

THE EFFECTS OF THE DURATION OF FEDERAL TAX REDUCTIONS: EXAMINING THE EMPIRICAL EVIDENCE



Chairman Jim Saxton (R-NJ)

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Executive Summary

The permanency of the federal tax code is an issue currently before Congress. President George W. Bush is seeking to accelerate the implementation of the individual income tax rate reductions in the *Economic Growth and Tax Relief Reconciliation Act of 2001* (EGTRRA) and to make all of its provisions, including the rate reductions, the expansion of the child tax credit, and the repeal of the estate tax, which are currently scheduled to expire on December 31, 2010, permanent.

According to the available evidence, individuals respond more strongly to a permanent federal tax rate reduction or other permanent tax incentives than to a temporary federal tax reduction or a federal tax rebate. Thus, the duration of a federal tax reduction affects how much it can stimulate economic growth.

Empirical studies generally show that many individuals (between 50 percent and 80 percent) smooth their consumption over their lifetime based upon their expectations of permanent income (*i.e.*, lifetime average income excluding any one-time income gains or losses) while liquidity constraints, myopia, and other limitations compel other individuals (between 20 percent and 50 percent) to limit their consumption to current after-tax income.

Because only a permanent federal tax reduction can increase permanent income, a permanent federal tax reduction elicits higher near-term consumption and GDP growth than a temporary federal tax reduction or a federal tax rebate. A survey of relevant empirical studies using a variety of statistical models and data sets suggests that a permanent federal tax reduction affecting individuals will increase first-year aggregate consumption and GDP twice as much as a temporary federal tax reduction of the same amount and at least three times as much as federal tax rebate of the same amount, all other things being equal.

Instead of finding that individuals anticipate how announced federal tax changes affect their after-tax income and alter their consumption even before such changes are implemented, empirical studies generally find that the most of the economic benefits from federal tax reductions affecting individuals when such reductions are implemented. Lengthy phase-ins and implementation delays minimize the near-term boost to consumption and GDP growth from federal tax reductions affecting individuals.

Joint Economic Committee
1537 Longworth House Office Building
Washington, DC 20515
Phone: 202-226-3234
Fax: 202-226-3950
Internet Address:
<http://www.house.gov/jec>

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THE EFFECTS OF THE DURATION OF FEDERAL TAX REDUCTIONS: EXAMINING THE EMPIRICAL EVIDENCE

I. Introduction

In response to the recession that began in March 2001, the *Economic Growth and Tax Relief Reconciliation Act of 2001* (EGTRRA) was enacted in June 2001. EGTRRA reduces individual income tax rates, expands the child tax credit, and repeals the estate tax, but these provisions are currently scheduled to expire on December 31, 2010. The subsequent economic disruptions associated with the terrorist attacks of September 11, 2001, intensified the recession. To stimulate both short-term and long-term economic growth, President George W. Bush is seeking among other things to accelerate the implementation of the EGTRRA's individual income tax rate reductions and to make all of EGTRRA's provisions permanent.

As a result of these developments, U.S. policymakers are evaluating various options for reducing federal taxes affecting individuals in order to stimulate consumption and foster economic growth.¹ These options include:

1. Permanent federal tax reductions,
2. Temporary federal tax reductions, and
3. One-time rebates of federal taxes previously paid.

Duration is a key difference among these options. This study examines the federal tax system as it affects individuals to determine how duration influences the ability of these options to stimulate near-term consumption and cause economic growth to accelerate.²

To answer these questions, economists must first how the after-tax income of individuals affects their consumption. Observing that individuals smooth their consumption over their lifetime, Nobel laureate Milton Friedman hypothesized that individuals base their consumption during any period upon their current wealth and their expectations for permanent income; *i.e.*, lifetime average after-tax income excluding any one-time income gains or losses. This is the permanent income hypothesis. Economists also hypothesized that age influences individual consumption decisions. This is the life cycle hypothesis. Because the life cycle and permanent income hypotheses are so closely interrelated, they may be combined into a single life cycle permanent income hypothesis for analytical purposes.

Economists recognize that liquidity constraints, myopia, and other limitations prevent some individuals from smoothing their consumption. Instead, their consumption varies with changes in current after-tax income. Empirical studies generally support a modified life cycle permanent income hypothesis; *i.e.*, many individuals (between 50 percent and 80 percent) smooth their consumption in accord with the life cycle permanent income hypothesis while the consumption of some individuals (between 20 percent and 50 percent) tracks their current after-tax income.

¹ In this study, federal taxes affecting individuals are defined as (1) the individual federal income tax excluding its provisions relating to sole proprietorship, partnerships, and subchapter S corporations, (2) federal payroll taxes for Social Security and Medicare, and (3) federal excise taxes on consumer products such as alcoholic beverages, motor vehicle fuels, and tobacco products.

² This study does not examine the federal tax system as it affects business firms to determine how would the duration of federal tax reductions affect their ability to stimulate near-term investment and when would such reductions cause economic growth to accelerate.

According to the rational expectations theory of economic behavior, forward-looking individuals should anticipate how announced federal tax changes affect their after-tax income and should alter their consumption even before these changes are implemented. Contrary to the rational expectations theory, however, empirical studies generally find that individuals adjust their consumption when tax changes actually affect their tax payments or take-home pay.

Under the modified life cycle permanent income hypothesis, consumption responds differently to a permanent tax reduction, a temporary tax reduction, and a tax rebate. A permanent federal tax reduction causes an increase in permanent income, but a temporary federal tax reduction and a federal tax rebate do not. Therefore, a permanent federal tax reduction should elicit higher near-term consumption and gross domestic product (GDP) growth than a temporary federal tax reduction or a federal tax rebate. In accord with the modified life cycle permanent income hypothesis, empirical studies of major federal tax changes during the last half of the previous century confirm that the perceived duration of a federal tax change greatly affects its impact upon near-term consumption and GDP growth.

In summary, a survey of relevant empirical studies using a variety of statistical models and data sets suggests that a permanent federal tax reduction affecting individuals will increase first-year aggregate consumption and GDP twice as much as a temporary federal tax reduction of the same amount and at least three times as much as federal tax rebate of the same amount, all other things being equal. Empirical studies found that most of the economic benefits from a federal tax reduction affecting individuals occurs when such reductions are implemented and actually affect tax payments or take-home pay. Lengthy phase-ins and implementation delays minimize the near-term boost to consumption and GDP growth from federal tax reductions affecting individuals.

This scope of this study is limited to a review of the empirical literature concerning how differences in the perceived duration of federal tax reductions affecting individuals influence near-term consumption and GDP growth. Clearly, federal tax reductions may have other near- and long-term effects; *e.g.* reducing the deadweight losses from taxation and improving the incentives for work and saving. However, this study does not examine either the long-term economic consequences of federal tax reductions affecting individuals or any economic consequences of federal tax reductions affecting business firms. These topics have been examined in past JEC studies and will be examined further in future JEC studies.

II. Modified Life Cycle Permanent Income Hypothesis and Rational Expectations

A. Theory

1. Modified Life Cycle Permanent Income Hypothesis

Nobel laureate Milton Friedman observed that individuals smooth their consumption over their lifetime. Consequently, Friedman hypothesized that individuals base their consumption during any period upon their current wealth and their expectations for permanent income; *i.e.*, average lifetime after-tax income excluding any one-time income gains or losses. Thus, individuals benefiting from a temporary increase in their after-tax income are likely to save a significant portion of their windfall initially and then increase their consumption very slowly by drawing upon their additional savings in small increments over a long time, while individuals suffering from a temporary decrease in their after-tax income are likely to decrease their savings to maintain their previous consumption. This is the permanent income hypothesis.

Age also influences the consumption of individuals. When individuals enter the labor market, they frequently consume more than their current after-tax income by borrowing. During their peak earning years, individuals save a significant portion of their income. After retirement, individuals may draw upon their savings to maintain their consumption. This is the life cycle hypothesis. Because the life cycle and permanent income are so closely interrelated, they may be combined into a single life cycle permanent income hypothesis for analytical purposes.

Economists acknowledge that real world factors may limit the ability of some individuals to smooth their consumption. Some individuals may be liquidity constrained; *e.g.*, they own few assets, the assets that they own cannot be easily and quickly converted to cash, or they are unable to borrow because of their poor credit history. Contrary to the life cycle permanent income hypothesis, liquidity constraints may force individuals to reduce their consumption in response to a decline in their current after-tax income. Empirical studies found that approximately one-fifth of individuals are liquidity constrained. Examining data from two surveys done by the Federal Reserve Board of Governors in 1963 and 1964, Mariger (1987) found that 19.4 percent of the households are liquidity constrained, accounting for 16.7 percent of consumption in the population sampled.³ Applying a statistical model to the 1983 Survey of Consumer Finances data, Jappelli (1990) found that 19.0 percent of households are liquidity constrained, accounting for 12.7 percent of total income and 7.0 percent of wealth.⁴ Other individuals are myopic; *i.e.*, they ignore well-anticipated changes in future after-tax income and respond only to changes in current after-tax income. Thaler (1990) suggested other limitations on borrowing to smooth consumption; *e.g.*, Because individuals cannot easily access the wealth stored in home equity or pension funds, individuals may be reluctant to liquidate these assets or use them as collateral for loans; and Individuals may simply be debt averse.⁵

Because of these limitations, economists generally accept a modified form of the life cycle permanent income hypothesis; *i.e.*, many individuals (50 percent to 80 percent) smooth their consumption in accord with the life cycle permanent income hypothesis while other individuals (20 percent to 50 percent) suffer from liquidity-constraints, myopia, or other limitations and adjust their consumption to reflect changes in their current after-tax income.

2. Rational Expectations Theory

Nobel laureate Robert E. Lucas, Jr., proposed the rational expectations theory. Simply put, the rational expectations theory holds that economic decision-makers are forward-looking and take into account all available information that has a significant bearing on the future consequences of their actions. In regard to federal tax changes, the rational expectation theory implies that individuals should react to the enactment of federal tax laws that reduce (increase) their federal tax liabilities by increasing (decreasing) their consumption after the enactment but well before the tax payment, change in withholding, or receipt of tax refund or rebate actually occurs.

B. Empirical Evidence

1. Empirical Evidence for the Modified Life Cycle Permanent Income Hypothesis

Empirical studies generally support the modified life cycle permanent income hypothesis. Using National Income and Product Account data for disposable income and nondurable consumption expressed in seasonally adjusted real per capita terms, Flavin (1981) developed a consumption model in which consumption responds both to changes in permanent income signaled through changes in current income and to changes in current income. The response of consumption to current income beyond which is attributable to the role of current income in signaling changes in permanent income is the excess sensitivity of consumption to current income. If the unmodified life cycle permanent income hypothesis were true, then the excess sensitivity of consumption to current income should be zero. Instead, Flavin

³ Randall P. Mariger, "A Life-Cycle Consumption Model with Liquidity Constraints: Theory and Empirical Results," *Econometrica* 55 (May 1987): 533-557.

⁴ Tullio Jappelli, "Who is Credit Constrained in the U.S. Economy?" *Quarterly Journal of Economics* 105 (February 1990): 219-234.

⁵ Richard H. Thaler, "Anomalies: Saving, Fungibility, and Mental Accounts," *Journal of Economic Perspectives* 4 (Winter 1990): 193-205.

found that the excess sensitivity was 0.355. Therefore, Flavin rejected the unmodified life cycle permanent income hypothesis.⁶

Examining food consumption for households in the University of Michigan's Panel Study of Income Dynamics over seven years, Hall and Mishkin (1982) found:

According to our extended model, about 80 percent of consumption obeys the life cycle permanent income hypothesis. Consumption does not adjust in the same mechanical way to every change in income. Instead, consumers think about the source of a change in income and react vigorously only to those changes that signal a major shift in economic well-being. But the data reject the strong hypothesis that all consumption is governed by the life cycle permanent income principle.⁷

Analyzing food consumption for households in the Panel Study of Income Dynamics from 1968 through 1982, Zeldes (1989) tested the unmodified life cycle permanent income hypothesis against a modified life cycle permanent income hypothesis, under which individuals optimize their consumption subject to liquidity constraints, by splitting the sample into two subgroups – one likely to be constrained and the other unlikely to be constrained. Zeldes found that “liquidity constraints have important influences on consumption ... constraints caused annual food consumption growth [for the constrained group] to be 1.7 percent higher than it would have in the absence of constraints.”⁸ Zeldes' findings are consistent with the modified life cycle permanent income hypothesis.

Comparing retail sales and personal consumption expenditure data to changes in Social Security benefit payments from 1965 to 1985, Wilcox (1989) found that “fully anticipated increases in Social Security benefits cause large increases in consumption expenditures at the time when the increases are paid, especially for durables.” Wilcox rejects the unmodified life cycle permanent income hypothesis, showing that the relationship between changes in current after-tax income and consumption are statistically significant. Wilcox attributes this relationship to consumer myopia, liquidity constraints, and transaction costs in the consumer loan market.⁹

Examining aggregate quarterly U.S. income and U.S. nondurable and services consumption data expressed in real per capita terms from the first quarter of 1953 through the fourth quarter of 1985, Campbell and Mankiw (1990) found a statistically significant relationship between after-tax income lagged by two to six months and consumption. Moreover, they concluded that 50 percent of individuals based their consumption upon current after-tax income and 50 percent of individuals based their consumption upon their permanent income.¹⁰ While Campbell and Mankiw rejected the unmodified life cycle permanent income hypothesis, their findings were consistent with the modified life cycle permanent income hypothesis.

Mariger and Shaw (1993) contended that previous empirical studies using the Panel Study of Income Dynamics data – Hall and Mishkin (1982) and Zeldes (1989) – employed consumption models with an inappropriate constraint; *i.e.*, forecast errors are independent of all available information in the

⁶ Marjorie A. Flavin, “The Adjustments of Consumption to Changing Expectations about Future Income,” *Journal of Political Economy* 89 (1981): 974-1009.

⁷ Robert E. Hall and Frederic S. Mishkin, “The Sensitivity of Consumption to Transitory Income: Estimates from Panel Data on Households,” *Econometrica* 50 (March 1982): 480-481.

⁸ Stephen P. Zeldes, “Consumption and Liquidity Constraints: An Empirical Investigation,” *Journal of Political Economy* 97 (April 1989): 307.

⁹ David W. Wilcox, “Social Security Benefits, Consumption Expenditures, and the Life Cycle Hypothesis,” *Journal of Political Economy* 97 (April 1989): 288-304.

¹⁰ John Y. Campbell and N. Gregory Mankiw, “Permanent Income, Current Income, and Consumption,” *Journal of Business and Economic Statistics* 8 (July 1990): 265-279.

past. While this restraint is appropriate for time series data, it may not be appropriate for cross sectional data. In a cross section of households such as the Panel Study of Income Dynamics, erroneous forecasts about future macroeconomic events may cause such households to make common errors in estimating their permanent income in any given year. Therefore, surprise changes in income and consumption may be correlated to lagged changes in income. Mariger and Shaw found that failure to account properly for this correlation biased previous studies toward a rejection of the unmodified life cycle permanent income hypothesis. Mariger and Shaw developed a consumption model that adjusted for this correlation. Using food consumption data from the Panel Study of Income Dynamics during 1970-1971 and 1974-1981, Mariger and Shaw were unable to reject the unmodified life cycle permanent income hypothesis.¹¹

Attanasio and Weber (1995) found that many previous empirical studies made a number of simplifying assumptions in their consumption models that biased their results toward rejecting the unmodified life cycle permanent income hypothesis. Using aggregate consumption data – Flavin (1981) and Campbell and Mankiw (1990) – may obscure important differences among households. Using food consumption as a proxy for total nondurable consumption – Hall and Mishkin (1982) and Zeldes (1989) – is misleading because food is a poor proxy for overall consumption.¹² Furthermore, Attanasio and Weber observed that the allocation of nondurable consumption over time varies with predictable changes in the household composition and the labor supply of individual household members. Failure to specify these predictable changes properly caused previous consumption models falsely to show an excess sensitivity to current after-tax income. Consequently, Attanasio and Weber developed a consumption model that allows for demographic and labor supply changes within households. Using household nondurable consumption data from the Consumer Expenditure Survey from 1980 to 1990 to construct cohorts grouped by birth and education, Attanasio and Weber were unable to reject the unmodified life cycle permanent income hypothesis.¹³

Shapiro and Slemrod (1995) explored the response of individuals to the executive order of President George H. W. Bush to lower individual federal income tax withholding from February 28, 1992, through December 31, 1992, by \$28.80 per month for married couples and \$14.40 per month for singles in the 28 percent and 15 percent tax brackets. Bush's order did not change anyone's federal income tax liability for 1992. Instead, the temporary increase in disposable income during the balance of 1992 was fully offset by an equal decrease in disposable income through higher federal tax payments or lower refunds in 1993. Shapiro and Slemrod found that 43 percent of the individuals who responded to a telephone poll said that they would spend most of the additional take-home pay. The findings of Shapiro and Slemrod are remarkably similar to those of Campbell and Mankiw.¹⁴

Using food consumption data from the Panel Study of Income Dynamics from 1984-1987, McCarthy (1995) tested whether the marginal propensity to consume (*i.e.*, the percentage of the last dollar of after-tax income that an individual receives that is consumed) from a one-time change in after-tax income varies according to wealth. McCarthy found that the marginal propensity to consume of low-wealth households is higher than that of high-wealth households. McCarthy attributed this difference to precautionary savings and liquidity constraints. McCarthy also found that when low-wealth households are split into moderately low-wealth and very low-wealth household subgroups, *the marginal propensity to consume of very low-wealth households is lower than that of moderately low-wealth households.*

¹¹ Randall P. Mariger and Kathryn Shaw, "Unanticipated Aggregate Disturbances and Tests of the Life Cycle Consumption Model Using Panel Data," *Review of Economics and Statistics* 75 (February 1993): 48-56.

¹² Food is a necessity; other nondurable goods may be luxuries. Food is not separable from the consumption of other nondurable goods. The relationship between the prices of food and other nondurable goods is not constant over time.

¹³ Orazio P. Attanasio and Guglielmo Weber, "Is Consumption Consistent with Intertemporal Optimization? Evidence from the Consumer Expenditure Survey," *Journal of Political Economy* 103 (1995): 1121-1157.

¹⁴ Matthew D. Shapiro and Joel Slemrod, "Consumer Response to the Timing of Income: Evidence from a Change in Tax Withholding," *American Economic Review* 85 (March 1995): 274-283.

According to McCarthy, this unexpected downturn in the marginal propensity to consume may be attributed to the insurance effects of federal means-tested safety net programs.¹⁵

Noting that the previous studies were based upon one data set, the Panel Study of Income Dynamics, which provided detailed information on labor income, but reported only food consumption data, Lusardi (1996) combined the income data from the Panel Study of Income Dynamics with the very detailed consumption data in the Consumer Expenditure Survey from 1980 to 1987. Lusardi estimated an excess sensitivity of aggregate consumption to current after-tax income of between 0.2 and 0.5 depending on how consumption is defined. Although Lusardi rejected the unmodified life cycle permanent income hypothesis, Lusardi's findings agree with the earlier findings that support the modified life cycle permanent income hypothesis.¹⁶

2. Empirical Evidence against the Rational Expectations Theory

Empirical studies do not generally support the rational expectations theory that individuals adjust their consumption in anticipation of announced federal tax changes before they are implemented. Using weekly tax refund and earned income tax credit data from the *Daily Treasury Statement*, monthly social security benefit data from the *Social Security Bulletin*, and monthly consumption data from National Income and Product Accounts from January 1977 through February 1989, Wilcox (1990) found a statistically significant relationship between fluctuations in federal income tax refund disbursements (including the earned income tax credit) and the timing of consumption spending. Since individuals know the size of their federal income tax refunds well when they file their returns, the rational expectations theory holds that individuals should increase their consumption when they file their returns, not when they receive their refunds. Yet, Wilcox finds that aggregate spikes in consumption spending occur when refunds are received contrary to the rational expectations theory.¹⁷

Using household-level consumption data from the Consumer Expenditure Survey from 1980-1993, Parker (1999) tested whether individuals whose annual employment income exceeded the taxable maximum for applying Social Security old-age, survivor, and disability insurance (OASDI) payroll taxes contemporaneously increase their nondurable consumption expenditures during months in latter part of the year when payroll tax no longer apply and their take-home pay increases. If the rational expectations theory applied, then individuals should smooth this predictable change in their take-home pay. However, Parker found:

*A predictable, 1-percent increase in after-tax income in a three-month interval contemporaneously increases expenditures on nondurable consumption by around a half of a percent. To put this into perspective, since nondurable consumption averages about 40 percent of income, expenditures on nondurable goods rise 20 cents for each dollar of predictable increase of income.*¹⁸

Using data from the Consumer Expenditure Survey from 1980 to 1991, Souleles (1999) examined the response of household consumption to a predictable and transitory source of income – income tax refunds. Souleles found the marginal propensity to consume out of an income tax refund to be at least 35 percent within a quarter, up to over 60 percent. “Liquidity constraints appeared to play an important role,

¹⁵ Jonathan McCarthy, “Imperfect Insurance and Differing Propensities to Consume Across Households,” *Journal of Monetary Economics* 36 (1995): 301-327.

¹⁶ Annamaria Lusardi, “Permanent Income, Current Income, and Consumption: Evidence from Two Panel Data Sets,” *Journal of Business and Economic Statistics* 14 (January 1996): 81-90.

¹⁷ David W. Wilcox, “Income Tax Refunds and the Time of Consumption Expenditures,” *Economic Activity Section Working Paper Series 106* (Washington, D.C.: Federal Reserve Board of Governors, April 1990).

¹⁸ Jonathan A. Parker, “The Reaction of Household Consumption to Predictable Changes in Social Security Taxes,” *American Economic Review* 89 (September 1999): 960.

because the nondurable consumption of constrained households increased at the time of refund received, far more than unconstrained households.”¹⁹

In contrast to the other empirical studies, however, Dunkelberg and Peterson (1979) found “consumers anticipate major changes in federal income tax rates and modify their behavior in advance of as well as subsequent to the actual tax changes.” Dunkelberg and Peterson developed a model for the personal saving rate with dummy tax anticipation variables of 1 in each quarter between a presidential announcement of a major income tax change and its congressional passage. Using aggregate data from the first quarter of 1955 through the first quarter of 1975, Dunkelberg and Peterson found that the tax anticipation variables are statistically significant in explaining changes in the personal savings rate.²⁰

III. Theoretical Expectations Regarding the Near-Term Effects of the Duration of Federal Tax Changes on Consumption and GDP Growth

The modified permanent income-life cycle hypothesis has important theoretical implications for federal tax policy. The minority of individuals whose consumption responds to their current after-tax income due to liquidity constraints, myopia, or other limitations will react in the same way to either a permanent or a temporary change in their federal tax liabilities. The majority of individuals whose consumption responds to their permanent income will react differently based upon their perception of whether a federal tax change is either permanent or temporary. Permanent federal tax reductions increase permanent income while temporary federal tax reductions or federal tax rebates do not. For unconstrained individuals, a permanent federal tax reduction will elicit a large and swift increase in their consumption. A temporary federal tax reduction will immediately increase their savings. Unconstrained individuals will draw upon their additional savings very slowly over a long time to increase their consumption gradually. The different response of these two groups of individuals to a one-time change in their current after-tax income under the modified life cycle permanent income hypothesis means that a permanent federal tax reduction should be significantly more effective in stimulating near-term increases in consumption and GDP growth than a temporary federal tax reduction or a federal tax rebate, all other things being equal.

IV. Empirical Evidence Regarding the Near-Term Effects of the Duration of Federal Tax Changes on Consumption and GDP Growth

During the 1960s, many economists thought that the federal government could maintain economic growth and moderate inflation through frequent fiscal policy adjustments. This doctrine was known as “fine tuning.” In 1965, President Lyndon Johnson simultaneously escalated the Vietnam War, won congressional approval for numerous “Great Society” programs that would vastly increase domestic spending, and did not increase federal taxes. Meanwhile, the Federal Reserve maintained an accommodative monetary policy while the U.S. economy expanded vigorously. Consequently, inflation began to rise. Believing in both “fine tuning” and economic equivalency between permanent and temporary tax changes, Johnson’s economic advisors pressed for a temporary federal tax increase to curb inflation. In August 1967, Johnson sought a 10 percent federal income tax surcharge for 1968. In June 1968, Congress enacted the *Revenue and Expenditure Control Act of 1968*, which imposed a 10 percent surcharge retroactive to January 1, 1968, for corporations and to April 1, 1968, for individuals. In 1969, Congress extended the surtax at a 10 percent through remainder of 1969 and at a 5 percent rate from January 1, 1970, through June 30, 1970.²¹

¹⁹ Nicholas S. Souleles, “The Response of Household Consumption to Income Tax Refunds,” *American Economic Review* 89 (September 1999): 956.

²⁰ William C. Dunkelberg and Richard L. Peterson, “Consumer Anticipation of Federal Income Tax Changes,” *Journal of Macroeconomics* 1 (Spring 1979): 191-208.

²¹ Donald W. Kiefer, *Tax Cuts and Rebates for Economic Stimulus: The Historical Record* (Washington, D.C.: Congressional Research Service, January 2, 1992): 6.

The results of the 1968 surcharge in taming inflation were disappointing. Among other things, Eisner (1969, 1971) attacked Johnson's policy for ignoring the implications of the permanent income hypothesis on the effectiveness of a temporary federal income tax surcharge in curbing aggregate consumption.²² Eisner's criticism prompted economists to undertake numerous empirical studies during the next three decades into fiscal policy issues, including whether the duration of federal tax changes affects their ability to stimulate near-term consumption and GDP growth. The findings of these empirical studies generally support the theoretical expectations regarding duration of federal tax changes under the modified life cycle permanent income hypothesis.

A. Revenue Act of 1964

The *Revenue Act of 1964* is the first permanent federal tax reduction that economists widely studied. In January 1962 during his State of the Union address, President John Kennedy proposed a broad reduction in federal income taxes. In March 1964, Congress enacted the *Revenue Act of 1964*, which reduced individual federal income tax rates from a range of 20 percent to 91 percent in 1963 to a range of 14 percent to 70 percent in 1965 and the corporate federal income tax rate from 52 percent in 1963 to 48 percent in 1965. The investment tax credit was made more generous by eliminating the required deduction of the credit from the base for the depreciation of the qualifying asset in subsequent years.²³

Based on one and one-half years of data, Okun (1965) estimated the first year and ultimate effects of the *Revenue Act of 1964* on gross national product (GNP). Okun calculated that the tax reduction would increase nominal GNP by 1.38 times the size of the reduction at the end of 1964, 2.31 times by the end of 1965, and 2.78 eventually.²⁴ Examining consumption behavior during the three years after the 1964 tax reduction, Ando and Brown (1968) found that "the speed of adjustment to consumer expenditures to [permanent] income changes is much faster than is generally thought to be." Individuals will spend 64 percent of their permanent tax reduction in the first quarter rising to 93 percent in the first year.²⁵ Later empirical studies based upon more sophisticated econometric models suggested that the *Revenue Act of 1964* had a somewhat more modest, but still substantial effect on GNP. In 1976, Wharton Econometric Forecasting Associates (WEFA) and Data Resources, Inc. (DRI) estimated that the *Revenue Act of 1964* increased nominal GNP by 1.25 times and 1.22 times, respectively.²⁶

Nobel laureate Franco Modigliani and Steindel (1977) developed a model of consumer expenditures designed specifically to test for differences in the effects of transitory and permanent changes in federal tax liabilities. Finding that conventional models used past tax liabilities to estimate permanent income from lagged gross income (which implies that individuals respond to a permanent tax change in the same way as they do to a transitory change in gross income), Modigliani and Steindel developed an alternative model that applied the permanent tax rate to lagged gross income to estimate permanent income (which implies that individuals respond promptly only to permanent tax changes). Using 1964 data, Modigliani and Steindel found their alternative model provided a better forecast of

²² Robert Eisner, "Fiscal and Monetary Policy Reconsidered," *American Economic Review* 59 (December 1969): 897-905; and Robert Eisner, "What Went Wrong?" *Journal of Political Economy* 79 (May-June 1971): 629-641.

²³ Kiefer: 4.

²⁴ Arthur M. Okun, "Measuring the Impact of the 1964 Tax Reduction," in *Perspectives on Economic Growth*, ed. Walter E. Heller (New York: Random House, 1968): 27-49.

²⁵ Albert Ando and E. Cary Brown, "Personal Income Taxes and Consumption Following the 1964 Tax Reduction," in *Studies in Economic Stimulation*, ed. Albert Ando, E. Cary Brown, and Ann F. Friedlaender (Washington, D.C.: Brookings Institution, 1968): 117-137.

²⁶ Kiefer: 6.

actual consumption expenditures following the *Revenue Act of 1964* than conventional models, confirming “permanent tax reductions have a prompt effect on consumption.”²⁷

B. Revenue and Expenditure Control Act of 1968 Surcharge

Okun (1971) argued that the *Revenue and Expenditure Control Act of 1968* had been effective. Comparing actual consumption from the third quarter of 1968 through the third quarter of 1970 with the “full effect” results from Data Resources, Inc., University of Michigan, Office of Business Economics, and Wharton models, Okun concluded that the surcharge was between 59 percent and 88 percent as effective as a permanent federal tax increase in curbing consumption.²⁸

Other economists challenged Okun’s findings. Recognizing that “Okun’s conclusion that the surcharge worked never was consistent with the incontrovertible fact that the saving rate took a sharp dip in late 1968 and throughout 1969,” Springer (1975) uncovered “three defects of formulation and estimation procedure [in Okun’s work], which would lead one to an erroneous conclusion.”²⁹ After Springer corrected Okun’s methodological errors, Springer found “the 1968 income tax surcharge did not effectively reduce consumer expenditures.”³⁰ Springer concluded:

*Thus, the evidence of the 1968 surcharge period, far from confirming the general efficacy of temporary changes in income taxes, leads me to be pessimistic regarding the use of flexible tax policy to regulate aggregate demand. It appears that in order to have a significant effect on consumption expenditures, an income tax change must be permanent.*³¹

Applying their alternative model to 1968-1970 data, Modigliani and Steindel (1977) compared the actual effects of the surcharge on consumption expenditures with the predicted effects if the surcharge had been permanent. Modigliani and Steindel found that “the reduction in consumption was roughly half as large as it would have been had the tax been permanent.”³² Poterba (1988) found that the 1968-1970 surcharge decrease consumption expenditures between 5 cents and 28 cents per dollar of the surcharge depending upon how consumption is defined.³³

C. Tax Reduction Act of 1975 Rebate

The *Tax Reduction Act of 1975* provided individuals with a 10 percent rebate of their 1974 federal individual income tax liability with a minimum rebate of \$100 and a maximum rebate of \$200 for income under \$20,000 phased down to \$100 for incomes above \$30,000. The standard deduction was increased, a \$30 per exemption tax credit was added, and the investment tax credit rate was increased to 10 percent.

²⁷ Franco Modigliani and Charles Steindel, “Is a Tax Rebate an Effective Tool for Stabilization Policy?” in *Brookings Paper on Economic Activity 1*, eds. Arthur M. Okun and George L. Perry (Washington, D.C.: Brookings Institution, 1997): 195.

²⁸ Arthur M. Okun, “The Personal Tax Surcharge and Consumer Demand,” in *Brookings Paper on Economic Activity 1*, eds. Arthur M. Okun and George L. Perry (Washington D.C.: Brookings Institution, 1971): 167-211.

²⁹ William L. Springer, “Did the 1968 Surcharge Really Work?” *American Economic Review* 65 (September 1975): 655, 657. The three defects to which Springer refers are: (1) Okun used models for simulating both the full-effect and the zero-effect views that were estimated using the full-effect concept of disposable income, biasing the results toward the full-effect view; (2) None of the models included the real interest rate as explanatory variable even though the inclusion of the real interest rate is well grounded in theory and has considerable explanatory power; and (3) Okun failed to correct his models for autocorrelation errors.

³⁰ Springer: 657.

³¹ Springer: 658.

³² Modigliani and Steindel: 196.

³³ James M. Poterba, “Are Consumers Forward Looking? Evidence from Fiscal Experiments,” *American Economic Review* 78 (May 1988): 413-418.

Using their alternative model, Modigliani and Steindel (1977) found that individuals spent only 23.0 percent of the tax rebate in the last three quarters of 1975.³⁴ Poterba (1988) found that the 1975-tax rebate increased consumption expenditures between 12 cents and 25 percent per dollar of the rebate depending upon how consumption is defined.³⁵

D. Economic Recovery Tax Act of 1981

In 1981, President Ronald Reagan won congressional approval for the *Economic Recovery Tax Act of 1981*. Among other things, the Act reduced the highest individual federal income tax rate from 70 percent to 50 percent immediately and all individual federal income tax rates by 5 percent in October 1, 1981, 10 percent in July 1, 1982, and 10 percent on July 1, 1983, for total of 23 percent over 33 months. Using the Consumer Expenditure Survey for 1982 and 1983, Souleles (forthcoming) examined how aggregate consumption responded to the previously announced 1982 and 1983 reductions. Contrary to the unmodified life cycle permanent income hypothesis, Souleles found that aggregate consumption was excessively sensitive to changes in current after-tax income.³⁶ In particular, Souleles estimated a marginal propensity to consume nondurables of between 0.6 and 0.9. Souleles concludes:

*The consumption response is larger than previously estimated for tax refunds and more concentrated in nondurables. These differences have important implications for the structure of tax changes, in particular for choosing between varying withholding rates versus “lumpy” final tax payments and refunds.*³⁷

E. Multi-Period Empirical Studies

Using quarterly data from the first quarter of 1953 through the fourth quarter of 1977, Blinder (1981) developed a model to compare cumulative propensity to consume from an equivalently sized permanent federal tax reduction, a temporary 2-year tax reduction, and a tax rebate. At the end of first year, a temporary tax reduction is 54 percent as effective as an equivalent permanent tax reduction in boosting consumption. A tax rebate is 38 percent as an equivalent permanent tax reduction in boosting consumption. Thus, Blinder determined that a permanent tax reduction of \$9.5 billion (1972 dollars) would have the same impact on aggregate demand as the \$20 billion (1972 dollars) tax rebate had.³⁸

V. Implications of Empirical Results for Federal Tax Policy

From this survey of relevant empirical studies using a variety of statistical models and data sets, it may be reasonably inferred that a permanent federal tax reduction affecting individuals will increase aggregate consumption and GDP twice as much in the first year as a temporary federal tax reduction of the same amount and at least three times as much in the first year as federal tax rebate of the same amount, all other things being equal. Put another way, the first-year revenue loss from a temporary tax reduction affecting individuals would have to be twice as large as the first-year revenue loss from a permanent federal tax reduction to have same near-term effects, all other things being equal. Likewise, the first-year revenue loss from a federal tax rebate to individuals would have to be at least three times as large as the first-year revenue loss from a permanent federal tax reduction to have the same stimulating effects on near-term consumption and GDP growth, all other things being equal.

Empirical studies suggest that the most of the stimulation from federal tax reductions affecting individuals occurs when such reductions are implemented and actually affect tax payments or take-home pay. If the implementation of previously enacted federal tax reductions affecting individuals is delayed

³⁴ Modigliani and Steindel: 199.

³⁵ Poterba: 413-418.

³⁶ Nicholas S. Souleles, “Consumer Response to the Reagan Tax Cuts,” *Journal of Public Economics* (forthcoming).

³⁷ Souleles (forthcoming): 4.

³⁸ Alan S. Blinder, “Temporary Income Taxes and Consumer Spending,” *Journal of Political Economy* 89 (February 1981): 26-53.

for several years due to lengthy phase-ins, such reductions have a minimal effect on stimulating near-term consumption and GDP growth.

These implications for federal tax policy are subject to a number of important qualifications. Specifically, this study examines the empirical evidence regarding the effects of duration of a federal tax change affecting individuals on near-term consumption and GDP growth. Permanent federal tax reductions, temporary federal tax reductions, and federal tax rebates may have other effects, especially over the long-term, which U.S. policymakers should consider.

Taxes create disincentives toward economically productive behavior such as work, saving, and investment. Thus, taxation alters the economic behavior of individuals in ways that reduce overall economic welfare. This is known as the deadweight losses from taxation. A survey of the empirical literature found that 40 cents for every dollar collected in federal taxes was a reasonable midrange estimate for deadweight losses.³⁹ Because deadweight losses from the federal tax system are so large, how federal tax changes affect deadweight losses is important. Because both permanent and temporary federal tax reductions increase the incentives for individuals to engage in economically productive behavior, both permanent and temporary federal tax reductions will reduce deadweight losses though the gains from a permanent reduction are likely to be larger and more lasting than the gains from a temporary reduction. A federal tax rebate does not change incentives and therefore cannot affect deadweight losses.

A permanent federal tax reduction may have a larger static effect on the federal fiscal balance and federal net debt over the long-term than a temporary federal tax reduction or a federal tax rebate. However, the dynamic gains from improved incentives should increase output. Higher output expands the federal tax base and may offset at least some of the revenue losses from a permanent federal tax reduction in future years.

Many people believe that unless Congress enacts federal spending reductions to offset all projected losses in federal revenues from a permanent federal tax reduction, lower projected federal budget surpluses (or higher projected deficits) will cause long-term interest rates to increase and crowd out domestic investment. Thus, higher interest rates may cancel the stimulative benefits from a federal tax reduction. This alleged linkage between the budget balance of the U.S. government and interest rates persuades some people to prefer a temporary federal tax reduction is preferable to a permanent federal tax reduction because a temporary federal tax reduction implies a lower projected loss of federal revenues than a permanent federal tax reduction. Despite many people's belief in the linkage between the federal budget balance and interest rates, empirical studies have failed to find any statistically significant relationship between the federal budget balance and real interest rates.⁴⁰ To the extent that the federal budget balance does not materially affect real interest rates, then the federal budget balance cannot significantly affect domestic investment or real GDP growth over time. Over any range relevant to U.S. policymakers, any change in the federal budget balance from a permanent federal tax reduction is unlikely to dissipate its stimulative effects.

VI. Conclusion

Empirical studies generally support a modified life cycle permanent income hypothesis; *i.e.*, many individuals (50 percent to 80 percent) smooth their consumption in accord with the life cycle permanent income hypothesis while other individuals (20 percent to 50 percent) suffer from liquidity-constraints, myopia, or other limitations and therefore adjust their consumption to reflect changes in their current after-tax income. Empirical studies do not generally support the implication of the rational expectation theory that individuals should react to the enactment of federal tax laws that reduce (increase) their federal tax liabilities by increasing (decreasing) their consumption after the enactment but well

³⁹ Robert P. O'Quinn, *Fiscal Policy Choices: Examining the Empirical Evidence*, prepared for the Joint Economic Committee, 107th Congress, 1st Session, November 2001: 11-14.

⁴⁰ For a review of empirical studies, see O'Quinn: 7-10.

before the tax payment, change in withholding, or receipt of tax refund or rebate actually occurs. Instead, empirical studies found that many respond to actual tax payments, changes in withholding, or the receipt of tax refunds or rebates.

Under the modified life cycle permanent income hypothesis, consumption responds differently to a permanent tax reduction, a temporary tax reduction, and a tax rebate. A permanent federal tax reduction causes an increase in permanent income, but a temporary federal tax reduction and a federal tax rebate do not. Therefore, a permanent federal tax reduction should elicit higher near-term consumption and GDP growth than a temporary federal tax reduction or a federal tax rebate. In accord with the modified life cycle permanent income hypothesis, empirical studies of major federal tax changes during the last half-century confirm that the perceived duration of a federal tax change greatly affects its impact upon near-term consumption and GDP growth.

A survey of relevant empirical studies using a variety of statistical models and data sets suggests that a permanent federal tax reduction affecting individuals will increase first-year aggregate consumption and GDP twice as much as a temporary federal tax reduction of the same amount and at least three times as much in the first year as federal tax rebate of the same amount, all other things being equal. Empirical studies suggest that the most of the economic benefits from federal tax reductions affecting individuals occurs when such reductions are implemented and actually affect tax payments and take-home pay. Lengthy phase-ins and implementation delays minimize the near-term boost to consumption and GDP growth from federal tax reductions affecting individuals.

Robert P. O'Quinn
Economist

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