

A NEW LOOK AT THE RELATIONSHIP BETWEEN REALIZED INCOME AND WEALTH

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THE STATISTICS OF INCOME (SOI) DIVISION OF THE IRS has periodically combined wealth data reported on Federal estate tax returns, filed for relatively wealthy decedents, with income tax data reported by these decedents for the last full year prior to death. Such linked datasets provide unique windows into the relationship between realized income and wealth. Here, we define realized income to include all direct cash flows from an underlying asset, as opposed to unrealized income, which takes the form of appreciation in the value of the asset. Of particular interest is how the composition of income varies among decedents in different phases of the life cycle. Past research has shown that older wealth holders report less income and earn lower rates of return on assets than similar, younger decedents (see, for example, Steuerle, 1983; Steuerle, 1985; and Johnson and Wahl, 2004). This paper updates earlier research, using a new dataset focused on decedents who died in 2007, a group with sufficient wealth to place them in the top 1.0 percent of the wealth distribution. Unlike some earlier datasets, the relatively large sample size of the dataset used in this research allows us to examine differences among demographic groups in detail, and its focus on a single year of death reduces inter-temporal effects on results. In this paper, we compare our findings with those from the earlier studies and find surprising similarity in the estimated aggregate rates of return on assets over the more than 3 decades represented in these studies.

THE DATA

Estate tax returns, IRS Forms 706, provide a rich source of information about an individual at the time of death, including demographic characteristics, asset portfolio composition, and charitable bequests. This paper focuses on data reported on estate tax returns filed for Year of Death 2007 decedents that have been linked to income, deduction, and tax liability information reported on the Form 1040 filed by the decedent for the year prior to death, Tax Year 2006.¹ Form 1040 is used to report income earned by single filers, or the joint income of married couples.²

The misalignment of the unit of observation between the estate and income data for joint income tax filers is an important limitation of these data.

Summary income items from Form 1040, for example total income and adjusted gross income, generally include only the taxable portions of items that receive preferential treatment in the tax code such as interest earned on tax-exempt bonds and retirement income. In order to present a more complete accounting of income earned by 2007 decedents, we create a new measure, gross income, by adding to total income reported on Form 1040 the value of tax-exempt interest income; the non-taxable portions of Individual Retirement Arrangement (IRA) distributions, pensions, and annuities; and Social Security benefits. We then subtract the value of IRA rollovers, IRA recharacterizations, and Roth IRA conversions to calculate gross income.³ Gross income therefore includes forms of realized income that are not used in calculating income tax while excluding transactions that reflect the shifting of retirement assets from one form to another, rather than true economic income.

RETURN ON ASSETS

Steuerle (1983) discusses in detail the limitations of using realized income as a measure of well-being, especially for the wealthy, in part because realization of income on capital is, to a great degree, discretionary. To examine the relationship between realized income in the year prior to death and wealth at death, he calculated rates of return, both on overall wealth, and for various asset classes. In this section, we do the same, and begin by examining the overall return on wealth using three related measures of return:

Measure 1: *Gross income / Total gross estate*

Measure 2: *[Gross income – (wages + Social Security Income)] / Total gross estate*

Measure 3: *[Gross income – (wages + Social Security Income) – capital gains] / Total gross estate*

Measure 1 captures all of the decedent’s realized income and therefore includes income from sources such as wages and Social Security that may not be directly related to the decedent’s asset holdings. Measure 2 more closely aligns income and wealth by excluding these items, but may underestimate the realized return on capital for decedents whose businesses paid them a salary. Measure 3 attempts to recognize that at least some income from capital gains recognized in 2006 will have been used for consumption, for example to pay medical expenses, and will have disappeared from decedent’s balance sheet at death. A drawback to using this measure is that the rate of return will be understated to the extent that realized 2006 capital gains were reinvested rather than consumed. Therefore, this measure forms at best a lower bound estimate of the realized rate of return.

Overall Return

Overall, 2007 estate tax decedents reported a median rate of return on assets of 5.56 percent, calculated using gross income, for Tax Year 2006. Excluding wage and Social Security income, the median rate of return was 4.49 percent. Removing capital gains from this measure yields a rate of 3.61 percent. Figure 1 shows the median return on assets separately for single decedents and married decedents, by age of decedent and size of gross estate.

Using all 3 measures of income, the median return on assets was higher for older single decedents than for those under age 70. The disparity was greatest when wages, Social Security, and capital

gains were excluded from the income measure. Married decedents had a higher median return on assets than single decedents in each age and size of estate class, which is expected because our income measures include the income of both the decedent and a spouse, while wealth is observed for the decedent only. Unlike singles in the same age group, the return on gross income for younger married decedents was higher than that for older married decedents. However, for income measures that exclude wages and Social Security, the relationship reversed – older decedents had higher median rates of return than their younger counterparts. This suggests that for the younger married decedents, wages earned by the surviving spouse contributed significantly to our gross income measure.

Another broad pattern shown in figure 1 is a decline in median return on assets across wealth categories regardless of the measure of income used. This pattern is the least pronounced when return on assets is calculated using gross income less wages and Social Security, and is likely influenced by the declining share that wages and Social Security income contribute to adjusted gross income/gross income for decedents in higher wealth categories. Excluding capital gains, which make up larger shares of income reported by decedents in higher wealth categories, exaggerates the trends seen using the less restrictive income measures. The robustness of this decline in rates of return across increasing wealth size classes seems to affirm the voluntary nature of income realization for the very wealthy.

Figure 1: Overall Return on Assets, Single and Married Decedents

Age of decedent, size of estate	Single decedents			Married decedents		
	Measure 1: Gross income	Measure 2: Less wages and Social Security	Measure 3: Less capital gains	Measure 1: Gross income	Measure 2: Less wages and Social Security	Measure 3: Less capital gains
All	4.26	3.65	3.00	7.64	5.80	4.57
Age of decedent						
Under 70	4.08	2.84	2.03	8.13	4.41	3.17
70 and older	4.28	3.73	3.09	7.47	6.30	4.88
Size of estate						
\$2.0<\$3.5 million	4.40	3.65	3.06	7.98	5.92	4.79
\$3.5<\$5.0 million	4.20	3.65	3.07	7.40	5.68	4.51
\$5.0<\$10.0 million	4.04	3.74	2.98	7.05	5.63	4.20
\$10.0<\$20.0 million	3.80	3.57	2.71	7.06	5.81	3.95
\$20 million or more	3.55	3.46	2.64	6.37	5.87	3.54

Return by Asset Class

We next decompose overall rates of return by calculating rates of return on specific asset types. We construct broad asset and income categories to minimize misclassification of either assets or income, recognizing that even these broad categories are subject to some classification error. For example, we include all common stock and most mutual funds in the “dividend bearing assets” category because we are unable to separately identify common stock and growth-oriented mutual funds from preferred stock and income funds. The results are shown in figures 2 and 3. Figure 4 shows the distribution of rates of return on overall assets and specific asset classes in box plot form. The box displays the 25th, 50th (median) and 75th percentiles, while top of the upper “whisker” shows the value at the 95th percentile. The bottom of the lower “whisker” shows the value at the 5th percentile.

Notably, rates of return varied significantly by asset class.⁴ Looking first at single decedents, the median rate of return ranged from a scant 0.09 percent for business assets to 5.78 percent for retirement assets (see figure 2). The low median value for businesses is because the rate of return was zero or negative for more than 50 percent of decedents (see figure 4). The high median rate of return on retirement assets and more generally, the large dispersion of rates reflects the eclectic nature of this category, which includes both investments-generated income from 401K plans as well as income from traditional pension plans for which there is no associated asset in the estate.

In asset classes for which there was variation across wealth groups, rates of return were often lower for those in the higher wealth categories. For single decedents, the return on interest-bearing assets and tax-exempt bonds did not vary signifi-

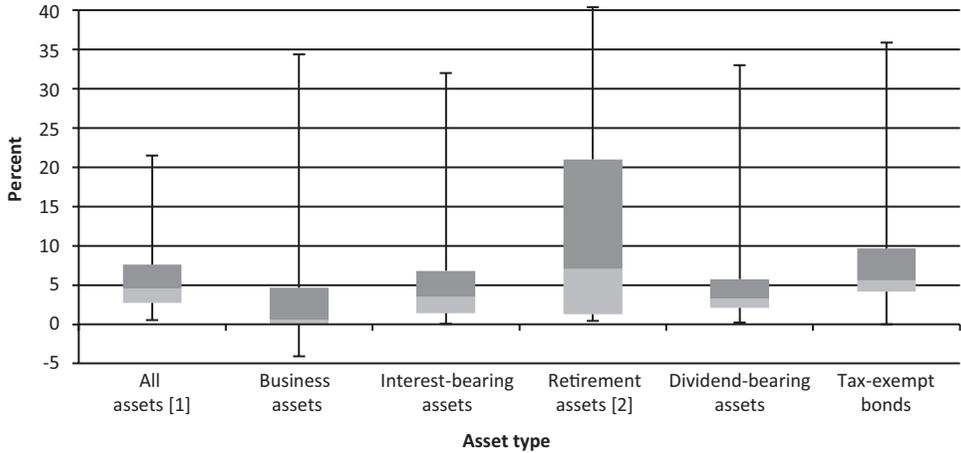
Figure 2: Rate of Return by Asset Class, Single Decedents

<i>Age of decedent, size of estate</i>	<i>Business assets</i>	<i>Retirement assets</i>	<i>Interest-bearing assets</i>	<i>Dividend-bearing assets</i>	<i>Tax-exempt bonds</i>
All	0.09	5.78	2.55	2.72	4.85
Age of decedent					
Under 70	0.02	0.00	2.09	2.16	4.39
70 and older	0.09	6.95	2.65	2.77	4.87
Size of estate					
\$2.0 < \$3.5 million	0.01	6.26	2.51	2.74	4.83
\$3.5 < \$5.0 million	0.19	5.50	2.72	2.78	4.88
\$5.0 < \$10.0 million	0.17	5.13	2.64	2.71	4.89
\$10.0 < \$20.0 million	0.38	5.72	2.37	2.51	4.80
\$20 million or more	0.17	4.50	2.35	2.41	4.84

Figure 3: Rate of Return by Asset Class, Married Decedents

<i>Age of decedent, size of estate</i>	<i>Business assets</i>	<i>Retirement assets</i>	<i>Interest-bearing assets</i>	<i>Dividend-bearing assets</i>	<i>Tax-exempt bonds</i>
All	1.14	7.20	5.10	4.18	8.33
Age of decedent					
Under 70	1.56	0.00	4.48	3.60	7.07
70 and older	1.04	10.23	5.29	4.39	8.48
Size of estate					
\$2.0 < \$3.5 million	1.06	8.26	5.24	4.40	8.55
\$3.5 < \$5.0 million	1.36	7.53	5.03	4.09	8.08
\$5.0 < \$10.0 million	1.06	5.29	4.75	4.03	8.17
\$10.0 < \$20.0 million	1.32	5.50	4.88	3.59	7.42
\$20 million or more	1.41	4.59	5.39	3.38	7.33

Figure 4: Box Plots of Rates of Return on All Assets and Selected Asset Types
 (Boxes represent the 25th, median and 75th percentile values, whiskers show the 5th and 95th percentile values)



[1] Return on assets calculated using gross income less wages and Social Security income.

[2] The 95th percentile value for return on retirement assets was trimmed to 40 percent to fit the graph.

cantly by level of wealth for single decedents. This is expected because these types of assets likely provide the taxpayer little control over the timing and amount of realized income. In contrast, the return on retirement assets declined markedly for decedents in higher wealth categories.

As expected, overall rates of return in each asset class were greater for married decedents, ranging overall from 1.1 percent on business assets to 8.33 percent on tax-exempt bonds. The patterns by wealth class generally mirror those for single decedents, with the exceptions of the returns on tax-exempt bonds and dividend-bearing assets, which, although relatively constant for single decedents, declined notably for the married decedents.

Figures 2 and 3 also show that single and married decedents age 70 and older realized higher median rates of return on assets for most asset classes than their younger counterparts. For retirement assets and dividend-bearing assets, this result is expected because many decedents in the under 70 category would have been too young in 2006 to realize income from their pensions, annuities, and retirement plans. The higher returns on dividend and interest-bearing assets for older decedents is consistent with life-cycle investment models that predict that older individuals are more likely to prefer less risky, income generating assets than younger individuals.

Comparison with Prior Studies

As discussed, this work replicates that of three prior studies that have used linked data from estate tax returns and individual income tax returns to estimate rates of return on assets in the year prior to a decedent’s death. Combined with ours, these studies span 25 years that encompass significant changes in tax policy and the economy, some of which are summarized in figure 5. The selected economic data associated with each study year were chosen to provide some context to the rates of return presented for each period. In addition, we present data on contemporary tax law provisions because a substantial body of research suggests that the amount of income reported on tax returns is affected by the level and structure of tax rates.^{5,6} Of particular note are changes to both overall income tax rate schedule, as well as the tax rates that applied to capital gains and dividends.⁷

The overall return on assets, here calculated using AGI less wages in the numerator for consistency across the four studies, was significantly lower in the 1972 decedent study than in the other three studies, an expected result because the 1972 study was based on a very small sample of observations chosen for the condition that the decedent’s estate was composed primarily of small business assets. As we have shown, the realized return on

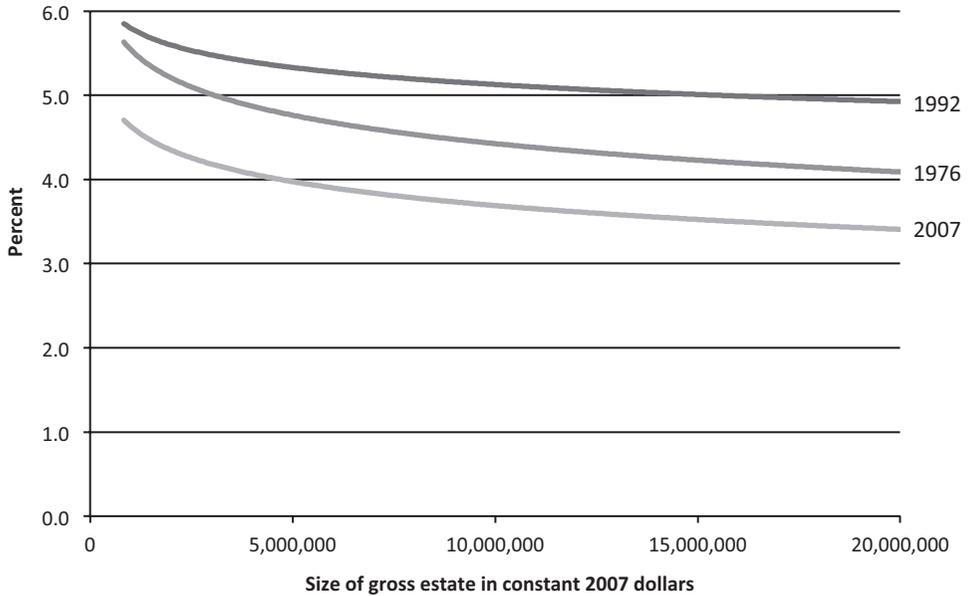
Figure 5: Return on Assets Comparison [1]

	1972 Decedents (Steuerle, 1983)	1976 Decedents (Steuerle, 1985)	1992 Decedents (Johnson/Wahl 2004)	2007 Decedents
Year of income tax data	1971	1975	1991	2006
Filing threshold (nominal/constant 2007 dollars)	\$60,000/\$238,200	\$60,000/\$178,800	\$600,000/\$834,000	\$2.0 million
Inflation (GDPCPI)	5.00	9.46	3.48	3.15
3-month T-bill rate	4.33	5.78	5.38	4.73
30-year conventional mortgage rate	7.38	9.04	9.25	6.41
S&P 500 annual return	14.31	37.20	30.47	15.79
S&P 500 dividend yield	3.35	4.99	3.72	1.75
Top individual income tax rate	70	70	31	35
Top long-term capital gains tax rate	39	45	28	15
Top dividend tax rate	70	70	31	15
Return on assets, all decedents				
AGI less wages	1.88	4.50	5.90	4.21

[1] Note that economic and tax policy data in the figure reflect the tax year for which the income tax data were reported, i.e., the year prior to the year of death.

Sources: Federal Reserve Bank of St. Louis Economic Data, <http://research.stlouisfed.org/fred2/>; Standard and Poors, [http://www.standardandpoors.com/home/en/us](http://www.standardandpoors.com/home/en/us;); and Federal Reserve, <http://www.federalreserve.gov>.

Figure 6: Return on Assets, by Size of Gross Estate, 1976, 1992, and 2007



business assets tends to be much lower than the return on other asset types.

A surprising result is the relative similarity of overall rates of return on assets between the 1976, 1992, and 2007 decedent studies. Overall return on assets calculated using AGI less wages stayed within a relatively narrow band of 4.21 to 5.90 percent. Broadly speaking, rates of return on individual asset categories, by wealth class, are also very similar. Of particular note is the similarity of overall rate of return found by Steuerle (1985) in his study of 1976 decedents to that calculated for our 2007 decedents, despite overall top marginal income tax rates that were 50 percent lower, and rates on capital gains and dividends that were 66 percent lower in the latter period. This suggests that the income realization choices of the wealthy decedents in these studies were based more on attitudes toward risk and consumption needs than the tax regime in effect at the time.

One key source of difference in the data across the four studies is the estate tax filing threshold in effect for the year of death. For 1972 and 1976, the filing threshold was nominally \$60,000, or \$238,200 and \$178,800, respectively, in constant 2007 dollars. The inflation-adjusted filing threshold for 1992 was significant higher at \$834,000, and

higher still for 2007, \$2.0 million. These filing threshold increases may affect comparisons of aggregate rates of return on assets because all four studies show that wealthier individuals tended to report lower overall return on assets than less-wealthy individuals. Thus, all other things being equal, one would expect that the inclusion of more low-wealth decedents in the earlier estimates would inflate the rates of return, relative to those calculated for the higher wealth decedents observed in 2007. In an attempt to present more comparable information, figure 6 shows estimated trend lines for all three studies, generated using constant 2007 dollar gross estate categories.⁸ Although based on a limited number of data points in each year, the figure shows a steady decline in the rate of return on assets for increasing wealth within a relatively narrow band of returns. Rates of return for decedents with more than \$5 million in gross estate were lowest in 2007, the year with the lowest interest rates and dividend yield, and highest in 1992.

CONCLUSION

In this preliminary look at a new dataset combining wealth and one year of income data, we see surprisingly little change in realized rates of return

on assets between 1976 and 2007, despite significant changes in the income tax structure between the periods studied. This suggests that the income realization choices of the wealthy decedents in these studies were based more on attitudes toward risk and on consumption needs than the tax regime in effect at the time.

An important consideration in computing rates of return on assets using these data is the effect of estate planning on asset values. Mechanisms for smoothing the transition of family wealth between generations, such as family limited partnerships, can result in significantly discounted asset values for estate taxation purposes (see Raub et al., 2010). These types of techniques have become more pervasive in recent years and could significantly affect the trends shown in figure 6. Therefore, the rates of return calculated for 2007 may actually be somewhat overstated relative to the prior studies. It must also be emphasized that the results we show apply to individuals at the end of their lives, many of whom may have made extensive changes to their finances in anticipation of death, and thus may not be generalizable to healthy individuals in similar age and wealth cohorts. For example, we may observe higher pension income realization for younger single decedents or lower business income in general among those suffering a chronic illness. In the future, we hope to examine the influences of aging and anticipation of death due to illness on these results. To study this, we will construct a longitudinal panel of income data for our decedents and compare their income realization patterns over time with similar data for survivors.

Notes

- ¹ For detailed information about Individual income tax returns filed for Tax Year 2006, see Internal Revenue Service 2008.
 - ² For purposes of this analysis, we assign each decedent's marital status based on the filing status reported on the matched individual income tax return. Marital status is grouped into two broad categories, single (including those who filed as single, widowed, head of household, and married filing separately) and joint.
 - ³ In addition to other possible benefits, rolling over funds from 401(k)s and other qualified plans into traditional or Roth IRAs prior to death offered estate tax planning advantages prior to 2007. Unlike inherited IRAs, inherited 401(k) plans could not be rolled over into IRAs by non-spousal heirs – these heirs were limited to the existing payout options of the inherited 401(k).
- The Pension Protection Act of 2006 allowed inherited 401(k)s to be rolled over to IRAs starting in 2007.
- ⁴ Calculations for return by asset class exclude observations for which income from a particular asset class was reported but no corresponding asset was present. These cases may result from the sale of assets between the filing of Form 1040 and the date of death.
 - ⁵ For a review, see Saez et al. (2009).
 - ⁶ See, for example, Auerbach (1988).
 - ⁷ Corporate issuance of dividends surged following the 2003 reduction in the dividend tax rate -- see Chetty et al. (2004).
 - ⁸ We omit the rate of return for highest wealth group in 1976 in determining the trend line because of its reliance on an extremely small sample size.

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