity Identification Number (EIN) assigned to the trust instead of the SSN. Careful examination of the linked and unlinked files revealed that linkage failure rates differed by relationship of the beneficiary to the decedent, size of the bequest, and age of the decedent.

In constructing the weights for the linked 1040 files, a base weight was first calculated from the original estimates of the estate tax decedent populations in 1988 and 1989. The second step was to use post-stratification to adjust the base weights for non-response or linkage failure. Since some of the beneficiaries may have been young and would not have filed an income tax return, it would not have been appropriate to include them in the population for calculating this adjustment. However, beneficiary age was not available for non-linked returns. Therefore, hotdeck imputation was used to assign ages to these beneficiaries (Hinkins and Scheuren, 1986). The non-response adjustments were then made to the base weights for the linked beneficiaries using data for beneficiaries age 15 and older, within cells based on the following characteristics: relationship to the decedent, bequest size, and age of decedent.

After final selection, decedent information was combined with beneficiary information to form a single record. The unweighted total of such records equaled 1,477. Estimates presented in this work reflect all bequests to children of this target population.

Beneficiaries

In order to isolate the children of wealthy decedents and to see their labor force participation, only beneficiaries from the 1989 Estate Collation Study that met the following criteria were used in this paper: (1) beneficiaries must have been children of the decedent, either by birth or adoption; (2) beneficiaries must have filed an individual income tax return in the year of their parent's death and three years after the year of death with at least one exemption in both years; (3) beneficiaries must have been 19-58 years old in the year of their parent's death; (4) the filing status of beneficiaries for income reporting purposes must not have changed between the year of their parent's death and three years after the year of death; (5) beneficiaries must not have been a beneficiary of multiple estates.

Using these five criteria and the two aforementioned time periods, the year of the decedent's death (period one: 1988 or 1989) and three years after the decedent's date of death (period two: 1991 or 1992), characteristics of the 62,205 beneficiaries who met the selection criteria were examined. First, there were more males in this selection of child beneficiaries than females, 58.8 percent to 41.2 percent. Moreover, more of the selected beneficiaries were single, 52.1 percent, while 47.9 percent were married. Since the majority of beneficiaries were single in both periods, it was not unexpected that 53 percent of returns included a single

income while 48 percent included dual incomes. The marital status of the beneficiaries was inferred by using the filing status recorded from each beneficiary's income tax return[3]. For instance, if a beneficiary on his or her return, marked married, filing jointly, or married but filing separately, they were listed as married for this study. If the beneficiary marked single, head of household, or widower, they were considered single for this study.

Working with period one (1988 or 1989), Figure 1 shows the total adjusted gross income or AGI for the beneficiaries who met the stated selection criteria. Adjusted gross income is the annual income of a person including income losses and or gains, as well as adjustments for retirement plan payments, alimony payments, and certain payments associated with being self-employed. Overall, as the AGI category increased, the number of beneficiaries decreased. The lowest AGI category, under $50,000, included 56.8 percent of the beneficiaries compared to the highest AGI category, $400,000 and above included only 2.2 percent of beneficiaries.

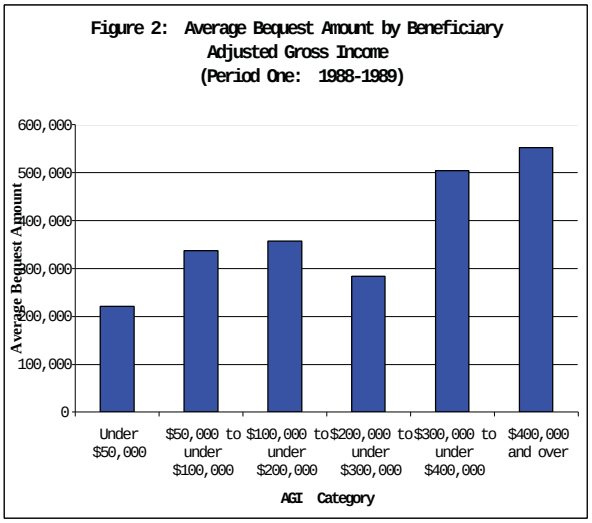
Figure 1: Adjusted Gross Income for Period One

AGI category	Number	Total AGI
Under $50,000	35,334	346,972,256
$50,000 to under $100,000	12,687	881,484,824
$100,000 to under $200,000	8,661	1,152,889,162
$200,000 to under $400,000	4,133	1,121,116,857
$400,000 and above	1,390	2,347,981,770
Total	62,205	5,850,444,869

It is also interesting to compare the beneficiaries' AGI with the size of the bequest received. The total AGI for these beneficiaries was almost $5.9 billion in period one (1988 or 1989) while the total amount bequeathed was almost $17.4 billion. Therefore, the total amount bequeathed was about three times the AGI of the beneficiaries. In addition, the average bequest amount increases as the AGI category increases (see Figure 2). For instance, the average bequest amount rises from the lowest value of just more than $200,000 for the under $50,000 AGI category, to the highest value of almost three times this amount, $550,000, for the $400,000 and over AGI category.

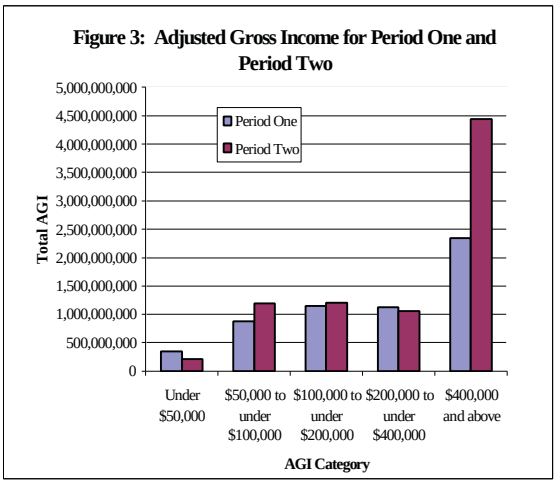
Effects of Bequests

To see how beneficiaries were affected by their bequests, analyzing changes in their AGI is necessary. Here, AGI in period one is compared to AGI three years after the decedent's death (period two). Comparing period one AGI and period two AGI, beneficiaries in the highest AGI category experienced an increase of about $2.1 billion between the periods



(see Figure 3). The second highest change between the two periods was for beneficiaries who had an AGI between $50,000 to under $100,000. This group of beneficiaries experienced approximately $300 million change in AGI.

The next characteristic examined in determining the effects of receiving a bequest was the beneficiaries' labor force participation. Building on the



strengths of these data and using a simple test design, entries on individual income tax returns for beneficiaries that directly reflected active participation in the labor force were identified. For this study, five separate entries on the individual income tax return were selected to infer labor force participation. To be classified as in the labor force, beneficiaries must have had an amount reported for at least one of these five income categories: (1) wages, salaries, and tips; (2) self-employment tax from Schedule SE; (3) non-passive partnership income from Schedule E; (4) gross receipts and other income from a sole proprietorship from

Schedule C; or (5) gross farming income from Schedule F. Labor force participation was determined for each beneficiary for both periods regardless of filing status, as long as the number of incomes reported did not change between periods. It is important to note that since these data were limited to information that was required on an individual income tax return, several items of interest could not be addressed. For instance, wage rate, number of hours worked, position held, and identity of workers (for joint returns) were not discernible[4].

Overall, a majority of all beneficiaries who were selected from the 1989 Collation Study were in the labor force during both periods. For period one, almost 92 percent of all beneficiaries were in the labor force. For period two, this percent decreased slightly to just under 86 percent. Again, beneficiary age was confined to 19-58 years, the primary working age for most adults.

When classified by beneficiary characteristics, the majority of beneficiaries who were selected from the 1989 Collation Study were in the labor force during both periods (see Figure 4). By sex, 91.9 percent of male beneficiaries were in the labor force during both periods, one and two, compared to 74.4 percent of female beneficiaries who were in the labor force during both periods. However, the percentage of female beneficiaries who exited the labor force by period two, 11.9 percent, was more than three times the percentage of male beneficiaries who left the labor force by period two, 3.8 percent. Similar in some aspects to the comparison of male and female beneficiaries, 96.1 percent of beneficiaries who filed dual income returns were in the labor force during both periods, while only 74.4 percent of those beneficiaries who filed a single income return were in the labor force during both periods. In addition, of those who exited the labor force by period two within this group of single or dual income filers, the percentage of beneficiaries who filed a single income return was over seven times the percentage of beneficiaries who filed dual income returns.

Figure 4: Labor Force Participation, by Period

Beneficiary group	Period			
	Period one: No Period two: No	Period one: No Period two: Yes	Period one: Yes Period two: No	Period one: Yes Period two: Yes
Males	2.8	1.5	3.8	91.9
Females	13.2	0.5	11.9	74.4
Single Income	12.5	1	12.1	74.3
Dual Income	1	1.2	1.7	96.1

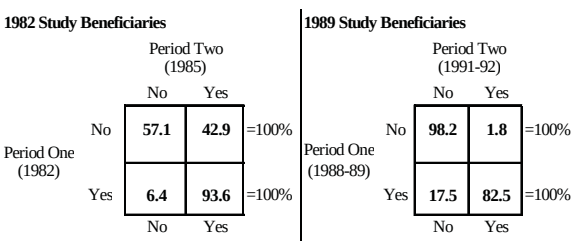
In order to provide a context for evaluating the data in this paper, the results from an earlier study of labor force participation were examined. The previous paper used 1982 Collation Study data to examine 1982 decedents and beneficiary labor force participation over two periods[5]. Period one was 1982 and period two was 1985. The main difference between the 1982 collation data and the 1989 collation data was the filing threshold amounts, $300,000 in 1982 and $600,000 in 1989. Both research identified beneficiaries from data reported on estate tax returns, restricted the research to beneficiaries who were between 19-58 years at the time of the decedent's death, and inferred labor force participation using individual income tax return data. In all, 4,332 observations were used in the paper that examined the 1982 Collation Study, and beneficiaries were not limited to children. However, these observations were not weighted, nor were they adjusted for non-response.

In order to compare trends between the 1982 and 1989 Collation Study data, the following two common criteria were established: (1) only single income returns were included, and (2) to be considered in the labor force, a reported amount for wages and salaries or sole proprietorship income was required[6]. In addition, beneficiaries of both studies were arranged into two groups according to the size of their bequests, $200,000 or less or more than $200,000, in constant 1989 dollars[7].

The two sets of boxes in Figures 5 and 6 represent the 1982 and 1989 Study beneficiaries and their labor force participation for period one and period two. The percent shown in each cell represents a beneficiary's period two work status given their period one work status. The percentages are read horizontally.

As a whole, beneficiaries whose bequest was $200,000 or less tended to stay in the labor force in period two if they were in the labor force in period one, and vice versa (see Figure 5). For instance, 57.1 percent of 1982 Study beneficiaries and 98.2 percent of 1989 Study beneficiaries started out and remained out of the work force during both periods. In contrast, for beneficiaries at this bequest level who were in the labor force in period one, 93.6 percent of 1982 Study beneficiaries and 82.5 percent of 1989 Study beneficiaries stayed in the labor force in period two. Of the remaining beneficiaries who were in the labor force during period one, 6.4 percent of 1982 Study beneficiaries and 17.5 percent of 1989 Study beneficiaries exited the labor force by period two.

Figure 5: Labor Force Participation Comparison, $200,000 or Less Bequest Level



Next, for beneficiaries whose bequest level was $200,000 or more, there were three notable items (see Figure 6). First, like the beneficiaries who received smaller bequests, labor force participation did not change after receiving a bequest for the majority of these beneficiaries. Second, the difference between the percentage of 1982 and 1989 Study beneficiaries in each labor force cell at the more than $200,000 bequest level was not as large compared to the difference between these groups at the lower bequest level. And third, for 1982 Study beneficiaries, the percentage who exited the labor force by period two after being in the labor force in period one was higher at this bequest level than at the $200,000 or less bequest level. However, for 1989 Study beneficiaries, the percentage who exited the labor force by period two after being in the labor force in period one was lower at this bequest level than at the $200,000 or less bequest level.

Figure 6 Labor Force Participation Comparison, More than $200,000 Bequest Level

1982 Study Beneficiaries

Period One (1982)	Period Two (1985) No	Period Two (1985) Yes	
No	84.1	15.9	=100%
Yes	18.1	81.9	=100%
	No	Yes	

1989 Study Beneficiaries

Period One (1988-89)	Period Two (1991-92) No	Period Two (1991-92) Yes	
No	88.3	11.7	=100%
Yes	13.7	86.3	=100%
	No	Yes	

Although additional study of beneficiaries at all bequest levels is needed, to gain a complete picture of behavior, particular interest is often expressed concerning beneficiaries who receive large bequests. With this in mind, beneficiaries who were selected from the 1989 Collation Study and who were bequeathed in excess of $1 million were examined. Unlike most of the beneficiaries discussed above, a majority, 66.7 percent, of those beneficiaries who were not in the labor force in period one entered the labor force in period two (see Figure 7). Only 33.3 percent of those beneficiaries who were not in the labor force in period one remained out of the labor force in period two. In contrast, of those beneficiaries who were in the labor force in period one, a majority, 88.8 percent, stayed in the labor force during both periods. Therefore, only 11.2 percent of beneficiaries who were in the labor force in period one exited before period two.

Conclusion

The unique data set used in this work has allowed some insight into the effects of bequests on labor force participation for a select group of beneficiaries. The results presented in this paper point to three conclusions. First, a majority of the beneficiaries examined were in the labor force during both periods. Second, beneficiaries who started in the

Figure 7: Labor Force Participation Comparison, Greater Than $1 million Bequest Level

Period One (1988-89)	Period Two (1991-92) No	Period Two (1991-92) Yes	
No	33.3	66.7	=100%
Yes	11.2	88.8	=100%
	No	Yes	

labor force tended to stay in the labor force, and beneficiaries who started out of the labor force tended to stay out of the labor force, regardless of bequest size. Finally, the results presented in this paper do not seem to support earlier findings, which concluded that labor force participation decreased as the bequest level increased.

While these findings may run contrary to expectations, it is important to remember that this research focused on a narrow group of beneficiaries whose parents' estates were required to file an estate tax return. In addition, it is important to consider that many factors may play a role in beneficiary labor force participation. For example, some beneficiaries may be aware of an inheritance and its relative size well in advance of its receipt and, therefore, adjust labor habits accordingly before the death of the donor. Moreover, some beneficiaries may have received gifts during the life of their donor that far exceeded the magnitude of testamentary bequests, thus reducing the effect of such bequests on labor habits. In addition, the size of a bequest may not provide enough wealth for a beneficiary to exit the labor force, given other factors, such as desired standards of living or responsibilities, including dependents. Finally, basic parental and societal norms and values may promote labor force participation in some capacity regardless of wealth.

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[1] The Estate Collation Study, as well as the sampling and weighting of Federal estate tax returns, is conducted by the Statistics of Income division (SOI) of the Internal Revenue Service (IRS).

[2] Existing tax law, as well as law in effect in 1988 and 1989, does not require the estate to report information for beneficiaries receiving bequests of less than $5,000.

[3] It was possible for a beneficiary to change his or her marital status between period one and period two. Since the number of incomes included on a return was the more important variable, marital status was allowed to vary for each period, if the number of incomes reported remained the same.

[4] While single income returns provide a clear picture of beneficiary labor participation, this was not true for dual income returns. Since identifying the number of workers or the transition of workers for dual income returns was not possible, beneficiaries may have left the labor force but still would have been coded as in the labor force if their spouse continued working.

[5] The 1982 and 1989 Estate Collation Studies share common data goals and data collection procedures. Both studies were conducted by SOI.

[6] Not all beneficiaries from the 1982 and 1989 Estate Collation Studies were used in this comparison. As stated before, each body of work selected beneficiaries from collation studies based on already-stated criteria.

[7] Constant dollar factors were calculated using the Gross Domestic Product Chain-Type Prince Index. The source for this index was the *Economic Report of the President 1998*, Table B-3.