

A NOTE ON COST-EFFECTIVENESS APPROACHES TO DEVELOPMENT WITH PARTICULAR REFERENCE TO INDUSTRIALIZATION IN MALTA

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I GENERAL CONSIDERATIONS

It may be said that cost-benefit analysis is, in some respects, as old as economic science, and in other respects, a new technique. It is a scientific tool which attempts to establish, from different economic standpoints, the relative efficiency of investments.

The main aim of cost-benefit analysis is to act as a guide in the process of decision making. Essentially, in a macro-economic sense, it seeks to establish the costs or disadvantages, and the benefits or advantages, entailed by each of several alternative courses of action.¹ Such courses of action could be different ways of channelling investment from government sources into productive sectors of the economy; or, as in the present context, the efficiency of a given mode of government investment carried out according to a specific blue-print of industrial development.

In this sense, one must distinguish cost-benefit analysis as that form of project appraisal used to assess the viability of, for example, water resource developments, dams, transport and urban developments² from a form of appraisal of, for example, the cost-effectiveness of a government programme for economic growth. We are concerned here with this second type of approach.

¹ Cf. Peacock and Robertson, *Public Expenditure – Appraisal and Control*, London, 1963, p. 18.

² For discussions of several cost-benefit analyses and references to others, see John V. Krutilla and Otto Eckstein, *Multiple Purpose River Development*, John Hopkins Press, 1958; Otto Eckstein, *Water Resource Development*, Harvard University Press, 1958; Jack Hirshleifer, James C. Dettaven, and Jerome W. Milliman, *Water Supply, Economic Technology and Policy*, University of Chicago Press, 1960; Michael Beesley and D.J. Reynolds, *The London-Birmingham Motorway, Traffic and Economics*, Road Research Technical Paper, No. 46, London, 1960, Part II.

It may be useful here to elaborate on the nature of this approach since misunderstandings might arise concerning the goals and the limitations of this type of analysis. In approaching the cost-effectiveness of an industrial programme such as Malta's, one is essentially dealing with two completely different systems. For, one has an industrial programme stemming on the one hand from Government's role as the planner of development and on the other hand from the role of Government's partner (in the mixed economic system) which is the executor of that programme – namely, private enterprise. In effect this may imply different weights and measures as well as, in some respects, different aims.

In the case of Malta, the principal aim of Government policy has been the maximisation of investment measured primarily by the yardstick of employment while the aim of the private sector which has been channelling that investment into productive activity has obviously been the maximisation of profit. This distinction is of vital importance since in an industrial programme such as Malta's, one has two mechanisms at work; that of Government which may be basically socially-oriented and that of private enterprise which is basically economically-oriented.

Hence, in assessing the cost-effectiveness of such a programme, one must bear in mind that one is not necessarily comparing like with like – the benefit of the output may have a meaning for Government which is different from that which the private entrepreneur would give it; thus, for example, the uninhibited operation of the price mechanism is not normally considered by governments to be a useful yardstick of social benefit.

It must therefore be remembered that the effectiveness of private industry in Malta cannot be considered in absolute economic terms for purposes of Government decision making. It has to be a relative assessment subject to the constraints of social utility and to the framework within which industry operates.

This question has no mere academic importance but has also an important practical value. For some may contend that industrial output effected by the constraints of a Government-built infrastructure and of Government legislation and control might not be a good measure of benefit.

These constraints are real. Indeed, when they have reached such an extent whereby price mechanism could offer no guide at all to economic benefits (e.g. areas such as education and health); or where the investment was so large that its costs and benefits could not be conceived as marginal; or where external costs and benefits were very large – in all these areas cost-benefit analysis is well-nigh impossible to apply. On the other hand where, despite the constraints referred to above, the output is sold through the normal market channels and according to the normal price-

mechanism, a cost-benefit approach has its uses.³ The most important consideration, is that however much some may denigrate cost-benefit analyses because of their constraints, one has to admit that since the 1930s⁴ no other process has been developed to assess the cost-effectiveness of government investment.

The problem of the profit mechanism in a mixed industrial programme can to some extent be solved by assigning prices to all goods and services involved in the programme and by trying to ensure that such prices reflect their real costs and their real benefits to society. The difference between such costs and benefits would then be the yardstick of society's gain and would be social profit.

The assumption inherent in the above solution is that 'accounting prices' can be given to social costs and benefits which are quantifiable. It is evident that there is hardly any problem if one is dealing with goods or services which can be given a market value. It might appear that in a cost-benefit analysis of industry, where goods and services are sold, no difficulty arises and that consequently, one could have a completely valid cost-benefit analysis if one has fairly accurate values for outputs and inputs.

In effect, however, this is not always the case, particularly when one is dealing with a programme such as Malta's which implies such a drastic restructuring of the economy that there are bound to be inputs and outputs which are exogenous to pure economic performance. Furthermore, such a programme entails inputs (e.g. training) which produce benefits the measurement of which is not easy to specify or quantify.

We shall deal with inputs and outputs which have a mainly social rather than an economic content in another part of the study. With regard to the second type of inputs referred to in the preceding paragraph certain considerations may be made. The economic benefits of training, for example, may be viewed from three different stand-points:

1. From that of the individual trainee;
2. From that of Government budgeting; and
3. From that of the overall economic situation.⁵

To the individual, the main economic benefits resulting from a training

³ Cf. *Manual of Industrial Project Analysis in Development Countries*, Volume II, Social Cost-Benefit Analysis, (by I. Little and L.J. Mirrilees), O.E.C.D., 1969.

⁴ While the theory of cost-benefit analysis was enunciated by Jules Dupuit in 1844, its real use came into being in U.S.A. in the 1930s with analyses of water resource developments.

⁵ Cf. Ziderman, A., *Costs and Benefits of Adult Re-Training* in the U.K. in *Economica*, November 1969.

course are higher pay and improved job security; his principal costs would be earnings foregone during training and any existing social welfare allowances that would no longer be payable at the higher post-training salary or wage level.⁶

From the standpoint of Government budgeting, the expenditure would include the capital costs of the scheme and the recurring operating costs of running training centres and of disbursing training grants, while the benefits would include the net increase in tax revenues payable on a higher post-training incomes.

+ For the economy as a whole, part of the cost of the training programme would be created by the circumstance that the economic and other resources used in running the training programme would not be available to the economy for use in other ways – a principle, this, which applies to the whole area of Government expenditure on industrial and similar development. The main benefits which accrue to Government through a training scheme take the form of the increase in the output of goods and services resulting from the subsequent higher productivity of the trainees.⁷ In addition there would be several indirect benefits – such as the increased productivity of auxiliary workers operating side by side with the trained men; higher profit margins in those industries employing trained personnel and so on.⁸

The above example has been given in order to highlight the intricacies involved in dealing with the cost-effectiveness of Government investment in industry. If one attempted to carry out such an investigation in depth to cover the whole spectrum of Government investment in all areas which in one way or another affect the social and economic life of the community one would need, apart from several years of research, a very large mass of statistical data relating to each sector of the economy. And even then, because of the considerations made above and because of the many intangible costs and benefits which are interwoven into the texture of any system of economic growth, one would not be sure of a result which would have either meaningfulness or validity.

⁶ Where the trainee was unemployed prior to his embarkment on training the unemployment benefits would be included as part of the cost, but there would be no earnings foregone during training.

⁷ There may, of course, be disadvantages in that, for example, the trained men may send workers of a lower skill out of work. Cf. Burton, A., Wesbrod, *Conceptual Issues In Evaluating Training Programs* in Monthly Labour Review, October 1966, Page 1095.

⁸ Cf. Gerald G. Somers and Ernest W. Stormsdorfer, *A Benefit-Cost Analysis of Manpower Re-Training* in *Proceedings of the Seventeenth Annual Conference of the Industrial Relations Research Association*, December 1964.

In the case of Malta, moreover, such an exercise is ruled out largely by the absence of the relevant statistical data. Indeed, at the present stage of statistical information, it is not yet possible to make a significant cost-benefit assessment of industry broken down in detail by industrial sector. Furthermore, while it may be possible in theory to discuss the effectiveness of investing Government money in one sector of the diversified economy rather than in another (for example, in Industry rather than in Tourism or viceversa) yet it is practically impossible to express a preference in economic terms, for investment in Industry rather than in, say, Education – since Education is in itself an input, albeit not strictly calculable, of industrial development.

It may be pertinent here to quote Dr. McKean of the Rand Corporation 'For one thing, when we set about comparing specific courses of action, we find that it is by no means easy to select good criteria, that is, the tests of the better or best policies. Since all gains and all costs cannot always be measured in monetary units, we cannot use maximum net gain as the test. In desperation we occasionally adopt criteria that are quite irrelevant. Our test of the preferred alternative sometimes turns out to be like that of the high school student who was asked, "Which is more important, the moon or the sun?" and who answered, "The moon, because it gives us light at night, when we need it more".'⁹

A cost-effectiveness approach of industrial development which has validity in Malta is one which aimed at establishing simple cost-benefit ratios over a fairly narrow spectrum of monetary costs and benefits. It would not attempt to take account of the opportunity costs of the resources involved. Nor would it measure the indirect effects of industrialisation to the tourist amenities of a small island or the social effects of factory work as against domestic or other employment. The ratios calculated could not be used to make comparisons with other Government programmes. To assume otherwise would be, in our view, something of a chimera and could produce results which, however sophisticated, could smack of sophism rather than of science.

It must also be borne in mind that a comparison of cost-benefit ratios in the broad spectrum of Government social and economic investment would be a highly subjective exercise. By definition, it would be coloured by the valuer's subjective attitudes to the framework and policy of Government's programme of development. Even if such a comparison could have statistical significance, it would have little relevance for assessing the economic validity of past performance or for guidance in the shaping of

⁹ Roland N. McKean, *Cost-Benefit Analysis and Defence Expenditure in Public Expenditure – Appraisal and Control*, Edinburgh 1963.

future policy. Arthur Smithies has stated that 'Judgement plays such an important role in the estimation of benefit-cost ratios that little significance can be attached to the precise numerical results obtained.¹⁰' While this view may be an exaggeration, yet it is useful not to forget it altogether.

This type of analysis can usefully fulfil three functions in assessing industrial development in Malta:

(a) to show the impact of the industrialisation programme on Government revenues;

(b) to evaluate its effectiveness in creating National Income and contributing to the Balance of Payments;

(c) to assemble data on the actual cost of the principal measures in the incentive package as a first step to appraising their cost-effectiveness.

In Malta the only attempts to evaluate the programme have been confined to relating the costs of grants, loans and factories to the single benefit of employment. Yet there are other costs, for example, tax revenue foregone and administrative costs of the programme, which require deeper assessment. This broader concept of costs should be related to the overall impact of the new projects in generating increased National Income rather than to employment.

THE NATURE OF COSTS AND BENEFITS

It may be said that the essential task for the analyst would be:

- (i) to establish which costs and benefits are to be included;
- (ii) to evaluate and discount them; and,
- (iii) to identify the relative constraints.¹¹

The last part has in fact already been largely covered by the foregoing. We can therefore comment on the other two aspects of the problem.

BENEFITS

At the risk of stating the obvious, one must clearly distinguish between the enumeration and evaluation of benefits.¹² With regard to *enumeration* in the case of industry in Malta, it is evident that many different forms of benefits accrue and it may be difficult to enumerate them all without some measure of double counting. Some benefits may be included in other types

¹⁰ Arthur Smithies, *The Budgetary Process in the United States*, New York, 1955, p. 344.

¹¹ Cf. A. R. Prest and R. Turvey, *Cost-Benefit Analysis: A Survey in Economic Journal*, December 1965.

¹² This matter is discussed at some length in Prest and Turvey, *op. cit.*

See also W.R.D. Sewell, J. Davis, A.D. Scott and D.W. Ross: *Guide to Benefit-Cost Analysis*, Ottawa 1962.

of benefits and different beneficiaries may be deriving benefits which are not always clearly distinguishable.

MAIN BENEFITS

One has again to distinguish between primary or direct benefits and indirect or secondary benefits. In the case of Malta it may be said that the ultimate aim and therefore the main benefit of industrialisation, has been and is, a potential improvement in the welfare and standard of living of the nation as a result of a higher National Income stemming from the contributions made by industry. In the measure that these additions to the wealth of the nation are expressed in a rise in the National Income, it is possible to evaluate benefits through National Income computations. On this basis, one would argue that direct benefits are derived from the expenditure on the products of aided industries either as exports or as import substitutes in the domestic market. It could furthermore be said that industrial enterprises contribute directly to Malta's National Income in two principal ways:

- (i) through remuneration payable to their local employees;
- (ii) through payments for and yields from capital in Malta.¹³

To (i) one would add payments made by industrial enterprises for services received, e.g. professional services. To (ii) one would add rents payable by industries for factories and land.¹⁴

Some criticism may be advanced to the effect that the payment of interest and rent should not be considered as being a direct contribution to National Income on the ground that the contribution to National Income is in this case made by those who provide the capital for plant and machinery and for factory premises.

Such an argument is, of course, a very tenuous one for a variety of reasons. In particular, in a macro approach the overall consideration is not *who* made the contribution to Gross National Product but whether a contribution was made as a result of, and only because of, industrialisation. It is evident that capital inputs imply costs of capital and, if one were to reduce the argument ad absurdum, one would argue that had there been no industrialisation at all, there would have been no capital costs. Equally, it would be somewhat naive to argue that the capital involved in industrialisation could have been used more productively for other investment

¹³ To the extent, of course, that interest is paid on loans locally and that profits are retained in Malta.

¹⁴ One would normally take account of the taxes that a project pays but as virtually every firm in the aided sector has a tax holiday, this is reflected in larger profits. The sum of these payments is the direct contribution for the programme to National Income.

projects – unless one could adduce convincing reasons to show that opportunity costs would have favoured an alternative use of capital.

SECONDARY BENEFITS

It is important not to ignore, in the enumeration of benefits, a wide area of advantages which accrue not only to Government (and to the Gross National Product) and to the industrialists themselves but also to those persons or bodies who thereby increase in one way or another their physical production possibilities or the satisfaction that, as consumers, they can derive from increased productivity.¹⁵

The upshot of this distinction (which admittedly may not be easy to maintain in practice, since there may be benefits which are partly technological and partly monetary) is that one has to eliminate from a cost-benefit assessment those items which are simply transferred or distributed; for one is obviously concerned principally with the increase of output arising from industrialisation and not with the increase in the capital value of assets. Hence changes in the pattern of demand and in the distribution of income may be considered as social benefits arising out of industrialisation not necessarily as pecuniary benefits.¹⁶

The extent to which Malta's National Income benefits indirectly cannot be measured exactly. Indirect benefits, like direct benefits, are just factor payments within Malta but they are the result of the expenditure of the income created as direct benefits. This is the multiplier effect of the factor payments of aided industries. The size of the multiplier is obviously crucial to the resulting cost-benefit ratios.

MAIN COSTS

The main costs of administering the industrial programme for Malta fall broadly into capital costs incurred directly as a result of the investment incentive scheme and the current costs which are principally the annual administrative charges arising out of the implementation of the industrial programme.

COSTS – CAPITAL

The capital costs include grants, loans and payments for factories and for the capital costs of services connected with industrialisation. These services include a certain part of the infrastructure which was directly required by industrialisation. Certain capital costs listed in the budget es-

¹⁵ This important distinction between technological and monetary spillovers is discussed at length in R.N. McKean, *Efficiency in Government Through Systems Analysis*: N.Y. 1958.

¹⁶ Cf. Prest and Turvey, *op. cit.* p. 688.

timates under Industrial Development (e.g. improvements in approaches to the industrial estates) are averaged over a number of years. Grants may be counted as costs according to the manner in which they were disbursed.¹⁷

One must consider loans and factories from a different standpoint to the one that one adopts towards disbursements à fond perdu. For Government, a loan would be an investment. Provided the rate of interest was not concessionary there would be no long-term cost¹⁸ – unless it could be proved that there was a de facto opportunity cost amenable to computation.

It must also be pointed out that though the Government borrowing rate is often used as an easily applicable measure of costs (for the twin reasons of its being a financial cost for investment by Government and because it is a risk-free rate of interest) yet in effect it has not yet been shown that the marginal efficiency of private investment is de facto equal to the interest rate. And even if it were possible to make such a measurement, the significance of the result would only be limited to the area where the costs evaluated were made up completely of displaced private investment.¹⁹ In the event the calculation of opportunity costs for the use of this capital tends to become an academic problem which is not readily open to a satisfactory solution. Again in Malta's instance it is hypothetical, to say the least, to postulate the availability of the funds for industrial development had they been required for purposes other than this investment. Because of these considerations, therefore, considerable caution must be exercised in interpreting the social opportunity cost rate.

COSTS – CURRENT

The principal current costs of industrial development in Malta include the costs incurred, primarily in terms of wages and salaries, in keeping Government staff to operate the programme. In the main, it has been the cost of running the Department of Trade and Industry, and, as from January 1968, the Malta Development Corporation. Some allowance, although necessarily arbitrary, would have to be made for administrative costs incurred by other Government departments involved in the industrial programme.²⁰

¹⁷ This system may not be entirely satisfactory since disbursements on grants varied from year to year; but it is of course difficult to average the grant over the life of the machinery and equipment.

¹⁸ When repayments are deferred or interest is charged at a concessionary rate, the cost to Government would be the difference between the concessionary and the commercial rate.

¹⁹ Cf. Prest and Turvey, *op. cit.* pp. 698-9.

²⁰ This allowance has to be marginal also due to the fact that the Department of Trade and Industry had administrative functions other than those required by the industrialisation programme.

SECONDARY COSTS

Like benefits, so also costs may be incurred in a secondary and external manner. Thus it could be argued theoretically that if a project received some useful input for which it did not pay, this input should be included as a cost and the producer of the benefit would be entitled to an equal recompense. But such wholly external effects would not be likely to be of real significance insofar as Industry itself is concerned.²¹

There are also secondary effects, which are sometimes known as economies arising out of backward linkages. Such effects may arise through a new demand for inputs created by industrialisation itself. Thus the increased demand created by industrialisation for certain inputs available locally could produce economies of scale which are in themselves exogenous to industrial projects.

It would appear that to attempt to assess such benefits vis-a-vis Malta's industrialisation would lead us into an area of over-lapping inputs where it would be extremely difficult to identify the nature and the causality of costs. One would not, therefore, include them.

The use of the ten-year exemption from company taxation in Malta as a major incentive has meant that during the last twelve years, the Government collected virtually no revenue directly from the aided sector. There are no property taxes in Malta that firms are eligible to pay and there are no sales taxes on the products of aided industries. Nevertheless, these firms generated a substantial amount of Government revenue for the income that they pay out to their employees. Moreover, the multiplied income that this generates is part of the Island's tax base. Income tax is paid on this money where it is received as income and indirect taxes as it is spent. The problem of calculating the extent of this contribution to Government revenue would have to be solved by employing a short-run multiplier derived from calculations relating to the growth of the economy as a whole.

II SOCIAL COSTS AND BENEFITS

It is appropriate, in our view, to include a note on social inputs and outputs. Industrialisation brings with it certain changes which though not essentially economic in character and are, in most cases, unquantifiable, leave an imprint on the structure and behaviour of the community. Such changes cover the whole breadth and depth of social activity in an industrialising country.

While, of course, considerations such as the above cannot be taken into account in the present context, yet perhaps it would not be out of place to

²¹ Cf. Little and Mirrilees, *op. cit.* p. 215.

refer to certain changes which are partly social and partly economic.

Thus *tariff protection* and *import restrictions* have provided a favourable local market to certain industries whose products are sold at a higher price than otherwise would be the case. We do not have data to compare prices and whether they are normal or excessively high. To the extent, however, that local market prices are higher than is economically justified, a cost is borne out by the community. The aided industries have been provided with a high volume of public assistance, direct and indirect, and it could be argued that it would be only fair that part of this assistance as well as of all productive activities, would also be enjoyed by the consumer at large in the form of reasonable prices.

Certain inputs of industrialisation stem from the educational and institutional changes which industrialisation itself may have called for. Thus the industrial programme has called for special skills and techniques, new banking facilities and new organisations to deal with the industrial programme and with the emergent economic pattern made possible by industrialisation. Insofar as these are of benefit to the community they may be attributed, as positive factors, to industrialisation. Such factors may in fact have acted (in addition to the incentives discussed in another part of this report) as a catalyst to entrepreneurs.

Again, some of the land used to provide factory space was previously agricultural land. Though there can be little doubt that, in terms of physical space, productivity per square foot is much greater in Industry than in Agriculture, yet there is certainly a cost to the community in the loss of agricultural land. The cost may include higher prices for crops where agricultural output declines as a result of the contraction of land under cultivation.

There is also an intangible but important cost borne by the community due to the utilisation of agricultural land for industry. One refers to problems relating to the landscape – itself one of Malta's most important natural assets and a primary input of its Tourist Industry. Moreover, Industry may have given rise to some measure, however small, of pollution and to noise disturbances.

One must balance against the above, the intangible benefits reaped by the community in Malta as a result of industrialisation. Paramount among these benefits is naturally the ability to buy more goods and services and thereby to improve one's standard of living. There is no doubt that in Malta this has taken place over the decade under study. Here as well there are indirect intangible benefits relating to the cultural and educational uplifting of the community as a result of industrialisation.

One could refer, for example, to the fact that the congregation of workers in factories, with the attendant sociopsychological pressures and the

interplay between individual mores and those of the industrial group to which one belongs, has improved the general standards of life in the rural areas. Hence, the social cost of the exodus of the farms is, in some measure, counter-balanced by the fact that the industrial worker brings to his whole community in the rural area the higher social and educational standards he has acquired from his industrial group on the factory floor.

The foregoing does not necessarily imply that industrialisation in Malta has improved the quality of life in these Islands – which should be the ultimate aim of state-sponsored activity. One cannot say with any certainty that industrialisation has definitely been good for Malta in human terms. But if we look at some of the indicators of the standard of living in Malta, notably consumption and education, one finds ground for satisfaction. Again one could postulate that such advances would have taken place anyway and an industrial programme, with its heavy economic cost to the community, was not necessary to make possible such material progress. To argue in this way, however, is to remain in the area of hypotheses with no hope of pragmatic verification; it would be an argument bereft of scientific objectivity and hence outside our ken.²²

²²The above article formed the theoretical base on which the Department of Economics and of Applied Economics of the Royal University of Malta drew up a confidential report, for the Malta Development Corporation, on a cost-benefit analyses of industrial development in Malta.