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The improvement and expansion of measures of personal wealth in this country are both desirable and feasible. Consequently, there has been a great deal of ongoing research in the wealth area. Ideally, one method of estimation could be used to measure the wealth of the entire population. However, there is, as yet, no one method suitable for the populace as a whole. A more feasible approach might be to incorporate various techniques, each specifically suited to measuring a certain level of wealth.

The survey method is the most comprehensive approach, having been successfully used for measuring the wealth of all but the most affluent individuals. The most recent attempts to measure household and personal wealth by the survey method are the Survey of Consumer Finances (SCF) conducted in 1983, and the Survey of Income and Program Participation (SIPP), which will include questions on wealth in 1984 and 1985 [8,12]. The SCF, sponsored by the Board of Governors of the Federal Reserve, and the SIPP, conducted by the Census Bureau, both attempt to measure the wealth of the entire population.

Estimates of the financial assets of middle to high income households have been obtained using the "capitalization of income" method, which is based on the rates of return realized on financial assets. In addition, there has been an attempt to blend the capitalization of income method with the use of administrative records. Greenwood [4] has estimated wealth by combining income capitalization with information from estate tax returns and survey data.

The measurement of the wealth of the most affluent individuals, however, is more problematic. Neither the survey method nor the capitalization of income method has been successful at very high levels of wealth. A primary problem with the survey method is survey nonresponse, which is known to increase dramatically as wealth increases. For example, a high income sample designated by the Internal Revenue Service for the 1983 Survey of Consumer Finances revealed a response rate of only 9 percent of those surveyed. Even for those wealth-holders who do respond to a survey, their valuation of assets is only an approximation of actual wealth held, subject to inaccurate estimates or to the omission, intentional or otherwise, of certain assets. The capitalization of income method is also inadequate for high levels of wealth because it ignores wealth that does not produce income and has difficulty estimating certain other types of wealth and debt [21]. An alternative method for measuring wealth, one uniquely suited to the upper percentiles of the population, is the estate multiplier technique.

The estate multipilier technique uses data reported on estate tax returns filed for the deceased to estimate the wealth of the living population. The estate tax return is a valu-able source of economic information which, having been prepared from records, generally by highly skilled people, and under exacting requirements of law, represents a fairly accurate assessment of an individual's wealth.

Despite its great potential for use in research, the estate tax return is nevertheless an administrative record which primarily reflects the needs of administrators and only

Figure A

Estate Tax Return Filing Requirements 1916–1987

Size of Gross Estate
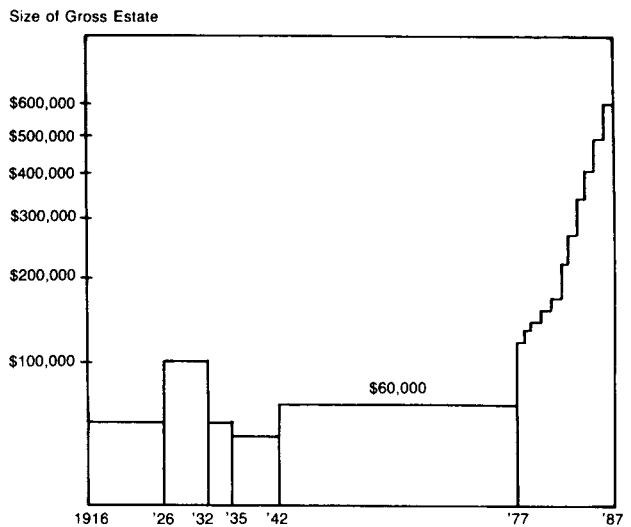
Estate Tax Returns Filed as a Percentage of All Deaths
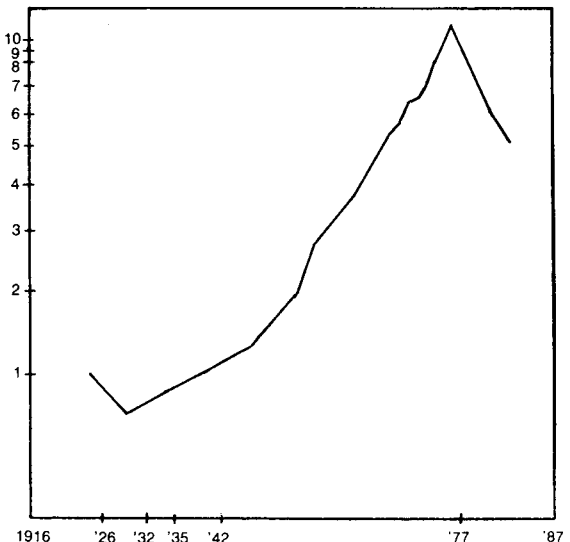
indirectly reflects the interests of scholars. Its function as an administrative document places constraints on its use for research purposes. For example, Federal estate tax returns are required to be filed only for decedents leaving a rather large estate. The filing requirement for decedents dying in 1984 is $325,000 of gross estate. This has increased from the $60,000 filing requirement in effect for 1976. It is scheduled to rise to $400,000 in 1985, to $500,000 in 1986 and to $600,000 in 1987. Because the estimates of wealth are based on those estates subject to filing a return, the higher filing requirement necessarily restricts the population for which these estimates can be made. The increase in the filing requirement in recent years is the result of an effort to return the scope of the tax to its original intent. While $60,000 represented a substantial estate held by only a small percentage of individuals in the early years of the estate tax, the $60,000 filing requirement still in effect for 1976 subjected the estates of many middle class people to the tax as well. At the highest point, 1976, 10.5% of all decedents filed estate tax returns. Figure A shows both the filing requirements in effect since the inception of the tax and the percentage of decedents filing estate tax returns by year.

As a result of the increases in the filing requirement, only 101,000 estate tax returns were filed in 1983. These returns, most of which were filed for decedents dying in 1982, represented about 5 percent of all deaths occurring in 1982. Approximately 63,000 of these returns, or about 3 percent of all deaths in 1982, were filed for individuals who died leaving an estate with total assets of $300,000 or more. These returns represented about 3 percent of all deaths occurring in 1982. Using the estate multiplier technique, we obtain an estimate of the wealth of those members of the living population for whom an estate tax return would have been required to be filed had they died in a particular year.

The first section of this paper presents preliminary estimates of the personal wealth of individuals in 1982 based on the application of the estate multiplier technique to estate tax returns filed in 1983. Section 2 contains a description of the estate multiplier technique. Section 3 contains a discussion of several methodological issues with respect to the application of the estate multiplier technique.

1. TRENDS IN PERSONAL WEALTH

Summary estate tax return data and preliminary estimates of personal wealth for each filing year are produced annually by the Statistics of Income (SOI) Division of the Internal Revenue Service, with comprehensive personal wealth estimates produced every four years. The preliminary wealth estimates presented in this paper are part of a personal wealth report for 1982 which will be published in full in the spring of 1986. The final personal wealth estimates for 1982 will be based on returns filed during 1982 through 1984 for individuals dying in 1982 [22]. As the estate

tax return is not required to be filed until nine months after the date of death, most returns for individuals dying in 1982 are not filed until 1983. However, because an extension of time for filing the return can be obtained, a limited number of returns may be filed in 1984 as well. By sampling returns filed over the series of years 1982 to 1984, we can capture the returns filed for all individuals who died in 1982. This represents a change in scope from past studies [6]. In the past, wealth estimates were made from the estate "filing year" sample, representing returns filed in a particular year for deaths that occurred over several years. The wealth estimates generated from a sample selected on a filing year basis thus reflected the value of wealth held during several years, unadjusted for the different annual rates of inflation. The advantage of a "year-of-death" sample is that the wealth represents that of a given year rather than a series of years and so more closely reflects wealth at a particular point in time.

Preliminary estimates of the personal wealth of individuals in 1982 show that there were approximately 4.4 million people with gross assets of $300,000 or more. These individuals, hereafter referred to as "top wealthholders," represented only 2.8 percent of the nation's adult population and held total assets of $2.9 trillion. Their net worth, the value of their assets after reduction for debts, was over $2.4 trillion, and made up approximately 25 percent of the wealth in the United States in 1982.

In contrast, during 1976, fewer than two million people had a similar level of gross assets. The net worth of these top wealthholders in 1976 was over $1.0 trillion, or nearly 23 percent of the net worth of all individuals in the country [1].

Wealthholders with Gross Assets
of $300,000 or More, by Sex

ITEM	ALL	MALE	FEMALE
Number	(thousands)		
1976	1,938	1,302	636
1982	4,378	2,659	1,719
Total Assets	(billions)		
1976	1,238	775	463
1982	2,897	1,746	1,151

Female wealthholders, as shown above represented 39.3 percent of the 4.4 million top wealthholders in 1982. In 1976, only 32.8 percent of the individuals with the same level of asset holdings were women.

In 1982, real estate constituted the greatest share of the assets held by all individuals with gross assets in excess of $500,000 (see Figure B). This continued the trend first observed the previous year for top wealthholders [18]. In contrast, estate multiplier estimates of wealth for 1976 and earlier years showed corporate stock to be the most commonly held asset. In

Figure B--ALL TOP WEALTHHOLDERS WITH GROSS ASSETS IN EXCESS OF $500,000, PERCENT OF TOTAL ASSETS BY ASSET TYPE,BY SEX, 1976 AND 1982

Type of Asset	Total		Males		Females	
	1976	1982	1976	1982	1976	1982
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Cash	7.1	7.8	6.9	6.8	7.3	9.4
Corporate stock	34.7	24.8	36.3	26.8	32.3	21.5
Bonds	9.1	6.0	7.4	4.3	11.9	8.8
Life insurance	0.9	1.2	1.4	1.6	0.2	0.5
Notes and mortgages	4.0	4.5	4.5	5.1	3.2	3.5
Real estate	24.3	31.5	26.2	32.1	21.4	30.6
Business assets1/	5.2	8.5	6.9	10.7	2.6	4.8
Other assets	14.5	15.7	10.4	12.5	21.1	21.1

1/ From partnerships and sole proprietorships.

any case, real estate and corporate stock together accounted for more than 56 percent of the assets of the top wealthholders in 1982, slightly less than the 59 percent of the assets they represented in 1976. Corporate stock, long the most prominent asset in the portfolio of top wealthholders, declined, however, from nearly 35 percent of the assets in 1976 to less than 25 percent in 1982. This was likely the result of the decline in the stock market [16] as well as a reflection of the increase in the value of real estate during that period. The Dow-Jones Industrial average fell 9.3 percent between 1976 and 1982 [1], while the consumer price index for home purchases rose 67.2 percent during the same period [2]. These measures of the market conditions illustrate the reasons for the shift in the composition of the assets of the wealthy.

The composition of the wealth held by men and women reveals some interesting differences. Real estate and corporate stock represented the greatest share of the wealth of both males and females. These two assets made up 59 percent of the estates of males and 52 percent of the estates of females, with corporate stock representing nearly 27 percent of the assets of men but only 21 percent of the assets of women. A greater contrast is observed in the proportion of the assets held by each sex as noncorporate business assets and bonds. Noncorporate business assets made up nearly 11 percent of the assets of men in 1982, compared with less than 5 percent of those of women. Conversely, wealth held by females was typified by a greater concentration held as bonds than that of males, nearly 9 percent as opposed to only 4 percent for males.

An examination of the composition of the assets held by the wealthiest of the top wealthholders, those with net worth of $1,000,000 or more, reveals that corporate stock constituted the largest share of the assets. This contrasted with the aforementioned observation of real estate as the largest single asset held by all top wealthholders (see Figure C).

The relative importance among millionaires of corporate stock and real estate changed significantly between 1976 and 1982, with corporate stock declining from 42 percent to 31 percent of

Figure C--ALL TOP WEALTHHOLDERS WITH NET WORTH OF $1,000,000 OR MORE, PERCENT OF TOTAL ASSETS BY ASSET TYPE, BY SEX, 1976 AND 1982

Type of Asset	Total		Males		Females	
	1976	1982	1976	1982	1976	1982
Total assets	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Cash	5.7	6.0	5.7	5.3	5.8	7.1
Corporate. stock	42.0	31.2	46.3	33.4	36.0	27.5
Bonds	12.3	7.8	10.5	5.7	14.9	11.3
Life insurance	0.5	0.6	0.7	0.9	0.1	0.1
Notes and mortgages	3.1	4.5	4.0	5.5	1.9	2.9
Real estate	14.7	23.6	15.6	25.1	13.4	21.3
Business assets 1/	3.8	9.9	5.0	12.0	2.1	6.4
Other assets	17.9	16.4	12.2	12.1	25.8	23.4

1/ From partnerships and sole proprietorships.

the assets and real estate rising from less than 15 percent to nearly 24 percent of the assets.

The increase in the share of the wealth of millionaires which was held as noncorporate business assets was even more significant than the aforementioned increase for all top wealthholders. While noncorporate business assets represented less than 4 percent of the assets of millionaires in 1976, their share increased to nearly 10 percent in 1982. Proportionately, millionaires held more corporate stock, bonds, and noncorporate business assets and less real estate, cash, and life insurance than all wealthholders in general.

2. CURRENT ESTATE MULTIPLIER TECHNIQUE

The estate multiplier method [9,10,20] takes deaths for a given year as a stratified sample of the living population for that year. Assuming that death draws a random sample from the living population within specific age/sex classes, data from estate tax returns filed for the deceased can be weighted using the inverse of the population mortality rates to approximate the wealth of the living. The relationship can be specified as follows:

$$P_{ij} = E_{ij}/M_{ij}$$

where

P_{ij} is the estimated wealth of the population,

E_{ij} is wealth measured from estate tax returns, and

M_{ij} is the mortality rate for each population stratum.

Death, however, is not a truly random event. The probability of "death's selection" of an individual depends on various factors. There is much evidence, for example, that the mortality rate of the wealthy is actually more favorable than that of the population as a whole [7]. Studies correlating mortality rates with income, occupation, education, and socioeconomic status have substantiated the inverse relationship between social class and mortality [3,15].

Although these and several other factors are known to influence mortality, the general U.S. population mortality rates, published annually by the National Center for Health Statistics [11] from its tabulations of registered deaths (in conjunction with Census Bureau population estimates), are stratified only by age, race, and sex. Therefore, in order to accurately reflect the mortality experience of the wealthy, an adjustment to the general mortality rate is needed.

The mortality rates assumed to approximate those of male top wealthholders are based on the mortality experience of the Metropolitan Life Insurance Company for preferred risk "Whole Life" policyholders with large life insurance policies. We are assuming that the mortality experience of these generally wealthy policyholders is representative of that of the wealthy

population. The general white male population mortality rates are adjusted by differentials based on the divergence of the mortality experience of Metropolitan Life's male policy holders from the mortality rates of the general male population. Figure D illustrates the not unsubstantial divergence in the mortality rates of these two groups. Because Metropolitan does not compute statistics on female mortality, mortality rates for female wealthholders were generated by applying the male differentials to the general rates for white females. Multipliers were then derived by taking the inverse of the adjusted mortality rates for each decedent according to age and sex. These multipliers, applied to sampled estate tax return data, produced wealth estimates for the living population.

Figure D—MALE MORTALITY RATES: GENERAL POPULATION AND TOP WEALTHHOLDERS, 1976
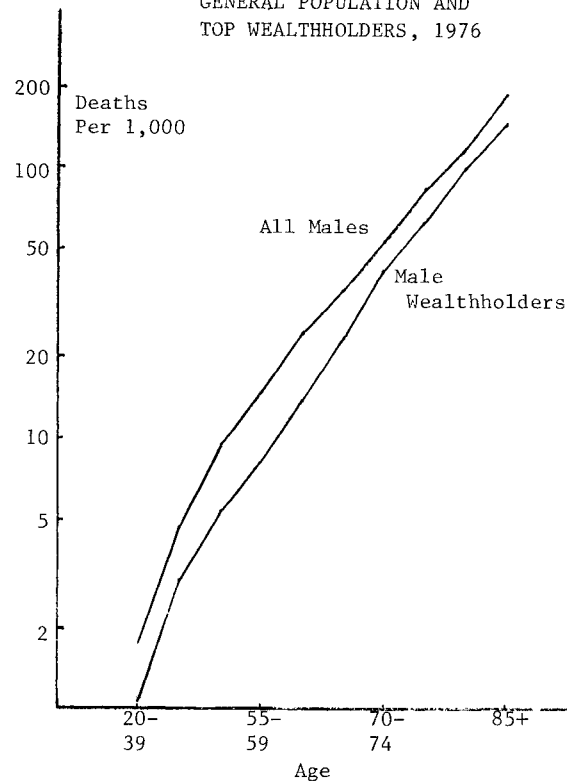
3. METHODOLOGICAL RESEARCH

In addition to the preparation of annual estate and personal wealth reports, much of the ongoing work of the SOI Division is devoted to the improvement and expansion of the estate multiplier technique. Several methodological issues are of major interest. The first of these is the estimation of improved mortality rates for the wealthy. The second is that of sampling error introduced by the "selection" of death's sample. The third is the nonsampling error imposed by the valuation of assets on the return and the difference in the definition of wealth resulting from the use of the estate tax return.

Mortality Rates - The accuracy of the estate multiplier estimates depends to a great extent upon the adjusted mortality rates assumed to reflect the mortality experience of the wealthy [13]. While we believe our adjustment to be a reasonable one, it may still include biases which would affect the validity of our personal wealth estimates. The size of the multiplier used will, of course, affect the overall estimates of the number and wealth of the top wealthholders. However, estimates of the patterns of asset holdings among different age, sex, and marital groups of the wealthy will remain proportionately the same, regardless of the multiplier.

In an ongoing effort to improve the accuracy of the adjusted mortality rates, we continue to study the relationship between wealth and mortality. We have proposed a study which would use a file of estate tax returns to establish a frame of wealthy decedents. Extracting information on cause of death and occupation reported on the death certificates for these decedents, we will generate cause-specific mortality differentials for the wealthy. These differentials will be a valuable tool in improving the estate multiplier technique.

Sampling Error - A second methodological issue that should be addressed is that of potential sampling error. Our sample size of about 19,000 estate tax returns filed in 1983 is large enough to minimize overall sampling error. In fact, our sample size is considerably larger than the approximately 750 high income individuals sampled for the Federal Reserve's 1962 Survey of the Financial Characteristics of Consumers [14] and the 5,000 high income individuals selected for the 1983 Survey of Consumer Finances. (More significantly, only 9 percent or about 440 of these individuals in 1983 agreed to be interviewed and only 44 percent or about 330 individuals in the 1962 study responded to the survey.)

Despite our very large overall sample size, however, the limited number of returns filed each year for young and very wealthy decedents can make results for these categories subject to considerable sampling error.

The achieved selection probabilities of death's sample of these young and very wealthy decedents in a given year can distort our estimates of the wealth of the living. Death "samples" at high and low rates which tend to average out over time, but which can result in large short-term fluctuations. When death "selects" a smaller sample--that is, fewer deaths for a limited population during a sample year--wealth estimates will be lower than the true population values. Likewise, with too large a sample, estimates are produced which overstate the wealth of the population.

The problem of under or oversampling is magnified at very high levels of wealth. Because our sample of those decedents with $90 million or more of net worth is already very small, a difference of just one return can have a significant effect on the estimates of wealth at this level.

In order to correct for varying sample sizes for low incidence/high variability categories,

we plan to compensate by averaging data for wealthier decedents and for younger wealthholders over a period of more than one year. Return information sampled over a period of three years will be used to produce a composite aggregate with each year's data given a weight of one-third. By taking data for the years before and after the sample year, we linearly average trends in prices and mortality to get a better estimate of average wealth.

Another way to reduce the sampling error associated with the use of the estate multiplier technique for high levels of wealth would be to supplement our estimates with outside information. We are exploring the possibility of using data from the annual Forbes magazine estimates of the 400 wealthiest individuals in the United States in conjunction with IRS data for these levels of wealth.

In order to evaluate the accuracy of the Forbes data for particular returns, a case-by-case comparison of our estate tax return data and the Forbes estimates will be made upon the filing of a return after the death of each individual on the Forbes list. Estate tax returns for those individuals who were incorrectly excluded from the Forbes 400 will also be analyzed. As of this writing, we have identified 15 members of the Forbes 400 who have since died and for whom estate tax returns have been filed. We have compared the asset information on these tax returns that we have received with the corresponding Forbes estimates, but the small number of available returns prevents a conclusive evaluation of the accuracy of the Forbes data. As we receive more of these returns, we will be better able to determine the validity of the Forbes estimates.

Once a pattern is established, the Forbes estimates can be adjusted for their general undervaluation or overvaluation of wealth. Having obtained an adjusted estimate of the total net worth of the 400 wealthiest individuals, information on the composition of the assets of these wealthholders will be derived from the estate tax returns of decedents with assets at this level. These aggregate figures will then be grouped by demographic characteristics obtained from the Forbes data. This will provide us with a more accurate estimate of the wealth of this segment of the population through the use of the net worth data for living individuals in lieu of a dependence on death as a "selector" of a limited and highly valuable sample.

Valuation and Definitional Differences - The third methodological issue to be addressed is that of the differences between personal wealth and estate tax wealth. The use of the estate tax return to estimate the value of assets held by living individuals is limited because the wealth reported on the return is not identical to what is ordinarily considered to be an individual's wealth. Certain assets are not required to be reported on the return. Other assets are required to be reported on the return even though they are no longer considered to be part of an individual's wealth.

In addition, because the estate tax returns

are sampled before audit, any changes made to the valuation of the estate during the IRS audit process will not be reflected in our final statistics. As mentioned previously, the valuation of asset holdings for estate tax purposes is complex, and therefore presents some potential for the mis- statement of wealth on the return. The only study of estate tax returns before and after audit, in 1949, revealed that the value of assets reported on the return was increased an average of ten percent after audit [5]. The extent of the undervaluation of pre-audit returns probably varies with the asset type and may even vary with the size of the estate. A study to assess the amount and the nature of the undervaluation is currently being pursued. If a pattern is discovered, our estimates can be adjusted to compensate for any inherent under- valuation of assets. In any event, the dif- ference between the taxpayer's valuation and the valuation of the auditors can be used as a measure of overall nonsampling error.

4. CONCLUSION

Estate tax returns are a valuable source of economic and demographic information about the wealthiest segment of the population. The estate multiplier technique has proven to be fairly successful at using tax return informa- tion to estimate the wealth of these individuals. In order to improve the estate multiplier estimates, we continue to study the assumptions underlying the application of the multiplier and to measure the range of possible error in our results. Through further study and method- ological adjustments to the technique, we hope to make our statistics more meaningful and useful. Eventually, we hope to use the estate multiplier technique in conjunction with other estimating techniques to chart the wealth distribution of the entire population.

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