CHAPTER 4

DISCOUNTING RATE & THEORY VS PRACTICE

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1. Brief Introduction:

'A bird in hand is better than two in the bush' says the common wisdom. The discounting rate and risk analysis basically deal with two separate but interrelated facets of this common sense wisdom. The first aspect is the preference for present consumption in comparison to the future consumption. The second aspect is the risk aversion: more certain gain is preferable to an uncertain gain.

In an investment decision, the expenses are incurred today, while the gains are in future and uncertain. Therefore both the considerations are operative. However, the theoretical analysis of these two facets pose distinctly different problems. For comparing gains (or losses) at different points in time, the major task is to find out a social time preference rate. For analysing risks and uncertainty the task is to measure variance at gains in each time period around the expected value.

For making allowance for time preference, the most common method employed is to discount the future gains to their present value. The allowance for uncertainty can be made according to Prest and Turvey in any of the following three ways:
(i) in the assessment of annual levels of benefits and costs,
(ii) in the assumptions about length of the project life,
(iii) in the discounting rate. It is only when the third way
is adopted, that, in theory and in practice, the problems of
time preference and risk aversion have to be considered toge-
ther. Since this is only one special case, in subsequent pages
we discuss these aspects separately.

2. Theory of Discounting Rate:

The theory of discounting rates has been reviewed and discussed
extensively. Mishan\(^2\), Dasgupta\(^3\), Irvin\(^4\), Little and Mirrlees\(^5\)
and Hansen\(^6\) are some of the notable authors. Here we present
a general outline of the major approaches, so that the practice
of various evaluators can be analysed in proper perspective.

Defining the problem: Let \( B_j \) be the benefit and \( C_j \) be the
cost in \( j^{th} \) year. Let \( n \) be the length of time in years
during which the project produces its effects. Then \( B_j - C_j \) is
the net contribution of the project in the \( j^{th} \) year. We would
have such \( n \) contributions, viz. \( B_1 - C_1, B_2 - C_2, \ldots, B_n - C_n \)
occurring in the years 1, 2, \ldots, \( n \). The problem is how
to aggregate these contributions. A simple aggregation of
the type \( \sum_1^1 \alpha_j \) would give equal weightage to contribu-
tions made in each year and fail to take cognizance of social
time preference.
The pay-back period: The simplest approach, adopted in the preliminary financial appraisal, is of pay back period. Here, we estimate the time period within which the initial investment would be recovered fully. Smaller the period, better it is. Mathematically, if \( I_0 \) is the investment, then we find a time \( t \) (measured, say, in years) such that

\[
I_0 = \sum_{j=1}^{t} B_j - C_j < n
\]

However, this criterion is obviously inadequate because (a) it fails to take cognizance of the time preference between years 1 to \( t \) and (b) it makes no allowance for the contributions generated after the year \( t \) till the year \( n \).

The internal rate of return (IRR): Here, we assume that the social time preference between any two consecutive time periods is constant. Then we find out \( 'r' \) such that

\[
0 = \frac{B_0 - C_0}{1 + R} + \frac{B_1 - C_1}{(1+R)^2} + \frac{B_2 - C_2}{(1+R)^3} + \cdots + \frac{B_n - C_n}{(1+R)^n}
\]

i.e., \( 0 = \sum_{j=0}^{n} \frac{B_j - C_j}{(1+R)^j} \)

Where time period zero represents the period when project has not become operative, therefore broadly \( B_0 - C_0 \) is the investment \( I_0 \). We then compare \( 'r' \) with a specified acceptable rate of Return \( 'r' \). If \( 'r' \) is greater than \( 'r' \) we accept the project.
Net Present Value ($NPV$): Here the approach is reversal at
IRR calculations. We first specify a rate of discounting $r$.
We assume that for any two consecutive time periods the same dis-
counting rate applies. Then we define the net present value of
the project as

$$NPV = B_0 - C_0 + \sum_{j=1}^{n} \frac{B_j - C_j}{(1+r)^j}$$

and accept the project if $NPV > 0$.

$NPV$ or IRR?: The advantage of IRR is that it
yields a pure number 'R', and hence it allows the projects of different
date to be compared directly. However, calculation of 'R'
involves repetitive iterations, and if greater accuracy is
wanted then the calculations become cumbersome. On the other
hand, NPV calculations are more straightforward and do not
involve repetitive iterations. Moreover, both methods
yield the same results if the specified level of 'R' is the
same. It can easily be shown that in general when

- $NPV > 0$ then $R > r$
- $NPV = 0$ then $R = r$ and
- $NPV < 0$ then $R < r$

The crux of the matter is how to specify the acceptable $r$. 
Social Discounting Rate \((r)\) : The discounting rate \((r)\), is denoted by various terms like social time preference rate\(^7\), consumption rate of interest\(^3\), accounting rate of interest\(^9\), marginal internal rates of return\(^10\) and social rate of discount\(^11\).

This difference in terminology is partly symbolic of the differences in methods proposed to arrive at the discounting rate. They are also indicative of the lack of 'paradigm' we discussed earlier. However, once this rate is arrived at, it is to be used as a decision parameter through the techniques of IRR or NPV calculations, as explained earlier.

How to Decide the Discounting Rate ? : Foldstein\(^12\) broadly divides the various approaches between the following groups :

(i) Market preferences,
(ii) Preferences expressed through ballot box,
(iii) What government in its wisdom thinks is good for this generation,
(iv) What the government thinks is good for this generation and future generations together.

In this division, the distinction between the third and the fourth approaches is rather difficult. Both of them belong to the area of 'political decision-making', in a restrictive sense of the word. It is better, therefore, to combine them. The major lacuna of this classification, however, is that it leaves out one major group, viz what the evaluator thinks is appropriate considering the interests of the present and the future.
generations. In 1964, Eidelberg had not perhaps anticipated that in another ten years the economists and the evaluators would appropriate to themselves this decision as being in their 'field of control'. However, the modern SCBA does attempt to derive the discounting rate as an outcome of 'economic analysis'. We may therefore redefine the present approaches for ascertaining discounting rates between the following groups:

(i) Market preferences,
(ii) Preferences expressed through ballot box,
(iii) What government in its wisdom thinks good,
(iv) What the economic - evaluator finds through his analysis most appropriate.

Market Preferences: The market rate of interest is most often used in financial evaluation of private investments. Even in such an analysis, in times of high inflation this poses a problem, because the private investor is having a time preference for the 'real worth' of his money, and he may find the market interest rate inadequate. Nonetheless, the problem is generally overcome by specifying a higher rate based on investor's subjective judgement, and this is adequate because it is the investor's money, and he is the ultimate decision-maker.

However, for public investment, the use of market rate of interest is inadequate and problematic. The major reasons for this can be summarised as below:
(i) No single unified money market exists in practice and it is not clear as to which market rate to use.

(ii) The money markets are imperfect. The interest rates may be higher or lower than the opportunity cost of the capital because of structural bottlenecks and barriers in the market.

(iii) The market interest rate generally reflects a combination of three aspects, namely: time preference, risk aversion and inflation. Since in the project evaluation these three aspects have to be analysed separately; to use market rate as the discounting rate, it must solely reflect the time preference. No such risk-free investment opportunity having a freely floating market rate exists, which can be used for reference.

Preference Expressed Through Ballot Box: This approach is generally not used because it is practically difficult and theoretically untidy.

The practical difficulties that would be associated with any attempt to ascertain appropriate discounting rate through 'ballot box' are obvious. (Naturally, the 'ballot box' is not to be understood literally; one may conduct sample surveys for instance. Nonetheless the difficulties regarding sample selection, questionnaire design, etc would be substantial.

Though this approach is apparently 'democratic' it is theoretically not very sound. Pigou in 1932, had suggested that individuals had 'defective telescopic faculty.' More recently,
Sen.\textsuperscript{14} has put forth a specific model, in which the welfare of the present generation is affected by what happens to its successors. He then shows that, if people are less 'selfish' for their heirs than for themselves, they may underinvest if the investment is left to the free market.

Government's Decision in its Wisdom: This approach would be practically the easiest one for the evaluator, if the government did specify such a rate. However, this does not really answer the question. If only transfers the question from economic area to political area and dumps it into the lap of the government.

The advantage of this approach is that it expressly recognises the role of political decision-making in the field of economic evaluation of projects. However, specified simply as 'Government Decision in its Wisdom', this smacks of arbitrariness. It also grants omnipotence to the government which is unacceptable to some economists, as this, according to them, is 'fundamentally an authoritarian' approach.

One more difficulty with this approach is rightly pointed out by Sen.\textsuperscript{15} when he says, "Another facet is the problem of conflict between the interest of different government agencies. This is particularly important for a federal country since the relations between the states, government and the Centre may be extremely complex. But even between different agencies of the
Central Government there could be considerable conflict of interests. Whenever such conflicts are present a question arises about the appropriate assumption regarding other agencies of the government in the formulation of the planning exercise by any particular agency

Sen's caution is very relevant in case of suggestion by Little and Mirrlees that there should be a Central Office of Project Evaluation (COPE) whose job it should be to "consult closely with the government in the choice of two main policy instruments, the ARI (Accounting Rate of Interest) and the SNR (Shadow Wage Rate) since these presuppose not only economic estimation but also basic value and political judgements."

In fact the approach proposed by Little and Mirrlees is a marriage between the economic analysis and political judgement. They recognise the role of Government and political decision making, but they would like to specify the economic considerations in detail so as to reduce the element of arbitrariness involved in political decision making. They therefore say:

"This then is the first task of COPE - to propose, explain and get approved by ministers, a system of social cost benefit analysis."

Economic Analysis: Broadly speaking economic derivation of the appropriate discounting rate is based on any one of the following considerations or their combinations:
(i) Pure time preference between present consumption and future consumption.

(ii) Opportunity cost of capital being invested in public projects.

(iii) Maximising growth by optimum combination of consumption and saving in each time period and

(iv) Maximising the social welfare of the present and the future generations.

Dasgupta and Pearce conclude that "derivation of a synthetic rate, reflecting STPR (Social time preference rate) and SOC (Social Opportunity Cost) considerations, provide the best means of choosing an operational discount rate". Their method is that consumption benefits be discounted at STPR and the savings benefits should be shadow priced and then discounted at the Marginal Internal Rate of Returns (MIRR). The MIRR is to be deduced from market rates of return which are widely quoted. Since public projects tend to be low risk projects, the MIRR should be calculated on similar low-risk projects in the private sector. It must be noted that Dasgupta and Pearce are mainly concerned with public investment in 'advanced economics' (as mentioned earlier, see Chapter 1,) where the assumptions regarding market quotations of rates of return and low risk of public investment projects, may be valid. The STPR should be calculated by using the formula:

\[ STPR = \text{Slope of SP} - 1 \]

Where SP is the social indifference curve between consumption in the period 't' (Ct) and consumption in the period 't1'(Ctt1).
The slope of \( SF \) will show the marginal rate of substitution between the present and the future consumption i.e.

\[
\text{Slope of } SF = \frac{V'(C_t)}{V'(C_{t+1})}.
\]

Sen\(^{19}\) is mainly concerned with the problem of pay off between consumption of the present generation and consumption of the future generation. Using an \( 'n' \) person game structure, he derives a general formula. His formula is:

\[
\text{discounting rate} = \frac{1+(B-E_d)B}{(i-1)L}.
\]

Where (i) \( L \) (ii) \( B \) (iii) are the weights an individual attaches to the consumption of (i) others in the future generation (ii) his contemporaries and (iii) his own heirs in the future respectively; presuming he attaches a weight of unit to his consumption today and

\( B \) is the number of individuals. It can be observed that Sen's formulation gives a more detailed understanding of the STPA proposed by Desgupta and Pearce. However, Sen does not claim that his formula can be used in practice. In fact, his main argument is directed at showing that discount rate can not be arrived at based on economic considerations alone.

Harberger\(^{20}\) proposes that the discounting rate should be the social opportunity cost of capital.

Like Desgupta and Pearce, he also calculates the discounting rate by combining marginal rates of time preference (STPA) and rates of marginal productivity of capital (MIPR). In addition
he makes allowance for division of savers in different tax brackets, division of corporations between different tax brackets, and a specified tax structure. His formula is:

\[
\text{Discounting Rate} = \frac{\sum_{k} k(Sk/3) \rho_k}{\sum_{j} n_j (IJ/3)} - \frac{\sum_{j} n_j (IJ/3)}{\sum_{k} k(Sk/3)}
\]

Where

- \( k \) : elasticity of supply of savings with respect to their rate of yield by individual in \( k^{th} \) tax bracket.
- \( n_j \) : elasticity of the investment schedule of the \( j^{th} \) sector with respect to the cost of capital.
- \( S \) : total private savings.
- \( P_j \) : marginal productivity of capital in \( j^{th} \) sector.
- \( r_k \) : marginal rate of time preference of savers in the \( k^{th} \) tax bracket.
- \( sk \) : private savings by individuals in the \( k^{th} \) tax bracket.
- \( IJ \) : private investment in the \( j^{th} \) sector.

Harberger claims the following advantages for his approach:

(i) The basic data required to estimate the discounting rate can, in principle, be obtained from market observations.
(ii) The procedures used to obtain the discounting rate are fully consistent with the tenets that underlie cost-benefit analysis as such.
(iii) The approach takes the existing distortions directly into account.
Little and Mirrlees\textsuperscript{21}, in the revised methodology proposed by them in 1974, do not go into details of the theoretical basis of what they call accounting rate of interest (ARI). This is because according to them 'the best guide to a proper choice of ARI is experience'. If more projects look acceptable than there are investible funds available, the ARI should be adjusted upwards; and if too little looks promising, the adjustment should go the other way. As a practical guideline they suggest a starting value for this process of iteration between 5 to 15\%. However, before this process of iteration is undertaken, all the benefits and costs must be evaluated at the correct accounting prices. As a quick ready reckoner to estimate ARI from test projects, Little and Mirrlees suggest the following formula:

\[ ARI = r + C'n = Wn, \]

Where

- \( W \) is the shadow wage rate.
- \( C' \) are the additional resources devoted to consumption.
- \( r \) is the uncommitted social income generated per unit of investment.
- \( n \) is employment of labour per unit of investment.

The UNIDO Guidelines\textsuperscript{22} and Guide to Practical Project Appraisal\textsuperscript{23} both use Consumption Rate of Interest (CRI). This is arrived at by striking a combination of consumption, growth (savings) and pure time preference. The theoretical formula proposed is:
\[ \text{CRI} = n + p \]

Where

- \( n \): is the elasticity of marginal utility of consumption with respect to changes in per capita income,
- \( g \): is annual growth of average per capital income, and
- \( p \): is pure time preference.

It is recognised that it is difficult to determine CRI empirically using the formula mentioned above. This because of inherently subjective nature of \( n \) and \( p \). The method to be followed in practice, as recommended by the Guidelines and the Guide is very similar to that proposed by Little & Mirrlees.

It only makes express provision for learning through experience, for instance, Rusesen says: 'The project analyst 'at the bottom' can prepare the project appraisal indicating that the internal rate of return is \( 14 \) per cent and present it to the ministers or planners 'at the top'.\(^{24}\) If the ministers or planners accept the project, the analysts can assume that the planners judge the CRI to be less than \( 14 \) per cent; if they reject the project on the basis of the rate of return, the analysts know that the CRI is higher than \( 14 \) per cent.

A repetition of this process, provided that the planners at the top are consistent, will gradually narrow the estimated CRI in the country to an acceptable range.
We have briefly presented the theory of discounting rate, without going into the merits of one approach or the other. We would now turn to the practice of evaluators under the Indian conditions. We would then be in a better position to judge the adequacy of a given theory.

3. Practice of Discounting Rate:

What is the practice adopted by various evaluators of rural development projects in India to estimate the discounting rate? The evaluators generally deal with this question very briefly, and hence instead of giving a summary of their approach it is possible to quote them without taking too much space. This also has the advantage of avoiding the summariser's bias to a large extent.

Gadgil Committee, in the context of (ex-post) evaluating the irrigation projects, had observed in 1967, "The interest charge on a project is essentially a device for giving monetary expression to time differences and certainty of occurrence of benefits and costs. The main considerations that would influence the choice of rate of interest are: (1) The proposed rate through increase in cost of supply of water should not impede optimum utilisation of potential created under a project. (2) The proposed rates should be comparable to rates applicable to other types of investment. The choice of an appropriate rate of interest would depend on several
factors viz., productivity of capital, time perspective involved and the general security of the taxing power of the State.\textsuperscript{25} These considerations are illustrative of the complexity of the problem involved in the choice of interest rate and indicate the need for formulating the standard and uniform practices in this regard.\textsuperscript{25}

In the illustrative calculations made in respect of two projects in Vidarbha appended to this report, the benefit-cost ratios have been worked out at two alternative values viz. 5 per cent interest on capital outlay and 10 per cent. The former conforms to the prevailing productivity rate.

In an underdeveloped country, however, with real scarcity of capital, it is necessary to allow for higher rate of interest. This will also partly provide for risk factor arising from uncertainties of accrual of benefits through the life of the project. It is customary in the United States to add a small percentage of cost to represent such risk and uncertainty factors. Taking these elements into consideration, Prof. Tinbergen\textsuperscript{26} has suggested that interest rate of 10 per cent per annum might be adopted for calculations in underdeveloped countries.

We would critically examine the practice of Gadgil Committee, after we have presented the practices adopted by other evaluators. However, we may mention here that we have quoted so extensively from Gadgil Committee, not only because it was a pioneering evaluation study in India, but also because this is the most comprehensive statement available
by an Indian evaluator regarding the practice adopted by him.

S.N. Mishra\(^2\)\(^7\), in his concurrent evaluation of intensive cattle development project (ICDP), Pune, Maharashtra suggests a repetitive iteration procedure for finding out 'acceptable' internal rate of return. We would evaluate this methodological innovation separately. However, ultimately what he does is:

"The benefits and costs of ICDP\(\ldots\) have been discounted at discount rates ranging from 0.0 to 11.25 percent, their sums of different discount rates are presented in Tables\(\ldots\)"

Ellis and James\(^2\)\(^8\), carried out an ex-ante evaluation of the proposed new Foot and Mouth Disease Vaccine production plant in India. They state: "Current practice is to use a discount rate of 12% for future costs and benefits in determining present worth of a particular investment or course of action. Although it is not appropriate to discuss the merits of rate the authors felt bound to demonstrate the effects of different rates so that the decision makers could bear them in mind." They then present tables showing benefit cost ratios for discounting rates varying between 0% to 25% at the intervals of 1%.

Gupta and Dasgupta\(^2\)\(^9\), in presenting their concurrent evaluation study of Rural Industrialisation Programme are very brief about the method used for estimating discounting rate. They state: "The social rate of discount is normally chosen at the
national level. For some time, a rate of discount of 10 per cent in evaluating projects has been suggested widely as representing the right order of magnitude in the Indian context. We shall use this rate in our calculations but, for comparison, evaluations at 5 per cent, 15 per cent and 20 per cent rates of discount are also carried out.

Maugon Phan-Thanh\textsuperscript{30} carried out an ex-post evaluation of a pilot intensive rural employment project (PISP) in Manggal Block of Tamil Nadu in India in 1979. She voices her difficulties:

"The literature on the derivation of the appropriate social discount rate is still controversial and lacks an adequate and acceptable conceptual foundation. As a result, the evaluator faces the problem of choosing a social rate of discount which is not so small as to neglect the time value of money and at the same time not so high as to place a prohibitive weight on future income via a via the present income". She then outlines her practice, which is: "Here, 10 percent discount rate suggested for developing countries by UN expert group\textsuperscript{31}, and considered as acceptable rate of return on capital for Manggal Block by the Panchayat Union Officials, has been taken as an approximation for discounting all PISP benefits and costs".

Gandhi\textsuperscript{32}, carried out cost benefit analysis of a sugar project in Goa, using the Little and Mirrlees technique to "test the application of comprehensive social cost benefit approach". While discussing the discounting rate he quotes with approval
Linn as saying "Traditionally this has been one of the most difficult parameters for practical evaluation. Even where substantial amounts of time were invested in the estimation exercise, or where significant amount of prior information was available, the final point estimates were credited with little reliability." Then Gandhi claims: "The IRR provides an alternative measure in that it is not dependent upon an externally decided discount rate." He then calculates the IRR. In the table of results he also presents the NPV and benefit cost ratios calculated at the discount rate of 11 per cent. However, the basis for selection of this particular value of discounting rate is not mentioned.

Mitra and Puranjan discuss the cost of capital and market rates of interest. However, they do not go in for any quantitative analysis. They say: "Capital in India is in short supply relative to demand. The rates of return to investment in Industry is much higher than 10-12 per cent.

Lending rates of financial institutions to industry and trade for not only short term purpose but long and medium term ones are higher than that. The rate of which the government borrows from the public is an artificial low rate maintained by making investment in government securities obligatory for many classes of saving and financial institutions. For all these reasons it was considered that the 6 or 7 per cent interest charged by RBI was too low a measure of the social opportunity cost of capital. It was agreed by the four groups of students undertaking the
studies for the R.E.C. that 15 per cent is a more appropriate rate for the purpose; we have used this as the social rate of discount".

Deepak Lal's study of irrigation wells, in Ahmednagar district was the first case study sponsored by OECD to 'prove' the method proposed by Little and Mirrlees in the manual published by OECD. Lal meticulously follows the basic structure of the manual and carries out minor innovative adjustments whenever required. He starts from the basic formula:

\[ S = \left[ 1 + \frac{i}{T} \right]^{T} \]

Where

\[ S \] Social discounting rate
\[ i \] consumption rate of interest
\[ r \] Social Return to Investment
\[ T \] Time in future when \( r = i \).

He then derives the values of 'i' and 'r' from the available information and the mathematical relationships implicit in the various and economic categories in the neo-classical economic theory. The value of \( T \) is assumed to be 100 years. He derives two alternative values for per capital growth rate (g) in consumption; viz. one, assuming the past trends would continue in future; and second, by finding out the growth rate implicit in the 'plan' prepared by the planning commission. He then derives the following values of \( S \).
\[ S_1 = 6 \text{ (if } g = 0.0072 \text{ as per the past trends)} \]
\[ S_2 = 3 \text{ (if } g = 0.02 \text{ as implicit in the plan)} \]

**d. Theory Vs Practice of Discounting Rates:**

How does the practice compare with the theory? Leaving aside Gadgil Committee\(^{37}\) and D. Lal\(^{33}\) whose work we will review separately at the end, the other practices can be divided into the following groups:

(i) Calculating the benefit cost ratio at different discounting rates and learning the problem of choice of discounting rate to the decision maker. Mishra\(^{39}\), Ellis & James\(^{40}\) belong to this group.

(ii) Quoting an authority: Mrs. Phan-Thuy\(^{41}\) quotes the authority as United Nations Research Institute for Social Development and office of Social Affairs\(^{42}\). Gupta and Dasgupta\(^{42}\) say that the rate they use 'has been suggested widely'. Ellis and James\(^{43}\) say that 'current practice is to use' a rate used by them. Gupta and Dasgupta as well as Ellis and James also carry out a sensitivity analysis of Benefit Cost Ratio to the discounting rate. To that extent they also belong to the first group.

(iii) To suggest that IRR itself is sufficient, and it eliminates the need for specifying discounting rate externally. Gandho\(^{44}\) directly makes this claim. Mishra\(^{45}\) develops an elaborate model of poly-central decision-making and repetitive iteration process.
but, as we shall show later, essentially means the same thing.

(iv) To discuss the considerations underlying the choice of discount rate in general and then to take up the responsibility to choose a discounting rate by subjective judgement. Mitra and Muranjand do this when they say: "It was agreed by groups of students undertaking the studies for the RBI that 15 per cent is a more appropriate rate for the purpose." 146

It is obvious that none of these approaches are based on any established theoretical position, nor are they backed up by any new theoretical formulations. Carrying out sensitivity analysis of Benefit Cost Ratio is an arithmetical exercise which sometimes yields additional insights (and is many times unnecessary, as we will show in chapter 7) but it in no way solves the problem of selecting a discounting rate.

Quoting an authority would have basis in theory if the authority was the government, concerned ministry or COPSE established by the government. But the quoted authorities are either not in the position (political) of authority, or they are quoted too vaguely as 'widely suggested', 'current practice'. This smacks of arbitrariness and is a clear case of a preliminary logical fallacy.

The claim that IMR eliminates the need for specifying the discounting rate externally is clearly erroneous. On having calculated the IMR such that NPV is zero, how can we judge whether the IMR is large enough? For this an acceptable
rate of return must be specified. And in that case specifying such a rate is precisely the problem of specifying social discounting rate. As we have explained earlier, the decision rule in case of IRR method is 'accept if $R > r^*$. This requires specifying $R$. In their particular studies Mishra and Gandhe are both lucky to escape this need for specifying $r^*$ because of the extreme values they get. Gandhe obtains $R$ of 67% which is so high that obviously the project is acceptable. In case of Mishra's study the Benefit Cost Ratio is less than 1 even for $R = 0$.

Therefore the project would be rejected for any $r^*$, however small. But luck cannot be a substitute for correct methodological approach. Irvin is right when he dismisses the claim that IRR eliminates the need for choosing the discounting rate as 'obviously invalid'.

Starting with any 'reasonable' discounting rate is the suggested methodology by Little and Mirrlees as well as UNIDO Guidelines. But then this discounting rate is to be successively refined through either using it to arrive at a balance between supply and demand for funds as in Little or Mirrlees, or through systematic learning about the decision makers' judgement as suggested by UNIDO Guidelines. Only Mrs. They made some effort in this direction. She did discuss the magnitude of discounting rate with the panchayat union officials. They are the lowest level of the government bureaucracy, and would have hardly the training and
ability to understand the complexities involved in choosing the discount rate. The 'bottom up' approach in the UNIDO Guidelines requires that the evaluators learn from the decisions of the 'ministers' or the highest decision makers. Panchayat union officials are the further removed from this level. One suspects that the reason for choosing the panchayat union officials was that only they were accessible.

A Critical Appraisal of Gadgil Committee: On this background the work of Gadgil Committee stands out in sharp contrast, particularly if we take cognizance of the fact that when Gadgil Committee carried out its work, the Little and Mirrlees method or the UNIDO method was not available.

The distinctive features of the Gadgil Committee practice are the following:

(i) It clearly spells out the factors considered while choosing discounting rate.

(ii) It takes discounting rate of 5 per cent as that is the marginal productivity of capital in farming sector. Here, in the terminology used by Dasgupta and Pearce, they are using the Marginal Internal Rate of Return (MIRR).

(iii) They make allowance for risks and uncertainty by increasing the rate of discounting to 10 per cent. Increasing the rate of discounting to provide for risk is, as we have already mentioned, one of the standard practices.

(iv) The Committee was specially appointed by the Planning
Commission to suggest guidelines for project appraisal. The Committee itself was the 'CORE' for the time being, to use the terminology of Little and Mirrlees.55

However, despite these positive features, the work of Gadgil Committee has also the following major drawbacks.

(i) One of the main considerations while choosing the discount rate is, according to the Committee: "The proposed rate through increase in cost of supply of water should not impede optimum utilisation of potential created under a project". This consideration is totally extraneous to the methodology of evaluation. A project evaluator must use what is the real social price of water in his calculations, and find out whether the project is beneficial. He must not start with a pre-conceived notion that the project is worthwhile and adjust the discount rate so that the project appears to be worthwhile. A political decision-maker is free to decide to execute an 'un-economic' project. He may sell the water, later on, at a price which is higher or lower than the real social price. But an evaluator cannot choose a discount rate with a view to make a project viable.

(ii) Gadgil Committee chooses a discount rate which is equal to the marginal productivity of capital. This is methodologically inadequate since it leaves out consideration of pure time preference. The Committee only mentions that "5 per cent conforms to prevailing productivity rate". It is to be
presumed that the committee is talking about marginal and not the average productivity, since that is the correct position theoretically. There are many problems involved in calculating the marginal productivity of capital. Economists of the neo-classical school like John Robinson, even challenge whether the concept could be operationally defined. In this context, it would have been better if the Committee had clearly specified as to in which sector the marginal productivity of capital has been estimated to be 5 per cent, and how this has been done.

Though it is one of the accepted practices to increase the discounting rate to provide for risk, it is generally to be done after the magnitude of risks has been closely analysed. Gadgil Committee doubles the discounting rate without any analysis of the risks and uncertainty. Therefore, though the authority of Prof. Tinbergen and 'customary' practice in the United States is quoted in this context, this allowance for risk appears to be substantially arbitrary.

Therefore, the work of Gadgil Committee, despite its positive features, suffers from methodological inadequacies, incorrect incorporation of political issues in economic analysis and arbitrariness.

Summary of the Analysis of Practice of Discounting Rate: The analysis carried out so far has been summarised in table No. 4.1. The following major conclusions can be drawn from this analysis.
<table>
<thead>
<tr>
<th>Evaluator(s)</th>
<th>Methodology Adopted</th>
<th>Discounting Rate Proposed(%)</th>
<th>Our Observations</th>
</tr>
</thead>
</table>
| 1) Gadgil Committee | Marginal Productivity of Capital adjusted for risk factor | 5% or 10% | 1) Eliminates the considerations of pure time preference; this is methodologically incorrect.  
2) S.N. Mishra | In a poly-central planning set up HRI is sufficient. Discounting Rate need not be specified. | Not specified | Methodology valid only under very restrictive set of assumptions which are not observed in reality.  
3) Ellis and James | Authority of 'Current Practice' | 12% | Arbitrary  
4) Gupta and Dasgupta | Authority of 'Widely Suggested Rate' | 10% | Arbitrary  
5) Nagueh Phan-Thuy | Authority of 'UN expert Group' and discussions with Mangalar Block Panchayat Union Officials. | 10% | Choice authority is 'arbitrary'. The level at which the discussions were held was too low to indicate acceptance by the 'political' decision makers.  
6) Gandhe | 'The IRR provides an alternative method.' | 11% | Methodologically incorrect. Arbitrary.  
7) Mitra & Narajan | Considerations of Market Rate and consensus amongst the evaluators. | 15% | Subjective and arbitrary.  
8) Deepak Lal | Malle and Margreens, under two alternative conditions of Growth rate in per capital consumption viz: (a) As in the past (b) as implied in the plans | 3% or 66% | The calculation procedure is highly unreliable. On an average it magnifies the errors in input by seven times, for an 10 per cent error in input data, the rate of 3 per cent can go as high as 14% per cent.
(ii) Some evaluators have a methodological misconception that the HBL eliminates the need for specifying social discounting rate.

(ii) Only one evaluator, namely Lal, has tried to apply the original method proposed by L & M in the Manual. The method is found to be unreliable.

(iii) There is a great amount of arbitrariness in the practice of deciding discounting rate. This results in values as low as 3 per cent and as high as 15 per cent of discounting rate in different studies carried out by different evaluators; though the discounting rate is supposed to be 'nationally specified' parameter.

(iv) The backbone of revised L & M and S & T methods is a continuous interaction between the evaluator and the CORE or other political decision-makers, and a progressive refinement of the discounting rate. Except for a very feeble attempt by Phan-Thuy, such interaction is absent.

Our analysis lends empirical support to the observation by Prest and Turvey, that: "Discussions about social rate of time preference, social opportunity cost, etc., do not cut ice in most empirical work.... The truth of the matter is that whatever one does, one is trying to unscramble an omelette, and no one has yet invented a uniquely superior way of doing this". It is interesting that Prest and Turvey had made this observation.
in 1965, before the advent of the new SCMA. Our analysis shows that despite the new SCMA, the situation basically remains the same after about twenty years.

5. What Needs to be Done?

All the four major problem areas outlined in the practice of discounting rate, only negative action is warranted to overcome the first two problem areas. Lai's method is unreliable and that IRR alone is sufficient is a methodological misconception, therefore the evaluator should take care that he does not commit similar mistakes.

The crux of the matter is why the evaluators do not practice the L & M revised method or the method prescribed in the UNIDO guide. The problem of arbitrariness is a corollary of this basic problem. The reasons are, unfortunately, not mentioned by any evaluator, though they frequently allege to lack of 'adequate theoretical framework'. However, it is possible to make an informed guess regarding the reasons.

A fruitful interaction between the evaluator and the political decision-maker requires (a) a mutual belief that a meaningful interaction is possible and (b) that such a meaningful interaction, even if possible, is desirable. The UNIDO guide and the L & M revised methodology are based on the assumption that these conditions exist. However, these conditions do not
exist. It is necessary to explore as to how and why these conditions do not exist so that we can think of how to bring about a change in this situation.

The present perception of the 'politician' by the evaluator and the perception of the 'evaluator' by the politician are not complimentary and are not based on a mutual belief in fruitfulness of the interaction.

An evaluator generally belongs to an urban middle class professional culture. If he is an Indian, he is generally a Brahmin. He has the highest university degrees. Even if he knows the 'native' language, he is more comfortable while speaking in English, (and that too with a non-Indian accent). He has no social contacts with the political hierarchy. He is an outcast from active politics. From his early childhood he has developed a stereotyped negative image of a politician. For him a politician is a third rate 'intellectual'; and a second rate human being, who is solely interested in 'personal gains'. Like other professionals, evaluators also have a tendency to treat their 'professionalism' as an 'un-challenge-able' reference norm. Evaluator has therefore a basic outlook that he is 'accountable' only to his 'professionalism' and that a meaningful interaction with the politician is neither possible nor required.

Successful politician, has definitely one quality; he is extremely sensitive to the opinion the other person holds
about him. He is therefore generally aware (consciously or subconsciously) of the opinion an evaluator has about him. For his own ego-satisfaction he reads into it an arrogance arising out of impotent pseudointellectualism (and some times the may/taught to be wary of the 'smooth talking' 'slippery' Brahmin.

In terms of transactional analysis, the interaction between a politician and an evaluator is therefore either a parent-child transaction or a parent-parent transaction.

This inherent tendency to avoid meaningful interaction is further supported by two additional factors.

Firstly, the politicians are generally reluctant to disclose the reasoning behind their decision-making, because if this reasoning is made known, then the common expectation of consistency would reduce the area of arbitrariness in the political decision-making. It can be argued that having such guide posts derived from past experience, in fact ultimately increases the area of political control. However, normally this is not the perception of the politician.

Secondly, the politician and the evaluator are both busy persons. Lack of time can therefore be a very convenient excuse to avoid interaction. To get the time of the decision maker of a voluntary agency itself can be looked upon as an
achievement. For instance, Deshi says: "It is not easy to get co-operation from the busy organisations of the practicing world".63

On this background, it is clear that the situation must be changed for a meaningful interaction between the evaluator and the political decision-maker, as suggested by UNIDO guide69 or L & M 70 to take place.

A large responsibility for this change rests with the evaluators, since they are generally the originators of a 'parental' stimulus. They must examine their parental recordings like 'Oh, this is politics' etc. and develop an adult view of politics and politicians. Prof. D.R. Gaigili71 had made, I believe, a beginning in this regard (here I am not referring to Gaigili Committee Report alone).

Evaluation reports are generally prefaced by lines like:
'The opinions expressed are those of authors and should not be attributed to the organisation'. This is fine, provided the opinion of the organisation is separately available, which is generally not the case.

The public in general has a right to know the political basis of economic decisions. The evaluators should take a lead in making this basis known since this directly concerns their work. Even 'pure professionalism' I believe, demands this.
REFERENCES FOR CHAPTER 4


17. Ibid.


24. ibid.


41. Naguen Phan Thuy (1975), op. cit.


52. Haguuen Phan Thuy (1975), op.cit


57. As quoted in Gadgil D.A. (1965), op.cit.


63. Nguen Phan Thuy (1975), op.cit.


65. Li D. (1972), op.cit.


