Title: The Discount Rate in the Public and in the Private Sector.

Course:
Year: 1993
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Report No: P93068

Abstract: The paper is concerned with answering the following questions: What is the discount rate? Why are there differences between the discount rate in the private and the public sector? What is happening when a public company is privatized? The discount rate or interest rate symbolize the time value of the invested money. The discount rate in the public and in the private sector is different. In principle there is no difference between a nationalized company and privately owned company regulated by a public agency.

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P9368

TERM PAPER

EMGT 535/635

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FALL 1993

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What is the discount rate?

The discount rate or interest rate symbolisize the time value of the invested money. The discount rate must be high enough to cover the interest of debts, the interest of their own money and the risk of failure. For an investment the discount rate computed for this special project must be higher than the interest rate paid by the company for debts. The discount rate is usually the interest rate plus a certain percentage dependent on the risk of the project.This means, that the discount rate is the crireia for a project to be economic or not to be economic. It is possible that only by using other criterias for estimating the discount rate, one technology becomes uneconomic and another technology becomes economical (Figure 1 and 2). The cost of capital is the largest cost category for most utilities. A

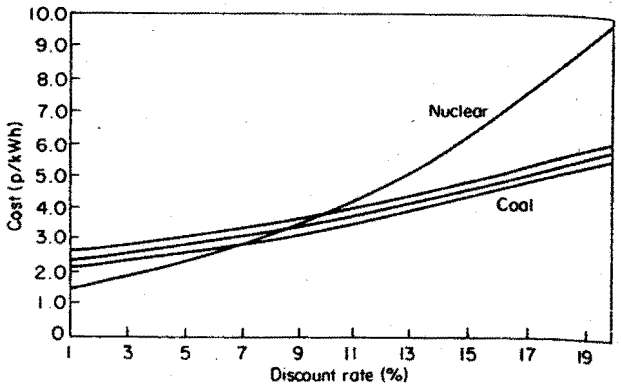

Figure 1. Sensitivity of nuclear and coal costs to discount rate (electricity costs are based on CEGB and Unipede Variants 1 and 2 fuel costs).

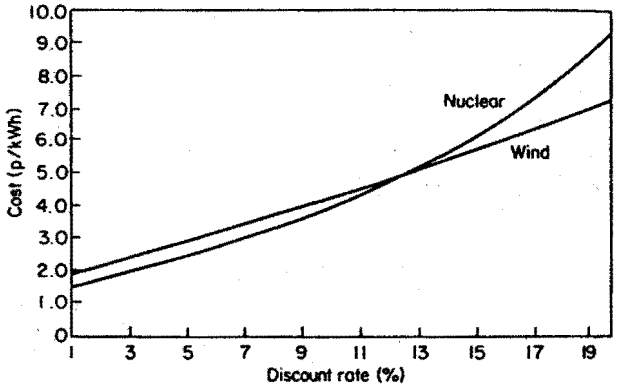

Figure 2. Sensitivity of nuclear and wind costs to discount rate.

change in the assumption about the rate of return that needs to be earned on capital can completely change the character of investment that is undertaken.

Usually the discount rate in the public sector is 2-3% lower than the discount rate in the private sector. Corporate funds are typically based on some MARR (Minimum Average Rate of Return) that is related to the company's actual cost of capital. Government funds are obtained through taxation or through borrowed funds to pay for some projects. When money is borrowed, one possible cost of capital would be the interest rate paid. However, federal law generally exempts the interest paid on municipal bonds. This has the effect of allowing a government a lower rate. There has been a tendency of government to set rates at relatively low rates to justify expenditures, particularly those with vary long life.

Why are there differences between the discount rate in the private and the public sector?

There are a number of reasons to believe that the optimal discount rate is considerably lower than the rate of return that needs to be paid on investor's capital. The two official main reasons for the differences are the presence of a risk premium in the rate of return and the presence of corporate income taxes. The third reason, it has been argued, is the attempt for a hidden federal subsidy. The first is that the public owned company is usually regulated and has a monopoly function. In the case of regulated

monopolies, there is comparatively little business risk from competition. And in the discount rate in the private sector there is about 2-3% for the risk included. This means, a public owned company doesn't face the same risks of failure, that a private owned company faces.

Ordinary business face substantial risk of loss due to variances in market share, and this risk is reflected in the rate of return that their securities must earn. However, events that are risks from the point of view of the individual private investor in a company are usually a much smaller risk from the point of view of the economy in general. One example for this point is drilling for oil. A small exploration company faces a large risk of bankruptcy because it might have several dry holes. By contrast, there would be relatively little risk from the point of view of a national monopoly oil company, there would be a well-defined expected success rate.

In the case of regulated monopolies, there is comparatively little risk from competition, but there is a substantial risk that punitive regulative will not allow rate increases which are high enough to cover rising costs. Therefore, the societal risk is obviously much smaller than the risk faced by the utility's shareholder: If rate payers and shareholders are substantially the same (as they are in the case of a publicly owned utility) the pooling significantly reduces the total risk. The classic work on risk in the evaluation of public investment decisions is by Arrow and Lindt [1]. Their analysis concluded that the discount rate on these investments ought to be lower than for private projects, to take into account the lower risk resulting from a pooling ownership.

The second reason for a change of the discount rate is that the privatized company now pays corporate income tax on its net income. It is

the main reason why the cost of capital rises for a privatized utility. For the average company in the United States, corporate income tax is a significant cost item, averaging roughly 10 percent of total costs in the past several years.

What is happening when a public company is privatized?

In resent years a movement has begun toward privatization of government owned companies, like electric utilities, ... This raises the interesting question of how the cost of capital should be treated when a utility is privatized. In the process of privatizing a company, it has been suggested that the discount rate for investments used by the privatized entity should be much higher than the one previously used. This raises interesting conceptual issues that are relevant to both shareholder and the publicly owned utilities. Most, if not all public owned companies, like electric utilities, ... are price regulated and continue to be regulated even after being privatized.

Dimson [4] argues that projects of privatized companies should be discounted at the discount rate which be appropriate for them. Other authors stated that it must be considered that even after being privatized, usually the price of the products will continue to be regulated and kept below the CPI increase. In the long run, this remains a cost-plus type of pricing scheme.

Conclusion:

The discount rate in the public and in the private sector is different, because the conditions are different. In the discount rate of a private project must be a certain amount of risk included and a private owned company has to pay corporate income tax on its net income. This means, the 2-3% lower discount rate for projects in the public sector than in the private sector is justified. The other question was, what is happening when a public company is privatized.

In principle there is no difference between a nationalized company and privately owned company regulated by a public agency. The regulator can be conscious of the pooling of risk from the public viewpoint, and insist that investment decisions be made as if the utilities were part of one nationalized company.

The optimal discount rate and the rate of return on investors' capital are two completely different concepts, serving two different functions. The discount rate is generally considerably lower than the rate of return on investors' capital. The utility that is privatized will have a large increase in the required return on invested capital, because of the discount rate which is used for engineering economics calculations.

Some of the authors state that the appropriate real discount rate is likely to be about 5 percent. This would mean a discount rate below the rate of return that is earned on capital. They argue that in monopolized areas it doesn't matter if it is the "real" discount rate or not because they are key industries. The public pays for the products regulated prices or it is

not possible to estimate the benefits of certain projects like bridges, independence of energy, worth of environmental protection,....

REFERENCES

1. Arrow, K. J. and R. C. Lind, "Uncertainty and the Evaluation of Public Investment Decisions," American Economic Review, Vol. 60, June 1970, pp. 364-378.

2. Bhattacharyya, S. K. and D. J. Laughhunn, " Price Cap Regulation: Can We Learn From the British Telecom Experience?," Public Utilities Fortnightly, October 15, 1987, pp. 22-29.

3. Bierman, H. and S. Smidt, "A Well-Defined Cost of Capital for Public Utilities," Public Utilities Fortnightly, December 10, 1987, pp. 24-27.

4. Dimson, E., "The Discount Rate for a Power Station," Energy Economics, July 1989, pp. 175-180.

5. Quirk, J. and Terasawa K., "Choosing a Government Discount Rate: An Alternative Approach, "Journal of Environmental Economics and Management, 20/1991 pp. 16-28

6. Scheraga, J. , "Perspectives on Government Discounting Policies," Journal of Environmental Economics and Management, 18/1990, pp. 65-71