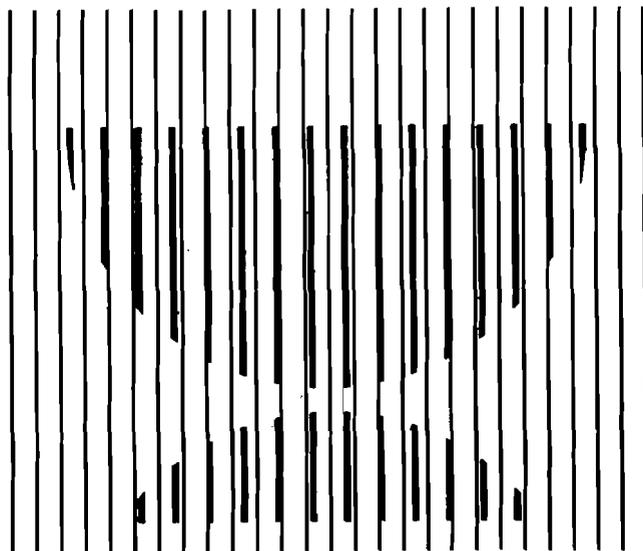


CBO STAFF MEMORANDUM

**COMPARATIVE ECONOMIC EFFECTS OF INCREASED PUBLIC
INVESTMENT AND REDUCED PAYROLL TAXES**

April 1991



**CONGRESSIONAL BUDGET OFFICE
SECOND AND D STREETS, S.W.
WASHINGTON, D.C. 20515**

This memorandum was prepared at the request of the Committee on Ways and Means of the U.S. House of Representatives. It examines the macroeconomic effects of increased public investment in comparison with those of reduced payroll taxes. In accordance with the Congressional Budget Office's mandate to provide objective and impartial analysis, the memorandum contains no policy recommendations.

Matthew Salomon of CBO's Fiscal Analysis Division prepared the paper under the direction of Frederick Ribe and Robert Dennis. Joyce Manchester, Trevor Alleyne, and Robert Arnold also contributed to the paper. Robert Hartman, Paul Cullinan, Michael Deitch, Jon Hakken, and Larry Ozanne provided considerable assistance with their critical comments. L. Rae Roy prepared the memorandum for final release.

INTRODUCTION

Recently, the Congressional Budget Office (CBO) examined the macroeconomic effects of proposals to reduce the Social Security payroll tax--proposals that, unless offset by cuts in other programs, would raise federal borrowing by an average 0.5 percent of the gross national product (GNP) over the 25-year period between 1992 and 2016.¹ Using three different macroeconomic simulation models, CBO found that, although the cut in payroll taxes might stimulate GNP in the short run, it would cause GNP to fall below its baseline levels in the longer run. The decline in GNP would occur because of the lower national saving rate implied by the increase in the federal deficit.

Not all policies that increase the measured federal deficit would necessarily reduce GNP. For example, this memorandum contrasts the macroeconomic effects of increases in the deficit stemming from expanded outlays for public investments with those stemming from reduced payroll taxes. The study finds that increased federal investment leads to an expansion in GNP in both the short and long terms, in contrast to the long-term declines that are likely to result from the increased deficits caused by reductions in the payroll tax.

The connection between public investment and Social Security taxes in this memorandum is made for analytic, not policy purposes. Policy decisions in these

1. Congressional Budget Office, "The Economic Effects of Uncompensated Changes in the Funding of Social Security," CBO Staff Memorandum (April 1991). Hereafter, this memorandum is referred to as CBO Staff Memorandum (April 1991).

two areas need not be related in any way.² Moreover, the evidence presented in this memorandum on the effects of a change in policy in either of these areas by itself does not constitute a recommendation for or against that change. Any policy decision in either area should take account of considerations beyond the economic impacts that are discussed here.

QUALITATIVE ANALYSIS

Dollar for dollar, increases in government spending on public capital are likely to lead to a higher GNP than would reductions in payroll taxes. This conclusion stems from two fundamental differences in the ways that increased investment and reduced taxes affect the economy. First, an increase in public investment raises demand and GNP directly in the short run while reduced payroll taxes do so only indirectly. Second, and more important, carefully chosen public investments work to increase the stock of productive capital. Assuming that the federal investments have at least as high a rate of return as investments in the private sector, this increase in the capital stock expands the economy's capacity to meet current and future increases in demand.³

2. Under the provisions of the Budget Enforcement Act of 1990 that set forth the guidelines for Executive and Congressional actions on the federal budget Social Security is separated from most programs that can be considered public investments.

3. Alternative approaches to expanding public capital, such as channeling part of the Social Security surplus into the bonds with which state and local governments finance their own spending on infrastructure would not expand the gross national product. This lack of effect on GNP is because, unlike the measures considered in this memorandum, investing Social Security reserves in state and local obligations would not increase total investment. Instead, such a measure would simply reshuffle existing flows of saving. Additional funds from Social Security would flow

In contrast, reductions in payroll taxes increase current demand, while they reduce the productive capacity of the economy. In other words, increased public investment raises the share of GNP devoted to investment and lowers the share devoted to consumption, while reduced payroll taxes raise the share of consumption and lower the share of investment.

Throughout this analysis, CBO assumes that the increase in public investment targets projects that are carefully chosen.⁴ The decision to invest in a particular capital project--whether it be physical infrastructure, human capital, or the intangible capital assets arising from federal expenditures on research and development--requires that the costs and benefits of that project be carefully considered to ensure that the rate of return on public investments is at least as great as in alternative uses.⁵ Poorly chosen projects are not likely to increase the economy's productive capacity in the long run--and they may even decrease it.

to state and local governments. However, other funds that presently flow to investments of state and local governments or of the private sector would be diverted to U.S. Treasury debt to replace the financing of the debt that Social Security was no longer taking care of.

4. In particular, the Congressional Budget Office assumed, for purposes of this analysis, that an incremental dollar spent on public capital increases economic capacity by an amount identical to that resulting from an additional dollar spent on private capital.
5. Some projects may yield benefits, such as improved health or reduced crime, that are not entirely reflected in increases in the measured gross national product, but still make the projects worthwhile.

Direct Versus Indirect Impacts in the Short Run

Increased public investment has a direct impact on demand and GNP in the short run: each additional dollar of public investment initially raises demand and GNP by a dollar.⁶ No such direct increase in the demand for goods results when taxes are cut. Reducing tax revenues affects demand by raising disposable income (dollar for dollar), which, in turn, stimulates consumption. Since part of the increase in disposable income is likely to be saved, each dollar of reduction in taxes increases consumption (and, therefore, GNP) by less than a dollar over the short run.

A Comparison of the Effects on Productive Capacity in the Long Run

In addition to increasing current economic demand, increased public investment would also raise future levels of GNP by adding to the stock of productive capital, thereby expanding the economy's capacity to produce over the long run. The impact of public investment on economic capacity is the single most important factor underlying the different macroeconomic effects of the two alternative fiscal stimuli, especially over the long term.

6. Investments expand aggregate demand at the time they are made because the purchased materials and services that go into them are included in the gross national product. Once they are completed, investments also increase GNP by expanding the supply side of the economy—its capacity to produce.

To be sure, the increase in federal investment will not expand productive capacity dollar for dollar. The higher government borrowing that is required to finance the public investment will increase interest rates, thereby displacing some private investment. This displacement is known as "crowding out". Still, capacity will be significantly increased because the reduction in private investment will be smaller than the increase in public investment. In any case, even if increased public investment were fully to displace private investment, the resulting level of economic capacity would be higher than when payroll taxes are reduced. This effect occurs because, by reducing investment and increasing consumption, the tax cut is likely to reduce economic capacity below its baseline levels.

While some analysts might argue that reductions in payroll tax rates also expand the economy's capacity to produce output by increasing the supply of labor, empirical evidence indicates that these effects are small. To the extent that reduced payroll tax rates induce more people to work, or induce those already at work to work harder, a cut in payroll tax rates can expand capacity. Nonetheless, economic research suggests that one can expect only small increases in the supply of labor and the intensity of work effort.⁷ Moreover, recent proposals for cuts in payroll taxes include features that would work partially to offset any increase in labor supply. First, workers whose pay is in excess of the maximum amount of wages subject to tax would find that their decision to work an extra hour is unaffected by a cut in the payroll rate (their "marginal payroll tax rate" is zero). Second, some proposals would

7. See, for example, Jerry A. Hausman, "Labor Supply," in H. Aaron and J. Pechman, eds., *How Taxes Affect Economic Behavior* (Washington, D.C.: The Brookings Institution, 1981), pp. 27-72.

raise this maximum wage subject to tax. Those workers whose salaries are above the old ceiling but below the new one would experience an increase in the marginal tax rate on their wages and, as a result, they might reduce their supply of labor.

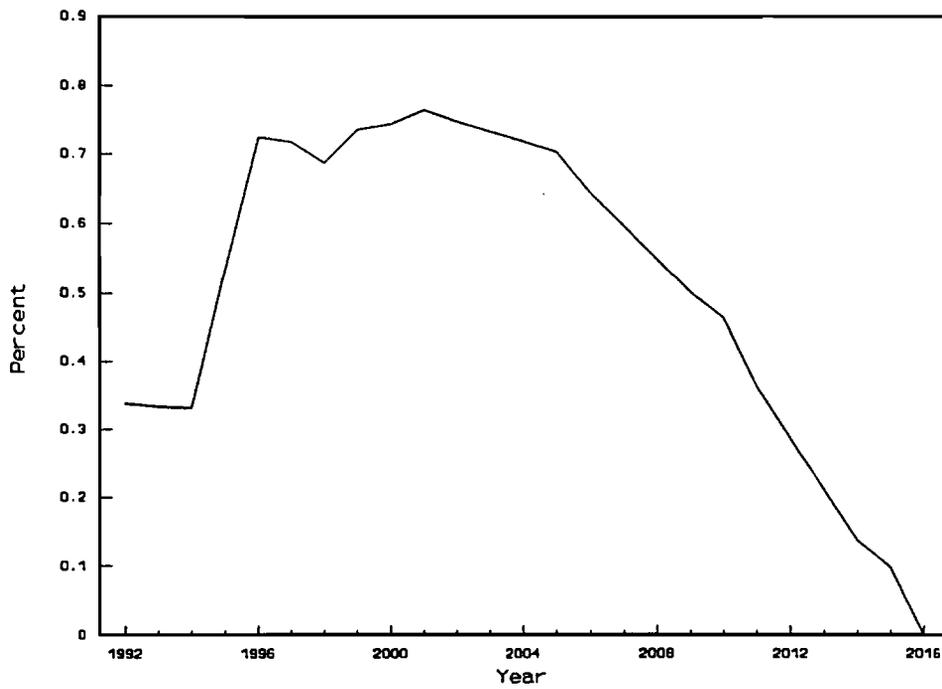
QUANTITATIVE RESULTS

This section presents estimates of the likely magnitudes of the economic impacts discussed above. CBO used the McKibbin-Sachs Global (MSG) model--a computer simulation model of the economy--to estimate the effects of an increase in public investment that raises federal borrowing by the same amount as did the reduction in payroll taxes that CBO analyzed in its earlier memorandum.⁸ CBO's assumption regarding the size of the increase in federal investment is only made to facilitate comparison of the two approaches, and it bears no necessary relationship to the amount of federal investment that could be justified by careful analysis of the costs and benefits of particular projects.

CBO has assumed increases in public investment that raise the deficit by the same amount as the cut in payroll taxes. The increase in federal investment rises until the early part of the next decade (see Figure 1). After peaking in the year

8. The McKibbin-Sachs Global model is one of three models used in the CBO Staff Memorandum (April 1991). While the other macroeconomic models would have produced different simulation results (as is evident in the earlier memorandum), other models are likely to show the same qualitative differences between the impacts of investment and tax policies.

Figure 1.
Increase in Real Public Investment (as a percent of potential GNP)



SOURCE: Congressional Budget Office.

"forward-looking" and some of the effects recorded before 2016 reflect conditions beyond that year, these effects are small.

2001, however, the fiscal stimulus diminishes steadily, and by the year 2016, it is gone.⁹

The simulation results show that increased public investment stimulates GNP to a greater degree than does the policy of reduced payroll taxes (Table 1). As a result of the additional public investment, real GNP rises by as much as 0.2 percent above its baseline levels over the 1992-2006 period before falling back to its baseline levels over the 2007-2016 period.¹⁰ By contrast, the reduction in payroll tax rates leads to a smaller initial increase in GNP and then to a decline below baseline levels. Unlike the reduction in payroll taxes, which primarily stimulates consumption, the increase in public investment directly raises the level of the capital stock, ultimately

9. This assumption for government borrowing differs from that of the earlier memorandum after the year 2016. In that memorandum, payroll taxes were reduced for the period before 2016 and increased thereafter, producing corresponding increases and decreases in government borrowing. Such a pattern of government borrowing, if carried out through changes in investment, would require sharp cuts in investment below baseline after 2016. Since few would advocate such a policy, the analysis in this memorandum is confined to the period before 2016 and assumes investment remains at baseline levels after 2016. While the McKibbin-Sachs Global model is "forward-looking" and some of the effects recorded before 2016 reflect conditions beyond that year, these effects are small.

10. The change to gross national product reflects offsetting movements in two components: production, measured by gross domestic product (GDP), and payments to service debt to foreigners. Increased public investment raises *real GDP* above baseline throughout the period of these simulations because it increases the capital stock and thus increases productive capacity. *Payments to service debt to foreigners* also increase because foreigners supply a portion of the savings needed to finance increased public investment. As a result, foreigners will hold more claims on the United States. Other things equal, these debt-service payments reduce available income—GNP—in the United States, even though they do not affect production. In the simulations reported here, the increase in payments to foreigners is sufficient to offset completely the increased production in the 2007-2016 period, so that GNP returns to its baseline level. A similar difference between the impacts on GDP and on GNP occurs in the case of payroll tax cuts, though in this case the capital stock, real GNP and real GDP all fall below their baseline levels.

TABLE 1. SIMULATED MACROECONOMIC EFFECTS OF INCREASED BORROWING TO FINANCE EXPANDED FEDERAL INVESTMENT AND REDUCED PAYROLL TAXES, USING THE MSG MODEL (In percentage difference from baseline, except where noted)

	1992-1996	1997-2006	2007-2016
Real GNP			
Increased public investment	0.2	0.2	0.0
Reduced payroll tax	0.1	-0.3	-0.6
Real GDP			
Increased public investment	0.2	0.4	0.3
Reduced payroll tax	0.1	-0.2	-0.3
Consumption			
Increased public investment	0.1	0.1	-0.1
Reduced payroll tax	0.5	0.5	-0.1
Nominal Short-Term Interest Rate ^a			
Increased Public Investment	0.2	1.0	0.7
Reduced Payroll Tax	0.1	0.9	0.8
Real Short-Term Interest Rate ^a			
Increased public investment	0.2	1.0	0.7
Reduced payroll tax	0.1	0.8	0.9
Nominal Long-Term Interest Rate ^a			
Increased public investment	0.6	1.0	0.3
Reduced payroll tax	0.5	1.0	0.5
Real Long-Term Interest Rate ^a			
Increased public investment	0.6	1.0	0.3
Reduced payroll tax	0.5	0.9	0.6
Real Exchange Rate			
Increased public investment	1.5	1.0	-1.0
Reduced payroll tax	1.5	1.6	-0.2
National Saving Rate (including government investment) ^a			
Increased public investment	0.2	0.3	0.1
Reduced payroll tax	-0.2	-0.6	-0.6
Capital Stock ^b			
Increased public investment	0.2	1.2	1.4
Reduced payroll tax	0.0	-0.3	-0.5

SOURCE: Congressional Budget Office.

NOTES: a. Difference from baseline in percentage points.

b. The Congressional Budget Office estimated the levels for the baseline capital stock.

by nearly 1.5 percent above the baseline, thereby raising the economy's capacity to produce.

The rate of national saving is likely to increase if public investment rises, although the additional saving would not prevent interest rates from rising. In contrast with reduced payroll taxes, which reduce the rate of national saving, the increased public investment raises savings and investment, as Table 1 shows. (Although the National Income and Product Accounts classifies public investment as a type of consumption, most economists regard public investment as form of national saving, and this study follows that convention.) On balance, the rate of national saving rises (broadly defined to include investment). Despite this increase, the demand for loanable funds rises with increased aggregate demand. As a result, interest rates rise by about the same amount--a half to a full percentage point--when public investment increases as when payroll taxes are reduced. As a result of the rise in interest rates above their baseline levels, the increase in public investment displaces some private investment.

When public investment increases, the exchange value of the dollar follows its initial rise from the baseline with a more rapid and deeper decline than occurs when the payroll taxes are reduced. This decline in the dollar occurs because the increase in domestic economic capacity increases the supply of domestically produced goods in world markets relative to those produced elsewhere. This relative abundance in the supply of U.S. products leads to a decline in the relative price of U.S. goods in world markets. The depreciation in the real exchange value of the

dollar shown in Table 1 is a reflection of this decline. Thus, the increase in economic capacity that accompanies the additional public investment improves the balance of trade over the long term, as goods produced domestically compete more effectively with foreign products.

Several alternative comparisons of the effects of increased public investment with reduced payroll taxes are shown in Table 2. This table displays the effects of the alternative fiscal stimuli on the level of real GNP (that is, adjusted for changes in the price level and stating all prices at 1991 levels), in real per-capita terms (further adjusting for the growth in population), and in terms of 1991 "dollar equivalents" (real dollar values that have been discounted so that they are commensurate with today's levels of income).¹¹

CONCLUSION

Expanding federal investment is likely to increase GNP in both the short and long terms relative to the levels that would otherwise have been achieved. By contrast, because it leads to increased consumption instead of investment, cutting payroll taxes by the same amount instead is likely to reduce GNP. In dollar terms, increasing federal investment in infrastructure could expand GNP by \$10 billion to \$15 billion

11. The 1991 dollar equivalents are calculated by discounting the dollar differences from baseline in these future time periods at a rate equal to the average rate of growth in real gross national product between now and the particular time period.

TABLE 2. SIMULATED EFFECTS OF INCREASED PUBLIC INVESTMENT AND REDUCED PAYROLL TAXES ON REAL GNP, USING THE MSG MODEL

	1992-1996	1997-2006	2007-2016
Difference of Real GNP from Baseline in Billions of 1991 Dollars			
Increased public investment	13	15	0
Reduced payroll tax	6	-22	-53
Difference of Real Per Capita GNP from Baseline in 1991 Dollars			
Increased public investment	47	53	0
Reduced payroll tax	24	-79	-179
Difference of Real GNP from Baseline in Billions of 1991 Dollar Equivalent			
Increased public investment	12	12	0
Reduced payroll tax	6	-18	-36

SOURCE: Congressional Budget Office

per year (in 1991 dollars) on average over the next 15 years. The change in GNP from cutting payroll taxes would be negative by about the same amount.

These results carry a number of caveats. Most important, they depend critically on the assumption that the federal government choose any infrastructure projects that it undertakes carefully to ensure that they are at least as productive as investment by the private sector. Furthermore, such decisions about federal expenditures and tax cuts should take account of many considerations beyond the purely analytic and macroeconomic factors that are discussed in this memorandum.