A Comparison of Wealth Estimates for America's Wealthiest Decedents Using Tax Data and Data from the Forbes 400

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Introduction

Measuring the wealth of the Nation's citizens has long been a topic of interest among researchers and policy planners. Unfortunately, such measurements are difficult to make because there are few sources of data on the wealth holdings of the general population, and most especially of the very rich. Two of the better-known sources of wealth statistics are the household estimates derived from the Federal Reserve Board of Governor's Survey of Consumer Finances (SCF) (Kenneckell, 2009) and estimates of personal wealth derived from estate tax returns, produced by the Statistics of Income Division (SOI) of the Internal Revenue Service (Raub, 2007). In addition, Forbes magazine annually has produced a list, known as the Forbes 400, that includes wealth estimates for the 400 wealthiest individuals in the U.S. While those included on the annual Forbes 400 list represent less than .0002 percent of the U.S. population, this group holds a relatively large share of the Nation's wealth. For example, in 2007, the almost $1.6 trillion in estimated collective net worth owned by the Forbes 400 accounted for about 2.3 percent of total U.S. household net worth (Kopczuk and Saez, 2004).

This article focuses on the estimates of wealth produced for the Forbes 400 and their relationship to data collected by SOI (see McCubbin, 1994, for results of an earlier pilot of this study). In all years examined, the threshold for inclusion in the Forbes estimates was well above the effective estate tax filing threshold; therefore, there should be complete overlap between these two sources of wealth information. Examining the Forbes and SOI data together should provide insights into strengths and weakness of both data sources for economic analysis. To the

extent that data from these sources prove different, this analysis should also provide insight into issues that influence measures of wealth derived from estate tax data and contribute to a fuller understanding of economic well-being. Finally, by examining, to the extent possible, the form of wealth held by these top wealth holders, this research may inform the ongoing debate surrounding the effects of the Federal estate tax on the general economy.

Background

Estate tax returns provide a rich data source from which to study the nation's wealthiest individuals. The return contains a complete listing of a decedent's assets and debts, a demographic profile of the decedent, and information on the costs of administering the estate. All assets are valued as of the date of the decedent's death, although special valuation rules apply for certain uses of real estate and for assets that decline in value within 6 months of a decedent's death.[2] The decedent's share of jointly held assets, as well as any assets over which the decedent held power of appointment are also reported, as is the face, but not cash, value of all life insurance policies. Valuations of business assets are frequently subject to significant discounts when there is evidence that a decedent's fractional ownership share affects marketability.

Forbes magazine has published a list of the 400 richest Americans annually since 1982. The wealth estimates for the individuals on the list are produced through investigative research and take into account interviews with employees, competitors, customers, attorneys, ex-spouses and securities analysts, as well as reviews of Securities and Exchange Commission (SEC) filings and legal documents. Privately held companies are valued by coupling estimates of revenues or profits with prevailing price-to-revenues or price-to-earnings ratios for similar public companies. Asset values are rounded to the nearest 100 million dollars and stocks are valued on August 31. Forbes acknowledges that its analysts do not have knowledge of all assets belonging to the

individuals on the list, and describes the published estimates as "deliberatively conservative," (Miller, 2009).

For its estimates, Forbes magazine uses net worth as the measure of wealth. For the SOI data, net worth is calculated as total assets minus debts, where total assets is calculated using the value of each asset on the day that the owner died. An estimate of the cash value of life insurance replaces the reported face value and any reduction in value for real estate allowed under IRC§ 2032A is disregarded in this calculation.

The Data

An exact match, based on name, between estate tax returns filed for 1982 – 2008 and the 1,378 individuals who have appeared in the publicly available listings of the Forbes 400 covering the same period yielded 376 individuals who had been listed in the Forbes 400 and for whom an estate tax return was available in SOI's database. This group also included a small number of individuals for whom estate tax returns were filed in 2009 or 2010 but for whom only limited data were available because the returns had not yet been processed by SOI. Estate tax returns could not be located for 20 deceased individuals who had appeared in the Forbes 400. With additional research, we were able to verify that the individuals' estates were not required to file for various reasons.[3]

By comparing SOI data to the annual thresholds for inclusion on the Forbes 400 list, we were also able to identify 26 individuals whose net worth at death, as reported on the estate tax return, was sufficient for inclusion in the contemporaneous Forbes 400, but who never appeared on the list. For about half of these individuals, the failure to appear on the list appears to be due to the method Forbes uses to assign wealth that is dispersed across families. For some of the others, the primary source of wealth was from creative endeavors, which may be particularly

difficult to value prior to an auction or other sale; in some cases these assets may increase substantially in value because the creator has died.

Results

The final Forbes-SOI matched dataset contained 376 records, consisting of 304 male and 72 female decedents. Male decedents had a mean age of 80, with more than half the sample aged 80 or older. Most, 74 percent, were married, with only 26 percent widowed, single, divorced or separated. For this group, the mean estate tax net worth was $405.9 million, while the median value was $174.1 million. Only 18 percent of female decedents were married, while 82 percent were widowed or otherwise single. The mean estate net worth for women was slightly higher than that for men, $495.9 million, but the median was lower, $110.4 million.

As seen in Figure A, the asset and debt holdings of decedents in the dataset differed by gender and marital status. For each class of decedent, stock, which includes shares of both publicly traded and closely held corporations, accounted for the largest share of any asset type, between 41.1 and 50.8 percent of total assets. Bonds, cash, real estate, including real estate partnerships and real estate investment trusts (REITS), and business assets, defined here as unincorporated businesses, typically combined to make up the bulk of the non-equity portion of the estate, although the percentage held in each asset type varied markedly by gender and marital status. Males held, on average, more of their portfolios in business assets and less in bonds than their female counterparts. This may reflect both the higher incidence of business ownership among men and the much higher percentage of women who were widowed, as widowed decedents may have divested active ownership interest in a late spouse's businesses following his or her death. For both males and females, unmarried decedents held, on average, a greater

share of their portfolios in bonds and cash than married decedents, and smaller shares in stock, business assets, and real estate. Males, had, on average, significantly more debt than females.

Figure A – Mean Percentage of Total Assets, Calculated for Asset Components, and Debt-to-Asset Ratio, by Sex and Marital Status

Asset Type	Males			Females		
	All	Married	Unmarried	All	Married	Unmarried
Stock	45.6	47.1	41.1	43.2	50.8	41.5
Bonds	12.2	10.8	16.0	17.8	4.8	20.5
Business assets	12.4	13.1	10.6	6.4	7.9	6.1
Real estate	9.8	10.0	9.1	11.5	23.2	8.9
Cash	5.4	5.2	6.1	6.9	4.5	7.4
Other assets	5.2	5.4	4.6	8.0	6.5	8.3
Mortgages/notes	4.3	3.0	8.1	2.6	0.6	3.1
Retirement assets	1.3	1.6	0.3	0.8	1.6	0.6
Insurance	0.5	0.6	0.4	< 0.1	0.1	0.1
Debt-to-asset ratio	8.3	8.0	9.3	4.0	4.1	3.9

One of the challenges posed by this analysis is the fluid nature of the Forbes 400 listing. Over the period examined, the threshold for inclusion on the Forbes list increased in most years, starting from an inflation-adjusted low of $225 million in 1982 and rising to $1.3 billion by 2007. Because the threshold for inclusion might increase as others' fortunes surpass those listed in any given year, individuals included on the list in one year may be absent in the next even if their wealth remained more or less constant. Members can drop off the list for other reasons as well; for example a member's wealth may diminish due to economic conditions or because of a significant charitable donation. Individuals may also die, making room for others.

Figure B provides information on the status of a decedent's membership on the Forbes 400 list at the time of death for the full linked sample in three categories: those who were listed either at the time of death or within 1 year of death; those whose net worth declined for some observable reason between the time that they were listed and death; and those who dropped off

the list prior to death seemingly because the growth of their individual net worth did not keep

pace with increases in the inclusion threshold.[4]

Figure B – Financial and Demographic Data, by Forbes Membership Status

| Asset Type | On the List at Death | | Dropped from List Prior to Death | | | |
| | | | Net Worth Declined | | Threshold Increased | |
	Male	Female	Male	Female	Male	Female
Number of observations	148	33	67	12	89	27
Mean net worth (SOI)	$621.1 million	$845.6 million	$213.8 million	$419.8 million	$192.6 million	$102.4 million
Mean Last Forbes estimate	$1,530.1 million	$1,347.9 million	$689.6 million	$838.3 million	$404.7 million	$417.3 million
Mean age	79.1	80.5	79.9	87.4	80.5	88.2
Mean Forbes Ratio	0.48	0.60	0.32	0.62	0.46	0.30
Mean % of Total Assets:						
Stock	53.1	48.7	38.1	50.1	38.6	33.5
Bonds	11.2	16.9	13.7	12.2	13.0	21.1
Business assets	10.2	4.4	13.4	8.6	15.4	8.0
Real estate	8.0	10.4	11.3	14.8	11.5	11.2
Cash	4.2	4.6	7.4	3.1	5.9	11.4
Other assets	5.5	9.0	5.2	5.5	4.7	7.9
Mortgages/notes	3.8	2.2	5.6	5.6	4.2	1.9
Retirement assets	0.9	0.7	2.1	< 0.1	1.4	1.2
Insurance	0.4	< 0.1	0.7	< 0.1	0.8	0.2
Debt-to-asset ratio	6.8	2.4	12.4	1.9	7.8	6.8

Note: All money amounts have been converted to constant 2008 dollars.

As expected, the average reported estate tax net worth in Figure B is highest for

decedents in the Listed at Death category; the lowest average was reported for those in the

Threshold Increased category. This pattern is also apparent in the average Forbes estimates of

wealth. Interestingly, the Forbes Ratio, defined as the value of net worth reported on estate tax

returns divided by the Forbes estimate of net worth, also varies between these groups, but the

pattern is somewhat different. For the decedents in the Threshold Increased group, the mean

Ratio is 0.42. For decedents in the Net Worth Declined group, the mean ratio is 0.37. For

decedents in the Listed at Death group, the mean ratio is 0.50. ANOVA analysis rejects the null

hypothesis that these three population means are equal at the 10% level (F = 2.51, p=0.824).

Comparing Forbes and Estate Valuations

Figure C displays the average Forbes Ratio by year of death, limited to the 181 decedents

who were on the list at death, whose estate and Forbes estimates we would expect to be most

closely aligned. If the estimates were identical, we would expect a straight horizontal line at 1.0. For these data, however, the average ratio is less than 1.0 for all but one year. While there is considerable year to year variation in the mean value, ranging from a low of 0.10 to a high of 1.83, the overall trend shows a slight decrease between 1982 and 2010. In aggregate, the average Forbes Ratio was 0.50, meaning that the values reported for tax purposes were about half of those estimated by Forbes. However, for 15.5 percent of decedents, the estate net worth was actually larger than the Forbes value.

Figure C - Forbes Ratio For Decedents on the List at Death, With and Without Spousal Wealth, by Year of Death
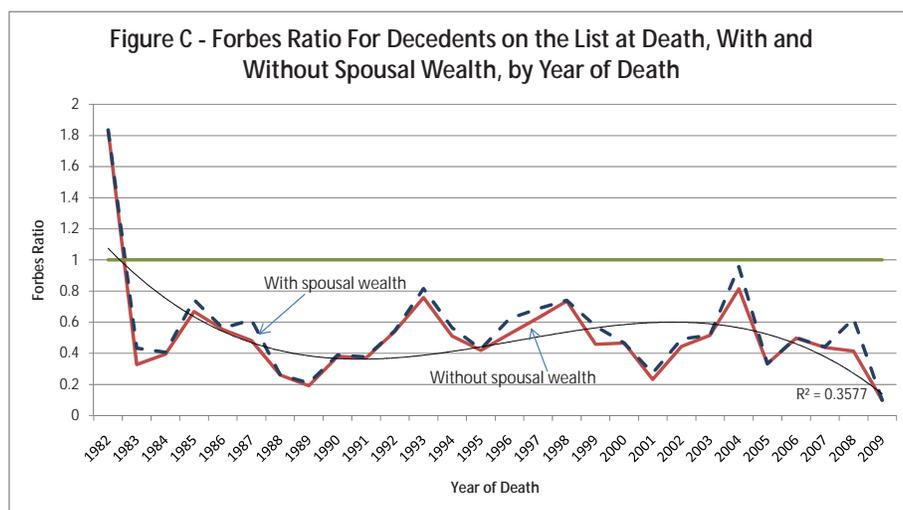
Although some of the year-to-year variation shown in Figure C is due to a relatively small number of observations in most years, some of it is certainly structural. A significant example is the differential treatment of assets held in trust between the Forbes estimates and the tax data. For valuation purposes, Forbes treats assets held in trust as belonging to the income beneficiary of the trust, even if that beneficiary has no control over the disposition of the *corpus,* or assets, of the trust. This is not the case for tax purposes where only assets that a decedent owned outright, or assets held in trust for which the decedent retained control or the power of

appointment are included in the estate for tax purposes.[5] The lowest Forbes ratios can be attributed to this difference.

Another structural difference between the Forbes and tax estimates is in the treatment of family wealth. The Forbes estimates for married persons treat joint wealth, including wealth owned by extended family members in some cases, as if it belongs to the listed individual, while for estate tax purposes only assets owned solely by a decedent are included. Thus, for married individuals in our data set, some of the difference can be attributed to the missing spousal/family wealth from the tax data. We can partially adjust for this by adding the full value of jointly held assets, both those held as joint tenants and as community property, to the reported tax values. While still omitting assets owned solely by a spouse or other family members, the dashed line in Figure C shows that, for some years, this additional wealth increases the Ratio closer to 1. In fact, for all married individuals in the file, the average overall Forbes Ratio increases from .46 to .53 when including these jointly held assets.

The explicit recognition of valuation discounts when valuing assets for tax purposes is another significant difference between the Forbes and tax values.[6] These discounts can be as large as 50 percent. In 2004, SOI began collecting data on the incidence and magnitude of discounts reported for estate tax valuation purposes. Almost two-thirds, or 64.4 percent, of estate tax returns in our data set filed on or after 2004 included some assets for which a valuation discount had been reported. Adding the value of these discounts to the estate tax values increased the average Forbes Ratio for this sub-group from .47 to .54. Adjusting for both the value of discounts and the value of spousal wealth, the average Forbes Ratio for this sub-group increased to .58. It is widely believed that the use and size of valuation discounts has increased over time. These may account for a portion of the relatively small decline in the Ratio over the period.

While these structural issues explain a portion of the differences between the Forbes estimates and tax values, there also seem to be some financial profiles that are easier for Forbes to estimate than others. Figure D shows that portfolio differences, in aggregate, between individuals with high and low Forbes Ratios, grouped in quartiles based on the ratio value, can be quite striking.[7] For those whose ratio was at least 0.78, the highest quartile group, the portfolio is dominated by stocks and bonds. Non-corporate business assets make up a relatively low proportion, as do real estate and cash. In contrast, for those whose Forbes Ratio was less than 0.10, the lowest quartile group, the data reveal an aggregate portfolio that is quite diversified. Equity investments account for less than one-third of the total, with real estate assets making up more than 15 percent, three times larger than for the higher ratio group. Other notable differences for the lowest-ratio group include a much higher concentration of business assets and mortgages and notes. Business assets are notable because of the subjective nature of valuating them, especially relatively small businesses for which a portion of the value may be derived from the personality or skills of a founder. The death of such a key person may have a strong adverse affect, at least initially, on the valuation of the firm and could account for a significant share of the difference between the tax and Forbes values in some cases. Overall, the portfolio of the high-ratio group is dominated by assets for which there is a ready market, making valuation for both estate and Forbes purposes relatively straightforward, while that of the low-ratio group contains higher concentrations of assets for which valuation is much more subjective, and more frequently subject to valuation discounts.

In addition to the differences in portfolio composition among the three groups, the disparate holding of debt is equally striking. While debts, on average, represented less than 2 percent of the total assets for the high-ratio group, they accounted for an average of nearly 10

unable to observe the incidence or magnitude of debts, and explain some of the overall gap

between the tax data and the Forbes estimates.

Figure D – Mean Percentage of Total Assets, Calculated for Asset Components, and Debt-to-Asset Ratio, by Forbes Ratio Quartile Group

Asset Type	Group		
	Low quartile (ratio < 0.10)	Middle quartiles (0.10 < ratio < 0.78)	High quartile (ratio > 0.78)
Stock	31.3	61.5	61.2
Publicly traded	14.9	26.9	31.2
Closely held	16.3	34.6	30.1
Bonds	13.6	11.3	15.2
Business assets	12.8	7.1	8.5
Real estate	18.4	5.3	5.3
Cash	6.8	5.4	2.3
Other assets	8.8	5.6	6.1
Mortgages/notes	5.7	2.3	0.4
Retirement assets	1.1	1.2	1.0
Insurance	1.3	0.1	<1.0
Debt-to-asset ratio	9.5	6.3	1.8

To further assess the relationship between the Forbes estimates and wealth reported on

estate tax returns, we used OLS regression to model the Forbes Ratio using demographic and

financial data from all of the tax records in the data set.[8] The dependent variable is a natural log

transformation of the Forbes Ratio. The results of this regression are shown in Figure E. The R-

squared value of this model is 0.3579, and the model has a joint F value of 11.18. Using GLS

type heteroskedastic robust standard errors did not substantially change the results of this model.

Binary variables were included to account for marital status and gender. Additionally, a binary

variable was included to indicate the group that had died while on the Forbes list.

Figure E - An Estimate of the Forbes Ratio

Variable	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	0.44481	0.11872	3.75	0.0002
nw08	<0.00000	<0.00000	8.82	<.0001
married	-0.16204	0.07368	-2.20	0.0285
male	-0.02348	0.04258	-0.55	0.5818
MarriedMale	0.14234	0.07887	1.80	0.0720
AGE	-0.00186	0.00128	-1.46	0.1457
nyod[1]	-0.00614	0.00210	-2.92	0.0038
DiedOnList	-0.05848	0.02795	-2.09	0.0372
lnStock[2]	0.00882	0.00384	2.30	0.0223
lnBonds[2]	0.00729	0.00186	3.91	0.0001
lnCash[2]	-0.02837	0.00740	-3.83	0.0002
lnMortnote[2]	0.00016	0.00214	0.07	0.9412
lnRetirement[2]	-0.00191	0.00201	-0.95	0.3426
lnBusiness[2]	0.00105	0.00215	0.49	0.6254
lnRealest[2]	0.00466	0.00388	1.20	0.2308
lnInsure[2]	-0.00364	0.00227	-1.60	0.1099
lnOther[2]	-0.00701	0.00516	-1.36	0.1749
lnDebts[2]	-0.00300	0.00248	-1.21	0.2271

[1]Year of death value is re-centered at 1982=0.   [2]All assets are expressed as portfolio shares.

The group of decedents whose Forbes Ratio was greater than 1, meaning that the estate tax value of net worth exceeded the Forbes estimate, was relatively small, consisting of only 49 individuals, or about 13 percent of all decedents. To investigate whether this group could better be modeled as distinct from those whose tax values were less than the Forbes estimate, we constructed an alternative model that included interaction variables based on this grouping, but there was not a significant enough reduction in the sum of squared residuals to justify its use over our original model.

Of the factors that contribute to modeling the Forbes Ratio, several seem particularly important. The decedent's marital status and the interaction term of marital status and gender are statistically significant in this model. We interpret this result to mean that differences between the way that the Forbes and tax estimates assign ownership of assets within families contribute significantly to the differences we observe in estimates from each. Year of death is also

statistically significant and negative. Although the parameter estimate for this variable is very small, it does suggest a slight decline in the average Forbes Ratio over time of 0.6 percent per year that is consistent with Figure C. The decedent's net worth is also statistically significant and positive, though the coefficient is extremely small. All else equal, wealthier decedents seem to have a higher Forbes Ratio. This observation is consistent with Figure C.

The coefficients for stock, bonds, and cash are all statistically significant at the 90 percent level. An increase in the share of the portfolio held in stocks and bonds has a predicted effect of increasing the SOI value relative to the Forbes estimate, and moving the Ratio closer to 1 for most cases. An increase in the share of the decedent's portfolio held in cash will have the opposite predicted effect. We speculate that in some cases, large amounts of cash in an estate represent the sale of an asset for less than the Forbes estimated value.

Summary

Using a unique data set that combines estimates of wealth from Forbes magazine's annual listings of the wealthiest 400 Americans for 1982-2009, with data reported on federal estate tax returns filed for deceased current and former listees, we have shown that, on average, the values reported for tax purposes are approximately half those estimated by Forbes. Although the ratio of these two estimates, dubbed the Forbes Ratio, varies a great deal due to the relatively small sample size and the unique nature of each decedent in this data set, we have shown that the trend of this average has been relatively stable over time, with a slight decline overall. Using detailed information reported on the tax returns, we have also shown that a portion of the difference measured by the Ratio is due to structural differences between the two sets of estimates. Specifically, Forbes includes the joint assets of married persons in their estimates, while for tax purposes only assets owned by the deceased partner are reported. Adding even a

small portion of the surviving spouse's assets to the tax-based net worth values decreases the difference between these estimates significantly.

The estate tax data also allowed us to examine portfolio allocation differences between individuals whose Forbes Ratio was relatively close to 1 and those for whom the Forbes Ratio was extremely low. Based on tabular data and regression results, we conclude that tax values and Forbes values were in closest agreement when valuation issues were relatively objective and when individuals had a relatively small amount of debt, but much further apart when the portfolio was dominated by assets for which valuation required a greater degree of subjectivity or were difficult to observe, and when individuals held relatively more debt.

This research highlights the inherent difficulties of valuing assets which are not highly liquid. The portfolios of very wealthy individuals are made up of highly unique assets and often the value of assets, such as businesses, are very closely tied to the personality and skills of the owner. Determining a precise value for these assets can involve more art than science. Previous researchers have suggested that differences between tax and Forbes estimates are due to evasion; however, these are high dollar-value returns filed for very well-known decedents and so they tend to be carefully prepared by licensed professionals. This suggests that, while values reported for tax purposes may be conservative, they will fall within legally defensible parameters. Estimates of value for other purposes may be much more optimistic, but perhaps no more precise than those provided to the IRS, and so, contrary to the Forbes' assertion that its methodology is conservative, these results suggest that it is actually generous in some cases. Without actually selling a difficult to value asset, it may be impossible to determine a precise "market value," especially in times of economic volatility. These data provide an important reminder that data reported for administrative purposes can be legally acceptable yet fundamentally different from

those collected for other purposes. This should be an important consideration when attempting to use data to answer specific research questions or when comparing results from several sources and even suggests that, in some cases, multiple data sources should be examined in order to obtain truly robust results.

Notes

[1] The views expressed in this paper represent the opinions and conclusions of the authors alone and do not necessarily represent the opinions of the Internal Revenue Service or the Treasury Department.

[2] Under Internal Revenue Code (IRC) Section 2032A, real estate used in an ongoing business or farm can be valued based on its present use, rather than its full market value. The reduction in value is limited, and the heirs must agree to continue the business or farm for 10 years after the decedent's death in order to qualify.

[3] For example, for some Forbes decedents, it was clear that most of the Forbes-identified wealth was owned through a continuing trust and not outright by the decedent.

[4] Decedents were assigned to "Net Worth Declined" category by Forbes based on information from Forbes that indicated either a large financial setback or because Forbes revised a prior year estimate when there was reason to believe that estimate was much too high. Decedents were assigned to the "Threshold Increased" category based on the Forbes Magazine estimates for 'near misses' in the year they were dropped from the list.

[5] The power of appointment is the power to determine who will be given the authority to dispose of certain property under the will.

[6] Common reasons for discounting an asset value below fair market include: problems with the physical condition of the asset; recognition that a business may have derived significant value

from the active participation of the decedent; or, most commonly, shared ownership arrangements which make the asset unattractive to a willing buyer, as in the case of assets held in family limited partnerships (FLP). For a more complete description of FLPs, see Raub, 2007 p. 121.

[7]The analysis in this section is limited to data collected by SOI after 1988 to take advantage of additional data which distinguishes between publicly traded and closely held corporate stock in the decedent's portfolio. While publicly traded stock can be accurately valued using exchange data, closely held stock values are more subjective in nature. It is important to note that the portfolio allocations for the 181-decedents used in the preceding analysis were very similar to those of this smaller, 136-decedent group.

[8]This analysis includes 362 observations from the full 376 observation data set; the omitted records were incomplete because SOI processing had not been completed at the time of the analysis. No additional detailed demographic or portfolio data were available from Forbes.

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