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ECONOMIC CONSEQUENCES OF THE TAX POLICIES OF THE KENNEDY AND JOHNSON ADMINISTRATIONS

Introduction

This paper is the first in a series examining federal tax policies implemented from the Kennedy to the G.W. Bush Administrations. This installment estimates the effects of the Kennedy and Johnson Administration tax policies of the 1960s on the U.S. economy and the federal budget. It shows why the design of the Kennedy tax cuts early in the decade made them highly successful in improving the performance of the economy, and reveals which features of the Kennedy cuts were most effective. It discusses the adverse effects of the Johnson surtax of the late 1960s on economic activity.

The study utilizes a model driven by the impact of marginal tax rate changes on incentives to work, save, and invest in additional capital formation. This approach can distinguish tax changes that make it more rewarding to produce goods and services from tax changes that merely "throw money from the top of the Washington Monument". The incentives approach is consistent with how labor and capital markets and the production process operate in the real world. It is also consistent with the analytical methods taught in business schools to the people who decide how much and what type of capital to create. This is in contrast to Keynesian models which focus mainly on the dollar amount of a tax change, under the erroneous assumption that taxes affect the economy by altering disposable income and "aggregate demand", and that the form of the tax and its impact on the supplies of labor, capital, and output are irrelevant. In practice, initial Keynesian demand effects of a tax change are offset by changes in federal borrowing or spending, leaving only the incentive effects of the tax change, if any, to alter behavior.

Elements of the Kennedy tax cuts

Senator John F. Kennedy was elected President in 1960, defeating Vice-President Richard M. Nixon. Kennedy ran on the promise to get the country moving again, following the third recession of the Eisenhower years. The tax program Kennedy designed largely succeeded in fulfilling that promise. It is a model of what works to encourage faster growth of capital, wages, and employment.[1]

[1] The first recession lasted from July 1953 to May 1954, had a peak unemployment rate of 6.1 percent, and recorded a drop in real output of 2.6 percent. The second recession lasted from August 1957 to February 1958,

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The Kennedy tax cuts came in two parts. The first steps were taken in 1962. That year, the Treasury issued a new set of depreciation guidelines that provided for faster write-offs of investment outlays. In addition, the Revenue Act of 1962, passed on October 2, 1962, introduced a seven percent investment tax credit (ITC) covering most equipment. The second part of the Kennedy program, approved after his assassination, was the Revenue Act of 1964, passed on February 26, 1964. It reduced the corporate income tax rate and individual income tax rates across the board. The individual tax rate reductions are what most people think of when Kennedy's tax policy is mentioned. However, the business provisions had more economic impact, and are deserving of at least equal attention.

The 1962 tax changes

In 1962, the Treasury implemented a major business tax change by shifting from the Bulletin F depreciation schedules to the Guidelines depreciation system (Revenue Procedure 62-21). The change shortened the asset lives used to calculate capital consumption allowances, the annual write-off of the cost of plant and equipment. The government requires businesses to write off the cost of investment in plant and equipment over many years, rather than when capital is purchased. The delayed deductions lose value due to inflation and the time value of money. The present value of the deductions is less than the up-front cost of the investment. Consequently, depreciation understates business costs over the lives of the assets, overstates income, and increases tax liabilities. The effective marginal tax rates on incremental investment are increased, reducing the total amount of capital that can be profitably employed.

Under the Guidelines, businesses were allowed to recognize their investment costs sooner, nearer the time when the assets were actually purchased. That raised the present value of the deductions to something nearer the full up-front cost of the investment. For example, the present value of the write-off of $100 in equipment spending in 1966 averaged $84 under Bulletin F and $88.54 under the new Guidelines (calculated at 1966 interest rates, and averaged across asset lives). Taxes were due a bit later, and were lower in present value, which lowered the pre-tax rate of return required to make an investment affordable. The lower required return increased the desired capital stock, and led to additional investment.

That same year, the Revenue Act of 1962 provided an investment tax credit of up to seven percent for equipment with asset lives of four years and above. Structures and structural parts of assets were not eligible. The full seven percent credit was available for assets with lives over eight years; two-thirds was allowed for assets of six to eight years; shorter lived assets got a third of the credit. The credit could be subtracted dollar for dollar from the business's tax liability. The tax credit made up some of the shortfall in the present value of the depreciation write-offs allowed under the tax system

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with a peak unemployment rate of 7.5 percent and a drop in real output of 3.1 percent. The third recession lasted from April 1960 to February 1961, saw a peak unemployment rate of 7.1 percent, and registered a drop in real output of 1.6 percent.

relative to the actual cost of investment in plant and equipment. The credit further reduced the required pre-tax return on investment and raised the desired capital stock.

In 1962, when first implemented, the ITC was partially offset by a basis adjustment, in that the cost basis of the asset had to be reduced by half the amount of the credit before applying the capital cost recovery (depreciation) allowance. For example, if a $100 asset received a $7 tax credit, the business could then only depreciate $96.5 in costs. When these offsets are in effect, they diminish the degree to which the credit encourages additional capital formation. This offset was removed in 1964, and the credit was in addition to the full regular depreciation allowance.

Congress enacted the basis reduction in part to reduce the revenue effect of the bill, and in part because it sounded odd that firms could write off a portion of the cost of an investment that had been covered by a tax credit. However, a combination of an investment tax credit and a set of asset lives and depreciation schedules is simply one of many ways to provide for a recovery of costs in determining taxable income. Full recognition of investment costs requires 100 percent expensing (immediate write-off of the full cost of the investment) or its present value equivalent. Anything less shortchanges the investor. The real test of a cost recovery system is whether it achieves the same tax effect as expensing, not whether the words describing the tax treatment sound logical to legislators.

Pure expensing is superior to depreciation-plus-tax-credit, because expensing always achieves a real present value deduction of one dollar for every dollar spent, regardless of changes in the rate of inflation or the time value of money (represented by a discount rate on a relatively riskless asset). The depreciation-plus-credit regime produces different present values of write-offs at different rates of inflation or interest, sometimes exceeding or falling short of the real cost of the investment.

The 1964 tax cuts

In 1963, President Kennedy proposed a reduction in income tax rates. He was assassinated in November of that year. President Lyndon B. Johnson pushed for enactment of the Kennedy plan, and Congress passed it as part of the Revenue Act of 1964. The 1964 Act included a two-stage reduction in the corporate tax rate, reducing it from 52 percent to 50 percent in 1964 and to 48 percent in 1965.

Most famously, the 1964 Act reduced the marginal personal income tax rates in the various tax brackets across-the-board, from a range of 20 percent in the bottom tax bracket and 91 percent in the top tax bracket, to a range of 14 percent at the bottom and 70 percent at the top. (See Table 1.) The rates were cut in two steps, in 1964 and 1965. Some additional tax brackets were created at the bottom, and some were merged at the top. The Act also created a minimum standard deduction of $200 per tax return plus $100 for each personal exemption claimed, up to $1,000. The standard deduction had previously been a flat 10 percent of income with a maximum of $1,000. The 1964 Act let the taxpayer choose the greater of the new minimum deduction or the 10 percent deduction.

TABLE 1
TAX RATES AND BRACKETS BEFORE AND AFTER KENNEDY INDIVIDUAL INCOME TAX CUTS

SINGLE FILERS

1963 Brackets From	1963 Brackets To	1963 Rates	1965 Brackets From	1965 Brackets To	1965 Rates
0	2,000	20.0%	0	500	14.0%
2,000	4,000	22.0%	500	1,000	15.0%
4,000	6,000	26.0%	1,000	1,500	16.0%
6,000	8,000	30.0%	1,500	2,000	17.0%
8,000	10,000	34.0%	2,000	4,000	19.0%
10,000	12,000	38.0%	4,000	6,000	22.0%
12,000	14,000	43.0%	6,000	8,000	25.0%
14,000	16,000	47.0%	8,000	10,000	28.0%
16,000	18,000	50.0%	10,000	12,000	32.0%
18,000	20,000	53.0%	12,000	14,000	36.0%
20,000	22,000	56.0%	14,000	16,000	39.0%
22,000	26,000	59.0%	16,000	18,000	42.0%
26,000	32,000	62.0%	18,000	20,000	45.0%
32,000	38,000	65.0%	20,000	22,000	48.0%
38,000	44,000	69.0%	22,000	26,000	50.0%
44,000	50,000	72.0%	26,000	32,000	53.0%
50,000	60,000	75.0%	32,000	38,000	55.0%
60,000	70,000	78.0%	38,000	44,000	58.0%
70,000	80,000	81.0%	44,000	50,000	60.0%
80,000	90,000	84.0%	50,000	60,000	62.0%
90,000	100,000	87.0%	60,000	70,000	64.0%
100,000	150,000	89.0%	70,000	80,000	66.0%
150,000	200,000	90.0%	80,000	90,000	68.0%
200,000 and over		91.0%	90,000	100,000	69.0%
			100,000 and over		70.0%

COUPLES FILING JOINTLY

1963 Brackets From	1963 Brackets To	1963 Rates	1965 Brackets From	1965 Brackets To	1965 Rates
0	4,000	20.0%	0	1,000	14.0%
4,000	8,000	22.0%	1,000	2,000	15.0%
8,000	12,000	26.0%	2,000	3,000	16.0%
12,000	16,000	30.0%	3,000	4,000	17.0%
16,000	20,000	34.0%	4,000	8,000	19.0%
20,000	24,000	38.0%	8,000	12,000	22.0%
24,000	28,000	43.0%	12,000	16,000	25.0%
28,000	32,000	47.0%	16,000	20,000	28.0%
32,000	36,000	50.0%	20,000	24,000	32.0%
36,000	40,000	53.0%	24,000	28,000	36.0%
40,000	44,000	56.0%	28,000	32,000	39.0%
44,000	52,000	59.0%	32,000	36,000	42.0%
52,000	64,000	62.0%	36,000	40,000	45.0%
64,000	76,000	65.0%	40,000	44,000	48.0%
76,000	88,000	69.0%	44,000	52,000	50.0%
88,000	100,000	72.0%	52,000	64,000	53.0%
100,000	120,000	75.0%	64,000	76,000	55.0%
120,000	140,000	78.0%	76,000	88,000	58.0%
140,000	160,000	81.0%	88,000	100,000	60.0%
160,000	180,000	84.0%	100,000	120,000	62.0%
180,000	200,000	87.0%	120,000	140,000	64.0%
200,000	300,000	89.0%	140,000	160,000	66.0%
300,000	400,000	90.0%	160,000	180,000	68.0%
400,000 and over		91.0%	180,000	200,000	69.0%
			200,000 and over		70.0%

Economy post-Kennedy cuts

The Kennedy tax cuts succeeded in boosting investment and employment over the next several years. Real GDP rose at a 4.9 percent rate from the first quarter of 1962 through the first quarter of 1969, well above the 2.9 percent rate of growth from the first quarter of 1953 through the first quarter of 1962. Personal income climbed in real terms, and several million jobs were created. Unemployment peaked at 5.7 percent in 1963 and fell to 3.5 percent in 1969.

Imposition of the Johnson surtax

The Kennedy expansion came to a halt with the recession of 1969-1970. The downturn can be traced in part to tighter monetary policy by the Federal Reserve, and partly to a tax increase requested by President Johnson. In 1968, Johnson asked Congress to pass a temporary 10 percent tax surcharge on individual and corporate income to help fund the Vietnam War and the Great Society programs. The 10 percent Johnson surtax was initially in place for the last three quarters of 1968 (an effective annual rate of 7.5 percent) and throughout 1969 (at the full 10 percent rate). The Revenue Act of 1969 later extended the surtax through the first quarter of 1970 (a 2.5 percent effective annual rate), after which the surtax expired. At its peak in 1969, the surtax raised the 48 percent corporate income tax rate to 52.8 percent, more than offsetting the Kennedy corporate tax rate reduction. It effectively increased the top individual marginal income tax rate from 70 percent to 77 percent.

The Johnson surtax largely coincided with the recession of 1969-70, which began in December 1969 and bottomed out in November 1970. Real output fell 0.6 percent from peak to trough.

Modeling the consequences of the Kennedy and Johnson tax changes

This section of the study simulates the Kennedy and Johnson tax changes using a simple model of the U.S. economy. The presentation is in two parts. Part one briefly discusses the model and some essential patterns to watch for in the results. Part two describes the economic growth and federal budget consequences of the Kennedy and Johnson tax programs. A fuller discussion of how to interpret the results, and a more detailed description of the model and the economics behind it can be found in the Appendix.

Modeling methods and what to watch for in the results

The study takes a neo-classical view of the economy, in which decisions about work, saving, and capital formation are driven by the after-tax rewards for these activities. The taxes that affect these decisions are the marginal tax rates on additional effort. They alter the choices between capital formation and consumption, and between labor and leisure.

The service price of capital is the pre-tax rate of return to capital required to cover depreciation, inflation, risk, and taxes and leave an acceptable real after-tax return – about 3 percent – for the investor. A lower service price raises the equilibrium capital stock, GDP, and labor income. A higher service price does the opposite. Taxes on capital income are part of the service price. Determining if proposed tax legislation would lower or increase the service price of capital is a quick way to tell if it would strengthen or weaken the economy (absent other provisions that drastically affect labor incentives). A larger capital stock increases worker productivity and the demand for labor, driving up wages and employment.

Workers are assumed to respond to changes in the after-tax wage rate. They increase labor force participation and hours worked as marginal tax rates on wages fall and after-tax wages rise; they reduce the labor supply as marginal tax rates on labor rise and after-tax earnings fall. The model contains an income tax calculator and entries for other tax variables that enable it to compute the effect of proposed tax changes on marginal tax rates and service prices. Changes in the labor supply and the capital stock due to the initial tax changes alter production and income. The changes in income in turn raise or lower marginal tax rates and the service prices, producing further income adjustments until a new equilibrium is achieved.[2]

The results tables display the changes in GDP, private sector output and income, capital formation, and the federal budget due to the tax changes being examined. They present the budget results on both a static basis (measuring the revenue effect of the tax change at the existing levels of income before any economic adjustments occur) and on a dynamic basis (net, after economic adjustments alter incomes). They also display the changes in GDP and after-tax income per dollar of net revenue gain or loss. This is done to emphasize the total cost to the taxpayer of raising a dollar of revenue to pay for a dollar of government spending. A dollar of federal spending costs the taxpayer the dollar of tax plus the resulting loss of GDP and income. Whatever the government is spending the money on should be worth that larger amount. If not, the public is better off without it..

These GDP, capital formation, employment compensation, and lost-income-per-dollar-of-tax numbers are critical to understanding the full cost of taxation and government spending. In this and other papers of the series, they reveal that:

- Tax cuts that increase GDP recover a portion of their apparent static revenue cost. Tax increases that reduce GDP do not raise their full estimated static revenue. Tax cuts are not as expensive, and tax increases are not as rewarding to the government on a dynamic basis as the static numbers indicate.

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[2] The tax calculator and a historical tax rate parameter spreadsheet have been made available by Gary Robbins of the Data Analysis Center of the Heritage Foundation, who has also assisted with modeling advice.

- Some types of tax changes have much more effect on GDP than others, and their dynamic revenue reflow can be quite large. They create more growth per dollar of net tax cut, or destroy more GDP per dollar of net tax increase.

- The tax treatment of capital is especially important, because capital formation responds more sharply to tax changes than does the supply of labor. Changes in capital taxation have a greater effect on GDP, income, and employment, and generate greater revenue feedback, than changes in taxation of wages.

- Very few types of tax changes have so strong an effect on income that their dynamic revenue reflow exceeds the static revenue change. That is, a tax cut raises revenue and "pays for itself" in a federal budget sense, or a tax increase loses revenue and defeats itself. In such cases it costs the government nothing to raise GDP and people's incomes by cutting the tax.

- Even when a tax cut does not pay for itself in the federal budget sense, it is often a very good deal for the taxpayer to give up a small amount of government spending to pay for a tax cut that raises after-tax income by a much larger amount, and increases total employment.

The effects of the Kennedy tax changes

The following tables display the simulated long run equilibrium changes in the economy and the federal budget as a result of the Kennedy individual and business tax changes. The simulation is based on a sample of tax returns and the national income and federal budget levels of 1966, the year after all the tax changes were fully in place. The simulation estimates the difference between the actual economy and a hypothetical one in which the Kennedy tax cuts had never occurred (leaving 1961 tax law in place), after allowing time for all economic adjustments. Results for the entire Kennedy tax package are shown first. Then the effects of the individual tax changes (marginal individual income tax rates and standard deduction changes) and the business changes (the corporate tax rate reduction, the ITC, and the depreciation changes), are shown separately.

GDP effects of the Kennedy cuts. The whole package of Kennedy's individual and business tax changes is estimated to have lifted the long run equilibrium GDP by 7.7 percent, or $56.4 billion at 1966 income levels. (See Table 2.) Private business sector output is estimated to be 8.2 percent higher with the tax reductions than without. Wages and hours worked in private businesses are higher with the tax reductions, lifting total labor compensation 8.2 percent, in line with business output. The equilibrium stock of private business capital is higher by 21.2 percent, or $228 billion. (Private sector business output excludes general government, government enterprises, and the household and institution sectors. The private business sector is more sensitive to tax changes than the other sectors.)

Tables 3 and 4 show separate results for the individual and business Kennedy tax cuts. Totals for the two portions do not quite add up to the results for the whole package due to interactions when

TABLE 2
KENNEDY INDIVIDUAL AND BUSINESS RATE CUTS
Kennedy vs. pre-Kennedy Law, at 1966 Income Levels

	Kennedy	Old Law	Difference	% Diff
Gross domestic product ($ billions)	$787.7	$731.3	$56.4	7.7%
Private business output (less indirect taxes plus subsidies)	$572.3	$528.8	$43.5	8.2%
Compensation of employees	$385.2	$355.9	$29.3	8.2%
Gross capital income	$187.2	$172.9	$14.2	8.2%
Private Business Stocks	$1,302.1	$1,074.3	$227.8	21.2%
Wage rate $/hr	$3.27	$3.11	$0.16	5.2%
Private business hours of work (billions)	117.918	114.611	3.307	2.9%
Total government receipts ($billions)	$206.7	$207.1	-$0.4	-0.2%
Federal	$141.0	$147.7	-$6.7	-4.5%
State & local	$80.1	$73.8	$6.3	8.5%
Total Federal expenditures	$144.5	$141.3	$3.2	2.3%
Federal surplus (+) or deficit (-)	-$3.5	$6.4	-$9.9	-155.1%
Individual income tax				
Federal marginal tax rates on AGI	21.8%	25.3%	-3.6%	-14.0%
Federal marginal tax rates on wages	20.3%	23.5%	-3.2%	-13.7%
Federal marginal tax rates on dividends	35.1%	40.7%	-5.6%	-13.8%
Federal marginal tax rates on interest income	21.7%	25.2%	-3.5%	-13.8%
Federal marginal tax rates on business income	27.6%	32.5%	-4.9%	-15.1%
Federal marginal tax rates on long-term capital gains	11.6%	13.0%	-1.4%	-10.8%
Weighted average service price				
Corporate	16.6%	18.9%	-2.3%	-12.2%
Noncorporate	11.5%	12.4%	-0.8%	-6.9%
All business	14.7%	16.5%	-1.8%	-10.7%
Federal budget effects*				% of static
Revenues			$ Billions	tax change
"Static" federal revenue gain (+) or loss (-)			-$21.0	100%
"Dynamic" federal tax reflow from economic changes			$14.3	-68%
Net federal tax change after dynamic effects			-$6.7	32%
Federal outlay change if federal pay tracks private wages			$3.2	-15%
Change in federal surplus (- is larger deficit, smaller surplus)			-$9.9	47%
Comparing change in GDP to change in tax revenue*		GDP Change $ Billions	Change per dollar Static	Change per dollar Dynamic
Rise in GDP, total, and per $1 reduction in federal revenue		$56.4	$2.69	$8.45
Rise in after-tax income, total, and per $1 reduction in federal revenue		$63.1	$3.01	$9.45
Revenue loss to government from tax cut that raises after-tax income $1.			$0.33	$0.11

* Notes: Most static revenue changes (+ or -) will move GDP in the opposite direction (- or +).
Dynamic revenue reflows due to the changes in GDP usually offset some but not all of the static tax change. If the dynamic GDP response is very large, the revenue reflow may offset all of the static change. If so, the net tax change after dynamic effects would be the same sign as the GDP change, and opposite in sign from the static numbers. For that type of tax provision, a cut raises tax revenue, an increase loses revenue.

TABLE 3
KENNEDY INDIVIDUAL RATE CUTS
Kennedy vs. pre-Kennedy Law, at 1966 Income Levels

	Kennedy	Old Law	Difference	% Diff
Gross domestic product ($ billions)	$787.7	$761.8	$25.9	3.4%
Private business output (less indirect taxes plus subsidies)	$572.3	$551.9	$20.4	3.7%
Compensation of employees	$385.2	$371.4	$13.8	3.7%
Gross capital income	$187.2	$180.5	$6.7	3.7%
Private Business Stocks	$1,302.1	$1,209.3	$92.8	7.7%
Wage rate $/hr	$3.27	$3.21	$0.05	1.6%
Private business hours of work (billions)	117.918	115.570	2.349	2.0%
Total government receipts ($billions)	$206.7	$211.1	-$4.4	-2.1%
Federal	$141.0	$148.2	-$7.2	-4.9%
State & local	$80.1	$77.3	$2.8	3.6%
Total Federal expenditures	$144.5	$143.3	$1.3	0.9%
Federal surplus (+) or deficit (-)	-$3.5	$5.0	-$8.5	-170.7%
Individual income tax				
Federal marginal tax rates on AGI	21.8%	25.7%	-3.9%	-15.2%
Federal marginal tax rates on wages	20.3%	23.9%	-3.6%	-15.2%
Federal marginal tax rates on dividends	35.1%	41.6%	-6.5%	-15.7%
Federal marginal tax rates on interest income	21.7%	25.7%	-3.9%	-15.4%
Federal marginal tax rates on business income	27.6%	32.5%	-4.9%	-15.0%
Federal marginal tax rates on long-term capital gains	11.6%	13.0%	-1.4%	-10.4%
Weighted average service price				
Corporate	16.6%	17.2%	-0.6%	-3.5%
Noncorporate	11.5%	12.0%	-0.5%	-4.1%
All business	14.7%	15.3%	-0.6%	-3.7%

Federal budget effects*		% of static
Revenues	$ Billions	tax change
"Static" federal revenue gain (+) or loss (-)	-$13.6	100%
"Dynamic" federal tax reflow from economic changes	$6.4	-47%
Net federal tax change after dynamic effects	-$7.2	53%
Federal outlay change if federal pay tracks private wages	$1.3	-9%
Change in federal surplus (- is larger deficit, smaller surplus)	-$8.5	63%

Comparing change in GDP to change in tax revenue*	GDP Change $ Billions	Change per dollar Static	Change per dollar Dynamic
Rise in GDP, total, and per $1 reduction in federal revenue	$25.9	$1.91	$3.59
Rise in after-tax income, total, and per $1 reduction in federal revenue	$33.2	$2.44	$4.59
Revenue loss to government from tax cut that raises after-tax income $1.		$0.41	$0.22

* Notes: Most static revenue changes (+ or -) will move GDP in the opposite direction (- or +).
Dynamic revenue reflows due to the changes in GDP usually offset some but not all of the static tax change. If the dynamic GDP response is very large, the revenue reflow may offset all of the static change. If so, the net tax change after dynamic effects would be the same sign as the GDP change, and opposite in sign from the static numbers. For that type of tax provision, a cut raises tax revenue, an increase loses revenue.

TABLE 4
KENNEDY BUSINESS RATE CUTS
Kennedy vs. pre-Kennedy Law, at 1966 Income Levels

	Kennedy	Old Law	Difference	% Diff
Gross domestic product ($ billions)	$787.7	$756.3	$31.4	4.1%
Private business output (less indirect taxes plus subsidies)	$572.3	$548.5	$23.8	4.3%
Compensation of employees	$385.2	$369.1	$16.0	4.3%
Gross capital income	$187.2	$179.4	$7.8	4.3%
Private Business Stocks	$1,302.1	$1,157.8	$144.3	12.5%
Wage rate $/hr	$3.27	$3.16	$0.11	3.5%
Private business hours of work (billions)	117.918	116.933	0.985	0.8%
Total government receipts ($billions)	$206.7	$203.3	$3.4	1.7%
Federal	$141.0	$141.2	-$0.2	-0.2%
State & local	$80.1	$76.4	$3.6	4.8%
Total Federal expenditures	$144.5	$142.5	$2.0	1.4%
Federal surplus (+) or deficit (-)	-$3.5	-$1.3	-$2.2	171.2%
Individual income tax				
Federal marginal tax rates on AGI	21.8%	21.4%	0.3%	1.5%
Federal marginal tax rates on wages	20.3%	19.9%	0.4%	2.1%
Federal marginal tax rates on dividends	35.1%	34.4%	0.7%	2.0%
Federal marginal tax rates on interest income	21.7%	21.3%	0.5%	2.2%
Federal marginal tax rates on business income	27.6%	27.6%	0.0%	0.0%
Federal marginal tax rates on long-term capital gains	11.6%	11.6%	0.0%	0.2%
Weighted average service price				
Corporate	16.6%	18.2%	-1.6%	-9.0%
Noncorporate	11.5%	11.8%	-0.3%	-2.6%
All business	14.7%	15.9%	-1.1%	-7.2%

Federal budget effects*	$ Billions	% of static tax change
Revenues		
"Static" federal revenue gain (+) or loss (-)	-$7.2	100%
"Dynamic" federal tax reflow from economic changes	$7.0	-97%
Net federal tax change after dynamic effects	-$0.2	3%
Federal outlay change if federal pay tracks private wages	$2.0	-28%
Change in federal surplus (- is larger deficit, smaller surplus)	-$2.2	31%

Comparing change in GDP to change in tax revenue*	GDP Change $ Billions	Change per dollar Static	Change per dollar Dynamic
Rise in GDP, total, and per $1 reduction in federal revenue	$31.4	$4.35	$137.80
Rise in after-tax income, total, and per $1 reduction in federal revenue	$31.6	$4.38	$138.80
Revenue loss to government from tax cut that raises after-tax income $1.		$0.23	$0.01

* Notes: Most static revenue changes (+ or -) will move GDP in the opposite direction (- or +).
Dynamic revenue reflows due to the changes in GDP usually offset some but not all of the static tax change. If the dynamic GDP response is very large, the revenue reflow may offset all of the static change. If so, the net tax change after dynamic effects would be the same sign as the GDP change, and opposite in sign from the static numbers. For that type of tax provision, a cut raises tax revenue, an increase loses revenue.

they are implemented together. Note, too, that aspects of what are labeled as individual tax cuts affect businesses, and vice versa. Individual income tax rates apply to earnings of non-corporate enterprises. Individual taxes on dividends and capital gains are part of the taxation of corporate income. The ITC and depreciation allowances affect non-corporate businesses as well as corporations.

The individual income tax portions of the tax cuts contributed about 45 percent of the growth in GDP from the total package, though they were about two-thirds of the static revenue cost. About 55 percent of the growth was due to the business cuts. The business tax reductions were responsible for about 62 percent of the increase in the capital stock. The business tax changes raised total labor compensation (pre-tax) by more than the individual cuts. The business cuts had relatively more effect on the pre-tax wage rate (by raising productivity and the demand for labor) than on hours worked, compared to the individual cuts (which raised after-tax wages without upward pressure on pre-tax wages). After-tax incomes rose by more than these pre-tax amounts indicate, because there was a net tax cut and a reduction in federal revenue as a share of GDP.

Federal revenue and budget effects of the Kennedy cuts. There has been a lively debate as to whether the Kennedy tax cuts expanded the economy and taxable income by enough to bring in more, rather than less, federal revenue. That is, did they pay for themselves from the perspective of the federal budget? As noted above, this is the wrong question. The real benefit to the nation from lower tax rates is higher income for the population, not an inflow of revenue to Washington. Nonetheless, the model can offer some insight into the net revenue cost of the Kennedy tax changes.

Our modeling work suggests that the Kennedy tax cuts significantly improved the economy, and were of enormous benefit to the population. GDP is shown to be $56.4 billion higher, in terms of the 1966 economy. However, the revenue reflow due solely to the higher GDP was probably not big enough by itself to fully offset the reduction in tax revenue.

The "static revenue effect" of a tax change is calculated by assuming no change in economic activity and income, ignoring economic reactions. The "dynamic revenue effect" factors in the changes in revenue due to changes in the economy. As shown in Table 2, the model suggests a static revenue loss from the Kennedy tax changes of $21 billion. After the economic expansion, the projected revenue loss dwindles to a dynamic value of $6.7 billion. That represents a recovery of 68 percent of the static revenue loss as a result of economic growth, far higher than in the case of tax changes that have no incentive effects on economic output. Put another way, the GDP rose by $8.45 for each dollar of dynamic revenue loss. After-tax income rose $9.45 for each dollar of dynamic revenue loss.

The simulation for the individual tax changes alone suggests they recovered 47 percent of their $13.6 billion static revenue loss. for a net reduction of $7.2 billion. (See Table 3.) That revenue recovery rate was held down somewhat by the revenue losses due to the increase in the minimum standard deduction, which did less than the marginal tax rate reductions to alter marginal incentives and promote economic activity. Nonetheless, on a dynamic basis, the personal tax cuts raised GDP

and after-tax income by $3.59 and $4.59, respectively, for each dollar of revenue loss. That was a good bargain for the taxpayer.

The simulation for the business tax cuts alone suggests they recovered 97 percent of their $7.2 billion static revenue loss, for a net revenue cut of only $0.2 billion. (See Table 4. Again, totals for the two portions do not equal results for the whole package due to interactions.). An ITC, faster depreciation, and a corporate tax rate reduction have powerful effects on the service price of capital and on capital formation per dollar of static revenue loss. They raise GDP, wages, and hours worked, which expands the tax base and raises revenues from all other tax sources. The business tax cuts, which nearly paid for themselves, are estimated to have boosted GDP and after-tax income by about $138 dollars for each dollar of lost revenue, an enormous bargain for the country.

For the whole tax package, the public would have to give up only $0.11 in federal services to gain a dollar in after-tax income. For the individual tax reductions, the sacrifice would be $0.22 in government output per dollar of after-tax income gain; for the business tax cuts, less than a penny.

The stronger economy would have affected federal outlays by increasing market wages, including the pay of government employees. For the whole package, the higher wages after the tax cuts would add another $3.2 billion to the cost of federal workers and federal investment costs, for a total rise in the deficit of $9.9 billion. If the government eliminated the deficit by cutting its services to the public by spending $9.9 billion less, and even if the GDP fell by $9.9 billion as a result, the country would be $46.5 billion better off. In fact, federal workers released by spending cuts would find other work, add to private sector output, and restore the lost GDP.

The increase in the deficit would have been covered by added business and individual saving. Much of the tax reduction would have been saved, and the expanded national income and higher after-tax returns on saving would have generated additional domestic saving, funding the deficit with enough left over to finance the increase in private investment. There would also have been a shift in the destination of U.S. and world saving, from investment abroad to investment in the United States. (Private saving includes personal saving, plus depreciation allowances and retained earnings of businesses.)

The model does not estimate reductions in government spending on income support payments, such as welfare, disability, and unemployment benefits, as the economy expands. Nor does it account for a reduction in the use of tax avoidance techniques by taxpayers in the upper brackets as a result of the tax rate reductions. Any tax avoidance decline following the Kennedy tax rate cuts would have contributed to additional personal income tax payments. Also, lower tax rates on capital gains would have led to faster realizations of gains and additional revenue for the Treasury. These forms of additional revenue feedback, not captured here, may account for some of the impression that the Kennedy cuts did not expand the deficit, and may have "paid for themselves" in a federal budget sense.

Why the Kennedy tax cuts promoted so much growth

A very high proportion of the Kennedy tax changes were directed squarely at reducing the service price of capital and the marginal tax rates on incremental production and income. Table 2 shows the reduction in the weighted average service price on plant, equipment, and structures in the corporate sector and non-corporate sectors, and for the private business sector as a whole (drops of 12.2 percent, 6.9 percent, and 10.7 percent respectively). The adjustments in the ITC and depreciation schedules reduce the service price of capital for all businesses, and the reduction in the corporate income tax lowers the service price of capital for the corporate sector. The individual rate reductions affect the non-corporate sector by lowering tax rates on non-corporate business owners, and affect the corporate sector by reducing tax rates on capital gains and dividends. A 10.7 percent reduction in the service price of capital is a major change, explaining the 21.2 percent rise in the desired capital stock.

Table 2 also shows how the Kennedy individual tax changes reduced marginal tax rates for total income and the various types of income: adjusted gross income (AGI), wages, dividends, interest, non-corporate business income, and capital gains. The average reduction in marginal tax rates on AGI was 14 percent from what the rate would have been under prior law had the Kennedy tax cuts not been enacted (i.e, a 3.6 percentage point decrease from 25.3 percent without the tax reduction to 21.8 percent after the tax reduction).

The marginal tax rate and service price reductions before any economic reactions (not shown) represent the initial incentive effect of the tax changes on labor and saving. As the economy expands, incomes rise, lifting some taxpayers into a higher tax brackets, and a small fraction of the initial reduction in marginal tax rates is eliminated. This "real bracket creep" effect dampens the expansion a bit. The tables show the service price and tax rate reductions calculated as a weighted average for each type of income across all tax returns on a dynamic basis, after the economic reactions have occurred. The dynamic reductions show the enhanced incentives that remain to support the new, higher amount of economic activity thereafter.

The effects of the Johnson surtax

The Johnson surtax aimed straight for the marginal tax rates, an efficient way to deter growth. The service price and marginal tax rate effects of the 10 percent Johnson surtax are shown below, as of their full extent in 1969, the baseline year. (See Table 5.) Had the surtax been permanent, it would have eventually reduced private business GDP by 3.4 percent and cut the capital stock by 8.3 percent. Instead of bringing in an estimated static revenue increase of $11.6 billion (based on unchanged 1969 income levels), it would have raised only $4.2 billion after economic adjustments. The surtax would have lost 64 percent of the expected revenue to a weaker economy. Had the full effect of the tax increase been achieved, it would have lowered the GDP by $32.5 billion, nearly eight times more than its net federal revenue gain, and over five times more than its reduction in the federal deficit after

TABLE 5
LBJ INDIVIDUAL AND BUSINESS SURTAXES
LBJ vs. pre-LBJ Law, at 1969 Income Levels

	LBJ	Old Law	Difference	% Diff
Gross domestic product ($ billions)	$984.4	$1,016.9	-$32.5	-3.2%
Private business output (less indirect taxes plus subsidies)	$699.3	$724.1	-$24.7	-3.4%
Compensation of employees	$488.2	$505.4	-$17.3	-3.4%
Gross capital income	$211.2	$218.6	-$7.5	-3.4%
Private Business Stocks	$1,669.5	$1,820.8	-$151.3	-8.3%
Wage rate $/hr	$4.00	$4.08	-$0.08	-2.1%
Private business hours of work (billions)	122.102	123.809	-1.707	-1.4%
Total government receipts ($billions)	$288.2	$288.3	-$0.1	0.0%
Federal	$196.2	$192.0	$4.2	2.2%
State & local	$112.3	$116.6	-$4.3	-3.7%
Total Federal expenditures	$190.0	$191.6	-$1.6	-0.8%
Federal surplus (+) or deficit (-)	$6.3	$0.4	$5.8	1335.0%
Individual income tax				
Federal marginal tax rates on AGI	25.6%	23.7%	1.9%	8.0%
Federal marginal tax rates on wages	24.1%	22.3%	1.8%	8.1%
Federal marginal tax rates on dividends	39.0%	36.1%	2.9%	8.0%
Federal marginal tax rates on interest income	25.6%	23.8%	1.8%	7.5%
Federal marginal tax rates on business income	32.7%	30.4%	2.3%	7.7%
Federal marginal tax rates on long-term capital gains	12.9%	11.9%	1.0%	8.5%
Weighted average service price				
Corporate	14.7%	13.8%	0.9%	6.6%
Noncorporate	9.9%	9.7%	0.2%	2.0%
All business	13.0%	12.3%	0.7%	5.3%
Federal budget effects*				% of static
Revenues			$ Billions	tax change
"Static" federal revenue gain (+) or loss (-)			$11.6	100%
"Dynamic" federal tax reflow from economic changes			-$7.4	-64%
Net federal tax change after dynamic effects			$4.2	36%
Federal outlay change if federal pay tracks private wages			-$1.6	-14%
Change in federal surplus (- is larger deficit, smaller surplus)			$5.8	50%
Comparing change in GDP to change in tax revenue*		GDP Change $ Billions	Change per dollar Static	Change per dollar Dynamic
Drop in GDP, total, and per $1 increase in federal revenue		-$32.5	-$2.80	-$7.73
Drop in after-tax income, total, and per $1 increase in federal revenue		-$36.7	-$3.16	-$8.73
Revenue gain to government from tax hike that cuts after-tax income $1.			$0.32	$0.11

* Notes: Most static revenue changes (+ or -) will move GDP in the opposite direction (- or +).
Dynamic revenue reflows due to the changes in GDP usually offset some but not all of the static tax change. If the dynamic GDP response is very large, the revenue reflow may offset all of the static change. If so, the net tax change after dynamic effects would be the same sign as the GDP change, and opposite in sign from the static numbers. For that type of tax provision, a cut raises tax revenue, an increase loses revenue.

TABLE 6
LBJ INDIVIDUAL SURTAX
LBJ vs. pre-LBJ Law, at 1969 Income Levels

	LBJ	Old Law	Difference	% Diff
Gross domestic product ($ billions)	$984.4	$1,003.2	-$18.8	-1.9%
Private business output (less indirect taxes plus subsidies)	$699.3	$713.9	-$14.5	-2.0%
Compensation of employees	$488.2	$498.3	-$10.1	-2.0%
Gross capital income	$211.2	$215.6	-$4.4	-2.0%
Private Business Stocks	$1,669.5	$1,744.5	-$75.0	-4.3%
Wage rate $/hr	$4.00	$4.04	-$0.04	-0.9%
Private business hours of work (billions)	122.102	123.477	-1.375	-1.1%
Total government receipts ($billions)	$288.2	$286.6	$1.6	0.5%
Federal	$196.2	$192.3	$4.0	2.1%
State & local	$112.3	$114.7	-$2.4	-2.1%
Total Federal expenditures	$190.0	$190.8	-$0.8	-0.4%
Federal surplus (+) or deficit (-)	$6.3	$1.5	$4.8	322.6%
Individual income tax				
Federal marginal tax rates on AGI	25.6%	23.5%	2.1%	8.9%
Federal marginal tax rates on wages	24.1%	22.1%	2.0%	8.9%
Federal marginal tax rates on dividends	39.0%	35.8%	3.2%	9.0%
Federal marginal tax rates on interest income	25.6%	23.5%	2.0%	8.7%
Federal marginal tax rates on business income	32.7%	30.1%	2.6%	8.7%
Federal marginal tax rates on long-term capital gains	12.9%	11.8%	1.1%	9.4%
Weighted average service price				
Corporate	14.7%	14.4%	0.3%	2.4%
Noncorporate	9.9%	9.7%	0.2%	2.2%
All business	13.0%	12.7%	0.3%	2.4%
Federal budget effects*				% of static
Revenues			$ Billions	tax change
"Static" federal revenue gain (+) or loss (-)			$8.4	100%
"Dynamic" federal tax reflow from economic changes			-$4.4	-53%
Net federal tax change after dynamic effects			$4.0	47%
Federal outlay change if federal pay tracks private wages			-$0.8	-10%
Change in federal surplus (- is larger deficit, smaller surplus)			$4.8	57%
Comparing change in GDP to change in tax revenue*		GDP Change $ Billions	Change per dollar Static	Change per dollar Dynamic
Drop in GDP, total, and per $1 increase in federal revenue		-$18.8	-$2.24	-$4.75
Drop in after-tax income, total, and per $1 increase in federal revenue		-$22.7	-$2.71	-$5.75
Revenue gain to government from tax hike that cuts after-tax income $1.			$0.37	$0.17

* Notes: Most static revenue changes (+ or -) will move GDP in the opposite direction (- or +).
Dynamic revenue reflows due to the changes in GDP usually offset some but not all of the static tax change. If the dynamic GDP response is very large, the revenue reflow may offset all of the static change. If so, the net tax change after dynamic effects would be the same sign as the GDP change, and opposite in sign from the static numbers. For that type of tax provision, a cut raises tax revenue, an increase loses revenue.

TABLE 7
LBJ BUSINESS SURTAX
LBJ vs. pre-LBJ Law, at 1969 Income Levels

	LBJ	Old Law	Difference	% Diff
Gross domestic product ($ billions)	$984.4	$998.1	-$13.7	-1.4%
Private business output (less indirect taxes plus subsidies)	$699.3	$709.5	-$10.2	-1.4%
Compensation of employees	$488.2	$495.3	-$7.1	-1.4%
Gross capital income	$211.2	$214.2	-$3.1	-1.4%
Private Business Stocks	$1,669.5	$1,744.1	-$74.5	-4.3%
Wage rate $/hr	$4.00	$4.05	-$0.05	-1.2%
Private business hours of work (billions)	122.102	122.432	-0.329	-0.3%
Total government receipts ($billions)	$288.2	$290.1	-$1.9	-0.7%
Federal	$196.2	$196.2	$0.0	0.0%
State & local	$112.3	$114.2	-$1.9	-1.7%
Total Federal expenditures	$190.0	$190.8	-$0.8	-0.4%
Federal surplus (+) or deficit (-)	$6.3	$5.4	$0.8	15.0%
Individual income tax				
Federal marginal tax rates on AGI	25.6%	25.7%	-0.2%	-0.7%
Federal marginal tax rates on wages	24.1%	24.2%	-0.2%	-0.7%
Federal marginal tax rates on dividends	39.0%	39.2%	-0.2%	-0.6%
Federal marginal tax rates on interest income	25.6%	25.8%	-0.2%	-0.8%
Federal marginal tax rates on business income	32.7%	33.0%	-0.3%	-0.8%
Federal marginal tax rates on long-term capital gains	12.9%	13.0%	-0.1%	-0.4%
Weighted average service price				
Corporate	14.7%	14.1%	0.6%	4.2%
Noncorporate	9.9%	9.9%	0.0%	-0.3%
All business	13.0%	12.6%	0.4%	3.0%
Federal budget effects*				% of static
Revenues			$ Billions	tax change
"Static" federal revenue gain (+) or loss (-)			$3.2	100%
"Dynamic" federal tax reflow from economic changes			-$3.2	-100%
Net federal tax change after dynamic effects			$0.0	0%
Federal outlay change if federal pay tracks private wages			-$0.8	-25%
Change in federal surplus (- is larger deficit, smaller surplus)			$0.8	25%
Comparing change in GDP to change in tax revenue*		GDP Change $ Billions	Change per dollar Static	Change per dollar Dynamic
Drop in GDP, total, and per $1 increase in federal revenue		-$13.7	-$4.27	-$1,864.81
Drop in after-tax income, total, and per $1 increase in federal revenue		-$13.7	-$4.27	-$1,865.81
Revenue gain to government from tax hike that cuts after-tax income $1.			$0.23	$0.00

* Notes: Most static revenue changes (+ or -) will move GDP in the opposite direction (- or +).
Dynamic revenue reflows due to the changes in GDP usually offset some but not all of the static tax change. If the dynamic GDP response is very large, the revenue reflow may offset all of the static change. If so, the net tax change after dynamic effects would be the same sign as the GDP change, and opposite in sign from the static numbers. For that type of tax provision, a cut raises tax revenue, an increase loses revenue.

allowing for lower federal wage costs. Put another way, it would have cost the public $1 in after-tax income to get the government $0.11 in higher revenue via the surtaxes.

Tables 6 and 7 show the separate effects of the individual and corporate surtaxes. The individual surtax causes 58 percent, $18.8 billion, of the estimated total decline in potential GDP, while the corporate surtax produces 42 percent, $13.7 billion, of the decrease. The static estimate of the revenue from the individual surtax is $8.4 billion. About 53 percent is lost to the associated reduction in GDP. The net revenue gain is only $4 billion, or about $0.17 for each dollar of lost national income. After-tax income would have fallen by $5.75 for every dollar of net revenue from the individual tax increase. The static estimate of the corporate surtax revenue is $3.2 billion. But on a dynamic basis, the loss of GDP due to the surtax virtually wipes out the revenue gain from the corporate surtax (by 99.77 percent). The government would have gained almost nothing in revenue (about $7 million) while costing taxpayers $13.7 billion in lost income.

Because the surtax was temporary and short-lived, it never achieved its long run effect on the economy. Nonetheless, the temporary increase in the tax on production had two consequences. First, it discouraged investment in very short-lived assets to be used during the surtax period, and, if people were not sure that the surtax would be temporary, may have discouraged longer term investment as well. Second, insofar as people believed the surtax to be temporary, it would have encouraged people to postpone the realization of income, including capital gains, until the surtax expired. For these reasons, the surtax had some negative short term consequences for the economy, and could not raise as much money as the static revenue estimate (assuming no recession) would have indicated.

Conclusion

These simulations have looked at the effect of the Kennedy tax cuts and Johnson surtax of the 1960s on the U.S. economy and the federal budget. This study estimates that the Kennedy cuts raised GDP by nearly 8 percent by reducing the required rate of return to capital and by reducing marginal tax rates on labor income. About 61.5 percent of the static revenue cost to the federal budget was offset by the tax revenue gains from a stronger economy. The gains to the GDP were several times the net cost to the federal budget. The Johnson surtax contributed to the 1969-1970 recession. Had the Johnson surtax been permanent, it would have undone about half the gains of the Kennedy tax cuts and would have raised barely 36 percent of the expected revenue.

The paper shows why the design of the Kennedy tax cuts made them highly successful in improving the performance of the economy, and reveals which features of the Kennedy cuts were most effective. The results fit nicely with the observed changes in economic growth over the period 1962 through 1968. The paper also shows the damage that income tax surtaxes can create by boosting marginal tax rates. The results suggest that tax reductions that improve the after-tax return to capital and that raise the after-tax wage at the margin can lead to significant growth in GDP and incomes. Tax changes that do the reverse can reduce GDP accordingly.

This effort illustrates that the effect of major tax changes can be simulated by determining their impact on the required pre-tax return on capital and the tax wedge on labor compensation. This neo-classical approach is consistent with the microeconomic price and incentive signals that govern how labor and capital markets and the production process operate in the real world, where income is linked to production decisions. This is in contrast to Keynesian models that assume that government fiscal measures work by manipulating total spending and aggregate demand in the economy separately from the supply of goods and services.

Neo-classical micro-economic analysis can and should be applied to any proposed change in the tax system. It is the best way to determine if the proposed tax change will raise or lower GDP, incomes, and employment. Changes that would lower the service price of capital, and to a lesser extent, the marginal tax rates on labor income, would be expected to raise GDP and employment, which would reduce the real cost of the tax reduction below the cost predicted by static revenue calculations. Tax changes that increase the cost of capital and lower the reward at the margin to labor should be expected to reduce GDP and employment, and would raise less revenue than expected. To legislate without this information is to legislate in a vacuum.

Stephen J. Entin
President and Executive Director

Appendix

A Small Comparative Statics Model of the US Economy

This series of papers on historical tax changes employs a small comparative statics model of the US economy. It is based on empirical observations of the behavior of the economy over the post World War II period. The underlying assumptions are straightforward:

- The long run real after-tax rate of return to physical capital is virtually constant over time, implying that the supply (quantity) of capital is very responsive to changes in the rate of return.

- Labor's share of factor income (and GDP) is virtually constant over the period.

- The supply of labor is somewhat inelastic (unresponsive) to its after-tax compensation.

These three assumptions define a set of five basic equations that, when solved, describe a baseline picture of the economy at a point in time. The equations also allow changes in government taxes and spending to yield an alternative picture, that is, to estimate the effect on the economy of a change in fiscal policy.

The first assumption says that real interest rates — which reflect real returns on investment in physical capital such as plant, equipment, and structures — tend to be constant when viewed over long periods. They need not be completely stationary; the assumption merely requires that deviations tend to return toward the average. Observations by economists as early as 1800 suggest this fact as they found that interest rates in England tended toward its average. The same result appears for the U.S. over the past 60 years. Deviations tend to return to the long run average within 5 years. The mechanics is simple – deviations above the long run average imply attractive returns that encourage extra investment, which drives the returns down, and deviations below the long run average discourage investment, raising the returns over time.

Looking at shares of factor income in businesses, one finds a second virtual constant. The share of factor income going to labor and capital are so constant that more sophisticated alternative explanations are statistically rejected. The implication of this observation is that output can be predicted by a simple relationship that is linear in the logs of output and factor inputs (capital and labor). Furthermore, the compensation paid labor and capital can be predicted as constant percentages of net revenues. Many have tried to estimate alternative models of production but none have overcome the empirical fact of the constancy of the shares.

Where the first assumption implies that the quantity of capital is highly responsive to its return, labor is much less responsive to changes in compensation. Dividing the labor force into primary and secondary pools reveals that the primary pool (males 15 to 64) is extremely insensitive to

compensation (an elasticity of about 0.1), while the secondary pool (primarily women) is much more responsive (elasticities approaching 1). For the work force as a whole, the model assumes an elasticity of labor supply of 0.3; that is a 10 percent increase in real after-tax compensation gives rise to a 3 percent increase in labor services. The model is constructed to allow researchers easily to change this assumption to a lower or higher number as they wish.

The model is constructed by separating the economy into production sectors: corporate and noncorporate private business, households and institutions, government enterprises, and general government. This aligns output according to how products are distributed and how the associated income is taxed. General government does not sell its product in the market place while government enterprises do. Institutions and households do not actually sell their products but can be loosely construed as indirectly doing so. All three of these sectors do have employees that pay taxes through the individual income tax. Private businesses produce the lion's share of output. They pay taxes on their capital income, and their employees pay individual taxes. This division into four sectors provides enough detail to construct tax bases for most taxes.

Each sector is constructed applying the three assumptions outlined above. This provides us with estimates of output and the compensation of capital and labor for the sector. Labor from all sectors is aggregated and the overall wage rate for labor is determined by the assumed response to changes in real after-tax compensation.

One final assumption rounds out the model — that the Federal Reserve changes its policy to maintain the price level at its baseline values. This allows the model to focus on the effect of the spending or tax change rather than on some combination of fiscal policy change with an accompanying monetary change. The secondary benefit is that one does not have to adjust for price changes in determining real compensation for capital and labor.

Using the structure outlined, one can calibrate the model to the chosen baseline. To test a policy change, an alternative fiscal mix of taxes and spending can be entered into the framework. The baseline after-tax rate of return on capital can then be used to calculate what the new pre-tax return must be under the new tax system to provide the same after-tax return being demanded by investors. This pre-tax rate of return on capital determines the associated pre-tax wage rate that must prevail under the existing production technology. The resulting pre-tax wage, less the taxes on labor, tells us the change in the after-tax rate of labor compensation. The assumed elasticity of labor supply then determines how much labor will be supplied in the economy. This then will determine how much capital will be employed and finally what the level of output will be.

Output and income are displayed in a manner that permits a calculation of the various tax bases needed to estimate taxes. One can calibrate tax revenue parameters using the baseline to match the known revenue for a year, or to match a baseline such as the CBO revenue forecast. The tax bases can then be used to calculate a detailed set of revenue accounts for federal, state and local governments. A spending account is added to calculate deficits as well.

A graphical presentation

Taxes matter "at the margin". Tax changes affect the economy by affecting two key choices: between supplying labor and taking leisure, and between capital accumulation (saving) and consumption. Taxes affect the willingness of labor and capital to participate in production, or, put another way, taxes affect the cost of labor and capital services, and therefore the cost of production. Capital and labor supply decisions are not usually all or nothing. One chooses to work a little bit more or less, or to save a little more or less, or to employ a slightly higher or lower number of machines, or slightly more or less powerful or modern ones, on the factory floor. The tax rates that affect such decisions are the marginal tax rates that apply to the last or next dollar to be earned from small reductions or increases in one's economic activity. Taxes imposed at the margin on incremental activity reduce the quantity of resources available for production. With fewer inputs, there is less output and income, according to the characteristics of the production process.

Unlike Keynesian models, this neo-classical model is not "demand driven". It does not assume that tax changes affect the economy by leaving people more money or by taking money away from them, affecting their total spending or demand. Nor does it assume that changes in government spending alter total demand for output. Suppose, at a moment in time, tax rates are reduced, and government spending is not cut to match. Alternatively, assume that government spending rises without a matching tax increase. In either case, the government must simultaneously borrow an equivalent amount from the population to continue to pay its bills. Saving must rise to fund the tax cut or government spending surge. This leaves people with no increase in spendable "disposable income" to alter total demand.

Therefore, the model does not assume any initial or "first order" income effect from a tax cut. It assumes that output is driven instead by tax changes that alter the incentives at the margin that govern the supplies of labor and capital, which in turn drive the production of goods and services. Output equals income. When output and income rise, demand will rise as a secondary effect.

Lump sum taxes, such as a head tax, involve a fixed dollar amount owed regardless of income, and so have no impact on decisions about increasing one's earnings. Likewise, one-time retroactive tax hits do not apply to future income, although they may make taxpayers suspicious that they will be repeated. Such taxes are not "at the margin," meaning that they do not affect the last or next dollar earned, and are the only kind of tax that do not reduce incentives and curtail activity. Similarly, rebates of taxes on income of past years, such as President Gerald Ford's 1975 tax rebate on 1974 income tax liability, give no incentive to increase output in the future.

Taxes at the margin on labor and capital income act to reduce the quantities of labor and capital offered and employed in production. (Charts 1 and 2.) Taxes force up the cost of labor and capital,

Chart 1 Effect of Tax On Labor

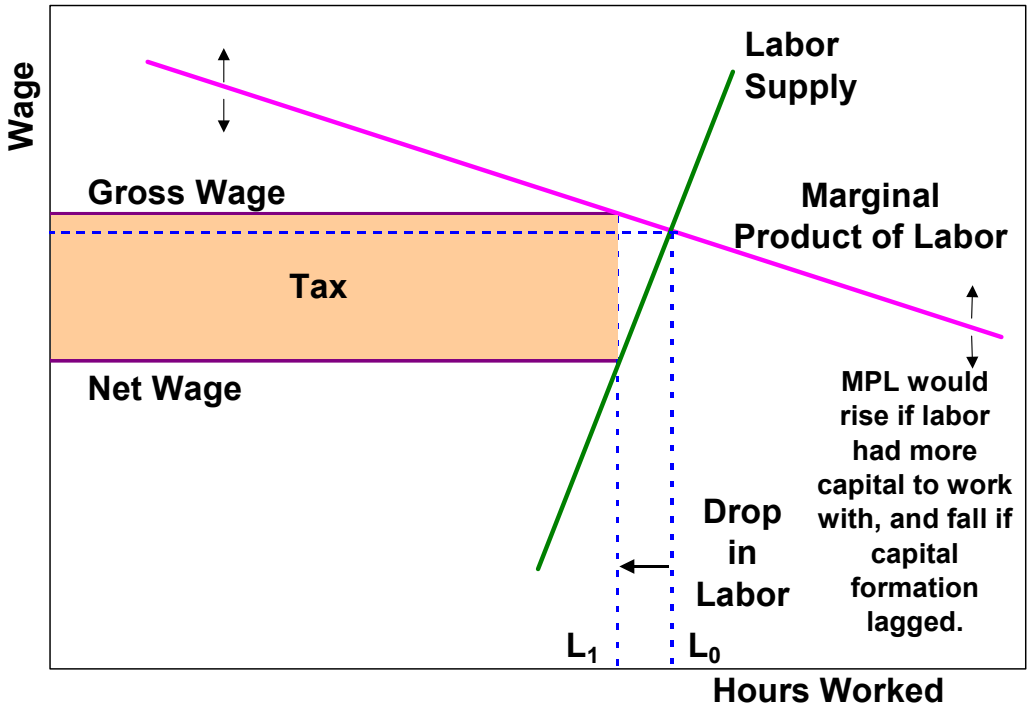
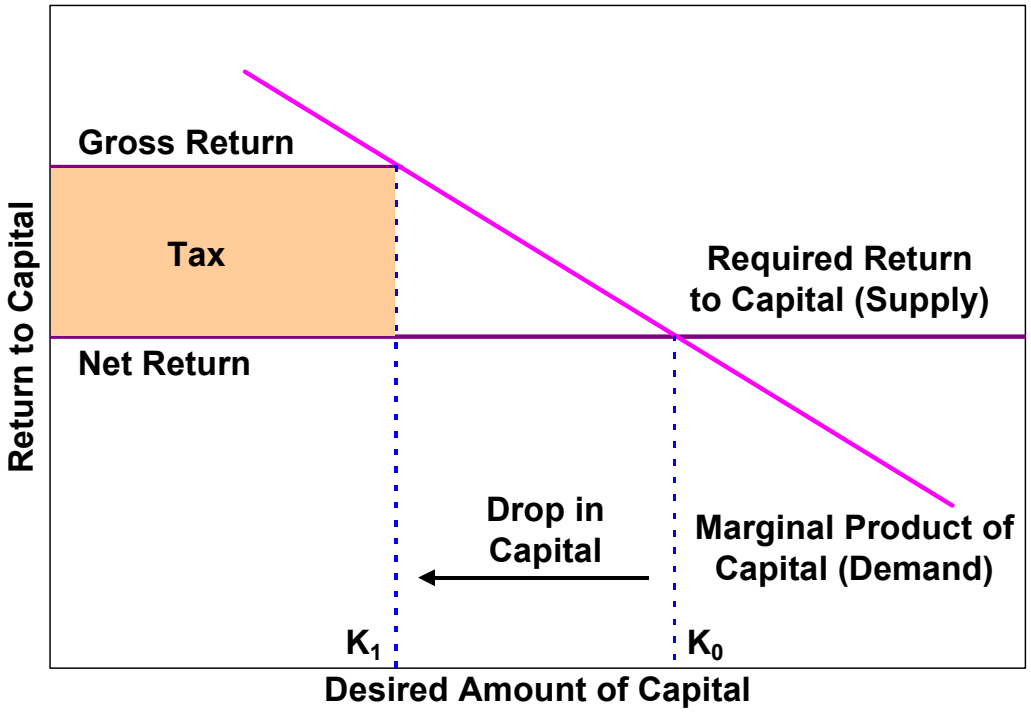


Chart 2 Effect of Tax On Desired Capital Stock



and restrict the supply of output for the whole economy. The tax in question could be the corporate income tax, the personal income tax, or the payroll tax for social insurance. Even sales or excise taxes can be represented as tax increases on the labor and capital used to produce the taxed products.

The quantity of capital is more sensitive to taxes than is the quantity of labor. Capital is easily reproduced (elastic supply) and it takes a large change in the quantity of capital to make a large change in its rate of pre-tax return. As for people's willingness to finance capital formation, people can always consume instead of save, or invest abroad instead of in the United States if the rate of return on saving and investment is driven down by rising taxes. Labor options are less flexible. Most people must work to have a satisfactory income, and to some degree they must conform their hours of work to the requirements of their employers. They have some choices — such as to take or reject overtime, whether or not to contribute a second earner from the family to the labor force, how long a vacation to take, and when to retire.

Taxes on capital hurt labor. Labor and capital work together to produce output. The more capital that a worker has to work with, the more productive he or she is. When markets clear, each factor of production is paid its marginal product — what an incremental unit of the factor adds to output and sales. That is, if employers find that they are able to boost output by $20 an hour by hiring an additional worker, that will be the going wage in a region. If technological changes occur, or if additional investment is affordable, that have the effect of boosting the marginal product of labor to, say, $30 an hour, then employers will compete for added workers until the wage rises to $30 an hour. Thus, the line that traces the "marginal product of labor" is also the "demand curve" for labor.

When there is a large stock of capital per worker, the marginal product of labor and the demand for labor are high, and so are wages and employment. When there is little capital per worker, the marginal product of labor and the demand for labor are low, and so are wages and employment. Taxes that discourage capital formation reduce the demand for labor and lower wages and employment. (Chart 3.) In this manner, much of the burden of taxes on capital income is shifted to workers.

Many economic studies indicate that labor would be better off with lower (or even zero) taxes on income from capital. Even if taxes on labor income were raised to offset the reduction in taxes on capital income, the pre-tax income of labor would rise by more than the tax liability, and after-tax wages would increase.[3]

Labor and capital are used in the production of every good and service. Consequently, personal and business tax rate increases may be drawn as shifting inward the aggregate supply curve for the whole economy, and a cut in tax rates on labor and capital earnings may be drawn as a shift outward in the aggregate supply curve for the whole economy.

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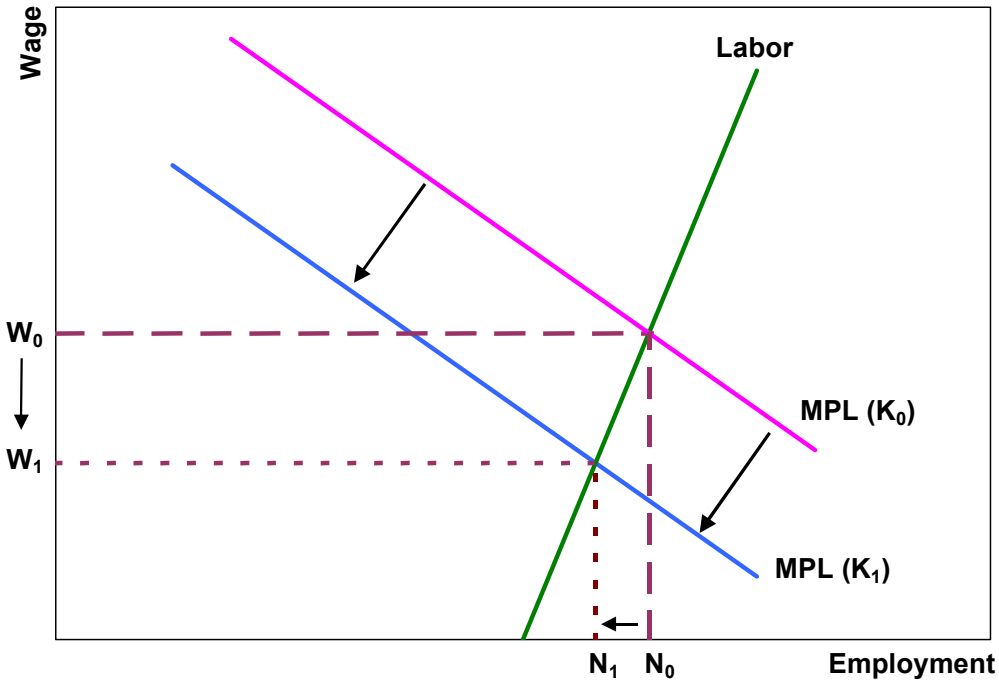
[3] See Stephen J. Entin, "Tax Incidence, Tax Burden, and Tax Shifting: Who Really Pays the Tax?" *IRET Policy Bulletin*, No. 88, September 10, 2004, available at http://iret.org/pub/BLTN-88.PDF.

Chart 3 A Smaller Stock Of Capital Reduces Wages



Charts 4 and 5 show the effect of a reduction in the marginal tax rate on labor or capital income on the aggregate supply curve. Cutting the payroll tax rate or the personal marginal income tax rates would reduce the gross-of-tax cost of labor to the employer while raising the after-tax wage to the worker. Cutting the personal marginal income tax rates and the corporate tax rates, reducing the tax rate on capital gains, enhancing capital cost recovery allowances (depreciation write-offs), or implementing an investment tax credit, would reduce the gross-of-tax cost of capital to investors in plant and equipment.

The supply of labor and capital services to the economy would increase, as suppliers of these services would be encouraged to substitute labor for leisure and saving for current consumption. The aggregate supply curve would shift outward. There would be greater output. The people furnishing additional labor and capital to the production process would be paid, and they would buy the added output with the added income (amounts demanded would increase with higher incomes along the aggregate demand curve). Output would expand from E_0 to E_1. Real income and purchasing power, reflecting the higher real production of goods and services, would rise.

The effect on the nominal price level would depend on the response of the Federal Reserve. The outward shift in the aggregate short run supply curve represents an increase in the supply of labor and capital services which also expands the full employment capacity of the economy, which is the long

Chart 4 Expanding Capacity By Reducing Taxes At The Margin (Constant Money Supply)

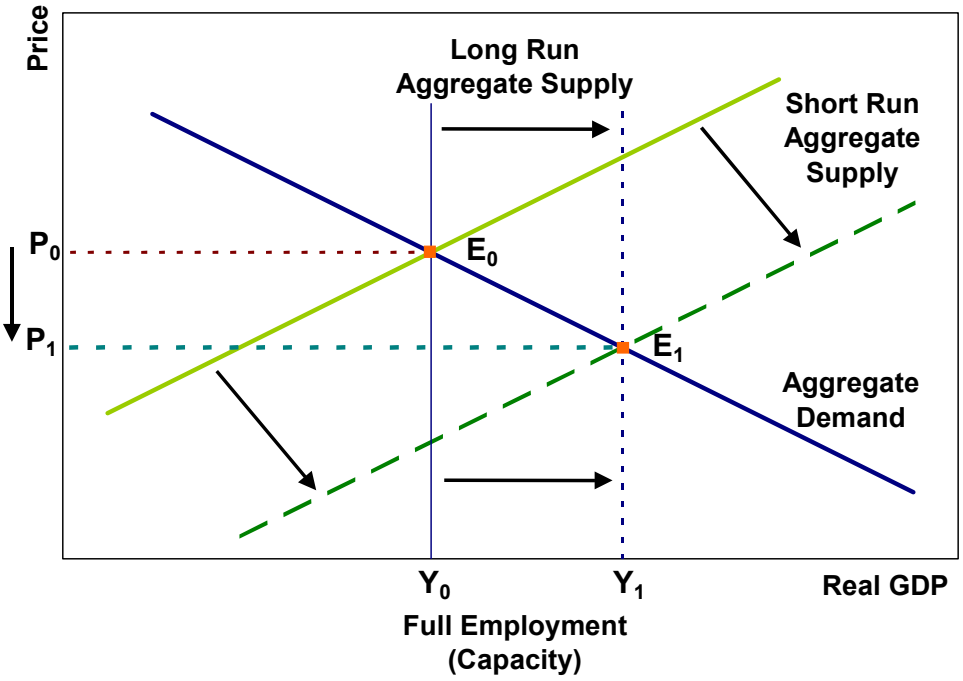
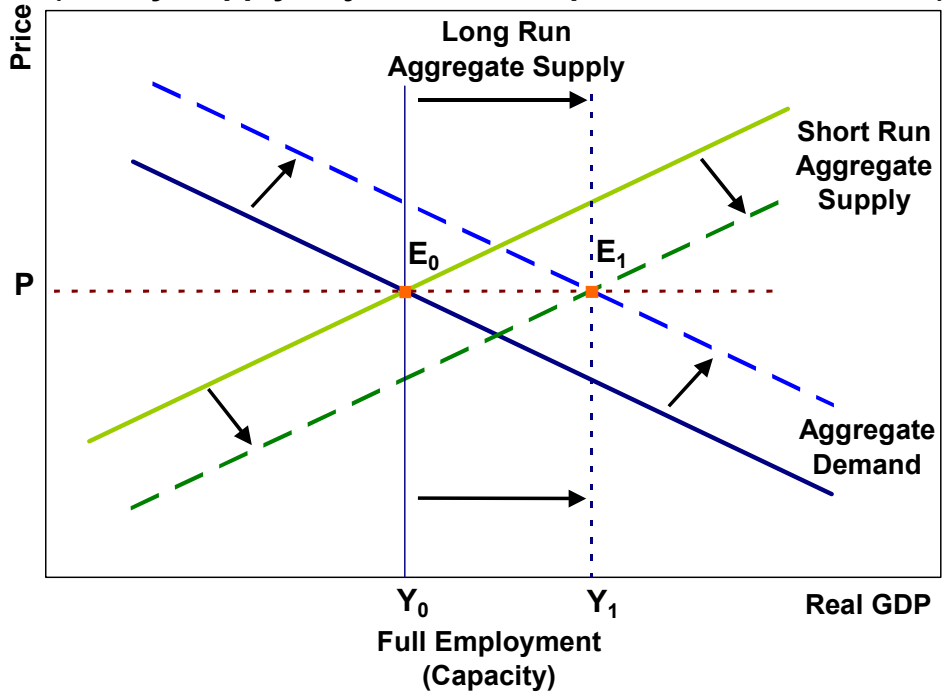


Chart 5 Expanding Capacity By Reducing Taxes At The Margin (Money Supply Adjusted To Keep Price Level Constant)



run supply curve. Only if capacity rises with the tax change will there be a permanent rise in real output and income. There is no inflationary pressure from a supply-enhancing tax reduction. If the Federal Reserve were to keep the money supply on an unchanged path (as in Chart 4), the added production would result in a lower price level, with more goods chasing the same amount of money. If the Federal Reserve were to increase the money supply in line with the faster expansion of real output, the short run supply curve and the demand curve would undergo a subsequent upward shift (as in Chart 5) to keep the price level unchanged.