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AVERAGE MARGINAL TAX RATES FOR
U.S. HOUSEHOLD INTEREST AND
DIVIDENED INCOME 1954-1980

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ABSTRACT

This paper carefully outlines a method for the calculation of average marginal tax rates. The method is applied to Statistics of Income data for dividend and interest income earned by U.S. households from 1954 to 1980. To illustrate the effects these data can have in empirical work, the tax rates are used in comparing the sample moments of before and after-tax real yields on financial assets.

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I. Introduction

Numerous macroeconomic problems require an aggregate measure of the applicable marginal tax rate. In a microeconomic context, exact marginal tax rates may be obtained. When macroeconomic data are used, however, a single rate must be computed for each type of income. It is the purpose of this paper to : (i) provide a method for the calculation of average marginal tax rates¹ for dividend and interest income earned by households, and (ii) present calculations of these rates for the United States for the period from 1954 to 1980 .

These rates will find applicability in several areas. For example, in any portfolio problem involving the demand for real asset balances, the relevant returns are presumably the real after-tax yields on the assets (see, for example, Friedman(1983)) . This distinction produces nontrivial changes for the important household sector, which accounted for 71% of all US financial assets held as of year-end 1982.² Marginal tax rates applicable to aggregate household data are not readily available for recent years.³

Another application involves providing empirical content to theories of capital formation and taxation (see, for example, Feldstein

¹The term "average marginal rates" may sound hopelessly oxymoronic to some. Purists may replace it with the more careful "weighted averages of marginal rates."

²Derived from Flow of Funds data: total household financial assets as a percentage of all financial assets (households, non-financial business, foreign, U.S. government, and State and Local governments).

³The last known attempt at carefully estimating interest and dividend income marginal rates seems to be Wright (1958). These estimates range only through the late 1950's. More recently, Barro and Sahasakul (NBER Working Paper 1060) have estimated overall

(1976)). Finally, these rates might be used to compare actual tax rates with those arising from optimal taxation norms.

In section II, we outline the precise method of calculation. Section III presents the calculated rates. Section IV illustrates the effect of applying average marginal tax rates to real financial asset yields.

II. Method of Calculation

All the data employed come from the 1954 through 1980 issues of the IRS Statistics of Income for individual tax returns.⁴ Dividend and interest income data are reported according to filing status and adjusted gross income (AGI) class. Statutory marginal tax rates, also reported by AGI class, are collected from the relevant tax rate schedules for each year.⁵

The essence of the method employed here is to calculate a weighted average of the statutory marginal rates. The weight for each income class is the amount of dividend or interest income in that class.⁶ Complications arise because the reported AGI classes used to

average marginal income tax rates.

⁴The most recent data available are the 1980 returns.

⁵The filing statuses reported for tax rates and income categories varied from year to year. For a detailed listing of the filing status assumptions made in calculating the weighted average rates, see the appendix at the end of this paper.

⁶Dividend and interest income are both taxed at the regular income rate. Only the difference in the distribution of interest and dividend holdings causes the weighted averages to differ.

present data for interest and dividend income are not the same as the AGI classes for marginal rates; hence there is a matchup problem. We used the following scheme for weighting:

- (1) If AGI categories match, apply the (income) weight to the (tax) rate.
- (2) If several rates correspond to one weight, divide up the weight according to the spacing of the AGI categories for rates.
- (3) If several weights correspond to one rate, apply the rate to each weight.

We considered an alternative interpolative solution to the mismatch problem:

- (1) Construct a histogram of the weights
- (2) Smooth the histogram by linearly connecting the midpoints of the bars.⁷
- (3) Apply the weights implied by the areas under the smoothed histogram to the rates.

The average rates calculated under this alternative method did not differ appreciably from those of the first, and so we used the simpler first method.

For clarity, we present in Table 1 a hypothetical example which

⁷In the descriptive statistics literature, this is called a "frequency polygon".

illustrates precisely the method described.

TABLE 1
EXAMPLE OF WEIGHTING METHOD

(1) WEIGHT AGI CLASS	(2) WEIGHT	(3) RATE	(4) RATE AGI CLASS	(5) ADJUSTED WEIGHT	(6) ADJUSTED RATE	(7) PRODUCT
0-2,000	20,000	.2	0-2,000	20,000	.2	4,000
2-4,000	40,000	.4	2-7,000	40,000	.4	16,000
4-6,000	70,000			70,000	.4	28,000
6-10,000	30,000			7,500	.4	3,000
		.6	7-9,000	15,000	.6	9,000
		.9	9-10,000	7,500	.9	6,750
TOTAL:	160,000			160,000		66,750

$$\text{Average Marginal Rate} = \text{Total(7)}/\text{Total(2)} = .4172$$

Note in the table that income is reported for AGI classes 0-2000, 2-4000, 4-6000 and 6-10000, while rates are reported for 0-2000, 2-7000, 7-9000 and 9-10000. Thus in this example we compute the weighted rates as follows:

- (1) In the first row, rate and weight categories match , and so we apply the rate (.2) to the weight (20,000) for a numerator entry of 4000.
- (2) The rate .4 applies to weight categories 2-4000 and 4-6000, and so we apply it to both.
- (3) The rate .4 also applies to the 6-7000 weight category. However, our weight data appear only for the range 6-10000, and so we allocate the the 6-7000 por-

tion of the weight according to the spacing of the rate AGI categories: 6-7000 (25%), 7-9000 (50%) and 9-10000 (25%). Thus, 25% of 30,000 is multiplied by .4, 50% by .6, and 25% by .9, yielding the entries in column (7) .

III. Average Marginal Tax Rates

Table 2 presents the average marginal tax rates for household interest and dividend income for 1954-1980. The 1964 tax cut has a pronounced effect on both tax rates, while other tax measures seem to produce little noticeable changes. Since then, note that both interest and dividend tax rates follow a general upward trend.

TABLE 2
AVERAGE MARGINAL TAX RATES FOR INTEREST AND DIVIDEND INCOME

<u>Filing Year</u>	<u>Interest</u>	<u>Dividend</u>
1954	0.3023	0.5054
1955	0.3013	0.5155
1956	0.3084	0.5172
1957	0.3066	0.5080
1958	0.3029	0.5048
1959	0.3046	0.5049
1960	0.2955	0.4949
1961	0.2989	0.5022
1962	0.2905	0.4968
1963	0.2892	0.5022
1964	0.2631	0.4597
1965	0.2552	0.4359
1966	0.2599	0.4376
1967	0.2695	0.4476
1968	0.2745	0.4500
1969	0.2803	0.4423
1970	0.3064	0.4536
1971	0.3360	0.4721
1972	0.3128	0.4559
1973	0.3120	0.4614
1974	0.3341	0.4967
1975	0.3341	0.4759
1976	0.3407	0.4834
1977	0.3243	0.4786
1978	0.3353	0.4874
1979	0.3442	0.4744
1980	0.3462	0.4757

IV. An Example: Real Yields and Portfolio Effects

Asset demand functions are typically assumed to result from an agent's optimization process. Thus it is marginal, not average, tax rates which are of primary interest. As an example of the effects of

applying these rates, in Tables 3 and 4 we consider before and after-tax quarterly returns on five assets: money, time deposits, short term bonds, long term bonds, and equities. The nominal returns are, respectively: zero; the regulated ceiling on small time deposits; the 4-6 month commercial paper rate; the BAA corporate bond rate plus the annualized capital gains on these bonds (as calculated from the consol approximation); the S&P 500 dividend-price ratio plus the annualized capital gain on equities (from the S&P 500 stock price index). In each case, the appropriate tax rate from Table 2 is applied to the interest or dividend component of the yield. Then, the actual rate of inflation in the CPI is subtracted to form a real yield. In addition, we use a capital gains tax rate as calculated by Feldstein, Poterba and Dicks-Mireaux.⁸

TABLE 3
MEAN REAL RETURNS, 1960-79

<u>Asset</u>	<u>Before Tax</u>	<u>After Tax</u>
Money (M)	-5.14	-5.14
Time Deposits (T)	-1.00	-2.27
Short-term Bonds (S)	0.76	-1.06
Long-term Bonds (L)	-1.30	-3.43
Equities (E)	4.64	2.61

⁸Feldstein, Poterba and Dicks-Mireaux, "The Effective Tax Rate and the Pretax Rate of Return", NBER Working Paper No. 740, Aug. 1981. We did not attempt a calculation similar to that above for capital gains, in part because data on long vs. short term capital gains are not readily available.

TABLE 4
COVARIANCE MATRICES, 1960-79

(A) Before Tax

	M	T	S	L	E
M	14.52				
T	12.53	11.03			
S	6.77	5.84	4.15		
L	32.10	29.97	13.15	219.21	
E	35.38	32.73	18.79	185.68	643.66

(B) After Tax

	M	T	S	L	E
M	14.52				
T	13.45	12.55			
S	9.66	8.96	6.96		
L	33.24	31.57	20.24	202.12	
E	35.01	33.31	23.99	170.22	573.43

Note in Table 3 that the inclusion of marginal tax rates changes the sample mean of the return on short bonds from positive to negative. In Table 4, the after tax variances are smaller for the returns on long bonds and equities, but they are larger for the returns on time deposits and short bonds. Such differences in both means and variances can bear important implications for implied optimal portfolio behavior.

APPENDIX
MATCHUP OF INCOME AND RATE TABLES BY FILING STATUS

<u>YEAR</u>	<u>DATA AVAILABLE</u>	<u>MATCHUP</u>
1954-70	Income: All Returns Single not HOH (Head of Household) or Separate Husband and Wife Returns Joint Husband and Wife Returns Rates: Unmarried HOH Single not HOH or Separate Husband and Wife Married Filing Jointly	Construct Income category "Unmarried HOH" from "All Returns" - Others .
1971-72	Income: All Returns Single, HOH Joint Husband and Wife Returns Separate Husband and Wife Returns Rates: Single, not HOH Married filing jointly Married filing separately Unmarried HOH	Construct income category "Single, not HOH" as residual from "All Returns"- Others .
1973-78	Income: All Returns Joint Returns Rates: Same as 1971-72	Assume joint returns taxed at "Married filing jointly" rate; remainder assumed taxed at "Single HOH" rate.
1979-80	Income: All Returns "Sources of Income by Filing Status" Rates: Same as 1971-72	Assume all returns are taxed at "Married filing jointly" rate.

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