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ECONOMIC AND FINANCIAL EVALUATION OF  
INVESTMENT PROJECTS: GENERAL PRINCIPLES  
AND E.C. PROCEDURES \*

by

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ECONOMIC AND FINANCIAL EVALUATION OF INVESTMENT PROJECTS:  
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SUMMARY

Public lenders - national and international - assess competing investment projects put forward by potential borrowers according to criteria differing from those of private investors with respect to both the scope of investment analysis and the prices at which costs and benefits are reckoned. This paper considers the general principles established in the standard practices developed by public lenders and the actual procedures followed by the European Commission (documents VIII/700/76-E of March 1976 and subsequent revisions; VIII/2057/79 of February 1979; VIII/527/79-EN and subsequent revisions).

In general, evaluation procedures of this kind are useful for assembling relevant information and testing the consistency of assumptions within the project and within the economy, but the dominance of current prices limits the reliability of procedures and turns them into microeconomic exercises unless they are viewed as only a stage in the planning process, subject to successive rounds of iteration and checks.

E.C. procedures are found to compare favourably with similar official rules for project evaluation, except for three specific drawbacks: i) the imputation of a charge on the historic cost of capital equipment already existing and on which aid has been received, which might prevent the fuller utilisation of that equipment; ii) the truncated treatment of inflation over the life of projects, which introduces a systematic unfavourable bias in the evaluation; and iii) the identification of real with economic and of nominal with financial profitability, as well as their occasional mixture, which is a potential source of confusion and error.

ECONOMIC AND FINANCIAL EVALUATION OF INVESTMENT PROJECTS :  
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1. Public interest and the evaluation of investment projects

Public lenders involved in financing investment projects in poorer countries have developed similar practices for the evaluation of competing proposals put forward by potential borrowers. Since investment projects commit resources and have effects over a long period of time some version of discounted cash flow methods is necessarily used, of a kind which would be employed by a private direct investor or financier, namely the calculation of present values, internal rates of return, and other compounding and discounting exercises (such as sensitivity analysis, treatment of uncertainty, etc) involving dated variables. Public lenders - whether national or international - however are bound to take into account also general considerations of public interest in the borrowing country. The class of investment projects submitted to public lenders usually have wider repercussions on the rest of the economy and on the achievement of government policy objectives; this is due to the large scale, impact on the balance of payments and economic independence, the commitment of national public funds, the additional government revenue generated by the operation of the project, the mobilisation of national

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\* This commentary on the official rules of the European Commission for the evaluation of investment projects is the result of direct experience as a consultant investment analyst in Central Africa in 1979-81 and of subsequent reflection while at the European University Institute in Florence.

resources (land, labour, water, etc.) otherwise under-utilised, the effects on income distribution among individuals, groups and regions, the spillover effects due to the wider use of infrastructures necessary for the implementation of the project. Public lending is in practice an enlightened form of economic aid, because long term loans in hard currency for above-average risky ventures are usually made available at interest and repayment terms better than market rates. Therefore commercial considerations are tempered by benevolent concern for the welfare of the people affected by the project and the impact on the realisation of government policies in the borrowing country.

While basic techniques remain the same, the broader evaluation of the project differs from that of the direct private investor in two major respects: 1) the scope of economic quantities entered on the credit and debit side of the project accounts, and 2) the prices at which these economic quantities are reckoned for the purpose of decision-making. In current usage, the evaluation of a project from the viewpoint of a private investor is called financial evaluation, while the evaluation of the project from the wider viewpoint of the economy as a whole and within the context of government policy is called economic evaluation<sup>1</sup>.

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1. We shall follow this terminology because it is widespread - though by no means universal - and is actually embodied in the EC recommended procedures for project analysis considered below. Here "private" investor should not be taken literally; it includes any economic agency with accounting autonomy, using its own capital and/or borrowed funds which it has to repay, responsible for the expenditures associated with the project and obtaining revenues from the sale of goods and services produced by the project.

2. The E.C. procedures

Like other public lenders, the European Commission has evolved basic guidelines and procedures for the evaluation of investment projects. In 1976 the Directorate General for Development issued a document entitled Appraisal of productive projects in agriculture: economic analysis and rate of return (VIII/700/76-E of March 1976, followed by a number of revised versions such as VIII/701/76-En/Rev.2 of June 1978; the latest version is VIII/701/76, Rev.4 of December 1980). In 1979 the same Directorate issued a document entitled Format for financing proposals (VIII/2057/79 of February 1979) and a Manual for preparing and appraising project dossiers (VIII/527/79-EN of March 1979, of which the latest version is VIII/527/79-EN, Rev. 1 of March 1983) dealing not only with agricultural development projects but also with industry (transport, telecommunications, manufacturing, mining, energy, etc.) and services (education, training, health, water, sanitation, housing, etc.). The first version of the Manual was drawn in response to a request by the ACP states' representatives during the negotiations for the renewal of the first Lomé Convention; they wanted "the Commission departments to spell out clearly their requirements with regard to the content of project dossiers, so that the national authorities responsible for drawing up the dossiers would know exactly what was expected of them" (Manual, Introduction, p.1). The document was presented to representatives of the ACP States and the Member States, to national authorities and subsequently to consultancy firms responsible for the preparation of dossiers.

The dominance of public interest in the evaluation of investment projects by the Commission was actually enshrined in the second Lomé Convention. Article 112(2) of Lomé II stipulates that projects must correspond to the objectives and priorities of the ACP State and must be consistent with other development efforts; they must be effective, viable and provide a return (from the social

as much as from the economic or financial standpoints); and appraisal must take into account also the "non-quantifiable effects", notably with respect to the environment. Article 108(4)(c) of the Convention stipulates also that the ACP States and the Community bear "joint responsibility" for "appraising projects and programmes and examining the extent to which they fit the objectives and priorities and comply with the provisions of the Convention".

Since 1979 considerable experience has been gained from the evaluation exercises and many discussions have taken place in various bodies (the Article 108 Committee, the ACP-EEC Consultative Assembly, ACP-EEC experts given the task of formulating sectoral principles, ACP-EEC working party on cultural cooperation, meetings of the Council's Working Party on Development Cooperation, the Ouagadougou (CILSS) Symposium of January 1982 on recurrent expenditure, and so on (see Manual, Introduction, p. 3). These developments have been embodied in the revised 1983 edition of the Manual.

The purpose of this paper is that of appraising the E.C. project evaluation procedures on the basis of the latest versions of the documents indicated above. In order to assess the advantages and weaknesses of these procedures it is necessary to distinguish between those pertaining to the general approach of public cost/benefit analysis and those related to the specific version of this general approach selected by the E.C. Therefore first a general version of the approach is considered in its publicly oriented coverage (section 3) and pricing (section 4), discounting procedures (section 5) and cost effectiveness (section 6); the rest of the paper deals with the possibility of conflicting economic and financial indicators (section 7), the general advantages and limitations of the approach (section 8) and of the E.C. specific procedures (section 9).



3. The scope of the evaluation

A direct private investor<sup>1</sup> would consider only those financial costs and benefits which are borne by or accrue to himself. Consequently the accounts will neglect specifically all other economic effects of the project which although identifiable as the direct result of undertaking the project do not lead to a specific positive or negative item in the investor's own cash flow. A fortiori, the direct private investor will neglect all effects of the project to which the market does not attach a price<sup>2</sup>. Taxes will appear as a cost and government subsidies as a net benefit to the investor.

On the contrary, the public assessment of investment projects should take into account, ideally, all the repercussions of the decision on the rate of utilisation of resources and/or their displacement everywhere else in the economy, including its impact on the government budget and the balance of payments. Thus a tax will appear not only as a cost to the investor but also as government revenue, i.e. as a transfer internal to the project's economic boundaries which therefore is not to be subtracted from the benefits of the project. Conversely, in the

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1. See p. 2, footnote 1.

2. Occasionally a direct private investor might consider intangible effects not appearing in his cash flow, such as the improvement (or worsening) of the investor's public image as a result of the wider implications of the project. Even in this case, however, the objects of concern are not the wider effects of the project on the economy as a whole, but the impact of those effects on the investor and his immediate environment. Thus the wider effects of the project, even if included by the private investor, would be measured (i.e. valued) according to the importance attached to them by the investor, not by the public as a whole or the government.

public assessment of projects, government subsidies are not added to the project benefits because they are exactly offset by additional charges on the government budget. Occasionally it may be necessary or useful to include possible repercussions even in other countries if they are indirectly affected by the project (e.g. pollution across borders; or absorption of another country's surplus stocks or surplus capacity, etc.).

#### 4. Actual versus "shadow" prices

Within the scope appropriate respectively to the public and the investor's viewpoint, the relevant economic items (physical flows of inputs and outputs, non material effects, changes in the evaluation of assets, etc.) are reckoned at different prices.

Private direct investors use the actual prices effectively paid or received in the markets for inputs and outputs. Even if an actual transaction is not involved, the price prevailing in actual markets is used in the evaluation; for instance, an investor using his own finance instead of borrowing will still refer to the actual prevailing interest rate to evaluate the present value of his project<sup>1</sup>.

The assessment of the project from the overall public viewpoint, on the contrary, reckons the inputs and outputs of the project (and any other relevant economic effect throughout the economy) at prices which

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1. Occasionally, if the market is not organised or functions imperfectly, the private investor also may use a measure of "opportunity" cost or benefit; this however will be related to his own circumstances and preferences, not to the overall national economic situation and government policy.

take the name of "accounting" or "shadow" prices to distinguish them from actual market prices. Shadow prices are designed to measure the cost (to the whole economy) of forgoing alternative opportunities of using the same resources, or the benefit of not having to incur an alternative expenditure avoided because of the output produced by the project: hence these shadow prices are expected to measure "opportunity costs" and "opportunity benefits" as opposed to costs and benefits actually incurred by the investor. Also, opportunity costs and benefits are valued, if possible, according to government preferences, expressed through its policies.

Actual market prices may be inaccurate measures of national opportunity costs and government preferences for a number of possible reasons. For instance:

i) there may be a divergence between market price and production costs (at the margin, or on average including a normal profit on capital), as in the case of monopolistic prices;

ii) taxation may distort the true picture of social costs and returns. If taxes (and subsidies, which are negative taxes) were imposed in order to convey to economic agents the wishes of the government as to the public desirability of certain commodities (for instance, a tax on smoke or other pollutants; a subsidy on the price of education) then taxes and subsidies would actually bring about the coincidence of private and social costs and returns; notwithstanding the argument of the previous section these taxes should be deducted from the benefits of a project because they offset a social "bad" for which they compensate the government; conversely, subsidies should not be deducted from the investor's benefit because the government outlay obtains a counterpart in the higher realisation of its objectives. But even when taxes and subsidies have the exclusive purpose of bridging the gap between actual prices and the government's values, they do not necessarily close the gap completely, and a further adjustment may be still necessary. Besides, most taxes have the function of raising government revenue, rather than correcting relative prices or incomes; while most subsidies are simply transfers from the government to economic agents either directly or through their purchase of goods; in this case taxes and subsidies can bring about a

divergence between actual prices and opportunity costs. It is difficult to distinguish between the two types of taxes (and of subsidies), because the distinction refers to the government's intention and cannot be ascertained simply by looking at types and rates of tax, and because both functions may be present in a tax and the distinction can be blurred<sup>1</sup>. This is why, rather than introducing these subtle distinctions, the evaluation of projects from the public viewpoint simply treats taxes and subsidies as transfers internal to the project.

iii) the actual price may fail to clear the market, i.e. there may be either excess demand or excess supply (or simply excess stocks or excess capacity) at the ruling price; for instance, because of price control or reserve pricing. The typical cases in a less developed country are those of foreign exchange, of which there is usually excess demand at the official exchange rate, and of labour, of which there is usually excess supply at the ruling wages (at least for unskilled labour). Thus for the purpose of the "economic" (i.e. nation-wide and from the government viewpoint) evaluation the price of deficit commodities should be raised, and of surplus commodities lowered, to their opportunity cost (and adjusted for the other factors mentioned here).

iv) in addition, there may be a divergence between the relative market prices - of factors and commodities - and the relative weight attributed to those factors and commodities (and to anything else of social importance not priced by the market) by the government in conformity with the ordering of its own policy objectives. Thus incomes generated in a less developed region may be given additional weight

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1. For instance, a tax on tobacco products usually has the dual purpose of raising government revenues and of discouraging the consumption of a commodity that endangers health. Strictly speaking, the evaluation of a project for the production and manufacturing of tobacco could not treat tax simply as a transfer to the government budget, because some (or all, or more) of it offsets the deterioration of health (and possibly greater expenditure from the budget on cancer treatment) that follows from the greater consumption of tobacco products encouraged by the realisation of the project.

in line with government regional policy; an extra weight may be given to income accruing to poorer sections of the community, in line with government distribution policy. A project promoting national self-sufficiency and economic independence, or the kind of structural change desired by the government for its longer run development strategy would qualify for evaluating its output above market price, and so on.

#### 5. Discounting procedures

Once the respective physical flows of inputs and outputs over time, associated with the economic and financial evaluation, and the prices appropriate to each evaluation, are established, the familiar discounting procedures are applied in order to summarise the total information about the relevant features of the project in a single indicator which is then used for the purpose of investment choice.

Two such indicators dominate the process of choice: the Present Value of the project, and its Internal Rate of Return. The Present Value is the sum of the net benefits of the project (i.e. benefits net of costs, in each year, presumably net benefits being negative during the gestation period of the project), the net benefits of each year being first discounted back to the beginning of the project by the application of an appropriate discount (i.e. interest) rate <sup>1</sup>. By the argument of the previous section, the interest rate to be used in the economic evaluation may differ from the market rate at which the "private" investor borrows (or could lend his own funds). The Present Value is a measurement of the increase in wealth which the investor or the nation (according to the type of evaluation) obtains as a result of undertaking the project; thus the project should only be undertaken if the Present Value is not negative. If mutually exclusive projects are compared, all meeting the financial constraints of the investor (or of the country in the economic evaluation),

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1) Or rates, if the rate of interest varies according to the length of time over which capital funds are lent and borrowed.

that with the highest Present Value should be chosen. If a number of mutually compatible projects are compared, and the investor (or the country) has unlimited access to investment funds at the relevant interest rate, then the Present Value of the entire batch of projects selected should be maximised, i.e. all projects with a positive Present Value should be undertaken, the project "at the margin" - i.e. on the line of indifference between undertaking it or not - having a zero Present Value. If the investor has only a fixed initial amount to invest (i.e. is credit-rationed) he should rank projects according to their Present Value/initial investment ratio, and undertake all the projects he can undertake up to the exhaustion of his investment fund (again, as long as only projects with a positive Present Value are included)<sup>1</sup>. These "rules" follow directly from the meaning of Present Value as additional wealth generated by the project the moment it starts<sup>2</sup>.

The Internal Rate of Return is the interest rate which, if constant over time and if it actually prevailed, would make the Present Value of a project equal to zero. Its meaning is the maximum interest rate which the investor could pay and still be no worse off as a result of undertaking the project. It is a convenient way of summarising the financial viability of a project and its sensitivity to alternative interest rates, because it is the rate at which the investor would be indifferent between undertaking the project or not. Not all projects can be summarised in this fashion, but if the flow of net benefits over time is first negative then positive, as it is in the vast majority of cases, then the internal rate of return will exist and will be unique. In this case the investor

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- 1) If the investor has a more complicated time pattern of fixed investment funds per year, or if the projects considered have a gestation (i.e. a negative net benefit) for more than one period, these simple techniques must be replaced by more complex programming techniques.
  - 2) The maximisation of present value is a rational rule only if the investor is in a position to lend and borrow without limits in the relevant range and at a lending rate equal to the borrowing rate, and can freely and competitively exchange the products of his project for other products.

by knowing the internal rate of return of a project could tell immediately that the Present Value of the project would be negative for an interest rate higher than its internal rate of return, and positive for an interest rate lower than its internal rate of return without having to recompute the Present Value for alternative interest rates. This is the only advantage of looking at the internal rate of return of a project instead of its present value <sup>1</sup>. It must be stressed that the internal rate of return is not a magnitude to maximise, since it is a theoretical maximum rate that the investor could afford to pay, but the investor cannot ignore the fact that he is actually confronted with another actual interest rate (or the country with another actual appropriate discount rate if it differs from the market interest rate), at which it can finance the investment. Therefore the consideration of the internal rate of return of projects does not (or at any rate should not) lead to a choice different from the maximisation of Present Value.

A number of questions arising from discounting procedures could be clarified straight away:

1) time horizon: when the expected lifetime of a project (technical or economic, whatever the shorter) is longer than the time horizon over which net benefits are considered, the choice of the time horizon introduces an element of arbitrariness in the evaluation of the project. This is avoided by the addition to the net benefits of the last period considered of an item for the terminal value of the capital equipment in existence at that time, evaluated not on the basis of historical cost but at the market value expected to prevail at that time.

2) choice of units: it is a matter of indifference whether the time flow of net benefits is measured at the constant prices of the initial period, or at the current prices of each period; or whether the internal currency is used, or an international currency or basket of currencies; as long as the interest rate (and the internal rate of return) are also

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1) In particular, if credit is rationed the ranking of projects according to their internal rate of return may lead to the selection of inferior projects.

expressed in terms of the same units. Thus if calculations are at constant prices a real rate of interest should be used for the calculation of the present value and for the comparison with the present value of the project; if current prices are used in domestic currency, then the nominal rate of interest should be used at which the domestic currency is lent and borrowed for the same purpose; if an international currency is used, then the interest rate in that currency should be used for the purpose, real or nominal according to whether constant or current prices in that currency have been used.

3) amortisation: the amortisation of debt incurred to finance the investment project should not be included among costs, otherwise investment costs would be exactly double counted in the calculation of present value; in the calculation of the internal rate of return, investment costs would not count exactly double (unless the internal rate of return was equal to the interest rate) but would still be grossly over-estimated.

4) replacement: the replacement cost of capital goods having a lifetime shorter than the time horizon assumed for the project evaluation could be accounted indifferently, for the purpose of the calculation of present value, as a cost incurred at the time of expected replacement, or as an annuity charge compounding over time to its historical cost (at a real rate of interest if the flow is reckoned at constant prices, at a money rate of interest if the flow is reckoned at current prices; the use of amortisation of expected replacement cost overvalues if there is inflation the incidence of capital costs). But for the calculation of the internal rate of return the annuity charge is inappropriate, because it distorts the calculation of the internal rate by the use of an actual interest rate; for that purpose replacement costs are best reckoned as a cost incurred at the time of expected replacement. Thus this is the best way of accounting for replacement meeting the requirements of both present value and internal rate calculations.

5) uncertainty: sometimes it is suggested that the uncertainty surrounding both the physical flows of inputs and outputs associated with the project and the (market or shadow) prices at which those inputs and



outputs should be reckoned in an unknown future should be accounted by deducting from the internal rate of return of the project an allowance for risk, or by adding the same small allowance to the interest rate used to calculate the project's present value, which is the same thing. This is inappropriate, because the arithmetic of discounting procedures compounds the impact of uncertainty over time in such a way as to give excessive weight to the uncertainty surrounding the magnitudes of variables belonging to a more distant future. This might appear to have some logic, because of the greater uncertainty surrounding a more distant future, but given the extraordinary power of compound interest over time, this procedure is bound to exaggerate the impact of uncertainty on project selection. In addition, in this way the impact of uncertainty is made to depend excessively on the actual discount rate used; and the treatment of alternative projects associated with different time profile of uncertainty is defective. It would appear that the use of statistical measurements of uncertainty is preferable, but this also has drawbacks: i) in this context uncertainty is often subjective, i.e. difficult for a project-analyst to establish; ii) the choice of the appropriate statistical measure of uncertainty (variance, standard deviation, etc. of the present value of the project of its internal rate of return) is arbitrary; iii) the choice between alternative features of the probability distribution of results could not be made a priori but would have to refer to the preferences of the decision-maker. In view of all these difficulties it seems better to explore the sensitivity of the project indicators (present value, or internal rate of return) to alternative levels of uncertain magnitudes, in order to establish some assessment of the importance of uncertainty about different variables, rather than attempt a more ambitious treatment directly in the decision-making process. One important aspect of uncertainty is the possible contribution of the project (possibly uncertain in itself) to the overall profile of uncertainty, for the investor or the economy.

6) inflation: the problems arising from inflation are already covered above under "choice of units" and "replacement". Namely, the flow of costs (including replacement) and benefits (including terminal capital) should be adjusted for inflation throughout the project's time horizon if a money rate of interest is used to calculate present value and a money internal

rate of return is sought. Otherwise, costs and benefits should be at constant prices of the starting period, but then a real interest rate should be used (equal to the difference between nominal interest rate and expected inflation rate <sup>1</sup>, divided by one plus the expected inflation rate). If a rate of return is calculated for constant prices data it will be a real internal rate of return.

Finally, an additional indicator of the project's expected performance is sometimes derived from discounting procedures: the Internal Exchange Rate. The concept is analogous to the internal rate of return. The Internal Exchange Rate is the rate which - if it was constant over time and actually prevailed - would make the present value of the project equal to zero. As long as the project makes a net contribution to balance of payments over time, the higher the Internal Rate of Exchange (expressed as amount of foreign currency per one unit of local currency) the better the terms on which the investor obtains foreign currency from the project (or saves the country foreign currency by replacing imports) over its lifetime. As in the case of the Internal Rate of Return, this is another form of sensitivity analysis, which can be undertaken instead of exploring the impact of alternative rates of exchange in the neighbourhood of the actual rate <sup>2</sup>.

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- 1) The notion of a single inflation rate is an oversimplification, because it is a double average across years and across products. It is better to use a money rate of interest and adjust all items of costs and benefits for the particular inflation rate appropriate to each of them.
  - 2) If the project made a negative contribution to the balance of payments, this would not automatically disqualify it from acceptance, though the implications would have to be borne in mind in a country whose development is impeded by external constraints. In this case, however, the lower the internal rate of exchange the better the project is, because the investor is a net "buyer", as it were, and a not a net "seller" of foreign exchange. An analogous reversal of the interpretation of internal rates takes place in the Internal Rate of Return: the lower the better, if the project involves an act of "disinvestment", i.e. positive net benefits in the initial periods of project life.

## 6. A variation of the approach: cost effectiveness

These discounting procedures simultaneously answer the question of whether the additional capacity generated by the investment should be created, and in what technical form (i.e. what location, degree of mechanisation, gestation, durability, choice of alternative inputs, etc.) by means of the comparison of the alternative streams of net benefits associated with different ways of generating the same capacity. However, sometimes the question of whether to create the extra capacity associated with the project does not arise, for instance because the project is undertaken by a public agency and the government is committed to create that capacity; or the question could not be answered - at least in financial terms - because the output of the project is not saleable (for instance, some health services).

In this case the financial and economic analysis must be limited to the cost effectiveness of alternative ways of generating that capacity. Thus the discounting procedures discussed above are used exclusively to calculate the present value of the expenditures associated with the project, in order to choose the project variant with the minimum present value of expenditures.

It is worth stressing that this procedure may be appropriate also to projects producing a saleable output, if that output is essential and cannot be obtained through international trade (because of rigid foreign exchange constraints due to stagnant and unstable export earnings and strict limits to foreign exchange borrowing; or bottlenecks in the transport capacity to handle foreign trade; of non tradeability of the output). In this case the government has no option but to expand productive capacity, it has no other choice, and the only question arising is one of cost-effectiveness, namely of where to locate the project in the country, and what production techniques to adopt. To say that there is no other choice is like saying, by definition, that the cost effectiveness version of the project has a sufficiently high present value and internal rate of return (and internal

rate of exchange) not only to be undertaken, but also to take priority over alternative projects generating tradeable goods or non-essential capacity. In theory, this outcome could be obtained in the economic evaluation of the project by using a sufficiently high shadow rate of exchange or price of the output, or a sufficiently low (or even negative, if necessary) discount rate, but this is not usually done, and if it was done would be bound to be regarded as "unrealistic" or "inappropriate" by government officers or aid donors; at any rate, it would make the project look less attractive than it deserves, probably - and paradoxically - less attractive than non essential projects producing a non-saleable output which are automatically excluded from tests other than cost-effectiveness. Financially the project could be made to look worthwhile if a sufficiently high government subsidy was put on the output of the project, but the government may be justifiably reluctant to do so because of the necessity to subsidise equally the output of already existing projects of the same kind, especially if in private hands; this would put a disproportionate burden on government finance and could have undesirable side effects on income distribution. In this case the best way of making the project financially worthwhile would be a government subsidy to the investment cost of the project (in the form of a contribution to interest charges, or to repayment of debt, or the direct financing of some of the investment expenditure out of the government budget); this would not have the negative side-effects described and would not commit the government to subsidising output indefinitely in the future. These measures for the improvement of the financial profile of a vital project, however, would reduce - though not eliminate - its economic attraction, because of the standard practice - reviewed above in section 4 - of subtracting government subsidies from the financial benefits of the project. Thus this kind of project should be a prime candidate for foreign aid; yet donors are often deeply entrenched in standard evaluation procedures and may discard a vital project channelling their aid towards less essential and even non-productive projects.

7. Conflicting economic and financial indicators.

If a project passes both financial and economic tests of acceptability the only problem that might arise is that investors in the private sector may be applying an even stricter financial test (such as the recoupment of capital expenditure out of the profits of the first three or four years of operation of the project). Even in that case the government could offer tax exemptions or other financial incentives in order to induce private firms to undertake the project, or simply make a public agency undertake the project. Finance would be forthcoming from private or foreign sources.

If the project is financially viable but does not pass the test of economic acceptance the government could apply financial disincentives, control access to credit for use in the project, or simply prohibit the realisation of the project.

The real problem arises if the project is viable economically and not financially, because of the asymmetry in the powers of government, which can prohibit but not order the realisation of a project by the private sector. In theory, the government could make the project financially viable by a system of subsidies, but the same problems discussed in the previous section would arise (financial burden from the extension of the same subsidies to similar activities, reluctance to commit the government to subsidies too far into the future, detraction of subsidies from the economic value of the project, official hostility towards the project), with the same conclusion: that the project should qualify for budgetary grant or foreign aid to cover at least part of its capital expenditure.

In fact, the purpose of the financial evaluation of projects of public interest should not be that of deciding whether or not to undertake the project, but that of identifying - if they are economically

viable - the extent and the nature of the subsidies required to convey the public interest to the private investor. If this is not done, the entire purpose of the economic evaluation is defeated. But there is the danger that only financially worthwhile projects will be checked for economic viability, thus turning the economic evaluation into an additional test, and not the paramount test for the acceptability of the project. Or projects could be assessed on the basis of some kind of mixture of its economic and financial indicators, thereby demanding a correspondingly greater economic attraction to compensate for a poorer financial profile; apart from the non-homogeneity of economic and financial indicators, this could also lead to the rejection of projects which are best from the viewpoint of the economy as a whole and the government economic policy.

Paradoxically, a project with economic but not financial viability is more likely to be less favourably treated if it is being considered by the public sector than if it is considered by a private company. In fact, a private company would be able to draw a clear line between the expenditures of the project pertaining to the private sector and the class of expenditures normally falling under the responsibility of the government (especially major works on social infrastructures: roads, power lines, communications, schools, hospitals, etc.). This separation could then make the private side of the project very attractive, enabling the private company to negotiate with the government the provision of that social infrastructure from a strong negotiating point; the government would have to consider these claims, and in turn would be in a good position to ask potential donors to fund expenditures which are desirable per se, and which in addition would promote such financially sound developments. Instead, when the same project is considered by the public sector the line between commercial operations and the provision of infrastructure is not drawn, the entire cost of social infrastructure is imputed to the project, there is no analogous outside agent to put the case and negotiate with the government for the provision of the necessary infrastructures, the project is made to look financially unattractive and given a lower priority by both government and potential donors.

## 8. Advantages and limitations of the approach

The advantages of the evaluation procedure discussed so far derive basically from two factors: i) the extension of the analysis from the limited scope of the project to the economy as a whole, thus attempting to reconcile the micro- and the macroeconomic approaches and to bridge the gap between partial and general equilibrium; ii) the extension of the analysis to include a consideration of government policy objectives. These are in fact the purpose of moving from the financial to the economic evaluation of projects. The use of these procedures is meant to decentralise investment decisions to the level of investors, credit institutions and relevant government offices without reference to a national economic plan - except in so far as the plan is a clear statement of government policy objectives and their relative ranking.

The limitations of these procedures derive from the drawbacks of such a decentralisation, and in particular from the overwhelming role of prices (whether actual or "shadow") and especially present prices in the assessment, compared to the relative neglect of the relationship between the quantities of inputs and outputs postulated in all the various investment projects in different sectors, and the total amount of those quantities in the economy as a whole. Various problems of internal consistency in the evaluations of projects arise: i) consistency between the assumptions about the price system made in the evaluation of different projects; ii) consistency between total resources and the uses postulated in the projects; iii) consistency between the prices postulated in the evaluation of projects and the changes in productive capacity resulting from the realisation of the projects. If the country had unlimited access to international capital markets and unimpeded trade at predictable and stable terms this would not matter so much, since any surplus or deficit in any commodity or in production as a whole could be made good in this way. But this is not the world in which we live, and it is precisely the danger of those inconsistencies that had led to the emergence of development planning, especially in the less developed

countries. But even in countries with advanced forms of economic planning the danger remains of a possible inconsistency between the national plan targets and the total inputs and outputs of the investment projects. Thus even in the planned economy the evaluation of projects can only be a stage in the planning process, subject to successive rounds of checks for reaching the internal consistency of project evaluation and plan.

For instance suppose that a wheat scheme is evaluated on the basis of a set of prices drawn from current experience and projection of trends. If the return on this kind of project is low not much more wheat will be produced; if as a consequence a wheat shortage appears, wheat could be imported and paid for by exporting whatever product has been expanded; if this is not enough, the necessary wheat could be paid for by borrowing abroad. But if, as it is invariably the case, terms of trade are not stable, export earnings are stagnant, there is no further access to borrowing, and the capacity of the transport system limits wheat imports, the result of the exclusive reliance on decentralised investment procedures - without checking the implications of all investment projects and their relations with the rest of the economy - may very well be famine and starvation.

Thus, the use of the investment procedures discussed in the previous sections should be supplemented by a closer scrutiny of the investment trend in projects in the same sector, and in sectors competing for the same kinds of inputs. If it was found, for instance, that there was not enough investment in the same sector in the rest of the country, there would be a case for applying to the project under examination the test of cost effectiveness instead of the more stringent test of the rate of return calculated at present prices, or for raising the postulated output price.



## 9. Specific features of EC procedures for project evaluation

Beside sharing the advantages and limitations of the general approach reviewed above, EC procedures, like all actual rules by similar agencies, have specific features differing from the standard approach (see official documents VIII/70/76 Rev.4 of December 1980, and VIII/527/79-EN/Rev.1 of March 1983).

These procedures in many respects compare very favourably with similar official rules for project evaluation, such as those of UNIDO and of OECD. For instance, they make a more limited use of international prices, which in view of the constraints of most developing countries is a sensible and more pragmatic approach. They avoid the complications of measuring all values in units of consumption (UNIDO) or in a foreign currency (OECD). They do not attempt to trace the entire (direct and total indirect) foreign currency content of domestic non-traded goods (as in the OECD rules). They do not attach a different weight to the value added generated by the project according to whether it is consumed or reinvested, which is theoretically debatable and in practice requires an additional forecasting exercise of dubious reliability (OECD). They do not regard the import content of workers' consumption as a deduction from the economic benefits of the project (as in the OECD rules), and rightly so, because additional consumption is of benefit to the country and if it involves imported goods the usual allowances for the scarcity of foreign exchange could be used, instead of deducting imported consumption of previously unemployed workers from the economic evaluation of the project (besides, in the OECD practice this contradicts their assumptions about unlimited trade opportunities). The EC procedures also have the merit of considering closely the relations between projects and the national plan.

There are a number of specific aspects of the EC procedures which are open to question. The first is the provision, in the economic evaluation of projects, of an imputed charge on the historical cost of capital equipment already existing and on which aid has been received. The controversial nature of this charge is recognised in the EC procedures but nevertheless the charge is requested. There are instances in which this practice may lead to the rejection of projects designed precisely to utilise more fully the capital provided by past aid. For instance, we could think of a hypothetical irrigation plant (without canalisation) financed out of past aid; if a subsequent land development project providing among other the canalisation required to utilise the plant was imputed a realistic charge on past aid it may prove unacceptable, thereby leading to the waste of that aid, the irrigation plant having no alternative use. The ability of the new project to pay a charge on already existing capital financed out of aid is a retrospective test of the wisdom of spending aid on that capital asset in the first place, not a test of the desirability of the further utilisation of that asset. The charge appropriate to the new project is not to be calculated on the historical cost of that capital asset, but on the market value that that asset might have - if any - in alternative uses other than in the project under consideration.

A second aspect of the EC procedures open to question is the treatment of inflation. The procedures recommend that the costs and benefits of the project should be reckoned at prices higher than those of the first period, to allow for inflation, only during the first few periods of operation (say, five or six years). After that no further adjustment is made, "in view of the total uncertainty concerning price prospects". This way of dealing with inflation is unfavourable to the project, because inflation raises capital costs - which occur nearly completely in the initial years - but is not allowed to raise the benefits throughout the lifetime of the project. If inflation is expected to take place at the

same rate for both inputs and outputs during those years, the occurrence of inflation benefits slightly the project by raising output values more than capital expenditure with respect to the case of price stability, but does not benefit the project thereafter, subjecting the project to a test of real profitability which by comparison with the private evaluation of project may be very strict indeed. Moreover, if the cost of capital goods inflates faster than the value of output during the first few years of the project, but no allowance is made for inflation in the price of the product thereafter, it is possible for inflation to make the project financially less attractive, instead of making it more attractive as one would normally expect. After all, there is no record of developing countries experiencing long-term price stability outside the socialist bloc (and even in those countries inflation has been increasing at an accelerated rate in recent years). A preferable way of dealing with inflation might be that of reckoning all costs and benefits at constant prices, those of the initial year, thus obtaining a real internal rate of return. This real rate of return could then be compared with the money rate of interest to infer what rate of inflation (or deflation) would make the present value of the project equal to zero; this rate of inflation could then be compared with past trends and as long as it was lower than a rate of inflation considered as plausible the project could be accepted. Alternatively, the real rate of return of the project could be compared with the real rate of profit experienced in the country or in other countries. This, incidentally, is reported to be close to zero both in developing and in advanced countries; in these conditions, a test real rate of the order of 5-10% appears an exceedingly severe test for any project anywhere in the world.

Another aspect of the EC procedures open to question is the proposition that the financial rate of return should be a nominal rate, while the economic rate of return should be a real one. There is no reason why a particular approach should be identified with real or nominal variables

(except in so far as the time preferences of the government - or for that matter of anybody - would presumably be expressed in terms of real consumption; but it is one of the advantages of the EC procedures that no attempt is made to relate the economic rate of return to a notional rate of time preferences of the community). As we have seen above (Section 5) the choice of units - real or nominal - is immaterial as long as homogeneous magnitudes are compared, i.e. a real rate of return is compared with a real rate of interest and a nominal rate of return is compared with a nominal interest rate. The EC association of economic analysis with real variables and financial analysis with nominal variables would therefore have no consequence, were it not for the ambiguity surrounding the comparison of the economic with the financial rate of return and the money rate of interest. We have argued above (section 7) that the valuation of a project according to whether both the economic and financial rate of return exceed their respective test rates is in itself too strict a test, given the primacy of the economic evaluation and the subsidiary use of the financial evaluation to ascertain the desirability and extent of government agencies and potential donors' intervention. We have also questioned the meaningfulness of using a combination of economic and financial parameters. This is a doubtful exercise even if homogeneous magnitudes (either real or nominal) were being compared; if, in addition, this dubious comparison involves a hybrid mixture of real and nominal indicators, the outcome will be meaningless, indeed positively misleading.

## 10. Conclusion

In common with official investment rules issued by other public agencies, the EC procedures have the advantages of extending project evaluation from the scope of the investor to the economy as a whole, of including the consideration of government policy objectives, and of decentralising investment decisions from national bodies to investors and to lower level government offices. Like similar procedures, EC rules suffer from the dominance of current prices and the possibilities of internal inconsistency in the evaluation of projects (between prices postulated in different projects, between total resources and uses in the projects actually selected, between the prices postulated in the evaluation of projects and the changes in productive capacities resulting from the realisation of the projects). Even in a planned economy the evaluation of projects according to this kind of procedures must be viewed as only a stage in the planning process, subject to successive rounds of iterations and checks.

The specific features of EC procedures in many respects compare favourably with similar official rules for project evaluation, such as those of UNIDO and of OECD. Three specific drawbacks however deserve mention and further consideration by the Directorate General for Development: the imputation of a charge on the historical cost of capital equipment already existing and on which aid has been received, which might prevent the fuller utilisation of that equipment; the truncated treatment of inflation over the life of projects, which introduces a systematic unfavourable bias in the evaluation; and the identification of real with economic and of nominal with financial profitability, as well as their occasional mixture, which is a potential source of confusion and error.

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