

ECONOMIC APPRAISAL OF INDUSTRIAL PROJECTS IN IRELAND

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SUMMARY

The paper sets out the method which the Industrial Development Authority (IDA) Ireland, uses in its evaluation of industrial projects and in determining the appropriate level of support for projects. It discusses the central roles of commercial viability, fiscal considerations and bargaining in this evaluation process. It also sets out the economic appraisal system used in evaluating large projects.

The main purpose of the economic appraisal system is to guide decisions on the levels of grants warranted for industrial projects although on all occasions the focus in negotiations is on minimising the cost to the State consistent with having the project go ahead. The paper sets out the actions taken by the IDA to obtain the information required to implement the system and also presents some of the main conclusions arising from its implementation.

Over the past decade an extensive and diverse literature on cost benefit has developed but despite the growing sophistication of the techniques very few development agencies use these techniques on a regular basis. The IDA, however, believes that these techniques, when suitably modified, provide a useful guideline on the level of grants which can be offered for new projects while ensuring that there is a high return to both the Exchequer and the economy.

The system used is specifically tailored to the objective of job creation and is designed to guide decisions on grant levels during negotiations on projects. It has three main elements:

- (i) All projects aided must be commercially viable. Grants are negotiated on “cost per job” criteria which are based on experience and knowledge of incentives in competitor countries.
- (ii) In the bulk of projects the cost per job is negotiated within the fiscal threshold, which measures the fiscal returns to the Exchequer from the project. The fiscal threshold is a limited estimate of the project “benefits” and grant levels for over 95 per cent of projects are below this threshold. The average grant across all projects is maintained well below the fiscal threshold.
- (iii) An overall economic appraisal is conducted for large projects and for projects where the grant levels approach the fiscal threshold. The net domestic value added based on shadow pricing resources is used as the estimate of the economic “benefit” of the project. Grants offered in these cases are maintained at a level less than one-quarter of the estimated benefits.

The labour employed provides a major portion of the economic benefit in projects and to assist in the shadow pricing of labour, the IDA carried out a survey of the recruit-

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ment pattern of new grant-aided industry. This survey shows that almost 20 per cent of those recruited were previously unemployed, with a further 55 per cent coming from non-manufacturing backgrounds.

Another part of the information base prepared for use in the economic appraisal system is a set of input-output relationships for newly established and expanding industry. This is currently being prepared and will further assist the economic evaluation work.

A concern with the use of cost-benefit analysis referred to in the paper is that while it provides a framework for evaluating the maximum support justified in terms of economic returns for a particular project, most development agencies are more interested in knowing the minimum required to ensure that a project goes ahead. It is in addressing this issue that bargaining skills are at a premium, and these skills are called into play on every project.

A comparison of past grant with the results of the economic appraisal system show that the average pay-back period to the Exchequer on grants paid is less than 2½ years, which implies a good return on State expenditure.

1. INTRODUCTION

The basic role of the Industrial Development Authority (IDA) is to encourage the development of manufacturing industry and generate employment in self-sustaining industrial projects. The first step in this task is active promotion, by marketing and direct contact, so as to get sufficient projects. Then, by means of incentives, IDA seeks to encourage these projects, whether Irish or overseas, to start-up production. Thus the level of State support through IDA which is justified to encourage the expansion of industrial employment is an important policy issue, given the need to create new jobs for our rapidly expanding workforce and the financial constraints within which the economy must develop. It is important that the most objective methods possible be brought to bear in directing policy makers on this issue.

It must be stressed at the outset, however, that the evaluation of projects is but one step in the industrial development process. Generating sufficient projects is the cornerstone of any successful industrial strategy. This strategy must also take account of the type of industry required whether highly skilled or not, the policy on individual sectors, on regional development, on small or medium/large industry, on public or private ownership and on native or foreign industry. Decisions on these elements of strategy should be taken on their own merits. The exercise of evaluating projects, at both the commercial and economic levels, arises therefore, only after desirable projects have been generated.

In evaluating these projects the IDA's basic approach is to support projects where viable. Indeed, in many cases, IDA seeks alterations in the initial proposals so that aid can justifiably be given rather than rejecting proposals which do not meet administrative requirements.

The IDA's system of project evaluation takes commercial viability as an essential requirement and seeks to keep the State's commitment to the minimum consistent with ensuring that the project progresses. Projects are evaluated case by case. Deciding on the level of financial support to offer a particular project depends to a great degree on the number of jobs involved, subject to statutory limits. It also depends among other things on the skill content of jobs, speed of build-up, growth potential, location, and the potential for linkage. For the majority of projects, the level of support per job is maintained below a *fiscal threshold*, which is discussed in Section 3.

For certain categories of projects, i.e. those where grant cost per job approaches the fiscal threshold, and for all large scale projects, a complete economic evaluation system based on shadow pricing techniques is used to assist in determining the level of support which is justified. This system is elaborated upon in Section 4.

A range of tax and financial incentives are available to foster industrial projects in Ireland. The tax incentives are *automatically* available to eligible firms, and they form part of the basic corporation tax structure. The financial incentives include grants for

capital investment and for training programmes and, on occasions, rent or interest subsidies. They are *discretionary* and are administered by the IDA. The focus of this paper is on these financial incentives and the appropriate level at which these should be made available for industrial projects. These incentives are usually referred to as "grants" although they may include annual subsidies which for administrative purposes are capitalised into present value form and expressed as grants.

The major reason for concentrating on the financial incentives rather than including the tax incentives is that the tax incentives essentially represent potential revenue ("benefits") foregone and not direct costs to the Exchequer as is the case with financial incentives. As McAleese (1972) noted "More generally . . . the concept of tax 'lost' has no strict *a priori* relationship with economic cost. Without the tax incentives, the firms may not have come to Ireland in the first place, with the resources they now employ being left idle or emigrated."

The financial incentives have a dual role. In the case of Irish projects, which account for over 80 per cent of the total assessed each year, the financial incentives provide an essential element of the capital required without which some of the projects would not be able to go ahead. This is particularly so for small firms (under 50 employees) which now constitute over 90 per cent of all Irish projects. For overseas projects the incentives are also used to influence location decisions and to induce such projects to set up in Ireland.

After a brief discussion of the main issues raised in the literature on cost-benefit analysis, this paper concentrates on the system of economic appraisal developed by the IDA for its use in evaluating industrial projects. It describes the steps which have been taken to develop the information base required to implement this system and it highlights some of the main conclusions arising from its implementation.

2. ECONOMIC EVALUATION TECHNIQUES

Economists argue that, because of market distortions and various externalities, private profitability is not the most appropriate criterion on which to base decisions of Government support for projects. Rather, they claim that such assessments should be based on overall economic benefits and costs of the project. The literature on cost-benefit analysis has expanded dramatically in recent years and a variety of techniques are based on shadow pricing the resources used in projects. To date, however, the evidence available indicates that few development agencies throughout the world use cost-benefit analysis on a systematic basis (Ward 1977). The reasons for the limited use are probably because the techniques suggested are difficult for non-economists to understand, many practitioners are unhappy with the assumptions on which the techniques are based, and they suspect that they can easily be misused to justify support for projects that should not be supported.

At the risk of over-simplification, the literature on cost-benefit analysis can be divided into three broad groupings (Ward 1980):

- (i) *Economic efficiency approach*: This method concentrates on maximising national "efficiency", measured as the net increase in national income deriving from the project. Occasionally market prices are used in the analysis but more usually the benefits and costs are estimated using shadow prices. This approach is used by the World Bank in its work and by those few countries which apply cost-benefit analysis to projects on a regular basis.
- (ii) *Social benefit/cost approach*: This method highlights three alternative objectives, those of efficiency, growth and income distribution. It uses shadow prices in pricing resources. It includes a "social" value for the income distribution effect, and a "social" value for consumption versus saving effect of the project. Many names are associated with the development of this approach but most particularly Marglin (1963) and Little and Mirrlees (1974).

(iii) *Multi-Objective approach*: This is really a series of approaches all designed to take account in a specified way of the project objectives other than efficiency. In the approach followed by the United States Water Resources Council (1973), for example, four separate evaluations are conducted for each project, one on national income effects, another on income distribution effects, a third on regional development and a fourth on environmental effects. A general characteristic of the approach is that no single objective function is maximised, but rather several objectives are optimised. Shadow prices and selected “weights” are used to derive a single measure, or “numeraire”, of the different objectives.

Carruthers (1977) summarised the main approaches, developed in the literature in a somewhat similar way (Figure 1). He also identified the authors associated with each approach, and the main institutions sponsoring them.

Figure 1: *Recent literature on project appraisal*

Main Authors	Gittinger	Little/Mirrlees	Squire Van der Tak	Dasgupta, Sen Marglin
Institutional sponsors	IBRD	OECD	IBRD	UNIDO
Main users	World Bank FAO	Research, also ODA, KFW (W. Germany)	World Bank	?
Numeraire	Value added in domestic currency	Foreign exchange at disposal of government	Public income in foreign exchange	Consumption in domestic currency
Main thrust	Economic efficiency	Consumption v Investment	Income Distribution	Consumption v Investment

Source: Carruthers (1977)

One of the main issues discussed in the extensive and diverse literature on cost-benefit analysis is the calculation of shadow prices. It is not the purpose of this paper to review this literature in detail except to note the different methods identified for calculating the shadow prices of labour, capital and foreign exchange. In the case of labour, for example, one can identify at least three suggested approaches, (i) the opportunity cost approach, (ii) the supply price approach (Harberger 1972) and (iii) the social cost approach (Little and Mirrlees 1974). In the case of capital and of estimating the appropriate discount rate the practitioner also has a range of alternatives to choose among, (i) the social time preference rate (Marglin 1963), (ii) the opportunity cost of capital (Baumol 1971) and (iii) the social opportunity cost which is a combination of the other two. Similarly in shadow pricing foreign exchange a variety of approaches have been presented in the literature. There is therefore a range of techniques available for calculating shadow prices, and there is scope for debate and disagreement on which system to use and in what circumstances. The practitioner of cost-benefit analysis has to select from the various techniques the approach that is judged to be most suitable to his purposes and circumstances, and to make his decisions accordingly.

In Ireland the techniques of cost-benefit analysis have been used on a number of occasions. Important publications include O'Donoghue (1969) on Aer Lingus, Mulvey (1971) on Irish Shipping and Bristow and Fell (1971) on Bord na Mona. They were concerned with estimating a social rate of return on the capital employed in these activities. They estimated the opportunity costs for labour and capital and also included foreign

exchange premia and secondary effects in their calculations. Bristow and Fell used regional premia. All three commented on the general data and methodological difficulties. Bristow and Fell commented that without "a full, quantified general equilibrium model of the Irish economy . . . we had to derive our own shadow prices. We accept that this was a very intuitive operation . . ." Mulvey noted the difficulty of calculating foreign exchange premia. Bristow and Fell considered the estimation of income distribution effects to be "impossible at current levels of knowledge."

Until recently, little work has been done in applying cost-benefit analysis to industrial development in Ireland although several important studies were conducted on the overall economic impacts of this development and on the policies directing this development, O'Farrell (1975), Kennedy and Bruton (1975), Kennedy and Foley (1978), Killeen (1975) and McAleese (1977). Both O'Farrell (1975) and McAleese (1977) estimated the average total grant per job paid to medium/large industry at £5,300 and £4,900 (1979) prices respectively. Two further studies, which were commissioned by IDA, are due for publication shortly, one on the local, regional and national linkage impacts of medium and large grant-aided firms, O'Farrell (1980), and the other on the input-output relationships and employment and income multipliers of these firms, Henry (1982). Although none of these studies has concentrated on cost-benefit evaluation *per se*, all have provided useful material for use in such evaluations.

Buckley (1975) specifically addressed the issue of an economic evaluation of individual projects and concluded that a systematic cost-benefit appraisal of industrial projects was possible and necessary. More recently two important papers have been published on this matter, Ruane (1979) and (1980). Ruane (1979) argues strongly that industrial projects should be evaluated from the perspective of *social profitability* incorporating the Little and Mirrlees (1974) method of calculating shadow prices. The social cost of labour is identified as "probably the most important element in estimating social profitability" and the need to segment the labour market is highlighted because ". . . opportunity cost may be zero, whereas if it comes from some other sector, its opportunity cost will be measured by its marginal product in that sector." This analysis is extended in Ruane (1980) and an estimate is made of the optimal labour subsidies for industrial projects in Ireland. This later paper concludes "that the actual subsidies paid in practice fall well within the range of the optimal subsidies estimated" although it is noted that this conclusion relates to the average subsidy paid and may not hold on each individual project. The paper emphasises that "the IDA should pay as low a grant as possible to generate additional employment."

The system which is used by IDA for its economic evaluation of projects is an extension of the economic efficiency approach. The benefits of projects are measured as the incremental *domestic value added* in the economy generated by a particular project when resources are priced at shadow prices. The costs taken are not the total costs of the project but rather the level of financial aids provided by the State.

Both the social benefit/cost approach and the multi-objective approaches appear to us to be overly elaborate for use in an economy like Ireland. It is doubtful whether individual projects should be assessed for their impact on saving, consumption or income distribution in developed countries, where explicit macro policies exist which are directed at these issues. As Carruthers (1977) argues "if there are imbalances between savings and consumption or if income distribution is sub-optimal according to declared political goals, then other administrative means can be used to cope with these problems."

3. COMMERCIAL VIABILITY AND THE FISCAL THRESHOLD

A system of economic appraisal of projects which is designed to meet the requirements of a development organisation like the IDA should have certain key elements:

- It should focus on the primary objective being pursued, which in the case of the IDA is job creation.

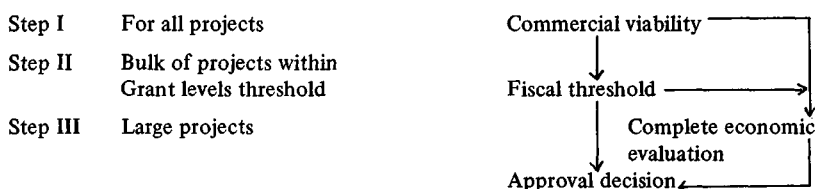
- It should be presented in a manner which is understandable and acceptable to decision-makers while remaining true to basic concepts.
- It should be able to cope with a large volume of projects. Each year over 1,000 projects are approved for grant-aid by the IDA while at the same time considerable staff time is spent on developing a project pipeline for following years and in assisting previously approved projects to get into production.
- It should be able to give indications to staff during negotiations on appropriate levels of aid.
- Finally, it should not be excessively demanding on staff time.

The approach which has been developed is deliberately conservative in its recommendations and is designed to act as a guide to staff working on generating projects. It is based on establishing a “grant cost per job” criterion within which the bulk of projects are negotiated with the aim in all cases of minimising the cost to the State for each job generated. There are three main elements in the approach:

- Projects must be commercially viable.
- For the bulk of projects the support per job is negotiated within the “fiscal threshold” and
- An overall economic appraisal is conducted for large scale projects and projects where the grant cost per job required approaches the fiscal threshold.

Diagrammatically this approach can be presented as in Figure 2:

Figure 2: *Project evaluation process*



Commercial viability

Commercial viability is defined here as the capability of generating sufficient profits to meet reinvestment requirements and shareholders’ demands within the financial and tax constraints under which the project actually operates. A viable project would not be expected to require further financial support from the Exchequer to stay in business.

A narrower definition of commercial viability than that used by the IDA would be an adequate return on capital employed, in the absence of financial aids. Ruane (1979) noted that “. . . the IDA seems to attach particular importance to the firms being privately profitable, independently of the financial aid it received . . .” This would imply that “sound” projects which do not adequately remunerate the total capital invested would be rejected, even if, with a grant from the IDA the return on the promoter’s own capital was adequate. Such, however, is not the case.

In assessing the commercial viability of industrial projects the IDA examines such aspects as production, marketing, finance and management. The examination must determine that the product proposed can be produced and that the technical and managerial expertise exists to do so. It must determine that sales projections are realistic given market conditions and the performance of competitors. In addition it must consider the availability of privately sourced finance. If these elements are not satisfactory in the initial proposal, modifications are suggested to bring them to the required level. Various state and state-sponsored organisations help in this process and where appropriate, indicate

standards or procedures to be followed.

In many cases projects could not proceed without the aids provided by the IDA. This is because:

- (1) The promoter would be unable to generate the extra funds and/or
- (2) the project would not remunerate the total investment at market rates. The total investment less grants could, however, be adequately remunerated by the project.

In the case of overseas projects the financial aids are designed to induce firms to set up in Ireland when, without these aids, they would establish elsewhere.

The IDA does not favour supporting manufacturing projects solely on the basis that they are socially profitable from an overall economic viewpoint, unless they meet or can be adjusted to meet the basic criteria of commercial viability. It seeks to ensure that all projects meet this basic discipline so as to enhance the chances that projects will survive. It recognises that even with this built-in discipline the pressures of competition in the market place will mean that some projects still will not survive.

Within the constraints of commercial viability, the level of support provided to an individual project varies with the characteristics of the project and where it locates. The legal limits of 60 per cent of Eligible Fixed Assets in the Designated Areas and 45 per cent in the Non-Designated Areas place absolute maximum limits on the level of support that can be offered (Industrial Development Act 1969). The IDA, however, generally applies upper administrative guidelines within these limits of 50 per cent and 35 per cent in the Designated and Non-Designated Areas respectively.¹

Decisions must be made quickly on the level of support for an individual project within these legal limits. The basic guideline followed in determining grant levels is the "cost per job". In addition to the number of jobs and the location some of the other characteristics which influence grant levels are:

- Level of added value.
- Skill content in jobs.
- Speed of build up.
- Long term growth potential.
- Significance of the technology of projects in facilitating expansion of desirable sectors.
- Projects where R & D or marketing functions will be established in Ireland.
- Projects using native natural resources.
- Projects with spin-off possibilities for existing firms.

In their regular discussion with clients, IDA staff negotiate on the basis of established "cost per job" criteria. The experience gained over the years and the detailed knowledge on practices elsewhere are used in establishing these criteria with the aim of keeping the costs to the State at a minimum.

Fiscal threshold

One of the key facts which must be faced in deciding on the appropriate level of State aid to industrial projects is the cash flow implications for the Exchequer. The Exchequer's cash-flow is affected on the one hand by the outflow of grants to the project and on the other hand by such inflows as extra income tax, social welfare contributions and reduced unemployment payments. The flows to the Exchequer, which determine the fiscal threshold used by the IDA, are calculated as the present value of the stream of annual fiscal returns from the project over 15 years, discounted at 10 per cent per annum. Tax and social welfare rates and unemployment payments are assumed to remain unchanged

over the period. For decision purposes the fiscal threshold is compared with the proposed level of financial aid to be provided by the State for the project. This financial support is calculated at (i) the present value of all grants approved, including capital and training grants, and the capitalised value of any rent or interest subsidies, plus (ii) the present value of any equity involvement, plus (iii) the present value of net expenditure by the State on infrastructure for the project. The fiscal threshold is a limited estimate of the benefits accruing to the Exchequer for individual projects. In practice it is based solely on the Exchequer returns from the labour employed directly in the project and as such is a conservative estimate of the total fiscal returns of the project. Its calculation is conducted as an accounting exercise. A fiscal criterion comparing the financial aids with the Exchequer returns can then be formulated as in 3.1.

$$\sum_{i=1}^t \frac{G+I}{(1+r)^t} < \sum_{i=1}^n \frac{(\sum_{i=1}^m TN_i) + (\sum_{i=1}^m SN_i) + (U.R)}{(1+r)^n} \quad 3.1$$

When:

G = state financial aids to project; I = net infrastructure cost; T = tax yield per worker (weighted for single and married persons); N = number of workers in each category (where the labour employed is segmented into m categories); S = social welfare contributions per worker; U = unemployment saved; R = numbers off live register; r = discount rate; t/n = number of years.

The fiscal threshold is adjusted each year to take account of any tax or other relevant changes made in the Budget. To calculate it, detailed information is required on the recruitment into grant-aided medium and large firms, the main details of which are summarised in Table 1. This survey in addition to providing a key element of the information required to calculate the fiscal threshold is also useful in calculating shadow prices for labour where complete economic evaluations are required.

Table 1: *Recruitment Pattern for Grant-aided Industry*

Source of Labour	School leavers & AnCO trainees	Live Register	Manuf-acturing	Agric-ulture	Other	Ret-urned Emig-rants	House Wives	Total
			(Transfers)					
%	23.3	18.4	24.1	4.9	17.0	3.6	8.7	100
Numbers	4,450	3,515	4,603	936	3,247	688	1,662	19,100

Source: IDA (1980)

In calculating the fiscal return per year, account is taken of the fact that only 18 per cent of the labour force are in receipt of unemployment payments immediately prior to entering industry. Also 41 per cent previously paid income tax and social welfare and their transfer to the new job is assumed to provide no extra returns to the Exchequer. At present the fiscal return is estimated at IR£1,950 p.a. which when discounted over 15 years at 10 per cent gives the total fiscal threshold of IR£14,600 (1979 prices).

Those projects which are assessed as being commercially viable, and where the grant cost per job required to have the project go ahead is below this fiscal threshold, are accepted and the level of aid negotiated for the project is approved. Over 95 per cent of projects approved by the IDA fall within this criterion, which means that a complete economic evaluation is not required for these projects. In this way the fiscal criterion acts as a filtering system which greatly reduces the number of cases requiring a complete economic evaluation.

4. COMPLETE ECONOMIC EVALUATION SYSTEM

For projects where the grant levels required approach the fiscal threshold and for all large scale projects,² the IDA conducts a full economic evaluation of the benefits of the project before deciding on the level of financial support to be provided. The economic evaluation system which has been developed emphasises efficiency criteria. It involves assessing the net domestic value added of the project and comparing this with the costs to the State of aiding the project. Both benefits and costs are discounted and a decision made on whether a particular level of aid is justified. The key components of the evaluation system include the shadow pricing of labour, capital and foreign exchange, dealing with indirect effects and calculating the State costs, including infrastructure, involved in the project.

Estimating Economic Benefits

Each economic evaluation contains a separate assessment for the construction and the operating phases of the project. The methodology employed is similar for both phases.

In the operating phase the details of gross output, inputs used, labour requirements, repair and maintenance, interest payments, depreciation and the remainder of net output are listed for each year. The domestic element of all resources used for the project is estimated for raw materials, for plant, for labour and for the different elements of the return on capital. The net domestic value added for each year is then calculated as (i) the difference between the actual income earned on materials, plant and labour used in the project and its value at shadow prices plus (ii) profits net of interest in Irish companies and/or unrepatriated profits from overseas equity. If the State has equity in the project this equity is regarded as a cost but the State's own share of profits (or losses) are included as domestic value added. Values for individual years are derived and are discounted over 15 years at 10 per cent per annum to calculate their present value.

The total domestic value added of the project is thus:

$$DVA = \sum_{i=1}^n \frac{d1(LP_m - LP_s) + d2(MP_m - MP_s) + d3(PP_m - PP_s) + \pi}{(1+r)^i} \quad 4.1$$

- Where LP_m = cost of labour priced at market wage rates
 LP_s = cost of labour priced at shadow prices
 MP_m = cost of materials priced at market rates
 MP_s = cost of materials priced at shadow rates
 PP_m = cost of plant and equipment priced at market prices
 PP_s = cost of plant and equipment prices at shadow prices
 π = profits (net of interest for Irish companies and/or unrepatriated profits on overseas equity)
 $d1, 2, 3$ = co-efficients of domestic components
 r = discount rate
 n = number of years

The single greatest contribution to domestic value added usually arises from the labour employed in the project, a fact also noted by Ruane (1980). This is because of the substantial difference between the opportunity cost of labour entering manufacturing and its market rate. It contrasts with most other inputs where the gap between opportunity costs and market prices is narrower. Because of the dominant contribution of labour to the total domestic value added of projects, frequently an abbreviated version of 4.1 is calculated as 4.2:

$$DVA = \sum_{i=1}^n \frac{d1(LP_m - LP_s)}{(1+r)^i} \quad 4.2$$

Based on the average recruitment pattern as set out in Table 1 and with labour priced at shadow prices, the discounted domestic value added for the average job in manufacturing using the abbreviated formula 4.2, is estimated at IR£26,500 (1979 prices).

Shadow Pricing

In estimating shadow prices the IDA uses the various abbreviated approaches which have been suggested in recent times by a number of authors. (For a more detailed discussion on these see Little and Mirrlees 1974, Ruane 1979, Ward 1980).

Foreign Exchange

The approach followed in dealing with shadow pricing the inputs used is based on Little and Mirrlees (1974). Border prices of traded goods are taken to adequately reflect true shadow prices and are usually expressed in domestic rates. For tradeable goods purchased from domestic suppliers, the increase in domestic value added depends on whether there is excess capacity or not in the supplying industry. Without evidence to the contrary, it is usually assumed that excess capacity does *not* exist but if the new project results in increased employment in the supplying firm this increase is included in the DVA of the new project. Non-traded goods (usually services) used in the new project are divided into labour and other components and account is taken of capacity in these industries in assessing the contribution to DVA.

McAleese (1977) demonstrated that new grant-aided manufacturing firms made a substantial positive contribution to foreign exchange earnings. Henry (1982) confirms this finding. It could be argued that in Ireland a premium should attach to such projects for their net contribution to foreign exchange earnings (O'Donoghue 1969). The IDA has not, however, used any such premium in its evaluations.

Labour

The IDA's experience to date is that the labour employed in projects provides the greatest single contribution to DVA. Consequently shadow pricing labour is a most important part of project appraisal, Ruane (1980). In shadow pricing labour we use the opportunity cost approach. In the case of those previously unemployed and of school leavers the opportunity cost is taken as zero. For those transferring from agriculture the opportunity cost is taken as the average income in agriculture, although a more correct figure would be the income of the marginal worker. Marginal income figures, however, are not available and would be very difficult and time-consuming to calculate. For those transferring from service activities and from other manufacturing sectors, the opportunity cost is taken as being equal to the market wage paid. The recruitment pattern profile used in individual cases is based on details of the specific project and its proposed location. The overall recruitment pattern presented in Table 1 is used as a cross-check on the project recruitment profile.

Capital and the Discount Rate

The literature on the appropriate discount rate to use in project evaluation is perhaps the least satisfactory of all the body of literature on cost-benefit analysis. Useful summaries on discount rates can be found in Layard (1974) and Ward (1980). Project appraisal theorists are not agreed on the conceptual approach to the problem of pricing capital let alone the actual specification of an appropriate discount rate for applied work.

The three basic approaches discernable were referred to earlier as the

- (i) social time preference rates (STP)
- (ii) opportunity cost of capital (OCC), and
- (iii) the social opportunity cost (SOC).

The STP approach recommends the use of a social rate of discount which would rep-

resent the time preference of society as a whole. It is generally argued that this rate is lower than the market discount rate basically because society has a responsibility to invest for future generations. The OCC is largely concerned with achieving static efficiency and recommends pricing capital in any project at its opportunity cost.

If, as Gittinger (1976) notes, the OCC rate was set perfectly, it would be society's social time preference, i.e. "it would reflect the choice made by society as a whole between present and future returns, and hence, the amount of total income the society is willing to save." Kelleher (1976) states that "the social rate of discount is an unknown quantity. There is no precise formula for calculating it."

Little and Mirrlees discuss the size of the accounting rate of interest in developing countries and state that "it would never be worth going below 4 to 5 per cent since returns of that order (after allowing for inflation) can be earned . . . in the international capital markets." On average they speak of real social rates of return of 10 per cent to 15 per cent with the higher rates in the more developed of the developing countries. Gittinger (1973) notes that "determining the opportunity cost of capital for a society is difficult, but economists generally consider it to be between 8 per cent and 15 per cent in most developing countries." The actual choice of discount rate according to Gittinger (1976) is "simply a rule of thumb: 12 per cent seems to be the popular choice."

In choosing the discount rate it is not possible to escape some degree of arbitrary choice. Bruton (1978) examined the real rate of interest on Government borrowing in Ireland since 1947. Table 2 below reproduces his findings and shows that the real rate has been negative since 1969. It would not be sensible to use a negative discount rate in project appraisal. The discount rate used by the IDA at present is a real rate of 10 per cent.

Table 2: *Nominal and Real Rates of Interest on Domestic Public Debt (%)*

	Nominal	Real
1947-51	3.26	+0.42
1952-58	3.94	-0.79
1959-61	4.37	+3.04
1962-68	4.94	+0.93
1969-72	6.24	-2.69
1973-75	7.10	-9.82
1975	7.60	-9.00
1976	8.50	-10.80
1977	9.00	-1.80

Source: Bruton (1978)

Environmental Control

At the request of the IDA, each project is investigated by the Institute of Industrial Research and Standards (IIRS). Some projects are investigated by An Foras Forbartha as technical advisors to the IDA. The project is also investigated in great detail by the relevant Local Authority at planning permission stage. Projects which fail to meet satisfactory standards are not offered grant assistance. Where IIRS or the Planning Authority recommends modifications to meet environmental control standards these must be implemented and the costs involved are internalised in the project. Consequently no special provision is made for any environmental "externalities" in the economic evaluation.

Indirect Effects

Ward (1980) states that "the most confused topic in the project appraisal literature is that of indirect benefits." The inclusion of indirect effects represents an attempt to move project appraisal towards a more general equilibrium analysis. The range of indirect effects referred to in the literature is extensive, Margolis (1957), Kneese (1959).

In project evaluations and decisions on grant levels, the IDA has to date excluded con-

sideration of indirect effects. It does accept that in the evaluation of total industrial programmes these indirect effects should be taken into account especially where they can be quantified with reasonable accuracy. The availability of Henry's input-output analysis will provide useful data for this purpose (Henry 1982).

Costs to the State

The State costs primarily consist of the grants provided, whether for capital investment or for training, the capitalised values of any subsidies, interest on rent and any equity investment. For large projects the net cost to the State of special infrastructure is also included. Frequently, however, where infrastructure is provided this is used to meet the needs of local communities in addition to those of the industrial project. In this case the difficult task arises of allocating costs among different users. Furthermore the national benefits arising in providing and using much of this infrastructure often outweigh the costs to the State. For these reasons, the net cost to the project is only included where it is significant.

Benefits and Costs Compared

When deciding on the level of aid for projects which undergo a complete economic appraisal the discounted *domestic value added* is compared with the discounted value of the costs expected to be carried by the State. In line with the aim of minimising the burden on the State, the IDA requires that the benefits to the economy substantially exceed the costs.

5. THE DECISION RULES

The application of project appraisal techniques in the IDA is distinctly different from most applications referred to in the literature. Analysts are normally faced with the problem of evaluating and choosing from a range of alternative projects. Their decisions are based upon the ranking which emerges from their analyses. As a practical matter the IDA cannot operate in this manner. It cannot hold up decisions on individual projects until a large selection is available for ranking. Indeed the IDA is usually faced with the problem of generating a sufficient number of projects, rather than choosing from among alternatives. For these reasons it must establish, in advance, decision rules which allow grant levels to be decided upon as negotiations are finalised on individual projects.

The economic evaluation process for a project yields the following:

- the discounted fiscal returns from the project
- the discounted domestic value added (DVA)
- the discounted costs of the financial aids (and infrastructure) provided.

From these the IDA calculates the:

- Exchequer payback period, i.e. number of years by which the State investment is balanced off by the discounted stream of Exchequer returns.
- Economic payback period, i.e. number of years by which State investment is balanced off by the discounted domestic value added stream.

The decision rules which are then applied in implementing the system are as follows:

- (i) The project must be commercially viable.
- (ii) Grant levels must be within the legal limits allowed.
- (iii) Grants per job should be negotiated at the minimum possible in all cases and should be within the established fiscal threshold. While grants per job for some projects may

exceed the fiscal threshold the IDA insists that the *average* grant per job over all projects is maintained well below the fiscal threshold.

- (iv) Where grants are close to the fiscal threshold and for large projects, a complete economic evaluation is conducted to determine the levels justified. In these cases grants are maintained below the level necessary to ensure that the ratio of Domestic Value Added/State Cost is greater than 4:1.

6. IMPLICATIONS AND CONCLUSIONS

As mentioned earlier the basic approach followed by the IDA is one of supporting projects whenever viable and this often means modifying initial proposals in agreement with the client. The level of financial aid provided for the bulk of projects is negotiated within "cost per job" guidelines which are based on practical experience and knowledge of what is available in competitor countries. The economic appraisal system complements this practical knowledge and provides a useful analytical tool to guide decisions on the level of aid justified for individual projects. The appraisal system used is deliberately conservative because of the importance attached to ensuring that the industrial strategy can continue to be financed over time. Experience to date in operating this system of appraisal highlights a number of issues:

The relevance of economic appraisal to decision making

Some areas of concern

Actual grants compared with those suggested by the economic appraisal system.

These issues are expanded in this section.

Relevance of economic appraisal to decisions on grants

Economic appraisal techniques provide a useful framework to evaluate the maximum level of support which is *justified* for an individual industrial project. For a particularly desirable project the State may wish to pay this maximum level and match the economic benefits of the project with its financial aids. Such a policy, however, could only be followed in few cases. The State could not afford the burden of paying these maximum levels for all projects, or even for a large number. It must also provide certain social and infrastructure overheads which are necessary to industrial and general economic progress.

While economic appraisal techniques show the maximum aid justifiable on economic grounds, it should be noted that the legal limits in existence (*Industrial Development Act 1969*) (EEC, 1979), are more constraining limits in all but the most capital intensive projects.

In 1979 the average fixed asset investment approved per job was IR£14,500, and for the majority of projects the figure was lower than this. The legal limits on the aid allowable for this level of fixed investment per job are IR£8,700 and IR£6,500 in the Designated and Non-Designated areas respectively. (The grant per job approved in 1979 was IR£5,500). These compare with the fiscal threshold of IR£14,600, which demonstrates that the legal limits are the more constraining limits for the bulk of projects.

Generally, IDA negotiators are not concerned with what the maximum grant might be but rather with the *minimum* required to ensure that the project goes ahead. It is in addressing this issue that bargaining skills are at a premium in order to minimise the actual cost to the State of each project. These skills are called into play on every project.

The relevance of economic analysis in project appraisal, therefore, is two-fold. It provides decision-makers with a clear guideline as to the maximum levels which are justified for projects in general, on economic and fiscal grounds. Also, when evaluating large projects it provides a mechanism for establishing whether the negotiated level of assistance is acceptable given the benefits to the economy expected from the project. Decision makers, however, must be wary not to pay the maximum level of support but

rather must ensure that projects are negotiated at the lowest level required for the project to proceed.

A further issue on the relevance of economic analysis of projects is the suitability of the different approaches described in the literature in different circumstances. The IDA argues that the economic evaluation of industrial projects in Ireland should be directed at measuring the economic efficiency elements of the project rather than encompassing wider issues such as the income distribution. Furthermore, it argues that it is not practical to include all elements of an industrial strategy within a single appraisal system. These elements vary from regional development to sectoral policies from the development of natural resources to policies on enterprise development, from the size scale of industry desired to the skill level sought, from the role of public enterprise to that of the private sector, and from the strategy for domestic industry to that for foreign industry. Decisions on these various components of industrial strategy should, in the opinion of the IDA, be made on their own merits and not incorporated into any one single evaluation procedure.

Areas of concern

Experience to date by the IDA indicates that the labour component is the single most important element in its project evaluation work. Correctly shadow pricing of labour, therefore, is a key element in any evaluation and it was for this reason that the IDA undertook the recruitment pattern survey summarised in Table 1. One issue of particular concern to the IDA is that, if existing economic evaluation techniques were applied rigorously, they would lead to a favouring of projects employing unskilled rather than skilled labour. In its long term development strategy for industry the IDA is geared towards developing high skilled industry with greater emphasis on research and development. The IDA believe that Ireland's strength lies in our generally high level of education and skills which can provide a workforce capable of employment in more technologically advanced industry. For this reason the IDA is prepared to pay higher than normal grants for industry with a high skill content.

Another source of concern to the practitioner is the lack of uniformity among theorists on the appropriate discount rate to use in project evaluation. The effects of using different rates are well known and well documented but the practical problem of the appropriate rate to use still remains.

A further issue relating to the treatment of capital in a project which IDA believes merits attention by specialists in cost-benefit evaluation is that of handling the different components of the return to private capital where it is combined with public capital in the project. For example, the treatment would differ from equity to borrowed funds and from funds provided domestically to those provided from overseas. Also the treatment of depreciation funds would differ depending on the sourcing of the capital equipment. One of IDA's objectives is to attract into Ireland overseas equity capital which would not otherwise be available to the economy. Since it is reasonable to assume that this capital has no displacement effect in terms of other capital available to the economy then it can be regarded as costless to the economy. Only overseas equity capital is treated in this way and the estimated unrepatriated profits on this capital are included as part of the DVA of the project.

The literature on cost-benefit analysis is particularly concerned with the issue of shadow pricing traded and non-traded goods in a project. The IDA believes that in Ireland this issue is of less importance in project evaluation, in terms of its effect on the calculation of benefits, than the treatment of the labour and the capital components of the project.

A weakness which economic evaluation techniques have in common with most, if not all, other formalised economic procedures is that they are essentially static concepts whereas most of the practical decisions on industrial development require a variety of judgements to be made on dynamic events. Actions and counter-actions have constantly to be taken as events alter these judgements.

Approved grants versus the fiscal threshold

The approach to project appraisal described here is designed to guide decisions during negotiations on projects, i.e. at the grant approval stage. Over the past six years the average grant cost per job approved by the IDA under its job creation programme was IR£5,000 per job. The cost varies from year to year depending mainly upon whether or not there are large projects approved in that particular year, Table 3.

Table 3: *Grant cost per job approved 1974-79
(constant 1979 prices)*

1974 (9 months)	£6,114
1975	£5,064
1976	£4,102
1977	£4,663
1978	£4,548
1979	£5,559
Average 1974-79	£5,035

Source: IDA Annual Reports.

The figure of IR£5,000 per job compares with the annual fiscal return of IR£1,950, which when discounted over 15 years gives the total fiscal threshold of IR£14,600 (1979 prices). This means that based solely on the fiscal returns from the labour employed directly in the operation of the project, the average pay-back period to the Exchequer is about 3 years. If the total fiscal returns per job from a new project, including those arising during construction, those arising from VAT, and from any spin-off employment generated were incorporated, then the estimated pay-back period would be reduced further.

When actual grant payments are compared with grants approved an even more favourable picture emerges for the Exchequer. The relationship between approved grants and grant paid depends on a combination of:

- (i) the extent to which job approvals translate into actual jobs, and
- (ii) the actual draw down of grant monies by firms.

McAleese (1977) estimated that "the rate of conversion of job approvals into actual jobs equals 71 per cent", but in his calculation "only approvals associated with active projects (are) considered". An IDA analysis which takes into account total approvals, has shown that in the case of medium/large industries, 60 per cent of approvals, on average, translate into actual jobs in five years, IDA (1979). On average 15 per cent of all job approvals are in projects which do not proceed. The industries which go ahead attain 70 per cent of the expected jobs within five years (70 per cent of 85 per cent \approx 60 per cent).

The actual draw down of grants is also phased and shows a similar conversion between approved grants and grants actually paid as occurs between approved jobs and actual jobs. An analysis for the period 1968-77 showed that actual payments were phased over seven years, and that only 55 per cent of the grant monies approved were eventually paid, IDA (1979). Combining the conversion ratios for jobs and grants the IDA estimates that in 1968-1977 average actual grant cost per job created was IR£4,450 (1979 prices).

In two separate analyses and including data on the early 1960s, when average grants approved were higher than in the 1970s, O'Farrell estimated the actual cost per job at IR£5,300 (1979 prices) for the period 1960-73 and McAleese estimated it at IR£4,900 (1979 prices) for the period 1966-73.

The actual pay-back period to the Exchequer on the basis of grants paid, therefore, is somewhat shorter, and thus even more favourable, than that suggested by grant approval data. Based on IDA's own figure of an actual grant cost per job of IR£4,450 the Exchequer pay-back period is less than 2½ years. Given that grants paid for a job in manufacturing are a once-off payment then these figures suggest a relatively good return on the State expenditure.

Table 4: Comparison of grant level and the fiscal threshold
(1979 prices)

	Grant approved	Grant paid
Grant level	£5,000	£4,450
Fiscal threshold	£14,600	£14,600
Exchequer pay-back	3 years	2½ years

These figures highlight the extent of the contribution over and above the initial grants, which accrues to the Exchequer from the average new job created in manufacturing. When the broader implications than the purely Exchequer impacts are examined and the benefit by way of domestic value added is included, the results highlight a greater net contribution to the economy.

The Exchequer "surplus" helps fund general social and infrastructural programmes of the Government from which the manufacturing sector and other sectors benefit. The implications of any dramatic changes in the relationship between approved grant levels and the fiscal threshold are important for overall Government finances and resource transfers within the economy.

The experience which the IDA has gained in implementing the economic appraisal system shows that it works and that it is useful. The results confirm the fact that the grant levels paid are well below those warranted by an economic evaluation and that the average pay-back period to the Exchequer of grants is less than 2½ years. The IDA, however, does not believe that it should increase overall grant levels, rather it will continue to seek to minimise the cost of grants and keep the average cost per job in line with present trends.

FOOTNOTES

1. In addition to the limits on grant-aid imposed by the Industrial Development Act 1969 the EEC Regulations on Ceilings of State Aids also impose upper limits on Member States (EEC Regulation – EEC Official Journal C. 31 of 3/2/79).
2. It should be noted that in the case of projects where the capital grant exceeds £1.25 m., Government approval is required.

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DISCUSSION

Frances P. Ruane: It gives me great pleasure to propose, on the Society's behalf, a vote of thanks to Dr. McKeon for his paper on the methods of evaluation used by the Industrial Development Authority to appraise industrial projects. Those of us who are concerned with the industrial development issue in this country are delighted to have this opportunity to discuss the IDA's approach to project evaluation, and the paper prepared for this evening by Dr. McKeon and his colleagues in the IDA, provides us with a very comprehensive account of this approach.

As an economist who has had the experience of working in the IDA for almost two years, I feel considerable empathy for Dr. McKeon and his fellow economists in the organisation. It is no mean achievement to have found the time to wade through the literature on project appraisal, and a still greater achievement to have persuaded their colleagues in the projects division to submit their projects to a formal process of evaluation. I don't mean to imply that the non-economist staff in the IDA ignore or disagree with their economist colleagues, but rather that, in one's role as an economist in the organisation, one is concerned with relatively few dimensions, albeit important ones, of the IDA's role in the industrial process. Indeed, economics as a discipline has relatively little to say about much of the Trojan work done by the IDA: I refer here to most of the work done

abroad in promoting Ireland as an industrial base; the work done at home in providing information and support services for Irish industry, and the actual accounting work associated with the grant system itself. (This is not to deny, of course, that many economists, in their non-professional roles as tax-paying hurlers on the ditch, are very vocal on many of these topics!)

There are, however, two main areas of the industrial development process to which economics as a discipline can, and should, contribute. Firstly, it provides a method of analysing the structure of the economy, and determining the broad categories of industry which can operate successfully within that structure, given both foreign- and domestic-market constraints. Secondly, it provides guidance on how much government assistance, if any, should be given to projects and to industry as a whole, taking into account both the range and availability of industrial projects, *and* the important alternative uses towards which scarce government revenue might be directed; for example, transport and telecommunications. These positive and normative issues are at the heart of the literature on project appraisal, which suggests that, if projects are being individually monitored by a government agency, their total benefit to the economy can be fairly readily estimated in a systematic manner, together with the appropriate levels of government assistance.

Let us now turn to examine the IDA approach to project evaluation as described by Dr. McKeon. Figure 2 sets out the three steps in the process of evaluating a project:

- Step I : to determine whether the project is *commercially viable*;
- Step II : to establish that the grant paid, together with the infrastructural costs to the Exchequer, fall within the defined *fiscal threshold*;
- Step III : to check that, in the small number of cases (less than 5 per cent according to the IDA) where the projects falls outside this threshold, its contribution to the economy, measured by the *Domestic-Value-Added concept*, must reach some acceptable level.

My first comment on this approach is that it consists of four rather than three steps, because there are really two stages in Dr. McKeon's Step I; I shall call these Steps Ia and Ib. Step Ia involves the determination of the grant based on the IDA cost-per-job criteria which are listed in the paper. As one can see, these criteria are qualitative rather than quantitative, and the actual method used to calculate the grant, which is a crucial step in the procedure, is not described.

In Step Ib the commercial viability of the project is calculated. Now, I must quarrel a little with the IDA here, as far as terminology is concerned, for to define a project as commercially viable, when the measure of viability includes the discretionary grant, is, to say the least, misleading. What Step Ib seeks to establish is whether or not, given the grant estimated in Step Ia, the project is profitable at market prices. Such profitability is of course essential if the project is to survive without additional government support. My concern with this criterion, is that, as described, it seems to assume that the payment of some grant is the norm, even if the project is profitable without government intervention. It is not clear what proportion of projects are profitable without government assistance although the paper seems to suggest that all foreign-investment projects, at least, fall into this category. In the case of such projects, the assistance may be intended to compensate for some real disadvantages associated with establishing a project in Ireland compared with alternative locations; if this is so then it will be reflected in the project's having lower net returns and requiring government assistance to become profitable. If the assistance merely inflates the profitability of foreign investment projects, then it is not clear how durable such projects are, unless the fiscal aids are permanent. I have no doubt that the IDA is well aware of these issues and of the dangers of overbidding for projects between countries, which may well result in no single country increasing its share of the limited supply of foreign investment. Ultimately, our long-run success as an industrial economy depends on the real rather than the fiscal advantages we have to offer

domestic and foreign investors.

Step II of the analysis examines whether the project falls within the fiscal threshold, which is defined as the stream of annual fiscal returns from the project over 15 years, discounted at a real interest rate of 10 per cent. Several aspects of this criterion give rise to concern. In particular, its validity as a concept rests on two important assumptions: first, that each and every project is *marginal* in the sense that, without government intervention, it would not be undertaken. The point here is that the subsidy to any project which is non-marginal involves a lump-sum transfer from the government to the owners of capital, which, under our current system of taxing profits, could not be recouped. If all jobs in the manufacturing sector came near to meeting the fiscal threshold, the government would have very little revenue available to meet alternative demands on its budget. In other words, unless there is no real government revenue constraint in terms of alternative uses, the *broad* use of the fiscal threshold criterion is inappropriate – we should expect rather than be surprised that most projects fall within the constraint. Determination of how marginal an individual project is poses many problems for administrators, but these problems must be faced unless we are to find ourselves shoring up the industrial sector, in a similar manner to the much criticised protectionist policies of earlier decades.

The second, and related, assumption implicit in the use of the fiscal threshold, is that domestic factors employed on the grant-aided projects would not otherwise be employed in non-grant aided projects. This is more likely to occur in the case of scarce factors, such as skilled labour.

I have a few more small comments on the concept of the fiscal threshold as formulated: first, it seems to me that the time period for calculating the benefits of the project is rather long and that a ten-year period would be more appropriate. Second, a real discount rate of 10 per cent seems very high, implying a nominal rate of about 28 per cent this year! Recent studies for the UK, for example, have suggested that the appropriate rate for government-related projects is, perhaps, closer to 5 per cent. Furthermore, in the Irish context, using the small-open-economy type argument now widely accepted for pricing traded goods, the marginal real interest rate at which the public sector can borrow abroad would appear to be the appropriate discount rate.

Step III of the analysis is what Dr. McKeon calls the complete economic evaluation, only applied to projects outside the fiscal threshold. Again, IDA terminology for this, namely, *Domestic Value Added*, is most unfortunate, as the concept of domestic value added already has a very precise meaning in economics, which is different from its use here. What Dr. McKeon is trying to measure here are the benefits and costs of the project to the whole economy – which is what the literature on project appraisal calls the *social profitability* of the project. Dr. McKeon shies away from using this term because he associates it with the differential weighting of components in the Little-Mirrlees type net benefit function, which he argues tends to be arbitrary and unnecessary. However, what he is trying to do is to measure social profitability in the special case where all components of the benefit are equally weighted, whether they accrue to government, employers or employees. I think this implicit attempt to distinguish the IDA approach, in principle, from that of the existing project-appraisal literature is something of a red herring. Indeed, in all the project evaluation literature, a higher premium is placed on government funds relative to benefits to employees or employers, which is precisely what the IDA does implicitly, by putting greatest weight on the fiscal threshold: the difference between the IDA approach and the approach adopted in the literature is that, while Steps II and III can be separated in both approaches, they are formally and systematically related in the latter.

This brings me to the actual measure itself of the project's contribution to the economy. I am not quite clear what role the capital term (plant and equipment) is playing in this equation, and how it relates to the discussion of the shadow pricing of capital later in the paper. Furthermore, it is not clear whether the formula is trying to measure the project's benefit to the economy, inclusive or exclusive of fiscal effects: it is clear that income taxes are included, but what about labour's social welfare contributions, and

the unemployment assistance saved? Finally, the question of whether the profits included are repatriated immediately or not is probably irrelevant: what is relevant is whether or not they accrue in some final sense to the Irish economy. A similar issue arises in the case of the capital investment: any component of it which is Irish-owned has a positive opportunity cost, whereas a foreign-owned component is usually costless to the economy. This difference must be qualified in any calculation of the project's social return, which suggests that the decision rule (iv) is not adequately formulated.

There is one last issue on which I wish to comment, and this relates to the shadow pricing of skilled labour, which is briefly discussed. While it is clear that a static economic evaluation would favour unskilled relative to skilled labour, even the simplest dynamic evaluation would avoid what seems to be an inconsistency in the current IDA approach, namely, that in the ad hoc evaluation in Step Ia, skilled jobs are favourably treated, whereas in the rigorous evaluation in Step III, they are discriminated against, relative to unskilled jobs. The problem here is not with the cost-benefit technique, but rather with the static assumptions which the IDA seems to assume it requires. It is simply not the case that the existing framework of orthodox project appraisal techniques is static, and while the shadow pricing of skilled labour is an important and complicated problem, it is one which can be handled in this framework.

In conclusion, I should like to stress that the similarities between the orthodox approach to project appraisal and the IDA approach totally dominate the differences between them. To an extent, the differences reflect an emphasis on theoretical rigour on the one hand, and a concern for administrative simplicity on the other. Nonetheless, as I hope my comments have made clear, I do not believe that there is any serious conflict between these two criteria, and furthermore, I believe that a more consistent and satisfactory method could be applied with no additional administrative effort. What really matters is that the principle of formally and systematically appraising industrial projects from a social viewpoint is now accepted. An immense amount of hard work has already been done by Dr. McKeon and his colleagues, and we can only be optimistic about the fruits of further research.

Finally, I should like to thank the IDA for its co-operation in giving me access to material relevant to tonight's paper and it is with the greatest pleasure that I propose a vote of thanks, on your behalf, to Dr. McKeon.

David Croughan: It gives me great pleasure to second the vote of thanks to Dr. John McKeon for his interesting paper on the internal workings of the IDA appraisal process. It is important that any agency spending large sums of money should have a real criterion against which proposed projects can be evaluated, and it is to their credit that the IDA has attempted this difficult exercise.

I do not propose to comment on the choice between the differing technical approaches which can be used and therefore the merits or demerits of the IDA's chosen approach. I leave this to others who have made this their field of study. For my part, I found the paper an interesting update of the research in this field, and most particularly of that undertaken in Ireland.

I also found of great interest the table of recruitment patterns for grant aided industry and in particular the high proportion of 46 per cent who come from existing employment. I have never seen this analysis before, and for that alone the paper has been valuable. It does, however, lead me to my first reservation, which is that the domestic value added as calculated could be considerably understated. The opportunity cost of those transferring from service activities and other manufacturing sectors is taken to equal the market wage paid. In most cases, this is unlikely to be the case as a major inducement to change employment is the higher level of income offered. We could take but one example of electronics assembly work to illustrate the point. The manual dexterity of sewing machinists is the kind of skill which electronic companies require and for which they are prepared to pay about 30 per cent more than a sewing machinist can earn. This, straight away, implies that the shadow price is overstated and therefore the domestic value added under-

stated. I would also like to enquire as to what proportion of the transfers from one job to another are by people who are facing redundancy and who have been prompted to change jobs because of it. Their shadow price may well be close to zero along with the unemployed and school leavers. I would further enquire, in this present day when economic activity at best is stagnant, how much more of the opportunity cost of labour over the next six months would more accurately be assessed at zero.

The reservations over the choice of discount rate which are voiced in the paper must throw some doubt on the validity of the exercise. The spread between 8 per cent and 15 per cent is very large, and I would be interested to know how sensitive the outcome of the overall evaluation of any given project is, if we choose a discount rate of 8 per cent and a discount rate of 15 per cent.

I am tempted also to quibble with the payback to the Exchequer which Dr. McKeon admits is conservative. Firstly, the 41 per cent who previously paid income tax and social welfare contributions are assumed to provide no extra returns to the Exchequer, whereas in reality their higher wages would bring in higher returns. Also, presumably in many cases this 41 per cent of people already employed will be replaced by other people who at the end of the chain will come from the unemployed section of the labour force. The Exchequer also picks up a considerable amount of additional revenue from a project in VAT and excise duties, either directly from some of the company's purchases, or indirectly through the increased expenditure of the people it employs. However, no attempt appears to be made to include such additional revenues. It seems right to me that at least these returns to the Exchequer could be included, let alone the additional spin-off generated by the project, if on the Government's expenditure side investment in infrastructure is included.

My main question and doubt, however, is how relevant is this kind of cost benefit analysis in our present economic environment? The exercise involves discounting to present value over 15 years. Thus from today, we are talking about discounting a flow of revenue to 1995. Perhaps 15 years ago when there was a steady rate of economic growth, a relatively stable political world scene, more predictable social cohesion and a moderate rate of technological change, it was easier to make assumptions about the distant future. At this present time, however, it is difficult to look even five years ahead. The economic environment is increasingly uncertain and difficult to regulate, political tensions worldwide are growing, technological change is so rapid that companies in the forefront of developments are running just to stand still, and social acceptance of change is harder to predict. An example of this change in social outlook is given by the decision to build a nuclear power station in Austria. No doubt many financial exercises were carried out prior to undertaking the project but no one could have envisaged that ten years later the social attitude towards nuclear energy would change and the population in a referendum would refuse to allow the plant to operate.

It is in these areas external to any individual project that I think we must direct our attentions. We must know in good time what the latest developments in other countries are likely to be so that we do not fall behind. Competitive strategy analysis may well be far more important than simple economic evaluation. It may well be the right decision to embark on a certain course of projects which would not stand up to the tests of the complete economic evaluation system, if it meant that in 1990 we were still in business with the rest of the world.

If the economic appraisal of projects in Ireland forces us to think of these developments, then it is of great value. I can see too, that it is of utmost importance to attempt regularly the assessment of the economic value of industrial projects in which the State has expended money. I would not like, however, to see such economic appraisals have an overriding influence on whether a particular project went ahead or not.

Sean Cromien: I would like to join with other speakers in congratulating Dr. McKeon on his excellent paper. The work of encouraging investment from abroad has been one of the great success stories of recent Irish history and the dedicated work of Dr. McKeon

and his colleagues has contributed enormously to this.

As for all success a price has had to be paid. It is the cost in Government aid, both in the form of expenditure and in tax foregone. Dr. McKeon has shown us how the IDA attempt to establish the economic cost of a particular project. This is a very important and worthwhile exercise. In the last resort it is the taxpayer who finances all these schemes and it is necessary, as with all other items of public expenditure, to establish that the scheme is cost-effective. In particular it is necessary to know that when you add up all the incentives which are available to Irish industry you are not paying too high a price for what you are getting – that you could not have got the same result with fewer or less costly incentives. The questions asked by Dr. Ruane about the marginality of projects helped by the IDA are very relevant in this regard.

I am somewhat concerned about the coverage of Dr. McKeon's exercise, particularly about his exclusion of the fiscal incentives. In Exchequer terms tax foregone seems to me to be much the same as a grant given. At a given level of expenditure and borrowing some other member of the community has to make up the tax that has not been paid. I can see the point that is sometimes made that if you do not bring in the foreign industry you will not get the tax anyway. How many times, however, does this stark situation occur? Can you be sure that if, instead of a zero rate of tax for export sales relief, you had had a low rate of 10 per cent (as you will have from next year), you would not still have got the industries? What about the tax foregone in the case of established Irish companies?

A particular activity which has taken on significance in recent years has been the leasing of capital equipment by the financial institutions at considerable cost in tax lost by the State. There is no doubt that if the leasing did not take place the State would have got tax from the financial institutions, so that there is certainly a cost to the Exchequer and the taxpayer and, indeed, a large cost. It seems wrong not to include this in calculations of what the community is paying to provide aid to industry.

I am not, of course, objecting to the tax concessions as such but only saying that the taxpayer is entitled to have them counted as costs.

Having made these points, I should again like to compliment Dr. McKeon on his thorough and painstaking paper.

Joe Durkan: I wish to make several points. First, the distant origins of cost benefit analysis lie in the district between private and social profitability, where the concern was with the point that many activities simply passed costs onto society rather than bore them themselves. Private profitability tended to be greater than social profitability. Modern cost benefit analysis and some aspects of the evaluation of projects undertaken by IDA as revealed in this paper turns this on its head by noting that projects that are private and not profitable may be socially profitable and therefore should go ahead. However, it must not be forgotten that private profitability in itself is not sufficient and that the traditional concern with social profitability is still important. The IDA ignore this.

“Those projects which are assessed as being commercially viable, and where the grant cost per job required to have the project go ahead is below this fiscal threshold, are accepted and the level of aid negotiated for the project is approved. Over 95 per cent of projects approved by the IDA fall within this criterion, which means that a complete economic evaluation is not required for these projects.”

In fact a full economic evaluation is still required. It is disturbing to note that 95 per cent of all projects approved by IDA do not get a full economic evaluation. Can the IDA be sure that some of the 95 per cent would not fail if such an analysis was carried out?

Second, it is not immediately obvious that concern with income distribution can be dismissed so easily. The author rightly identifies the IBRD as originator of techniques to deal with income distribution. (Squire and Van der Tak). The IBRD were concerned about income distribution precisely because growth in itself, and macro policies directed to growth, did not guarantee a more equitable distribution of income. There was also the point that power structures within societies were inimical to equity and that a degree

of sleight of hand was necessary. Those points seem to be relevant to Ireland. I am not familiar with any macro policies applied here that lead to greater equality.

Third, I am not at all clear what the author is getting at with the concepts of domestic value added. Dr. Ruane thinks it is an attempt to get at social profitability but it looks very much like a static first order value added concept used by economists in a National Accounts sense. I find it to be not very useful as a criterion for selecting projects, as the costs against which it is apparently measured viz. the discounted value of the costs expected to be carried by the State, do not provide a test criterion, ignoring as it does resource constraints. It is in principle always possible to increase value added by changing supply side constraints.

Finally, how many cases exist where a project is commercially viable without a grant, where the firm is domestic and unlikely to go abroad and where no grant is given? The objective should be to give no grant at all to domestic firms which are privately profitable without a grant.

Louis Smith: The objective of the IDA is making jobs, the more skilled and highly paid the better. The means were well chosen – to select the scarce factor inhibiting growth, Enterprise, and by assisting it to increase supply. Tax relief was most successful. Capital grants have the conflicting effect of increasing labour-competitive investment. At the same time the State taxes labour very heavily and progressively heavily on skilled workers compared to competing countries.

Is the extra tax revenue from higher skilled employment reflected in a higher grant to the individual firm in a form they can recognise? Are our present measures promoting skilled employment?

Is the scarce factor of skilled labour the new bottle-neck which should be widened by incentives, such as tax reliefs, to increase supply? It would, for example, be extraordinary for Research and Development to be set up in Ireland if the personnel are far more heavily taxed than in Britain, which is no tax haven.

Have we developed the idea that indirect taxes, such as VAT, which are refunded in full on exports, give much greater relief and incentive to export expansion than our relief of tax on profits of the firm finally exporting? Our relief is very small relative to output.

Does the IDA know the proportion of workers required from each category in Table 1 for individual factories or only globally? Individual knowledge is necessary because grants are assessed for individual firms. Do workers already in employment vacate jobs for those now unemployed? If so, the development makes a positive contribution to total employment. If machinists in clothing move up to use their skills more productively in electronics and others are trained in clothing to follow them, we have a useful upgrading of skills. The concept is interesting but not easily applied.

Grants per job have decreased in nominal and even more in real terms (Table 3). Tax collected per worker has risen steeply. One would have expected the expenditure to have been related to an anti-cyclical policy, or to the number of jobs required, or to real cost/benefit analysis. What is the limiting factor which has so reduced net benefits offered in a depression of business with heavy unemployment? Money is made freely available for the relatively sterile housing sector which produces no continuing employment.

This is a most useful and thought-provoking paper.

Brendan M. Walsh: Among the most valuable material in this paper are the data in Table 1. It is interesting to note that 42 per cent of the recruits to grant-aided industry are taken as having zero opportunity cost. This implies not only that they were earning nothing before being recruited to industry, but also that they would have earned nothing over the 15 year time horizon of the fiscal pay-back calculation. This is surely a most unrealistic assumption, especially for AnCO trainees, but also for the majority of school-leavers. It would be helpful to have this table refined by taking account of how long the people classified as unemployed or school-leavers had been looking for work. This would give

some indication of their prospects of finding work even if not recruited to a grant-aided firm. In any event it is suspect to apply a shadow wage of zero to such a large proportion of the Irish labour force.

The possibility that those transferring to new industry from existing firms do so only in response to higher wages has been underlined by previous speakers. To the extent that this happens, the fiscal pay-off should reflect the extra taxes paid from the increased wages. Furthermore, the repercussions of this inter-industry mobility is a problem that should not be entirely neglected. On the one hand, the mobile employees may be replaced by, for example, people recruited from the ranks of the unemployed or school-leavers. This is the optimistic scenario. The other possibility is that the impact of the new firm on the wage structure of existing industry leads to a loss of employment in these firms, in which case some debit ought to be entered into the IDA's calculations of the net impact of the grant-aided firm.

Sean Nolan: It is an important occasion when the state agency with responsibility for industrial development comes forward to explain some of its methods and procedures. While being extremely grateful to Dr. McKeon for his efforts in producing the present paper, I am left with two fundamental questions which the paper unfortunately leaves unanswered. The first of these concerns the extent to which the project evaluation scheme, as laid out here, is made use of by the IDA – if indeed it is used at all. The second, and more important, question concerns the determination of the level of grant assistance which the project receives.

My doubts concerning the actual use which the IDA make of these methods arise from a number of sources. First among these is an apparent inconsistency in Dr. McKeon's presentation. The IDA lay great stress upon the role of an overall industrial strategy in determining the framework within which individual projects are assessed. The purpose of such a strategy is to allow for external economies of industry, and the creation of inter- and intra-industry linkages, and to select "leader-pioneer" firms which will attract further capital inflow. Given the IDA's commitment to such an overall strategy, I find it somewhat contradictory that "indirect effects" are ignored in project evaluation, for such indirect effects are the very reason one requires an aggregate strategy. The conclusion I draw from this is *not* that the IDA lacks an overall strategy, but rather that the project evaluation techniques suggested here are an irrelevancy in the IDA.

This conclusion is strengthened by the implication I obtain from Dr. McKeon's paper that few, if any, projects are rejected on the bases of economic evaluation – that, in fact, the minimum value-added criterion, and the 4 : 1 ratio which he cites, provide such a high upper-bound on grant payments that the evaluation is redundant. One final statistical point which further supports the conclusion concerns the data requirements of calculating the domestic value-added measure proposed by Dr. McKeon. I find it strange that the IDA should now have *ex ante* profit repatriation data, given Dr. Dermot McAleese's inability to obtain *ex post* profit repatriation in his IDA-commissioned *Profile of Grant-Aided Industry* (1977).

The most important issue which Dr. McKeon's paper fails to confront is the determination of grant payments to a project. The primary advantage of a discretionary grant-giving agency such as the IDA is that it can channel funds directly to those projects which would otherwise not have occurred, while avoiding lump-sum transfers to intra-marginal projects – i.e. projects that would have occurred without aid. One must stress that the argument that one must provide grants to already profitable plants, lest they should locate elsewhere, is valid only for foreign firms – for practically all Irish firms lack such location choice. There is no obvious economic rationale for providing funds to intra-marginal projects; it merely involves an unnecessary expenditure of state funds that could otherwise be used in satisfying pressing social and infrastructural needs.

Given the importance of minimising state expenditure, and avoiding intra-marginal transfers, it is somewhat surprising that Dr. McKeon does not clearly define the method of determining grant levels. There is, in fact, substantial evidence in Dr. McKeon's paper

to suggest that the IDA does not, in fact, avoid such intra-marginal transfers. Firstly, the apparent “rule of thumb” determination of grant levels, the role of administrative guidelines, and of “cost per job” indicators all suggest that little or no attention is paid to the primary economic issue – would the project occur with a smaller grant or no grant at all. As a second piece of evidence, McAleese’s 1977 Survey indicates that grant-aided job gains account for all industrial employment gains, which suggests that all domestic employment-creating projects are in fact grant-aided. Since it is implausible to suggest that *no* domestic investment would occur without IDA assistance, it seems clear that many grants to native industry are, in fact, intra-marginal transfers, and hence an inefficient usage of scarce state funds.

A final, and possibly damning piece of evidence is to be found in Dr. McKeon’s statement that “in many cases, projects could not proceed without the aids provided by the IDA”. A logical corollary of this is that the remaining grant-aided projects could have proceeded without state aid. If *any* domestic projects fall into this second category, it would seem that Dr. McKeon, despite his explicit concern for minimising state expenditure, is implicitly accepting that unnecessary transfers of state funds take place.

In conclusion, while welcoming Dr. McKeon’s paper, I would like to express concern that it inadequately treats two of the central issues involved in project appraisal. He would indeed provide a useful service to Irish social scientists if he were, in a future paper, to explain why the IDA believes that formal project evaluation is of limited relevance – a position which is quite defensible. A clear outline of grant determination, and of the incentives negotiators have to minimise grants, would also be of major usefulness to all interested in the Irish economy and in public policy.