

resources through taxation. At that time, his estimate of the opportunity cost of public capital obtained through taxation was about 6 percent. However, in private correspondence, and I believe here yesterday, he indicated that using current data with his model would yield a cost estimate of about 8 percent.

Other investigators have calculated the cost of capital to the Government by assuming that the Government borrows the necessary funds. They have estimated that the cost of borrowed capital is significantly higher than the interest yield on Government bonds. Because Government borrowing displaces private investment to a significant extent, the Government forgoes the taxes it would collect on the returns to these investments. This cost to the Government must be added to the Government bond yield, less the taxes the Government collects on this yield, to come up with the right opportunity cost.

Working along these lines, the GAO estimated that Government borrowing costs may be as high as 7 to 8 percent, and other investigators have estimated it at closer to 10 percent. There are some problems with interpreting these calculations as opportunity costs, but I think the important thing to recognize is that both the tax models and the borrowing models economists have used have produced similar estimates of the opportunity cost of public capital, answers which are in the 7 to 10 percent range. I believe that further research along these lines will support this result, since both taxing and borrowing affect both consumption and investment to a significant degree.

Up to this point, the discussion has been in terms of undifferentiated Government investments whose costs and benefits can in principle be measured. In fact, there are many different types of Government investments, and for many of them it is difficult or impossible to measure or compare the value of the benefits, even in principle. For example, it is impossible to put a monetary value on the benefits of investment in a new defense weapon system. It is not possible, even in principle, to develop a market test of the volume of assured destruction capability against the Soviet Union or our ability to defeat Warsaw Pact tactical air forces in conventional combat in Europe, still less to put a monetary value on improvements in those capabilities.

In situations where there is no market test of benefits, two types of analyses must be done. First, should we buy the capability, however we measure the benefits? Secondly, which of the alternative ways of providing this capability should we choose?

Since this is the characteristic type of problem encountered in the Defense Department, it is worth discussing how we do it in more detail.

Typically we measure the benefits or effectiveness of our investments against some criterion of military need. For airlift and sealift investments, for example, the need is expressed in terms of the desired schedules for moving forces to where they may be needed. For tactical air investments, one way the need can be expressed is in terms of delivering ordnance to a target system, against expected opposition, in sufficient quantity to destroy a certain percentage of the targets. We set up tests of effectiveness like this in each mission area, using perhaps several different measures of effectiveness. Deciding whether or not additional investments should be undertaken involves complex judgments about the value of the extra effectiveness relative to its cost.