

TAXPAYER EFFECTS OF A CHANGE TO
A CONSUMPTION TAX BASE

by

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INTRODUCTION

It is widely recognized that the present federal income tax system contains many complexities and inequities. Much discussion has occurred in Congress in recent months concerning simplification of the Internal Revenue Code. Because of public dissatisfaction with the current system of taxation, many proposals for tax reform have been entertained. The need for tax reform has been apparent for decades, as evidenced by a statement made by Dwight D. Eisenhower during his tenure as President:

Our whole system of taxation needs revision and overhauling. It has grown haphazardly over many years. The tax system should be completely revised.

The current political climate has not changed, except, perhaps, for the presence of a more pressing need for reform, as preponderated by two prominent Brookings Institution economists, Henry Aaron and Harvey Galper (1984, Washington Post):

At present a prosecuting attorney would have no difficulty persuading an impartial jury to convict the federal income tax system on several counts: it diverts resources away from their most productive uses, it is complex, and it is unfair.

Since the Tax Reform Act of 1981, a proliferation of tax reform bills has been introduced in Congress. In addition, a presidential directive requiring the study of tax reform has produced a Treasury proposal incorporating a number of provisions which would lead to the elimination of many deductions and exemptions (Weltzler, p. 265).

Most tax policy experts concur on at least one thing: the current tax system is unacceptable. This system violates all of the characteristics of a good tax structure: (1) it distorts efficiency because an investor-taxpayer cannot determine the consequences of a transaction before he makes the decision to undertake it; (2) most taxpayers would agree that the system is unfair, if for no other reason than that many opportunities for avoidance and even evasion exist; (3) finally, simplicity is so far-removed from the current structure that it is not feasible to think that anything less than a complete overhaul could accomplish a more simplistic system, most perceive the system as unnecessarily complex and in need of reform.

When the U.S. economy needs a boost, legislation has typically been enacted which was intended to affect the economy

in the desired manner. // The goal of this study is to determine whether changes in tax law enacted with the purpose of inducing investment/savings actually have an impact on individual taxpayer spending behavior. The Congressional records indicate that much recent tax reform has been designed to emulate a consumption tax; therefore, an analysis of the effects of tax law changes designed to stimulate savings on the individual taxpayer should allow generalizations regarding the implications of a consumption tax base on the individual taxpayer, ignoring macroeconomic effects.

SIGNIFICANT PRIOR RESEARCH

The preponderance of prior research is more theoretically-based than empirically based. Prior empirical research generally utilizes data on aggregate saving within the U.S. and survey data collected from a cross section of the household population for a single time period (Bosworth, 1984, p. 69).

Prior research pertinent to the reform of the federal individual income tax area is limited. Fullerton, Shoven, and Whalley (1983) conducted a study in which they employed a general equilibrium model designed to determine the impact of the transition to a consumption tax. The primary conclusion of their study was that a consumption tax initially requires tax rate increases, but lower rates result in later years due to economic growth. Boskin (1978) utilized time-series data to estimate a consumption function. He concluded that there was a positive real rate-of-return effect. Feldstein (1978) analyzed the change in welfare which occurs when shifting from an income-based to a consumption-based tax system. While his results do not support a consumption base, he assumed no interest elasticity of saving was present. Thus, research conducted on an empirical or simulation platform, assuming at least a nominal interest elasticity of saving, suggests that a consumption tax is likely to be more efficient than an income-based tax system.

Theoretical literature on tax reform, and, in particular, the consumption tax framework, is extensive. Two major theoretical studies have been published recently: Blueprints for Basic Tax Reform (1977) and The Meade Report (1978). The conclusion reached in both of these studies was that the consumption tax is both feasible and desirable.

HYPOTHESES

This study attempts to demonstrate the generalized benefits of tax reform on the individual taxpayer. In particular, several specific questions are explored: (1) what is the effect on the propensity to save under a consumption tax base? (2) is the marginal propensity to save an increasing function of income? (3) what will be the effect on the progressivity feature of the tax system? and, (4) what are the likely implications of a consumption tax in the United States? Specific hypotheses examined were:

Hypothesis 1: It is possible to construct a consumption tax system in which the relationship between income and tax is not impaired.

Hypothesis 2: The equity of the current system can be maintained, if not improved.

Hypothesis 3: APS and MPS are different among individuals (i.e., MPS is an increasing function of income).

Hypothesis 4: A consumption tax does, indeed, encourage saving through interest rate changes, suggesting that saving is interest elastic.

Hypothesis 5: The demographic characteristics of a taxpayer are determinants of consumption, suggesting that the effects of a change to a consumption tax would be individual-specific.

Seven ancillary hypotheses which are derived from previous studies were also examined to facilitate the analysis of Hypothesis 5:

Hypothesis (5a) Geographic location is not a determinant of consumption.

Hypothesis (5b) Household size is a determinant of consumption.

Hypothesis (5c) The state tax system, as well as the federal tax system, is a factor influencing consumption.

Hypothesis (5d) Marginal federal tax rate is inversely related to consumption.

Hypothesis (5e) Retirement status, or a change in retirement status, affects consumption.

Hypothesis (5f) The number of earners, or a change in the number of earners, influences consumption.

Hypothesis (5g) Income from labor sources, as opposed to income derived from capital investments, behaves differently as a predictor of consumption.

TAX REFORM MEASURES EVALUATED

The United States' economy of the 1970's was plagued by inflation, unemployment, no growth in capital goods expenditures, and a struggling dollar in the world market. A tax program was instated which was composed exclusively of tax rate reductions and investment incentives.

Several items of tax legislation were enacted to promote investment during the period for which data is available, 1979 and 1980. There was a lowering of the marginal tax rates. The personal exemption was raised from \$750 to \$1000. There were the following zero bracket amount increases:

<u>Old Law</u>	<u>New Law</u>	<u>Type of Return</u>
\$3200	\$3400	Married, Filing Jointly
2200	2300	Singles & Heads of Households
1700	1600	Married, Filing Separately

The investment tax credit (ITC) was permanently set at 10 percent. The net capital gains deduction was increased to 60 percent. Dividend and interest income exclusions were doubled in 1980. Finally, the permissible time to contribute to an IRA

was extended, early withdrawal penalties were lifted, and an allowance was made for an excise tax to be imposed on contributions made in excess of the allowable amount. These tax law changes were specifically implemented to induce saving. Similarly, a consumption tax is predicted to promote saving, perhaps more dramatically than the items of tax reform examined in this study. Evaluation of these selected tax law changes designed to encourage saving provide implications of the impact of a consumption tax base on taxpayers in the United States.

DATA

The file used in this study is a subset of an Internal Revenue Service (IRS) Panel of individual tax returns data base developed at the University of Michigan. The sample was selected based on the presence of several return characteristics in both years available (1979 and 1980): (1) itemized deductions, (2) no schedule C or F, (3) 1040 returns only, (4) payment to IRA and Keogh, or interest income, dividends, business income or loss, capital gain, or supplemental income (from Schedule E), and (5) a single item from (4) need only be present in one year. A random sample of 933 returns fulfilling these criteria was utilized in this study.

Itemized deductions were required because some measure of tax-deductible consumption was necessary to determine total consumption. Because a measure of wealth was needed, income from a farm or a business or profession was an indication of the presence of diversification of assets, which may have interfered with the measurement of wealth. The savings items in (4), above, were vital to the measurement of wealth, or the surrogate variable, investment income. Also, the tax law changes designed to encourage investment which were enacted in 1979 and 1980 dealt with the items in (4). These items were utilized to determine the change in the propensity to consume and then generalized to an environment in which only consumption is taxed.

THE MODEL

The primary empirical research conducted was an investigation employing a model developed for this study:

$$\text{CONSP} = f(\text{DPI}, \text{DPI}(-1), \text{WLTH}, \text{WLTH}(-1), \text{CONSP}(-1), \text{INCSQ})$$

where: CONSP is current consumption
DPI is disposable private labor income
DPI(-1) is DPI with a one-period lag
WLTH is current capital income, a measure of wealth
WLTH(-1) is WLTH with a one-period lag
CONSP(-1) is CONSP with a one-period lag, a measure of permanent consumption
INCSQ is total income (DPI+WLTH) squared

This model was employed utilizing several strata, such as income levels, state and federal tax effects, labor versus capital

income effects, the number of exemptions, retirement status, geographic location, and the number of earners in the household.

Measurement of each of the variables included in the model is imperfect. Several surrogate variables were utilized in this study due to the lack of perfect information on the tax return. The first variable, the dependent variable CONSP, was measured using two alternatives. First, an individual's ratio of tax-deductible consumption to total tax-deductible consumption for all individuals within his/her income level was used to allocate total income group consumption. Second, the difference between income and the change in savings defines consumption. A t-test was employed to determine that the means of the two measurements of consumption were not significantly different.

The independent variables were derived from information provided on the tax returns. DPI is composed of all elements of labor income: salaries and wages, sales income, income from a business or profession, partnership income, small business corporation income, and alimony. Some elements of income are composed of both labor and capital income components; however, the likelihood that an item is predominantly labor or capital determines its inclusion in that category. Capital income includes: interest, dividends, income tax refund, capital gain distributions, rental income, royalty income, trust income, unemployment compensation, other income, and pensions. While some items included in the capital income category are derived from previous labor effort, they are currently received as passive income. An approximation for WLTH is derived, as well. Income from capital is compared to wealth measured using current interest rates (e.g., if interest income were reported, an approximation for the savings account balance would be derived by dividing the interest income by the current interest rate). A t-test again provides the testing vehicle for examining hypothesis (5).

Other independent variables which resulted from demographic stratification of the sample were: INCLEV (income levels), LOCAT (geographic location), SIZE (household size), RETIR (retirement status), CHGRET (change in retirement status), ERNR (the number of earners in the household), CHGERN (change in the number of earners in the household), STATAX (a state tax system variable), MTR (marginal tax rate), and LAWCHG (a variable indicating a change in deductions directly affected by a tax law change in the period under observation).

RESULTS OF HYPOTHESIS TESTING

The viability of the first two primary hypotheses, dealing with impairment of the equity of the current tax system with a change to a consumption tax base, is demonstrated in Exhibit I. Also, the necessary consumption tax rates are computed. The total tax collected from this sample was \$7,333,231. The rates indicated in the final column of Exhibit I represent equal progressivity achieved under a consumption tax system. A poll tax producing the same amount of revenue would require collecting

Exhibit I

Relationship Between Income and Tax Under Income
and Consumption Tax Systems

Average Income	Average Tax Rate	Tax	Disposable Income	APC	Consumption	Consumption Tax Rate
2322	14	325	1997	1.78	3555	8.4
3466	14	485	2981	1.15	3428	12.4
4749	14	665	4085	1.01	4126	13.9
5554	14	778	4776	.93	4442	14.9
6521	17	1108	5413	.89	4818	18.7
7392	18	1331	6061	.82	4970	21.1
9241	18.5	1710	7531	.77	5799	22.8
10744	16.8	1800	8944	.72	6440	21.8
13805	18.5	2554	11251	.67	7538	25.3
17778	21.9	3893	13885	.61	8470	38.6
22841	24.3	5544	17297	.57	9859	36.0
27502	26.8	7379	20123	.54	10866	40.4
32509	30.2	9827	22682	.52	11795	45.4
37249	33.4	12449	24800	.48	11904	51.1
44259	38.8	17172	27087	.40	10835	61.3
59592	45.1	26882	32710	.28	9159	74.6

\$7860 (7,333,231/933) from each taxpayer. A flat rate consumption tax would result in a rate of 55 percent (7,333,231/13,244,760). Similarly, any changes desired in the progressivity features of the current tax structure (i.e., alteration of amounts collected from a particular income/consumption group) could be achieved in the same manner.

Hypothesis (3) is also supported (APS and MPS are different among individuals). A nonlinear specification yields a better fit and the R-squared shows a 27 percent improvement with the inclusion of the nonlinear income variable in the model; thus, the evidence supports the hypothesis of differing marginal propensities to consume. The marginal propensities to consume by income levels are presented in Exhibit II. The long-run marginal propensities to consume, which are also presented in Exhibit II, were derived by dividing the short-run MPC's by the coefficient of the consumption lag term, .3503.

The fourth hypothesis was tested with a formulation previously derived by Feldstein and Feenberg (in Feldstein (1983)):

$$dCONSP = \frac{dCONSP}{R} dR + \frac{dCONSP}{INC} dINC$$

where: CONSP is consumption
R is the price of current consumption
INC is disposable income.

The change in consumption attributable to changes in tax law is the sum of a price effect and an income effect. The income

Exhibit II

IRS Marginal Propensities To Consume

Income Level	Short-run MPC	Long-run MPC
Under \$3,000	.7231	2.0642
3,000- 3,999	.7215	2.0597
4,000- 4,999	.7198	2.0548
5,000- 5,999	.7186	2.0514
6,000- 6,999	.7173	2.0477
7,000- 7,999	.7160	2.0440
8,000- 9,999	.7135	2.0368
10,000-11,999	.7114	2.0308
12,000-14,999	.7071	2.0186
15,000-19,999	.7015	2.0026
20,000-24,999	.6944	1.9823
25,000-29,999	.6879	1.9637
30,000-34,999	.6809	1.9438
35,000-39,999	.6743	1.9249
40,000-49,999	.6644	1.8967
Over \$50,000	.6430	1.8356

elasticity of consumption is .5597 (the coefficient of the independent variable, income). While interest rate is not a variable in this function because this is not a time-series study, implications that the interest elasticity of consumption is less than .5597 are inherent. (In a progressive tax structure, income elasticity exceeds interest elasticity.)

Income elasticity measures the responsiveness of consumption to changes in income, holding constant the impact of other consumption determinants. Since income elasticity is positive, as the economy expands and national income rises, consumption would also rise. When income increases by one percent, for example, consumption would increase by only .005597 (1 percent of .5597); so, consumption would not maintain its relative proportion of income, and saving would replace that decreased consumption.

Analysis of the fifth hypothesis, addressing the issue of the influence of various demographic characteristics on individual taxpayers, relies on resultant regression equations. Several characteristics are analyzed: geographic location, household size, state tax system, retirement status, number of earners, source of income, and marginal tax rate. In general, current income, whether from labor or capital, total income squared, lagged consumption and labor income, the marginal tax rate, and retirement status were significant predictors of current consumption. Exhibit III presents a summary of the results of testing hypothesis (5).

The final model included in the analysis encompassed the variables which were determined to be significant:

$$\text{CONSP} = f(\text{DPI}, \text{WLTH}, \text{INCSQ}, \text{CONSP}(-1), \text{DPI}(-1), \text{MTR}, \text{LAWCHG}, \text{RETIR}).$$

Exhibit III

Significance of Variables
in Determining Consumption

	Significance Level				Not Significant
	.0001	.005	.10	.20	
Labor Income	*				
Capital Income	*				
Lagged Consumption	*				
Lagged Income	*				
Income Squared	*				
Exemptions				*	
Retirement Status		*			
Change Retirement			*		
Lagged Income Squared	*				
Marginal Tax Rate	*				
State Tax Factor					*
Law Change Factor	*				
Change in Saving	*				
Location					*
Earners					*
Change Earners					*
Wealth Accumulations			*		

The directions of the signs of the coefficients of these variables were consistent with theory and results from this study (which are not presented). All factors, including the intercept ("fixed consumption") and excepting RETIR, were significant at the .0001 level. The specific effects of the factors on current consumption were intuitively satisfactory, as well.

$$\begin{aligned}
 \text{CONSP} &= 6603.18 + .5963\text{DPI} + 1.2136\text{WLTH} - \\
 &\quad (996.043) \quad (.0809) \quad (.0882) \\
 &\quad .0001 \quad .0001 \quad .0001 \\
 & .00000635\text{INCSQ} + .2222\text{CONSP}(-1) + .4671\text{DPI}(-1) - \\
 &\quad (.00000091) \quad (.0296) \quad (.0483) \\
 &\quad .0001 \quad .0001 \quad .0001 \\
 & 715.1467\text{MTR} - .3032\text{LAWCHG} - 103.7436\text{RETIR} \\
 &\quad (42.2951) \quad (.0669) \quad (779.237) \\
 &\quad .0001 \quad .0001 \quad .8941
 \end{aligned}$$

$$R^2 = .47$$

$$SSE = 17255541796$$

The implications of the above regression equation support the implementation of a consumption tax base. This model is, perhaps, more representative of the effects of savings incentives on taxpayers than any other presented. In this model, regardless of income, an individual consumes \$6603 per year. This seems

more realistic than the results of some of the previous models; in fact, it was highly significant in this case. Permanent income and consumption were positively related to current consumption, implying that a permanent increase in either income or consumption leads to higher current consumption. The sign of the coefficient of the nonlinear term, INCSQ, was negative, leading to the conclusion that there are differing marginal propensities to consume. Specifically, as income increases, consumption decreases at an increasing rate. The effects of federal tax policy on taxpayer behavior are also apparent. Increases in saving incentives result in corresponding reductions in consumption. An increasing marginal tax rate also causes decreased consumption. The coefficient of the retirement status variable carries a negative sign, as predicted; however, the coefficient was not statistically significant in this model. The highest R2 value was attained in this final model of taxpayer consumption, excluding the weighed average models.

In conclusion, each of the five primary hypotheses was supported by the data. First, the proportion of tax to consumption or income can be maintained in a change to a consumption tax base. Second, two examples of changes in equity through structural changes have been demonstrated. Third, the marginal propensities to consume/save differ among individuals. Fourth, saving is, indeed, interest elastic, as supported by the coefficient of the natural log function falling between zero and one. Fifth, demographic characteristics of taxpayers are determinants of consumption. Support of this final hypothesis is dependent upon several ancillary hypotheses, concluding that household size, retirement status, income sources, permanent income and consumption, and, most significantly, tax law changes designed to stimulate saving, are important factors determining current taxpayer consumption.

IMPLICATIONS OF THE RESULTS

In general, each of the primary hypotheses received support from the underlying data. Predominantly, the evidence of the impact of a consumption tax base on the individual taxpayer was provided by the ancillary hypotheses.

As previously asserted, the equity of the current tax system can easily be maintained, as is demonstrated with the application of simple mathematics (primary hypotheses (1) and (2)). An identical amount of tax can be collected, in total or according to income levels, as desired by the administration. Similarly, the total tax can be altered, with each income group contributing the same percentage. In either case, equal progressivity can be achieved. Also, tax rates can be determined from the amount of revenue desired to be collected from a particular income stratum. This manipulation allows for changes in the progressivity feature of the current tax system.

Much emphasis was placed on the examination of the third hypothesis. The differences in savings rates among individuals is an important fact to recognize when considering the implementation of a consumption tax system. Consider two individuals

with identical incomes, but who consume at opposite extremes. Under a consumption tax, the taxpayer with a low MPC will pay less taxes; however, this is a desirable effect of a consumption tax system which results in increased saving, and, thus, economic expansion. Sufficient study of the effects of a change to a consumption tax on MPCs is necessary before considering implementation. Following the enactment of tax reform intended to encourage investment, consumption may decrease to an unexpected level, particularly among the upper income level taxpayers, thus resulting in tax avoidance as experienced under the current tax structure.

Dealing with the interest elasticity of saving, evidence indicates that a consumption tax system would encourage saving during economic expansion. Both income and interest would encourage saving during economic expansion. Both income and interest elasticity are less than one, implying that, ceteris paribus, as income rises and the effective rate of interest (due to exemption of passive income from taxation) rises, the percentage of saving increases. Additionally, LAWCHG, the variable included to assess the impact of tax law changes on savings, which would be apparent on the tax return, is, in all cases, significant. An independent variable, SAVCHG, indicates that the tax law changes directly resulted in increased saving, attributable to a decrease in current consumption. The minor significance of the tax law changes during the period under examination in this study still resulted in noticeable increases in saving. This is an important discovery when considering the implementation of a consumption tax. Perhaps the most noteworthy aspect of this study is the use of several strata to explore the implications of a consumption tax base on individual taxpayers. The fifth primary hypothesis deals with the segregation of taxpayers based on various demographic characteristics: geographic location, household size, state tax system, retirement status, number of earners, source of income, and marginal tax rate.

LIMITATIONS

As in any study, there are several inherent limitations; the limitations of this study are predominantly imposed by the data source. Only two years of data are available and the tax law changes in those two available years are not ideal for this examination. However, because the tax reform package was small, and the base year, 1979, underwent no change, no confounding of results may have occurred; therefore, the measurable results may be more reliable.

Also, there are self-imposed limitations. This study ignores the increased revenue needs of the federal government. This issue was addressed in Hypothesis (1). It is easily demonstrated that increased revenue can be produced by a consumption tax system. Similarly, the viability of a consumption tax system is not being debated. This study simply examines the impact and corresponding implications of a consumption tax structure on individual taxpayers, ignoring the effects on the

economy.

SUMMARY

The significance of these results is apparent. Consumption tax proposals have been introduced in the House and Senate. The Reagan Administration favors a consumption tax primarily because it encourages saving. Senator David Durenberger claims that the federal deficit, impeding economic recovery, could be eliminated by enacting a national consumption tax reform package. The legislation, however, has not yet been fully developed; thus, the need for immediate research in the tax policy area is apparent.

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