Statement of
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NOTICE

This statement is not available for public release until it is delivered at 10:00 a.m. (EST) on Tuesday, December 8, 1987.

Mr. Chairman. Last week the Congressional Budget Office (CBO) released a study of investmentlike activities in the federal budget entitled Trends in Public Investment. The report was requested by the Joint Economic Committee. Today, I am pleased to appear before this subcommittee to discuss the contents of that report and the implications the report has for a capital budgeting system for the federal government. I will limit my statement to three key issues:

- What is "federal" investment?
- What do CBO's numbers show? and
- What are the implications for capital budgeting?

WHAT IS "FEDERAL" INVESTMENT?

Investment is generally defined as an activity that creates assets that have value because they generate future output and income. The National Income and Product Accounts (NIPA) treat as fixed investment all expenditures on new business plant and equipment and the purchases of dwellings by households. But under current NIPA accounting, government purchases of such long-lived facilities are not considered investment, even when they virtually duplicate commercial investments--as do, for example, the assets of power marketing authorities. Even these government assets are omitted because they cannot clearly be shown to generate net income as private investments are presumed to do. Many regard the exclusion of all government activity from the investment category as unduly restrictive. On the other hand, economists and accountants do not agree as to what government activities might be placed in this category. In our study, we look at several possible definitions of government investment.

Beyond the issue of what would constitute federal investment is the problem of figuring out what it is worth. A dollar's worth of federal investment must be "as good" as a comparable dollar of private investment for the two to be counted equally. Construction costs often provide the best information for measuring the value of fixed facilities. Construction costs are used to measure the value of private investments in the NIPA; this is a reasonable practice, since firms in the economy characteristically will not undertake investments unless their expected value exceeds their cost. But public investments are undertaken for social as well as economic reasons and, therefore, their costs may exceed their economic benefits, even though their social contribution may be substantial. On the other hand, some private investments result in losses and others are subsidized through the tax system or other mechanisms. Allowing for such offsets, the assumption of parity between the costs and values of private and public investments may not be unreasonable.

A further measurement issue concerns depreciation. Rules for depreciating government capital have not been established. Much federal investment is in large fixed facilities, such as dams, that remain in good condition for most of their useful lives and that lack private counterparts or secondhand asset markets to help determine the rate at which they depreciate. Whenever possible, we used two alternative depreciation rules to demonstrate the sensitivity of our results to these assumptions. One rule is the "straight-line" rule, which writes off equal shares of an asset's value over the course of its estimated life. The other is a "discard" rule that writes off the asset's entire value once it is withdrawn from service.

But some federal activities that might qualify as investment pose special problems. Depreciation of defense weaponry, for example, arises from both physical and technical

obsolescence, but neither is clearly measurable. Wide ranges exist for writing off past R&D efforts (if scientific or intellectual capital is to be included under the rubric of "investment") and no practices at all exist for depreciating human capital, were it to be included.

Finally, it is important to note that if certain activities were included in a definition of federal investment, then our notions of private investment would have to change accordingly. For example, the assets subsidized by federal infrastructure grants to state and local governments are already accounted as investments by the state and local public sectors. Assigning some portion of those investments to the federal government because of its financial role would mean lowering our estimates of state and local assets, dollar for dollar. Moreover, growing evidence suggests that these grants result in relatively little additional state and local investment, so it might be inappropriate to credit a share of this investment to the federal government based on the full value of its grants. Corresponding changes would have to be made in the rest of the NIPA. If the government's research and development (R&D) or education and training expenditures were to be considered investments, for example, then the NIPA would have to treat comparable private expenditures as investment, which is not the current practice.

WHAT THE NUMBERS SHOW

Let me first explain what our numbers do and do not represent. The numbers in our report are NIPA-based, meaning that they conform with economywide estimates of saving and investment. On the other hand, they are not directly comparable with the official budget numbers. (Unlike the unified budget calculations, the NIPA do not include transfers of such assets as land or loans, but they do count both gross revenues and

outlays in those areas where the current budget allows receipts to offset outlays, and also account costs when they are incurred, among other minor differences. In fiscal year 1986, for example, the NIPA budget deficit was $213.6 billion, in contrast to the unified budget deficit of $220.7 billion.)

With regard to investmentlike activities, the NIPA data on purchases of equipment and structures include only purchases with an expected life of at least five years, and thus include less than corresponding budget accounts. For example, budget data for highway spending include spending on administration, safety programs, maintenance, research, and so on, as well as spending on new construction, while NIPA data for capital spending on highways include only new construction, and any reconstruction that adds to the useful life of existing highways. Numbers in this testimony are calendar year numbers, not fiscal year numbers. Moreover, while the figures in our report were expressed in 1982 dollars to demonstrate historical trends, the numbers I am discussing today are for 1986 only and are, therefore, in 1986 dollars.

Depending on what is included, total gross federal investment spending in 1986 may have been as much as $15 billion or as much as $150 billion, as seen in Table 1. Net investment--that is, gross investment minus depreciation of past investments--may have been less than $2 billion or more than $75 billion. This wide range reflects the tremendous uncertainty regarding what should be counted as investment and how its depreciation should be measured.

Our study looked at five broad classes of federal spending that could claim to be investment in order to investigate the implications of different definitions.

TABLE 1. FEDERAL INVESTMENT IN 1986 UNDER DIFFERENT CAPITAL CONCEPTS (NIPA basis, in billions of dollars at current prices)

Capital Concept and Investment Type	Gross Investment, 1986	Capital Consumption from: Depreciation	Capital Consumption from: Discards	Investment Net of Depreciation	Investment Net of Discards
Economic Assets					
1. Federally owned physical assets of enterprises and civilian agencies, and military assets with civilian counterparts	15.1	13.9	10.4	1.2	4.7
Defense Assets					
2. Weapons systems and tactical vehicles	62.1	38.8		23.4	
Intellectual Capital					
3A. All federal research and development spending	52.3		29.1		23.2
3B. Commercially oriented federal research and development	16.8		5.4		11.4
Federal Capital Grants					
4. Federal capital grants to states and localities	25.6	12.8	1.9	12.8	23.7

SOURCE: Congressional Budget Office, based on *Trends in Public Investment* (December 1987).

NOTE: In addition, federal spending on education services in 1986 was $25 billion, some of which may qualify as investment in human capital.

Spending on economic assets, the first type of capital, includes services provided by the government that contribute directly to the nation's economy. Federal irrigation water, for example, is used in farming, municipal, and industrial applications. Other federal assets substitute for those that firms could rent to the government--office buildings, computers, and so on. This class of spending has possibly the clearest claim to be considered federal investment. As seen in Table 1, Row 1, gross spending in this category was $15.1 billion in 1986; net investment ranged from $1.2 billion to $4.7 billion, depending on one's choice of accounting techniques.

Spending on defense assets is undertaken to generate long-term services or benefits in the form of greater national security. It is impossible to place a value or a "price" on national security because it cannot be bought and sold by individuals. But the purchase of long-lived defense assets could be considered investment because of these benefits. Looking at Table 1, Row 2, we see that gross investment in such assets as weapons and tactical vehicles totaled $62.1 billion in 1986; net investment (after subtracting a depreciation charge estimated to be $38.8 billion for past investments) was $23.4 billion.

Spending on intellectual capital refers to research and development (R&D) spending, which (when successful) leads to new products or processes and creates future income, as does physical capital. On the other hand, the bulk of this spending is on military projects and prototypes that often use available technology rather than create new knowledge. Row 3A of the table shows that total federal R&D spending was $52.3 billion in 1986, although only $16.8 billion of this spending (shown in Row 3B) was commercially oriented. It is entirely unclear what useful lives (and therefore, depreciation rates) should be chosen for these assets. CBO adopted assumptions used by other researchers in the

field, and obtained results of $23.2 billion in net investment for all intellectual assets, of which $11.4 billion is for commercial uses.

Spending on capital grants supports investment by state and local governments for infrastructure and other physical assets. Table 1, Row 4, shows that these grants totaled $25.6 billion in 1986. The choice of a depreciation rule is most important in this area. If we deduct an equal annual share of the value of an asset (such as a road) over its estimated productive life, then net investment is substantially smaller--only $12.8 billion. If we deduct the entire value of the asset when it is withdrawn from service, then net investment was $23.7 billion. The difference between the two reflects the fact that many infrastructure assets--such as roads, airports, and mass transit systems--were constructed in the past few decades and are still in their useful lives.

Federal grants and loan subsidies for human capital finance training and education, which make workers more productive, as does physical capital. But economic advancement is only one goal of education programs; personal enrichment, social leadership and cohesion, or cultural awareness also are intended outputs. Thus, it would require a great leap to classify all spending on education as a form of economic investment. Such expenditures, therefore, were excluded from our calculations. Were they to be included, gross investment in human capital would have added $25.0 billion to federal investment totals in 1986.

Overall results. What is counted in the total for federal investment depends on which categories of spending are regarded as capital.

- If only economic assets are included, federal investment would be that shown on Row 1 of the table, that is, gross investment of $15.1 billion, depreciation ranging between $10.4 billion and $13.9 billion, and net investment between $1.2 billion and $4.7 billion. This is the lower range of federal investment found in the study.

- If spending on all fixed facilities and long-lived equipment were included, federal investment would include spending in both Rows 1 and 2 of the table. Gross investment would be $77.2 billion ($15.1 billion plus $62.1 billion), depreciation between $49.2 billion and $52.7 billion ($10.4 billion plus $38.8 billion to $13.9 billion plus $38.8 billion), and net investment between $26.6 billion and $28 billion ($1.2 billion plus $23.4 billion to $4.7 billion plus $23.4 billion).

- The largest measure of federal investment would include spending for intellectual capital and for grants to states and localities as well as for federally owned physical capital. Taking the lower measure (in Row 3B) for intellectual capital, this would put gross federal investment at $119.7 billion ($15.1 billion plus $62.1 billion plus $16.8 billion plus $25.6 billion). Taking the higher figure (in Row 3A) would give $155.2 billion ($15.1 billion plus $62.1 billion plus $52.3 billion plus $25.6 billion). For the higher of these levels of gross investment, depreciation could range between $80.2 billion (taking

the lower figure for depreciation on each of Rows 1, 2, 3A, and 4) to $94.6 billion (taking the larger figure for depreciation on these rows), putting the upper figure for net investment at between $60.6 billion ($1.2 billion plus $23.4 billon plus $23.2 billion plus $12.8 billion) and $75 billion ($4.7 billion plus $23.4 billion plus $23.2 billion plus $23.7 billion).

Thus the overall range of gross investment found in the study was from $15.1 billion for investment in economic assets to $155.2 billion for all investment concepts combined. Comparable depreciation estimates are a low of $10.4 billion for economic assets to $96.4 billion for all concepts, and net investment estimates range from $1.2 billion if only economic assets are counted to $75 billion for all concepts together.

IMPLICATIONS FOR CAPITAL BUDGETING

Identifying the investment component of federal spending raises a variety of issues related to capital budgeting. These include:

- the sensitivity of the result to assumptions employed;
- the implications of capital budgeting for investment choices;
- the meaning of the deficit under the unified and under the capital budget.

The Sensitivity of the Result

While a variety of capital budgeting proposals exist, they generally share the requirement that the current unified budget be split into two main budget accounts: on the one hand, a capital budget that would include all investment spending, and on the other hand, an operating budget covering all other federal expenses plus an annual allowance for the depreciation of federal assets during the budget period. The use of an annual allowance would reflect the fact that the true economic cost of using a long-lived asset is its depreciation that measures the loss in its value as it becomes older or obsolescent. Such a capital budgeting system would make federal budgeting more like that of firms, which measure their current income net of depreciation. Systems used by state and local governments, while a form of "capital budgeting," typically do not budget for depreciation of their assets.

The first implication of our report is that what such a capital budget might show would depend on a number of subjective assumptions regarding what capital is and how it should be measured. Since a capital budget would take gross spending on federal investment out of the budget totals and put annual depreciation in its place, net investment (gross investment minus depreciation) would be approximately equal to the difference between the deficit in a capital budgeting system and the deficit in our current, unified budget. In other words, since total net federal investment in calendar year 1986 ranged from $1.2 billion to $75 billion, the federal deficit in that year under a capital budgeting system might have fallen from $204.6 billion (NIPA basis) under the unified budget to anywhere between $203.4 billion and $129.6 billion, depending on the definitions used. The obvious implication is that what capital budgeting tells us depends on what is considered capital and how it is valued.

Making Investment Choices

Critics of cash budgeting claim that it gives agencies the incentive to minimize current spending, without regard to long-term consequences. Thus, agencies facing buy-or-lease decisions tend to favor leasing (because of the lower initial outlay), even though buying might be cheaper in the long run. This results in higher costs for future taxpayers. But CBO's analysis of these choices shows that the bias could be eliminated by requiring present-value comparisons of the two options1/.

Current cash budgeting, even if imperfect, requires comparisons of capital and noncapital options for each budget purpose. This requirement is most important in those programs where the competing capital and operational solutions are much wider than deciding to buy or lease office space. For example, the $25.6 billion in federal grants to state and local governments for infrastructure made in 1986 includes spending on new highways, airports, and mass transit systems. But improving transportation service requires comparing this new construction with the alternatives of increasing maintenance of existing facilities, subsidizing users, pricing airports or highways more efficiently during their peak-use periods, or simply assigning dedicated traffic lanes to buses and carpools. By allowing more capital-intensive solutions, a different budget treatment may invite a new source of bias into program decisionmaking. In fact, experience in federal programs shows that when these choices are restricted (whether by funding conditions, budget treatment, or any other factor), less efficient investment choices are made.2/

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1. See Congressional Budget Office, The Federal Buildings Program: Authorization and Budgetary Alternatives (June 1983).

2. See Congressional Budget Office, Federal Policies for Infrastructure Management (June 1986).

The Meaning of the Deficit

Finally, capital budgeting changes the meaning of the budget deficit. A deficit in the unified budget measures the overall spending impact of federal programs on the nation's demand for goods and services, and foretells the federal government's borrowing requirement. A deficit in the operating account of a capital budgeting system--the difference between receipts from current taxes and current expenses including depreciation--is analogous to measures of saving (that is, income not spent on consumption) by businesses and households. If the concern is credit markets, the unified deficit is the most indicative measure; if the concern is overall levels of saving and investment, the information found in a capital budget can be the basis for helpful adjustments.