Office of Tax Analysis
Technical Paper 7
June 2018

A Note on the Correlation between Income and Wealth for Taxable Estates

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A Note on the Correlation between Income and Wealth for Taxable Estates[1]

OTA Technical Paper

By Julie-Anne Cronin and John Eiler

Treasury's Office of Tax Analysis (OTA) includes all federal taxes in its distribution tables.[2] Most federal taxes are based on current income or current consumption and Treasury's distribution tables use current year cash income to rank families. The estate tax however is based on wealth which may be accumulated over many years. This paper explores to what extent distribution tables that rank families based on a single year's income properly rank the burden of a tax based on wealth.

We consider the 2011 estate tax, a year when only estates valued at more than $5 million were taxable. The high exemption level restricts estate tax burdens to families in the top 1% of the wealth distribution[3] but there are a few reasons why these families may not rank as highly in a distribution based on income: 1) The income measure used in Treasury distribution tables is from a single year whereas wealth may accrue over many years; 2) Treasury uses income in the year prior to death to estimate a decedent's family income and the year prior to death may be relatively low if income depends on the decedent's health and health is compromised in the year prior to death; and 3) Treasury's measure of income excludes accrued but unrealized income which may be a significant source of income for the very wealthy.[4]

To evaluate the relationship between income and wealth for high wealth decedents, we link taxable estate tax returns (estates valued at more than $5 million) for decedents who died in 2011 to the reported income of the decedent in the 14 years preceding death. The longer period allows us to consider more years of income, any one of which may contribute to the size of the estate in 2011, and to consider years in which the decedent was likely to be healthier than in the year prior to death. We find a correlation between income in the year prior to death and wealth at death but a higher correlation between income 5 years prior to death and wealth at death. We also find that the great majority (96 percent) of the 2011 estate tax burden is paid by decedents with at least one year of income over $500,000 (2010 income levels) in the 14 years prior to death and 86 percent of the 2011 estate tax burden is paid by decedents with at least one year of income over $1 million (2010 income levels) in 14 years prior to death.

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[1] Paper presented at
[2] See the Office of Tax Analysis, Department of the Treasury's Resource Center for current distribution tables. (https://www.treasury.gov/resource-center/tax-policy/Pages/Tax-Analysis-and-Research.aspx)
[3] Authors' calculations from the 2010 Survey of Consumer Finances. The cut off for being in the top 1 percent of the wealth distribution is approximately $7.3 million.
[4] Using data from estate tax returns filed in 2007 linked to income tax returns from 2002 to 2006, Bourne et. al.; https://www.irs.gov/pub/irs-soi/estatestaxbourne.pdf) find that the realized return for capital for estate tax files was typically less than 5 percent.

Estate Tax Law in Brief

In general, the estate tax is imposed on the fair market value of all assets owned by a decedent or in which the decedent had an interest at the date of death. The total value of these items is the gross estate. Certain deductions are then allowed to arrive at the taxable estate. Allowable deductions include mortgages and other debts, and the value of property passing to surviving spouses and qualified charities.[5] The taxable estate plus any taxable gifts made by the decedent after 1976 is then subject to an estate tax rate to arrive at the tentative estate tax. In 2011 the estate tax rate was 35 percent. The estate is then credited with any tax paid on taxable gifts and is allowed a unified credit. In 2011, the unified credit corresponded with an exemption level of $5 million.[6]

Methodology

We attempt to match all taxable estates for decedents who died in 2011 to individual income tax returns filed by those decedents (as either a primary or secondary filer) between 1997 and 2010. We drop any decedents for whom we cannot find a tax return in more than two years (less than one percent of all taxable estates). For decedents missing one or two years of income tax returns, we take an average income between the two missing years. For the remainder of the note, we refer only to the 4,138 decedents included in this study.

Only 16 percent of decedents in this study filed a joint income tax return (were married) in 2010. In contrast 58 percent filed a joint income tax return (were married) in 1997. This is not surprising since we are only including decedents with taxable estates and the estate tax allows for an unlimited spousal deduction. In our distributions that follow, we show tables and figures with and without an income adjustment for marital status. In the tables and figures with an adjustment ("A" tables and figures), income has been divided by 1.4 in the years during which the decedent was married. This is Treasury's standard family size adjustment for a 2 person family. It allows us to better rank families of different sizes in the same table by recognizing that larger families require more resources to achieve the same level of well-being but that families benefit from economies of scale.[7]

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[5] For a complete description of deductions and limitations for decedents dying in 2011 see Instructions for Internal Revenue Service Form 706 (Rev. August 2011), United States Estate Tax Return. (https://www.irs.gov/pub/irs-prior/i706--2011.pdf)

[6] Estate tax rates and exemptions have changed a number of times since 2000. The Economic Growth and Tax Relief Reconciliation Act of 2001 (EGTRRA) phased out the estate tax by gradually lowering the top estate tax rate from 55 percent in 2000 to 45 percent in 2009 and by gradually increasing the exemption amount from $500,000 in 2000 to $3.5 million dollars in 2009. EGTRRA repealed the estate tax effective for tax year 2010, and replaced the estate tax with carryover basis for high-wealth families. The Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 set an estate tax rate of 35 percent with a $5 million exemption (indexed for inflation). The Tax Cut and Jobs Act of 2017 doubled the estate tax exemption.

[7] Ranking families without adjusting for size implicitly assumes that families benefit from perfect returns to scale; a family of 5 is as well off as a family of 1 with the same level of income. Adjusting for size by dividing by the number of people in the family assumes there is no returns to scale from living within a family (see Cronin et. al. 2013 for further detail on Treasury's family size adjustments).

OTA's distribution tables use cash income to rank families. Cash income consists of AGI plus tax exempt interest, nontaxable fringe benefits (e.g. employer sponsored health insurance), and government transfers (e.g. nontaxable social security benefits and welfare payments). Employer contributions for payroll taxes and the federal corporate income tax are also added to place cash on a pre-tax basis. Many of these components require imputations. For this note, we use a narrower definition of income, AGI plus tax exempt interest. This definition will capture most of cash income for higher income taxpayers.

Neither cash income, nor our narrower definition of AGI plus tax exempt interest, will capture an economic or Haigs-Simons definition of income as current income plus changes in wealth. A Haig's Simons definition is particularly relevant for wealthy taxpayers since much of their economic income may be accrued but unrealized. To the extent that our narrower definition still ranks these families high in the income distribution (that is to the extent that it serves as a good proxy of the resources available to families with high accrued but unrealized income), the omission of accrued but unrealized income is less of a concern.

Results

Tables 1 and 2 (graphed in Figures 1 and 2) show results without an adjustment for the marital status of the decedent. The decedent is ranked by the AGI plus tax exempt interest of the return that they filed either as a single taxpayer or as a married taxpayer.

Tables 1A and 2A (graphed in Figures 1A and 2A) show the results with an adjustment for the marital status of the decedent in each year. In years in which the decedent was married, AGI plus tax exempt interest are divided by 1.4 to reflect the greater resources needed to make a family of 2 as well off as a family of 1.

Table 1 (Figure 1) shows the percentage distribution of taxable decedents (people) by income and year of all 2011 taxable decedents in each of the 14 years preceding death. Each year includes all 4,138 decedents and only the 4,138 decedents. The table reports the share of decedents in each income category for that year. All incomes are adjusted for inflation to 2010 income levels. In the year preceding death, 73 percent of the year 2011 decedents with taxable estates had reported income (AGI plus tax exempt interest) over $200,000, 31 percent had income over $500,000, and 16 percent had income over $1 million. Notably, 10 percent of decedents with taxable estates (wealth over $5 million) had reported income under $100,000 in the year prior to death. This may be surprising but is evidence that income and wealth are not perfectly correlated.

Five years prior to death (2006), income is generally higher for the 2011 decedents. This may be in part due to life-cycle issues or better health (more working decedents) but it is also likely due to the better economy in 2006. Eighty-seven percent of the 2011 decedents had income over $200,000 in 2006; 51 percent had income over $500,000, and 27 percent had income over $1 million. Just under 5 percent of the 2011 decedents had income under $100,000 in 2006.

Considering the entire time period, from 1997 to 2010, we find that over 97 percent of the 2011 decedents had at least one year of income over $200,000, 80 percent of decedents had at least

one year of income exceeding $500,000 and 57 percent of decedents had at least one year of income exceeding $1 million. Less than 1 percent (less than 40) decedents had income under $100,000 for every year between 1997 and 2010.

Table 2 (Figure 2) shows the percentage distribution of estate tax (dollars) by income and by year of the 2011 tax burden in each of the 14 years preceding death. Each year includes the total tax burden of $10.8 billion that was paid by the 4,138 taxable estates included in Table 1. As expected, we find the correlation between estate tax burden (amount paid) and income is even higher than the correlation between taxable decedents (counts) and income. Eighty-eight percent of the year 2011 estate tax burden was paid by decedents with reported income over $200,000 in 2010, 69 percent of the estate tax burden was paid by decedents with income over $500,000 in 2010, and 50 percent of the burden was paid by decedents with income over $1 million in 2010.

The most striking result is that 96 percent of the tax burden in 2011 was paid by estates whose decedent had at least one year of income over $500,000 in the preceding 14 years and 86 percent of the 2011 estate tax burden was paid by decedents with at least one year of income over $1 million in the preceding 14 years. Treasury's distribution tables rank families by their income in the year prior to death. As shown in Table 2, using income in the year prior to death underestimates the affluence of decedents relative to a measure based on income in earlier years or average income over a number of years.

Tables 1A and 2A (Figures 1A and 2A) show very similar results. Table 1A, reproduces Table 1, except that income has been reduced for years in which the decedent was married. Adjusting for marital status, in the year preceding death, 72 percent of the year 2011 decedents with taxable estates had reported income (AGI plus tax exempt interest) over $200,000, 30 percent had income over $500,000, and 14 percent had income over $1 million. Five years prior to death (2006), 85 percent of the same returns had income over $200,000; 47 percent had income over $500,000, and 24 percent had income over $1 million. Considering the entire time period, we find that 97 percent of decedents had at least one year of income over $200,000, 78 percent of decedents had at least one year of income exceeding $500,000 and 53 percent of decedents had at least one year of income exceeding $1 million.

Table 2A, reproduces Table 2, except that income has been reduced for years in which the decedent was married. Adjusting for marital status, 88 percent of the year 2011 estate tax burden was paid by decedents with reported income over $200,000 in 2010, 68 percent of the estate tax burden was paid by decedents with income over $500,000 in 2010, and 49 percent of the burden was paid by decedents with income over $1 million in 2010. The most striking result is that 95 percent of the tax burden in 2011 was paid by estates whose decedent had at least one year of income over $500,000 in the preceding 14 years and 84 percent of the 2011 estate tax burden was paid by decedents with at least one year of income over $1 million in the preceding 14 years.

Conclusion

Treasury distribution tables show the distribution of income and federal tax burdens. All Federal taxes are included in Treasury analyses: individual income taxes, corporate income taxes, payroll taxes, excise taxes, customs duties and estate and gift taxes. Treasury includes all Federal taxes

in order to present a comprehensive estimate of the total federal tax burden. Treasury's measure of ability to pay is based on current year cash income. Most Federal taxes are based on current year cash income so ranking families by current year cash income is the appropriate measure of ability to pay for most taxes. Estate taxes are the exception.

Estate tax liabilities are determined by a taxpayer's wealth, much of which may be attributable to income accumulated over many years. Treasury distribution analysis uses cash income in the year prior to death to estimate an estate taxpayer's current year cash income. But is cash income in the year prior to death a good proxy for the ability to pay estate taxes? All of the taxable estates in this study had estates in excess of $5 million. Arguably with the first $5 million of estate tax exempt, these taxpayers have significant resources but in the year prior to death only 73 percent had income over $200,000. In comparison, 97 percent had at least one year of income over $200,000, 81 percent had at least one year of income over $500,000, and 57 percent had at least one year of income over $1 million in the 14 years prior to death. We conclude that using cash income in the year prior to death may somewhat understate a decedent's ability to pay estate taxes. Although the ranking of estate tax liabilities may be imperfect, it is still estimated to be a highly progressive tax and one that should be included in the analysis of federal tax burdens.

Table 1: Percent Distribution of 2011 Taxable Decedents by Decedent Income by Year (2010 income levels)

(Total Number of 2011 Taxable Decedents is 4,138)

AGI plus Tax Exempt Interest	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	High Year
Negative	2.0	1.8	2.0	1.5	1.9	2.2	2.3	2.4	1.6	1.4	1.1	1.9	2.8	2.7	0.1
$0 to $50,000	2.3	2.2	1.8	1.8	1.9	2.3	2.6	2.0	1.8	1.4	1.2	1.4	2.0	3.5	0.1
$50,000 to $100,000	3.0	2.8	2.9	2.4	2.8	3.8	3.4	3.1	2.9	1.8	1.8	2.4	4.6	4.0	0.4
$100,000 to $200,000	10.0	9.1	8.3	8.7	10.7	13.3	13.8	12.4	11.2	8.8	7.1	12.5	18.7	17.0	2.1
$200,000 to $500,000	31.7	32.6	32.3	31.0	36.4	37.1	37.1	36.5	36.1	35.7	36.0	41.7	41.0	41.0	16.2
$500,000 to $1 million	23.9	23.7	24.7	25.3	23.6	22.0	20.8	21.0	21.6	23.3	25.0	20.5	16.3	16.6	24.0
$1 million to $5 million	22.6	23.1	23.0	24.4	19.0	16.5	17.0	18.5	20.3	22.6	22.1	16.0	12.7	12.6	41.7
Over $5 million	4.5	4.7	5.0	4.9	3.6	2.8	3.0	4.1	4.5	4.9	5.6	3.6	2.0	2.6	15.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 2: Percent Distribution of 2011 Estate Tax Burden by Decedent Income by Year (2010 income levels)

(Total 2011 Estate Tax Burden is $10.8 billion)

AGI plus Tax Exempt Interest	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	High Year
Negative	2.8	2.0	1.8	1.3	1.5	2.9	3.4	2.6	2.0	1.6	1.5	2.9	3.1	3.6	0.1
$0 to $50,000	1.1	1.0	0.8	1.0	0.8	0.9	0.8	0.6	0.6	0.3	0.2	0.3	0.6	2.3	0.0
$50,000 to $100,000	1.1	0.8	1.1	0.9	0.9	1.3	1.0	1.1	0.7	0.3	0.3	0.5	1.2	1.1	0.1
$100,000 to $200,000	2.8	2.5	2.4	2.2	2.7	4.1	3.7	3.3	2.6	2.0	1.5	3.1	4.6	4.7	0.3
$200,000 to $500,000	13.0	13.1	12.6	11.4	14.9	15.7	16.5	14.9	13.8	12.6	11.9	16.6	20.1	18.9	3.8
$500,000 to $1 million	16.8	17.1	17.3	17.9	19.7	20.0	17.8	17.0	17.5	16.4	17.5	18.8	18.2	19.1	9.8
$1 million to $5 million	36.8	37.4	36.9	38.3	35.1	33.2	32.3	33.4	35.5	37.7	36.0	33.1	33.6	28.1	36.4
Over $5 million	25.8	26.1	27.1	27.1	24.5	21.8	24.4	27.0	27.3	29.1	31.1	24.7	18.5	22.2	49.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 1A: Percent Distribution of 2011 Taxable Decedents by Decedent Income by Year (2010 income levels)

(Total Number of 2011 Taxable Decedents is 4,138)

AGI plus Tax Exempt Interest Adjusted for Marital Status	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	High Year
Negative	2.0	1.8	2.0	1.5	1.9	2.2	2.3	2.4	1.6	1.4	1.1	1.9	2.8	2.7	0.1
$0 to $50,000	2.5	2.5	2.1	2.1	2.1	2.6	2.7	2.3	2.0	1.4	1.2	1.4	2.1	3.6	0.2
$50,000 to $100,000	3.9	3.4	3.6	3.0	3.6	4.6	4.6	3.7	3.4	2.2	2.1	2.7	5.1	4.3	0.6
$100,000 to $200,000	13.0	12.1	10.2	10.4	13.9	16.1	16.0	14.4	12.3	10.0	7.9	13.6	19.6	17.7	2.2
$200,000 to $500,000	35.7	36.2	35.8	34.7	38.3	39.6	38.9	38.5	39.2	37.8	38.4	43.9	41.7	41.9	19.1
$500,000 to $1 million	21.7	21.8	23.6	24.4	22.0	18.8	18.8	19.7	20.0	23.1	24.4	18.9	15.7	15.7	25.3
$1 million to $5 million	17.8	18.3	18.9	20.1	15.2	14.0	14.1	15.6	18.0	20.0	20.0	14.7	11.4	11.8	39.4
Over $5 million	3.4	3.8	3.9	3.7	2.9	2.1	2.5	3.5	3.6	4.1	4.8	2.8	1.6	2.2	13.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 2A: Percent Distribution of 2011 Estate Tax Burden by Decedent Income by Year (2010 income levels)

(Total 2011 Estate Tax Burden is $10.8 billion)

AGI plus Tax Exempt Interest Adjusted for Marital Status	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	High Year
Negative	2.8	2.0	1.8	1.3	1.5	2.9	3.4	2.6	2.0	1.6	1.5	2.9	3.1	3.6	0.1
$0 to $50,000	1.1	1.1	1.1	1.0	0.8	1.3	1.0	0.6	0.6	0.3	0.2	0.3	0.6	2.3	0.0
$50,000 to $100,000	1.4	1.0	1.3	1.0	1.0	1.5	1.4	1.5	0.9	0.4	0.4	0.6	1.3	1.2	0.1
$100,000 to $200,000	4.2	3.6	3.0	2.8	3.9	4.6	4.1	3.6	2.9	2.4	1.5	3.5	4.9	4.8	0.3
$200,000 to $500,000	15.9	15.8	14.9	13.7	17.1	18.8	19.2	17.1	15.9	13.9	13.2	18.5	21.0	20.0	4.5
$500,000 to $1 million	17.4	17.5	18.5	18.8	21.3	19.5	17.7	17.6	17.8	17.3	17.7	18.4	18.7	19.1	11.1
$1 million to $5 million	34.7	35.1	35.7	38.1	32.3	31.4	31.0	32.0	34.7	36.7	35.4	32.9	32.8	27.8	38.1
Over $5 million	22.4	24.0	23.9	23.4	22.1	20.0	22.3	25.0	25.1	27.4	29.8	23.1	17.6	21.2	45.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 1: Pecent Distribution Distribution of 2011 Taxable Decedents
by Decedent Income (2010 Income Levels)
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
High Year
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Negative
$0 to $50,000
$50,000 to $100,000
$100,000 to $200,000
$200,000 to $500,000
$500,000 to $1 million
$1 million to $5 million
Over $5 million

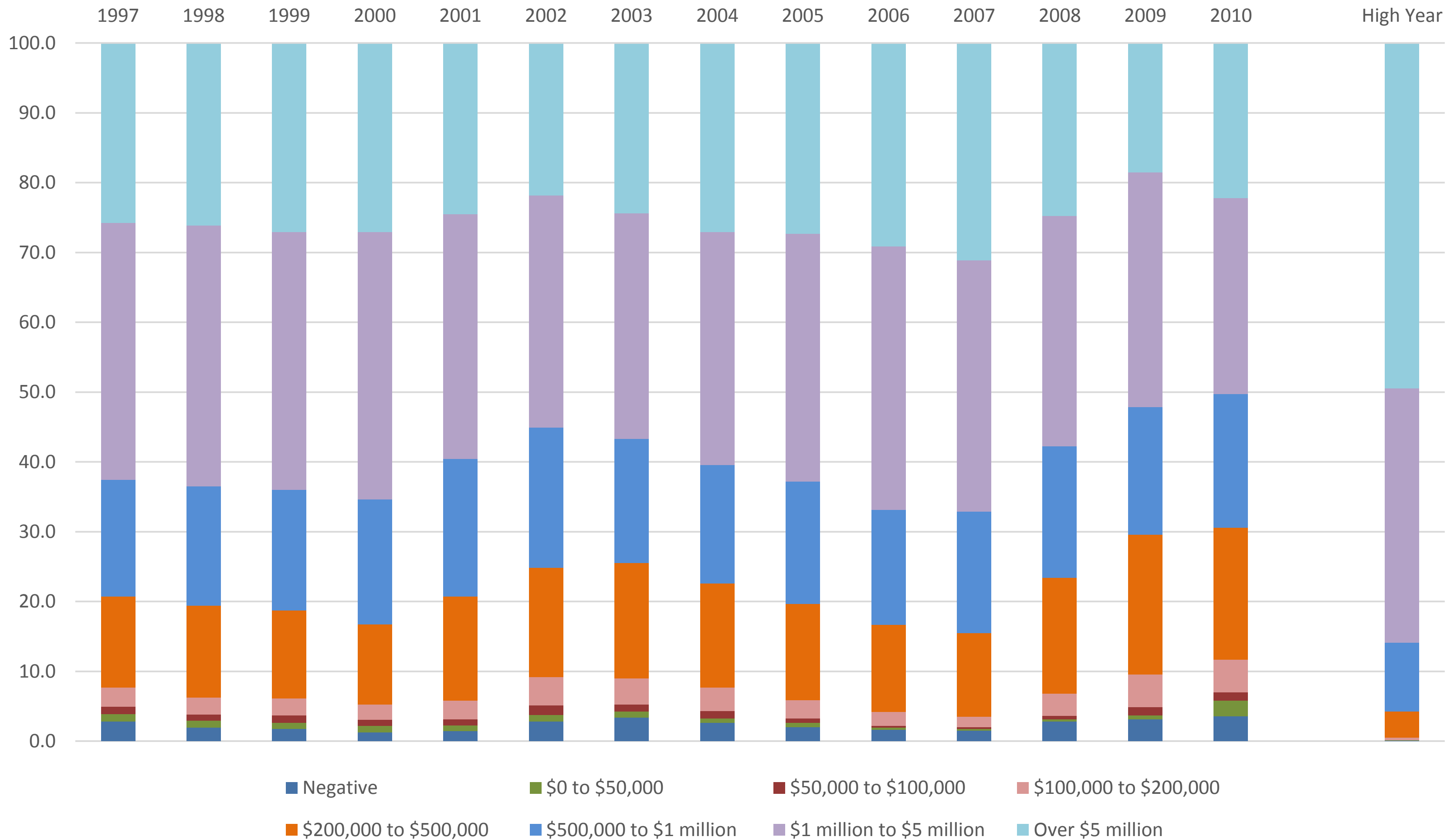

Figure 2: Percent Distribution of 2011 Estate Tax Burden
by Decedent Income (2010 Income Levels)
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
High Year
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Negative
$0 to $50,000
$50,000 to $100,000
$100,000 to $200,000
$200,000 to $500,000
$500,000 to $1 million
$1 million to $5 million
Over $5 million

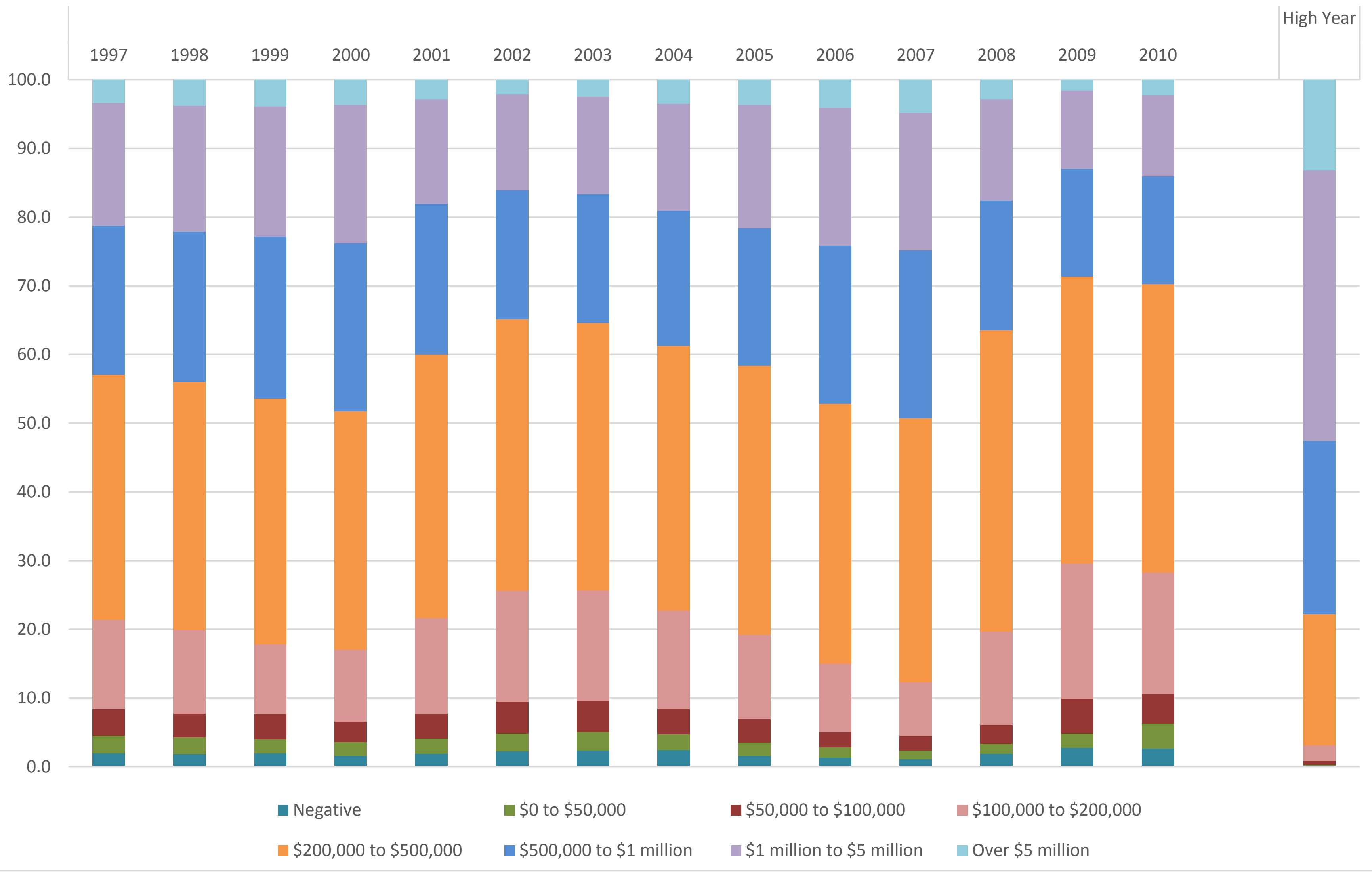
Figure 1A: Percent Distribution of 2011 Taxable Decedents
by Adjusted Decedent Income (2010 Income Levels)
High Year
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Negative
$0 to $50,000
$50,000 to $100,000
$100,000 to $200,000
$200,000 to $500,000
$500,000 to $1 million
$1 million to $5 million
Over $5 million

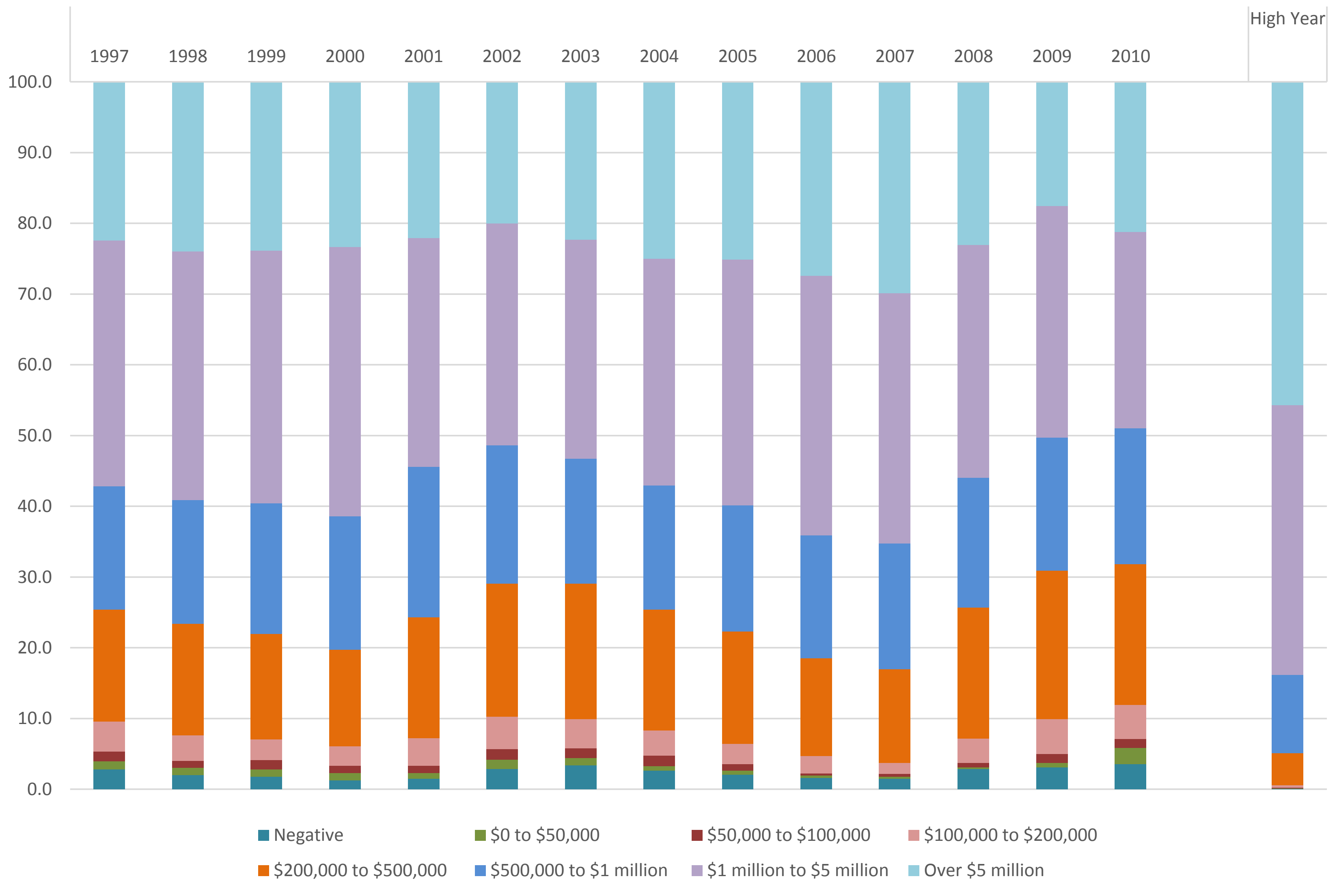

Figure 2A: Percent Distribution of 2011 Estate tax Burden
by Adjusted Decedent Income (2010 Income Levels)
High Year
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Negative
$0 to $50,000
$50,000 to $100,000
$100,000 to $200,000
$200,000 to $500,000
$500,000 to $1 million
$1 million to $5 million
Over $5 million