RELEVANT ASPECTS OF PUBLIC INVESTMENTS VALUATION

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ABSTRACT: *Recent developments, such as privatization and the private finance initiative, have raised the issue of which assets should be owned by the public sector and whether assets have different values in the public and private sector. In order to answer to this question we make here a parallel between public and private investment under considerations such investment appraisal, valuation criteria, cost of capital and the required rate of return , as well as the risk associated to public-sector investments. Finally we offer an example that highlights some of the considerations presented below.*

KEY WORDS: *investment project; property; public sector; private sector; cost of capital; costs; benefits; risk; assets; taxes; cash flow.*

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1. INTRODUCTION

The governments are responsible for setting macroeconomic policy. They seek to promote equity by aiding the poor and the disadvantaged and they provide a variety of services- education, health, defense, infrastructure, police and postal services. Most of these activities involve large investments.

One of the problems raised in public and private investment's appraisal is the value of the assets. If the assets have different values in the public and private sector which assets should be owned by the public sector and how to price assets that are transferred between the two sectors? In fact, investment appraisal in public sector should differ from that in the private sector? In this paper we try to answer to that question.

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2. PUBLIC VERSUS PRIVATE INVESTMENTS

The managers of firms in private sector will maximize the welfare of shareholders by undertaking all projects that increase shareholder wealth. A project's contribution to shareholder wealth, named its net present value (NPV), is calculated by discounting the project expected cash flows by the return expected on capital market securities of equivalent risk. Irrespective of the model used for estimating the expected return, investors require a premium for bearing risk. This risk premium takes the form of a higher required return and depends on the project's non-diversifiable (or factor) risk. Managers can best help shareholders by accepting all projects with positive NPV.

Both public and private sectors undertake projects that require making some initial investments and are expected to provide benefits over a number of years.

Both sectors must choose between making these investments and returning the cash to be invested to their beneficiaries (the shareholder in the case of private-sector firms and the citizenry in the case of governments) who can then invest the cash directly in the capital markets or spend it on current consumption. All parties involved (firms, government, shareholders, citizenry) have access to the same capital markets, so the opportunity cost of these investments should be the same for both sectors.

In neither case can the beneficiaries' wishes be ignored with impunity. Directors can replace managers if they prove to be incompetent, or run the risk of themselves being replaced. Similarly, citizens in a democracy are provided, through elections, with the regular opportunity to replace incompetent governments. They also elect representatives whose role is to monitor the government.

At first sight, one might expect the investment criteria that are appropriate for private sector firms to be fairly similar to those for government. That this need not lead to the same investment appraisal procedures is a consequence of the different nature of the agency relationships in the public and private sectors and of the differing intent of the contemplated investments as well as the presence of distortions such as taxes.

3.VALUATION CRITERIA FOR PUBLIC-SECTOR INVESTMENTS

These criteria cannot be identical to those for private-sector. The only cases where government assets should have the same value as their private-sector equivalents are those where there are no public goods, no monopolies and no externalities. These are the cases in which there no motive for public ownership.

Despite the assumption of a difference between public and private-sector valuations, there are important dimensions along which valuation techniques should be the same in both sectors. Differential agency effects, public goods, monopolies and externalities affect only the cash flows of a project. As we shall see, the cost of capital is the same in the public and private sector in the absence of tax distortions and with complete capital markets. Under these conditions, a given set of future cash flows with particular level of risk should be evaluated in the same way in the public and in the private sector. So we have to analyze the imperfections, such as taxes, that drive a wedge between the opportunity cost of capital in the public and private sector.

First, we have to consider the issue of unanimity among shareholders and citizen. The cost and benefits of a firm's investment decisions are shared proportionately by the firm's shareholders, who are therefore largely united in their objectives. Such proportional sharing is generally not true of public sector investments. Government investments may be motivated by externalities, which affect different segments of the population in different degrees. A rule that requires the government to make only Pareto improving investments (investments that make at least someone better off and no one worse off) is clearly too restrictive for practical use. An alternative rule (Hicks, 1940; Kaldor, 1939) would require the government to value all the benefits and costs of proposed investments and make those investments that offer the largest net benefits.

Under this criterion, project should be undertaken by the government if those who benefit from the project can afford to compensate those who suffer (those who bear the direct costs of the investment or are exposed to its negative externalities. If such compensation may not always be paid, the government needs to recognize the distributional effects of the investments it makes. This may be achieved by postulating a social welfare function that summarizes the relative merits of alternative income distributions, but it is unclear how such a function should be determined. Moreover, it would be suboptimal to take distributional considerations into account on a project-by-project basis. Thus, it is common simply to calculate the net benefits of an investment and to make separate judgement as to its distributional consequences.

4. THE COST OF CAPITAL IN THE PUBLIC SECTOR

The defining characteristic of investment decisions is their concern with benefits and costs that are not coincident. Costs are generally incurred at the outset, whereas benefits may be delayed. Future benefits and costs must be discounted to the present, so an important problem in public finance is the determination of the appropriate discount rate or cost of capital and its comparison with that used by private sector firms.

In the following considerations we first abstract from risk and taxes.

The opportunity cost to the government of investing in risk-free real assets is the reduction in interest payments that it would achieve if the cash to be invested were instead used to repurchase government debt. Since similar opportunities are open to private-sector firms, the rate of interest on government debt is the opportunity cost of capital for a risk-free investment by both the private and public sectors. The discount rate used by the government, the social rate of time preference or social discount rate should differ from the market rate of interest (Pearce and Nash, 1981) and conceptual distinction between the market rate of interest and the social discount rate:

I. Resource expenditure by government has an opportunity cost, because the resources would otherwise be available for other uses, to provide immediate consumption benefits and be at least partly invested to produce a return. There is a further cost of the distortions caused by taxation, at the margin, to fund increments in public expenditures.

II. These opportunity costs apply equally to extra expenditure and to expenditure savings, and in general, apply as much to later as to earlier years. They are therefore generally not relevant to the simple comparison of public expenditure over time, for which the conceptual basis depends on people's time preference for consumption.

It is unclear what is the appropriate decision rule if the two rates point to different courses of action or how the choice of rate depends on the nature of the flows. The difference between the two rates is unlikely to be large enough to justify making a practical distinction.

There may be several motives for wishing to distinguish between the opportunity cost of capital and the social discount rate. A benevolent government may be justified in encouraging investment for the future and may even want to invest in projects that have a lower return than that required by investors. More rationally, individuals may fail to consider the welfare of future generations in making their consumption and investment decisions. The government, acting as a guardian of future generations, should invest at rates of return that individuals acting in their own selfish interest would find unacceptable.

To the extent that involves a value judgement about the sacrifice that one generation ought to make on behalf of another, the social rate of time preference cannot be a matter for economics analysis. But it is not even clear that, in principle, a democratically elected government could or should use any discount rate but the market rate of interest to value its investment.

A government would be justified in using a discount rate that is lower than the market rate of interest only when the resources to be invested by the government cannot be invested at the market rate of interest. When these resources can be invested at the market rate of interest, whether by the private sector or the public sector, it is undesirable to divert them to an investment that will return the lower social discount rate. We may stating that the issue of distinguishing between the market rate of interest and the social discount rate arises only in the case of a large project in a large economy, for such a project may affect the market rate of interest. In the case of a small open economy, as are most economies today, resources can always be invested at the world market interest rate. As a conclusion, the social discount rate cannot be lower than the market interest rate, for it is the latte that represents the opportunity cost of any investment.

5. THE OPPORTUNITY COST OF CAPITAL AND THE REQUIRED RATE OF RETURN

In order to make a conceptual distinguish between the social discount rate and the opportunity cost of capital, we have to distinguish between the opportunity cost of capital and the real required average rate of return (RRR) which is used as the discount rate for investment in trading activities. It is difficult to understand this distinction. It is true that, if private sector firms undertake only those projects that have positive NPV when valued at the cost of capital, the average rate of return will be higher than the cost of capital. But private-sector firms do not in consequence change their criterion to one

of earning an above-average rate of return. If governments follow a policy of accepting only those projects that are expected to earn at least the cost of capital, they will find that their average return exceeds the cost of capital.

6. RISK AND THE COST OF CAPITAL FOR THE PUBLIC SECTOR

The choice by many governments and multilateral institutions of discount rate that are close to the risk free rate suggest that they view the public-sector projects as being of low risk. It is not entirely clear, whether this is because governments consider the projects undertaken by the public sector as being by nature of low risk or whether it is because they consider that projects become of low risk by virtue of being undertaken by the public sector.

A common but simple case for using a low public-sector discount rate focuses on the fact that the government can borrow at the risk-free interest rate. Private-sector firms generally borrow at a higher rate of interest than does the government and, must service equity made costly by the risk premium that must be paid to shareholders. The apparent contrast between cheap debt raised by the government and costly debt and equity raised by private-sector firms is misleading. Taxpayers bear the residual risk of government investments, particularly those of making good on the obligations to debtholders, in much the same way as the shareholders of a private-sector firm.

A more sophisticated argument for a low public discount rate has been made by Arrow (1965, 1966), Arrow and Lind (1970), Samuelson (1964), Solow (1965). As noted by Bailey and Jensen (1972), underlying this argument is the presumption that: a) the risk of public-sector projects is distributed over the entire population; b) diversifying risks through government ownership can serve to eliminate risk to a very large extent, and c) such diversification can be achieved more cheaply by the government than by financial markets..

Critics of these risk-pooling arguments are directed against each of the argument's three headings (Bailey and Jensen, 1972).

a) While it is true that much of the uncertainty about the costs of a government project is borne by taxpayers and is widely distributed, the uncertainty about the project's benefits is generally borne by the specific individuals who receive those benefits.

b) Pooling can eliminate risk only if the outcomes of public projects are independent both of each other and of outcomes of private investments. While Arrow and Lind recognize the former condition, they provide no evidence that it is satisfied.

c) The assertion that private markets do not constitute an efficient mechanism for insuring risk is not justified.

Perhaps the determining consideration is this (Hirshleifer, 1964; Bailey and Jensen, 1972): in the presence of complete capital markets, in which the pay-offs to all projects are spanned by existing securities, taxpayers can shed any risk that accrues from the undertaking of a project by the government by trading in the capital markets. The risk premium demanded by the capital markets is the cost of shedding this risk. It is therefore the risk premium demanded for both public- and private-sector projects.

It is well-known that the discount rate should vary with a project's exposure to risk. It is difficult to make fine distinctions regarding project risk, but when assets are exchanged between the public and private sectors, spurious apparent value may be created by the use of an inappropriate discount rate. This is particularly important in the case of those asset transactions that are effectively financing transactions (for example the sale and leaseback of a government property should be evaluated using a lower required rate of return than a typical public-sector project, because it generally has a very low risk level).

For many public projects, sponsors are concerned with the maximization of net benefits. In many cases benefits are taken as given and sponsors are concerned only with the minimization of costs. If these costs contain a sizeable fixed element, they may be somewhat less risky than net benefits. We cannot observe separate market prices for the revenue and cost streams of private-sector firms, but it is possible to estimate the covariance of changes in these firms' revenues and costs with changes in aggregate accounting profits. These co-variances can be used to derive accounting betas' that serve as proxies for the systematic risks of the revenue and cost streams.

The case for using a relatively low discount rate to value a stream of costs relies on the fixed nature of many costs. This is distinct from the common misconception that, when calculating present values, the adjustment for risk should depend on the sign of the cash flow. Stiglitz (1988) argues: "To see how increasing the discount rate may lead to absurd results, consider a project that, at termination, requires expenditure. Assume that there is some uncertainty about the magnitude of that cost. We would normally think that this uncertainty would make that project less attractive than if we knew for sure what the termination costs were. But consider what happens if we use a higher discount factor to offset the risk: the present value of those costs is reduced and the project looks more, not less, attractive".

7. INVESTMENT AND FINANCING

Another important feature of private-sector investment is that the evaluation of an investment should be independent of the financing of the investment. Also, it should be independent of the accounting treatment of the investment and its associated financing. For example, the fact that the government finances its investments by borrowing at a lower rate than the private sector is irrelevant to the evaluation of its investments as this low borrowing rate is made possible only by the government's powers of taxation and is unaffected by the projects that it invests in. Similarly a government transaction that happens to increase the public-sector borrowing requirement should not be treated differently from another transaction that does not affect the public-sector borrowing requirement.

8. AN EXAMPLE OF APPLICATION

We conclude our considerations with an example that highlights some of the issues mentioned above. This example is that of general purpose property, such as office buildings used by the public sector. The question we want to answer is: Should

these be owned and maintained by the public sector or should they be rented? Or: Should the public sector's valuation of these assets be different from their private-sector valuation?

In order to answer this question we consider the various effects that may give rise to a difference between public- and private-sector valuations: public goods, monopoly power, externalities, risk and taxes. In the absence of any differential effect across the two sectors, public-sector valuation should simply follow the best practice in private-sector valuation.

In the case of general purpose property, such as an office building, it is difficult to argue that there are any significant public goods, monopolies, or externalities. Agency effects that may result in less-efficient management of the property will be reflected in the estimated cash flows from the property. The discount rate used for valuation will not be affected by the existence of these effects. In so far as risk is concerned, risk sharing should be the same whether the asset is owned by the private sector or by the government, as the existence of a claim on a given property will do very little to complete the market. This leaves the final issue of taxes. If the public sector decides to own the property, rather than lease it, the present value of the lease payments thus saved must be compared to the purchase price of the property. This calculation should be carried out by discounting pre-tax cash flows at the appropriate pre-tax discount rate. In the private sector the relevant calculation involves the discounting of after-tax cash flows at the after-tax opportunity cost of capital. As a result, the private sector may value the asset more highly than the public sector if the private sector can use the asset to reduce taxes. The private sector may therefore be willing to pay more for the asset than the public sector by the present value of the tax savings it can achieve by owning the asset. This should not necessarily constitute a reason for the government to sell the asset to the private sector, for it is taxpayers who will pay for this apparent gain.

9. CONCLUSIONS

In this paper we made a general assessment of public investment, highlighting the differences between investment project in public and private- sector. Also, we presented the investment criteria within public-sector enterprises with particular emphasis on the cost of capital. In particular we argue that:

- in an open economy the relevant discount rate for government projects is the opportunity cost of capital – that is the expected return on comparable investments in the capital markets;
- since the government receives all tax revenues, risk-free projects should be valued by discounting their pre-tax cash flows by the pre-tax interest rate;
- if the pay-offs of the project are spanned by existing traded securities, then the risk premium demanded should be the same in both the public and privates sectors; the presence of complete capital markets lessens the need for the government to diversify on behalf of citizen;
- the appropriate discount rate for costs is generally substantially lower than for net cash flows.

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