COMMISSION
OF THE
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Directorate-General for
Regional Policy

INTERNAL DOCUMENTATION
ON
REGIONAL POLICY
IN THE COMMUNITY

AN APPRECIATION OF REGIONAL POLICY EVALUATION STUDIES

A Comparative Study

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The study "An Appreciation of Regional Policy Evaluation Studies" (ARPES) was undertaken on the initiative of the Directorate-General for Regional Policy. The study was conceived and carried out materially by the International Institute of Management, Wissenschaftszentrum Berlin under the direction of Mr. W.R. Nicol. The results of the study have been condensed in this comparative report which is available in English, French and German.

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The present study does not necessarily reflect the views of the Commission of the European Communities on the subject matter of the study nor does it necessarily anticipate the future attitude of the Commission on the topic.

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This report is based on the results of the individual ARPES country studies which were conducted by the following team members:

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An Appreciation of Regional Policy Evaluation Studies

Introduction

Terms of Reference

The study, An Appreciation of Regional Policy Evaluation Studies (ARPES), has the following terms of reference:

- To catalogue the major studies which attempt to measure the effects of regional policy.
- To provide a typology of the evaluation methodologies used.
- To detail the nature of the techniques used to evaluate the effect of policy.
- To provide critical comments on the techniques used to evaluate regional policy.

The Context of Evaluation

At its broadest level, evaluation can be defined as the examination of the comparative merits of different courses of action (Lichfield, 1975). A comprehensive evaluation study would therefore be concerned with the examination of a variety of aspects such as problem definition and perceptions, goal formulation, policy design, policy implementation features and a broad range of policy effects such as resource and exchequer effects, cost benefit analysis and the impact of (regional) policy on such factors as employment and investment generation in, and the movement of firms to, the assisted areas.

In the context of the ARPES study, evaluation is defined and used in a much more limited and partial way; the evaluation studies which form the basis of this report are those which seek to measure the size of the regional policy effect in terms of job creation, investment generation

and firm movement. As such, this type of study is, by and large, limited in what it can say about regional policy; while the studies provide measures of the size of the policy effect (in either absolute or relative terms) they provide little insight into why policy has had the observed effect or whether an improved effect could be achieved by, for example, a more appropriate policy design or implementation procedure. In addition to this, it is also the case that while the studies examined can determine, subject to a number of reservations, the size of the policy effect, we are generally not in a position to decide whether the identified effect can be regarded as substantial or acceptable or whether, and to what extent, the policy can be regarded as effective or successful. This follows because the goals of regional policy are generally not specified in the form of quantitative targets so that the identified effect cannot be measured or assessed in relation to goal achievement. Even if targets were set, however, this would not solve the problem since the target itself would be open to question. At best then, and to the extent that evaluation techniques can isolate and quantify the policy effect, the most that can be said about the effect of policy is that the situation would have been that much worse had there been no regional policy.

Types of Studies Examined

Given the above noted focus on partial evaluation studies, the following inclusion criteria were used to define the types of studies to be examined:

- The studies should focus on the behaviour of a particular assisted area (AA) variable which regional policy directly seeks to influence, for example, employment, investment, firm movement.

- The behaviour of this "impact" variable is examined with respect to the factors which should influence it; one of these should be regional policy (either as a whole or in terms of its individual instruments).

- A statistical technique should be used to attempt to identify and measure the impact of regional policy (either in absolute or relative terms).

From these criteria, two main types of studies have been identified and examined:

- Macro studies, which are able to separate out the effect of regional policy from that of other variables influencing the "impact" variable and to place a quantitative value on the size of the policy effect. This approach is characterized by the application of techniques such as standardization or regression to aggregate AA data series.

- Micro studies, which use questionnaire and/or interview techniques to examine the extent to which regional policy, among other factors, influenced firms' decisions in relation to employment, investment and location. This approach is not able to establish the quantitative size of the policy effect but rather allows a relative measure of the strength of policy by providing information on whether policy was the most significant factor/played a major role/had little or no impact in relation to employment etc. decisions. In addition, the ranking of regional policy within the range of forces influencing these decisions provides an insight into the relative importance of policy.

The Roles of Macro and Micro Studies within the Context of Partial Evaluation

The macro and micro approaches to measuring the effects of regional policy can be regarded as playing different, but complementary, roles within a partial evaluation of regional policy:

- Macro studies: to the extent that these are able to separate out the effect of policy from those other forces influencing the "impact" variable and to quantify the size of the policy effect, they can be regarded as the only way of reaching conclusions such as - regional policy was directly responsible for the creation of X thousand jobs, £Y thousand of investment or Z hundred relocations into the assisted areas. Thus, if the objective is to measure the size of the policy effect in these terms, the macro approach is the appropriate one to use.

- Micro studies: with a focus of quantifying the size of the policy effect, micro studies of the effect of regional policy can be regarded as having the following supportive and complementary functions:

  - First, by acting as a check on the results derived from the macro approach. As we shall show in the following section, that although a hierarchy of macro approaches can be derived in terms of the desirable attributes of a macro study, even the approaches which can be regarded as statically sophisticated are fraught with many major problems. Indeed, in some cases, the results of the approach used prove to be often highly sensitive to particular features (e.g. choice of policy off period, proxies for variables, time lags etc.). In addition, there are often very substantial differences in the size of the policy effect derived from different approaches or from modifications of a given approach. Given this, it may be possible to use the broad pattern of results from micro studies as a check on macro results. In particular, one can have more confidence in a macro result which showed, for example, that policy was responsible for (i.e. "explained") the major share of firm movement into the AAs when micro studies of locational behaviour also showed that, of the variety of determinants, policy played a major role.

  - Secondly, in terms of the processes which macro (particularly regression) approaches seek to model, micro studies can provide valuable information on processes such as relocation and this information can therefore be used in developing the model of the process under investigation.

  - Thirdly, in terms of the specification of macro (regression) approaches, micro studies of, for example, investment or locational choice determinants can provide information on the potentially relevant variables, time lags etc. to be included in the macro approach.

Micro studies, like macro ones, are not, of course, free of often major difficulties and the problems implicit or inherent in both groups of

approaches will be discussed in the next sections. At this point, however, it should be noted that for micro studies to be able to effectively perform the above roles, the information provided by them has to be accepted as a valid representation of how businessmen perceive the real world. To the extent that reservations have to be made on the quality of micro information then the less suitable are micro studies in terms of performing the above functions.

Section 1 : Macro Approaches to Measuring the Effects of Regional Policy

The focus of this section is to examine the macro approaches and techniques which have been used to measure the effects of regional policy. In particular, emphasis is placed on the relative abilities of the approaches to separate out and identify the effect of policy from those other forces influencing the variable under examination and the extent to which the approach gives an explanation of the identified effect. Initially, our concern lies with the potential of the various approaches to derive what can be regarded as a reliable result; subsequently, the "scores" achieved by the various approaches in relation to potential reliability are set against the problems and difficulties experienced in implementing them.

1.1 The Counterfactual Situation

The major question which macro studies pose and seek to answer is that of how the situation in the assisted regions (e.g. in terms of employment) would have been in the absence of (a stronger) regional policy. This situation has been variably termed the "expected" (Moore and Rhodes, 1973), hypothetical policy off (Ashcroft and Taylor, 1977), counterfactual (Schofield, 1979) or reference (Recker, 1979) position. To the extent that the counterfactual position can be appropriately defined, the size of the regional policy effect can be represented, figuratively speaking, by the gap between the actual and "expected" situations. It is this feature - the quantitative specification of the hypothetical policy off position - which differentiates macro studies from earlier attempts to comment on the effects and effectiveness of policy. At best, the latter could only say that so many thousand jobs, for example, were associated with (as opposed to induced by) regional policy or noted that the situation without regional policy would have been worse, although no one could say by how much, or whether the policy effect was a major or minor one (HMSO 1973-1974).

While the quantitative specification of the counterfactual position can therefore be used to allow a distinction to be made between macro and

other (including micro) approaches, the procedure adopted to define this position can be used to differentiate between the various macro approaches that have been used to estimate the effects of regional policy.

However, before doing so, it is useful to discuss some criteria or "desirable attributes" which evaluation approaches should ideally possess which will then allow a discussion of the relative merits of the alternative approaches in terms of their potential to establish reliable estimates of the policy effect. The extent to which this potential is realized in practise is then subsequently discussed.

1.2 Criteria for Assessing Macro Evaluation Approaches

Since the raison d' être of macro evaluation studies is to derive estimates of the policy effect, an obvious and prime consideration in comparing alternative approaches is the way in which they treat regional policy (as a whole or in terms of its individual instruments). Thus, it is clearly preferable when policy is treated explicitly as opposed to situations where it is treated implicitly, i.e. where its effect is derived by association from the performance of some other variable or component which is presumed to represent the influence of policy (and only policy). Similarly, it is preferable when the policy or instrument effect is directly estimated as opposed to situations where it is derived as a residual calculation.

A related feature to be considered is the extent to which the various approaches are able to isolate out the effect of regional policy from those other forces expected to influence the "target" variable (i.e. those variables which policy, in pursuing its objectives, attempts to directly influence - e.g. employment, investment, the movement of firms into the assisted areas). The processes by which these variables are determined are complex ones, so that each is likely to be influenced by a variety of forces, one of which may be regional policy. Thus, distinctions between the approaches should be made according to the comprehensiveness of the treatment given to other - non policy - forces. In other words, interest here lies with the relative ability to comprehensively specify the counterfactual situation. Thus, for example, an inaccurate specification of the hypothetical policy off position within an approach where the

policy effect is derived as a residual will obviously cast doubt on the reliability of the policy estimate.

Ideally, it is preferable when an apporach not only measures the effect of policy but also helps to explain the process by which policy acted to achieve the observed effect. Thus, a preference can be established for approaches which allow hypotheses on the processes by which policy operates to be tested in comparison to approaches where the policy process is constrained to act in a particular manner or to operate through a particular variable. Thus, for example, where an approach provides an understanding of the process of firm relocation, such information can be invaluable in improving policy design to achieve a higher impact.

Finally, since regional policy is a composite term, reflecting a package of different instruments such as capital subsidies, labour premia, locational controls and infrastructure provision, it is preferable when approaches are able to disentangle the effects of the package to allow estimates of the effects of individual instruments. Again, such information on the relative roles of the various components of the policy package can be invaluable in improving understanding of how policy produces its observed effect and whether, by a redesign or realignment of instruments, could produce a larger effect.

1.3 A Typology of Macro Evaluation Approaches

Figure 1 presents a typology of the macro approaches used to estimate the effects of regional policy.

Figure 1 : A Typology of Macro Approaches

Approach	Technique	Treatment of Regional Policy
Trend Projection	"Naive"	Residual
	Regression	Residual
Standardization	Shift-Share	Residual
	Analysis of Variance	"Associated" Variable
Explicit Modelling	Regression	Regression Residual
		Dummy Variable
		"Intervening" Variable
		Direct Measurement

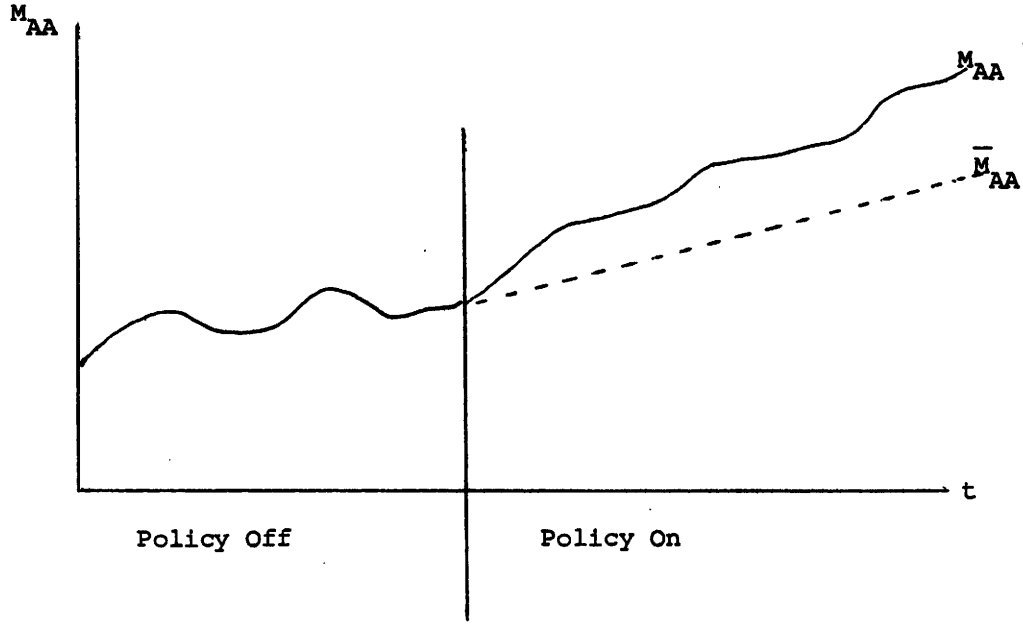
Initially, two features of this typology should be noted. Firstly, it has three levels, relating to the broad type of evaluation approach used (e.g. standardization), to the technique used to implement this approach (e.g. shift-share) and to the way in which regional policy is treated (e.g. as a residual).

Below, the ways in which these various approaches have been used to measure the effects of regional policy are described and assessed in relation to the above-noted "desirable attributes". It should be noted that the above typology is based on those approaches which have actually been used to estimate the size of the policy effect; approaches which could be used but which, to date, have not been used to this end are not considered.

1.3.1 The Trend Projection Approach

The essence of the trend approach to evaluation is the examination of an assisted area series over time, the central hypothesis of the approach being that, ceteris paribus, the introduction or strengthening of regional policy should result in an improvement in this series. A crucial prerequisite for the application of this approach is the clear ability to distinguish between periods of no (or passive) and active regional policy. If the assisted area series begins to improve around the time when policy clearly moved into an active phase, this provides a priori support that the improvement can be related to regional policy. The size of the policy effect is derived as the difference between the actual situation and the projected policy off, or counterfactual position, as shown in figure 2, using the example of the movement of firms into the assisted areas (M_{AA}).

Figure 2 : The Trend Projection Approach



In this example, it can be seen that a notable improvement in M_{AA} occurs as policy moves from its passive to its active phase, thereby providing a priori support for the contention that this improvement is due to regional policy. The policy effect is measured as $(M_{AA} - \bar{M}_{AA})$.

The trend projection approach has been implemented in two ways. The "naive" approach is that of taking some average policy off value (e.g. moves into the assisted areas) as representing the counterfactual position. It should be noted that, where this approach has been used (Moore and Rhodes, 1976; Ashcroft and Taylor, 1977, 1979) the estimates thereby derived have been used simply to provide a rough order of magnitude of the policy effect to act as a check on the results derived from other, more sophisticated approaches. This rather cavalier approach should not, however, be unduly dismissed since, as will be shown later, it provides results which are roughly in agreement with those of more refined approaches.

A second way of implementing this approach is to use a regression model to fit a trend line to policy off observations. This is then projected into the policy on period to provide the hypothetical policy off position. The only example of this approach is found in Germany (Recker, 1979) where it has been used to estimate the effect of policy on employment and investment. The model used by Recker to define the counterfactual or reference development is:

$$I_{r_t} = a_r + b_r T + c_r K_{r_t}$$

Where : I_{r_t} = investment in region r in year t

T = time, T going from 1 to 11 (1962-1973)

K_{r_t} = business cycle variable for region r in year t.

Recker's model therefore includes a trend variable (T), representing all long run influences on the region and a cycle variable (K) which is defined as the deviation of real investment (employment) from the long run trend, i.e.

$$K_i = \frac{\text{real investment}_i}{\text{investment trend}_i} \times 100$$

In terms of the "desirable attributes" noted above, the trend projection approach has a low "score". The approach can be characterized as measurement devoid of explanation. On the one hand, no explicit treatment is given to regional policy; rather, the policy effect is derived as a residual - that part of regional change which cannot be attributed to or associated with the development of the past. On the other hand, the non-policy world is taken as a fait accompli, the major concern of the approach lying with the specification of the counterfactual position. In such a case, the accuracy of the policy estimate obviously rests highly on the ceteris paribus assumption that, of the factors influencing the impact variable, the only difference between the two periods was the introduction (strengthening) of policy. Thus for an accurate specification of the counterfactual position, all other factors operating in the policy off period should continue to act in the same manner, magnitude and direction in the policy on period and no new forces should operate in the policy on period which did not operate in the policy off period. The validity of this approach to measuring the effect of policy depends heavily, therefore, on the quality of argumentation or supportive evidence brought to bear to show that these conditions hold in general.

In the examples found for the trend projection approach, it has been used to derive an estimate of the rough order of magnitude of the total policy effect with, perhaps for obvious reasons, no attempt being made to isolate the effects of individual policy instruments.

Finally, although a preference for the trend via regression approach could be easily justified, the above comments on the trend projection approach are equally valid for both of the ways in which this approach has been operationalized.

1.3.2 Standardization

The standardization approach to measuring the effects of regional policy is concerned with breaking down changes in regional growth performance (e.g. employment) into various components of change, each attributable to the influence of specific forces, including regional policy. Thus, for example, an obvious non-policy force to be considered when examining

differences in regional employment growth rates is industrial structure, since a general characteristic of problem regions is that they have industrial structures with a heavy concentration of nationally declining industries, which can be expected, ceteris paribus, to depress regional performance relative to the nation.

The most frequently used method of implementing the standardization approach is shift-share, which has been applied to estimate the effect of policy on employment (Moore and Rhodes, 1973, 1974, 1976a, 1976b; MacKay, 1976; Moore, Rhodes and Tyler, 1977), investment (Moore and Rhodes, 1973, 1974; Blake, 1976; Begg et al., 1976; Ashcroft, 1979; Rees and Miall, 1979) and the movement of firms to the Development Areas (MacKay, 1979). The shift-share technique focuses on the gap between actual employment change in a region (AEC) and the regional share or national growth component (NGC) (the latter representing the change in regional employment which would have occurred had the overall national average rate of growth applied to all industries in the region) and breaks this gap down into two components, structural (SC) and differential (DC).

$$\text{i.e. } AEC - NGC = SC + DC$$

In using shift-share to estimate the effect of policy, the implicit, underlying theory is that differences in regional growth rates are partly caused by structure. Thus, by removing the effect of structure from the data series examined, via the application of shift-share, allows the opportunity to concentrate on those other forces, including regional policy, which can also be expected to influence regional growth rates. Accordingly, the use of shift-share can be interpreted as transforming the implicit model from:

$$Nr = f\ (IS,\ X)$$

to

$$N_r - \bar{N}_r = g\ (X)$$

Where : Nr = regional employment

IS = industrial structure

X = other factors

$\bar{N}_r$ = structurally adjusted regional employment.

The structurally adjusted series ($\bar{N}$) can, under certain conditions, be taken to represent the hypothetical policy off position, so that the "expected" level of employment represents the base year employment level plus the regional share plus the structural shift. The gap between the actual and "expected" positions is therefore equivalent to the differential shift. Thus, any difference between the actual and "expected" positions is due to factors other than structure (i.e. X in the above model).

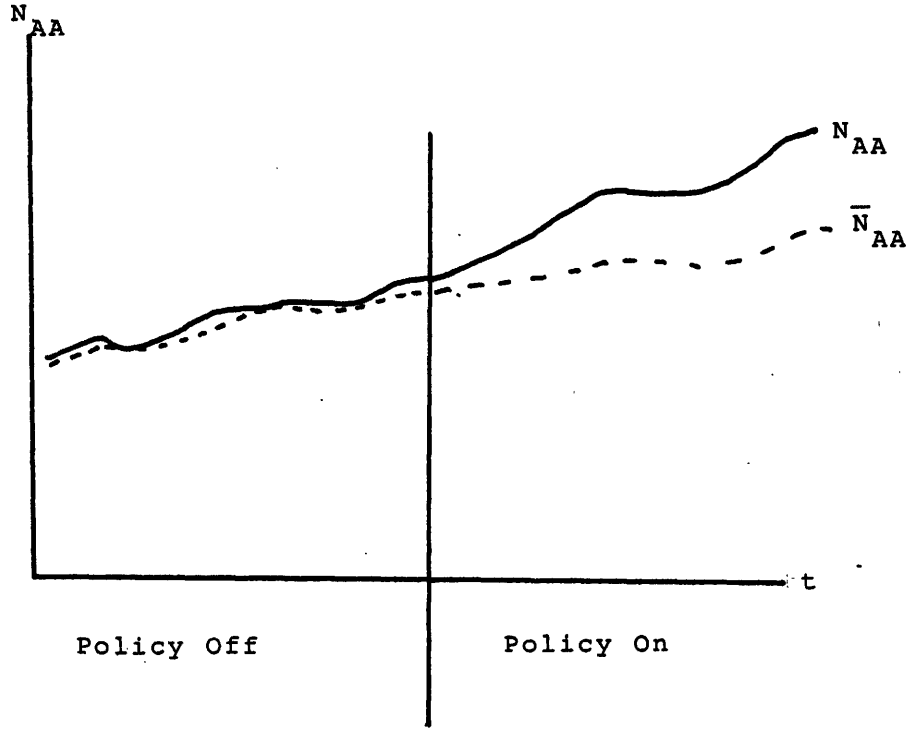
The next stage of this procedure is to examine the extent to which regional policy is a major factor explaining the ($N - \bar{N}$) difference. In general, the approach adopted has been to take the gap between the actual and "expected" positions as broadly representative of the rough magnitude of the regional policy effect, so long as, in a manner similar to the trend projection approach, the following conditions are met:

- In the policy off period, the actual and structurally adjusted series should closely coincide ($Nr - \bar{N}_r \approx 0$) but should begin to diverge ($N_r > \bar{N}_r$) around the time that policy moves into its active phase thereby providing a priori support, that the emergence of the gap between the actual and "expected" positions is attributable to policy.

- Argumentation should be brought to bear to show that, of the other factors which could have influenced regional growth performance, only regional policy could have operated in a manner (in terms of timing and direction) consistent with the observed change.

The following example (taken from Moore and Rhodes, 1973) shows how shift-share has been used to estimate the effect of policy.

Figure 3 : The Shift-Share Approach

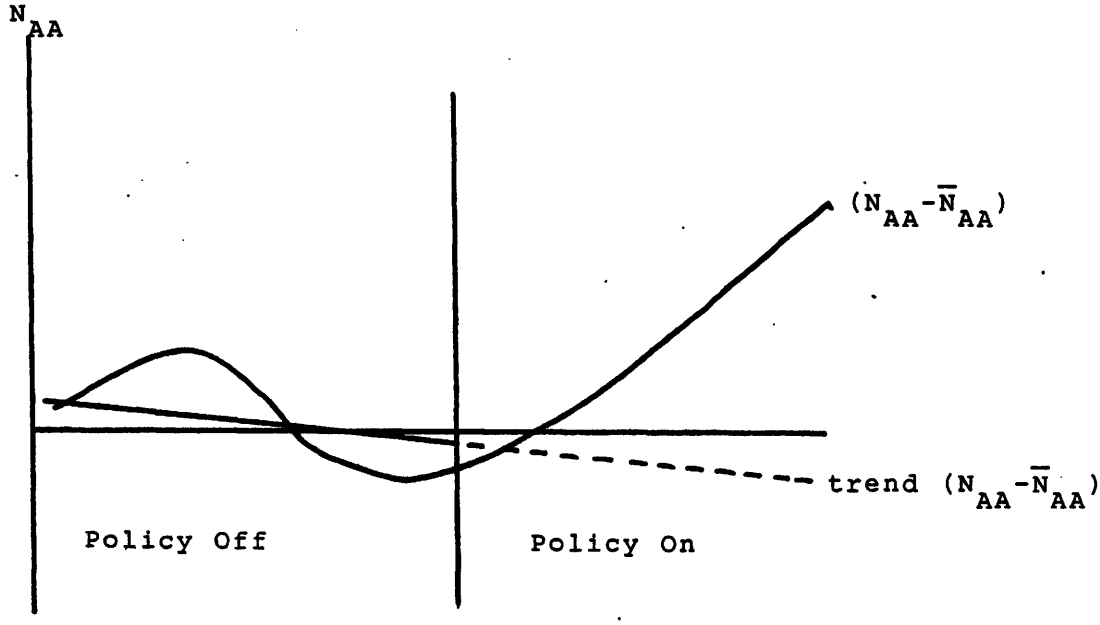


In figure 3, it can be seen that, in the passive policy phase, the actual and adjusted series closely correspond, but begin to diverge at the time when policy enters its active phase. This suggests that structure, by and large, was the main factor in the policy off period explaining differences in regional performance. Thus, so long as the only major difference between the policy off and policy on periods was the strengthening of regional policy, the gap $(N - \bar{N})$ can be tentatively taken as a rough measure of the policy effect. It should be noted that the researchers using this approach have generally reported a considerable body of supportive evidence to suggest that the above procedure identifies the policy effect.

It is clear, however, that industrial structure alone provides a less than adequate explanation of differences in growth performance at the

level of the individual region; factors other than structure are in operation even in the policy off period, as revealed by the fact that the actual and adjusted series do not often correspond closely in the passive policy period (Moore and Rhodes, 1974; Begg et al., 1976; Ashcroft, 1979). Indeed, Moore and Rhodes (1973) note that the correspondence between actual and adjusted series at the composite Development Area level, "...is a rather remarkable coincidence..." (p.95). To overcome this, the procedure adopted has been to combine standardization and trend projection approaches, as shown in figure 4.

Figure 4 : The Modified Shift-Share Approach



As seen from figure 4, the modified procedure is to fit a trend line to the policy off values of the $(N - \bar{N})$ series which is then projected into the policy on period. The size of the policy effect is then given by the gap between this projected trend and the actual policy on values of the $(N - \bar{N})$ series. This modification rests on the assumption that the other, unspecified, forces which operated in the policy off period

(causing $N_r \neq \bar{N}_r$) continue to act in the same direction and amplitude in the policy on period.

Further examples of the use of shift-share to estimate the effects of policy on investment and movement can be provided. For investment, Begg et al., (1976) derive the expected series as follows:

$$S_{i_{60}} = \left[\frac{I_{i_{60}}}{I_{i_{58}}} \right] a_{i_{58}}$$

Where : S_i = standardized investment for Scotland in industry i
I_i = UK investment in industry i
a_i = Scottish investment in industry i
58 = 1958, the base year (policy off)
60 = 1960, a policy on year.

In this example, standardized investment is calculated on the assumption that Scottish investment in a given industry grows at the same rate as its UK counterpart. Scottish investment in the policy on period, over and above this "expected" level, can then be tentatively attributed to the effects of regional policy.

For the movement of firms into the Development Areas, MacKay, (1979) derives the expected movement series as follows:

$$\hat{M}_{DA_t} = \left[\frac{\bar{M}_{DA}}{\bar{FC}} \right] FC_t$$

Where : $\hat{M}_{DA_t}$ = expected movement into the Development Areas

$\bar{M}_{DA}$ = annual average movement into the Development Areas over the policy off period

$\bar{FC}$ = annual average level of factory completions over the policy off period (GB)

FC_t = actual level of factory completions (GB), t referring to policy on years.

This "factory demand" approach can be interpreted as implicitly based on an investment demand movement model, focusing on factory expansion as a form of investment closely related to the movement decision, suggesting that movement is associated with major expansions, so that the more firms are interested in adding to capacity, the greater is the opportunity of policy to encourage movement. The approach suggests that, without policy, a certain proportion of factory completions will result in movement, so that any addition to this expected level in policy on periods can be taken as a rough guide to the size of the policy effect.

Before proceeding to the second way by which the standardization approach has been operationalized (analysis of variance), the shift-share procedure can be examined against the "desirable attributes". In this context, it can be seen that many of the criticisms raised concerning the trend projection approach apply equally to shift-share. Thus, for example, the prime concern of shift-share is with the establishment of the counterfactual position; no explicit treatment is given to regional policy, the effect of which is derived by association from improvement in the differential component, the latter being calculated as a residual, i.e. the policy effect is that part of improvement which cannot be attributed to structure. Indeed, it has been shown that as soon as minimal conditions are not met, the approach has to be modified in a way which takes us quickly back into the realm and associated problems of the trend projection approach. The similarity of these two approaches is well illustrated by an example of the application of shift-share to investment (Rees and Miall, 1979) where expected investment is calculated as follows:

$$\hat{I}_{ir_t} = (\bar{S}_{ir})\, I_{i_t}$$

Where : $\hat{I}$ = expected investment

I = actual investment

$\bar{S}$ = the region's share of national investment in the policy off period

i = industry i

r = region r

t = year t, referring to policy on years.

This procedure could equally be defined as a (share) projection approach, resting on the assumption that, in the absence of a stronger policy, observed shares would have been maintained, so that any improvement in shares can be associated with the effects of policy.

In order to overcome two problems of the shift-share approach - that the residual (policy effect) contains random error and that tests of the significance of the components of change cannot be conducted - a second standardization approach, using analysis of variance, has been used (Buck and Atkins, 1976). The following model was used to derive estimates of the structure and differential components:

$$G_{ir}W_{ir} = a_iD_iW_{ir} + b_rD_rW_{ir} + U_{ir}W_{ir}$$

Where : G_{ir} = growth of employment in industry i in region r

D_i = dummy variable for industry i

D_r = dummy variable for region i

W_{ir} = weight of industry i in region r

U_{ir} = residual random error.

As with shift-share, improvement in the differential component is attributed to or associated with the effect of policy. The latter is measured by the term $(br - \Sigma_r W_r b_r)$.

If the above model were to give perfect explanation, then the structure and differential components should sum to the difference between national and regional growth rates. In fact, however, the residuals are often large. Buck and Atkins suggest that this need not reject their hypothesis, arguing that large residuals result from instability in the two components which arises because of undetected structural and differential effects of undetermined causation which is not stable across all industries in a region.

An alternative explanation is, however, available (Ashcroft, 1979). The technique used by Buck and Atkins allocates only systematic changes to

the estimated components. Thus, the dummy variable Dr reflects the tendency for all industries in a region to grow faster or slower than their national counterparts. In other words, by associating differential improvement to the effect of policy, the analysis of variance approach looks for a general, industry-wide effect of policy since only systematic change is allocated to the differential component. However, there is considerable evidence to suggest that the effect of policy is concentrated only on a few industries, rather than systematically improving the performance of all industries in a region. Thus, any non-systematic effect of policy will go into the residual, suggesting that the large residuals contain some element of the policy effect. This suggests that the estimates derived by Buck and Atkins should be treated as minimum estimates of the policy effect. The above considerations serve to cast doubt on the contention of Buck and Atkins that their approach to estimating the policy effect - in particular that they derive an estimate which does not include random error - is preferable to the shift-share approach.

Many of the problems of the standardization approach - regardless of the way in which it has been operationalized - arise because the approach attributes improvement in the differential component to the effect of regional policy. Obviously, it is preferable to test whether this is in fact the case. In this respect, two approaches have been developed which combine the standardization and explicit modelling approaches. The first of these (Del Monte, 1977; Ashcroft, 1979) takes the structurally adjusted investment or employment series as the dependent variable and regresses this on policy and other factors. The second approach (Moore and Rhodes, 1976a) includes structurally adjusted employment as an independent variable in a model of indigenous employment performance. These examples take us into the third main evaluation approach - explicit modelling.

1.3.3 Explicit Modelling

This approach to estimating the effects of regional policy is characterized by the application of regression analysis to an explicit model of the process under examination (e.g. the movement of firms into the Development Areas). By comparison, the other approaches already examined contain no model (trend projection) or only an implicit model (standardization) of the forces influencing the "impact" variable. The explicit modelling approach is based on a clearly defined and theoretical model of the factors expected to influence the dependent variable and the processes by which they do so. The specification of the model spells out these features as well as the assumptions on which the model is based. Thus, to the extent that an acceptable model can be developed, this approach not only can provide an estimate of the size of the policy effect but can go some way to answering questions on why and how policy has had the observed effect.

In the studies examined, only the technique of regression analysis has been used to implement this approach. Within this category, however, we can distinguish four different approaches, these relating to how policy is treated in the approach and how the policy effect is derived from the model used. These alternative approaches are:

- No policy variables enter the model, so that the effect of policy is incorporated in the regression residual.
- Policy is treated as a dummy variable.
- The effect of policy on the dependent variable is specified in terms of the effect of policy on some "intervening" variable.
- Policy enters the model as an independent variable, directly measured in terms of scale or strength.

Regression Residual: In this approach, non-policy models (i.e. explicitly excluding any measure of policy) are specified, so that the effect of policy is picked up in the regression residual. Examples of this approach have been found only in the Netherlands (Vanhove, 1961;

van Duijn, 1975). In both cases, cross-sectional models of regional industrial employment are specified and the regression residuals are compared with the regional policy status of the various regions. The expectation is that when regions are ranked according to the size of their regression residual, ex hypothesi, the assisted areas will display the largest residuals. Thus, assisted areas should have large positive residuals, implying greater growth than expected on the basis of the non-policy model, this then being attributed to the effect of regional policy. The authors justify the use of this approach in terms of the difficulties associated with deriving measures of the strength of policy.

As an example of this approach, van Duijn's preferred equation is:

$$W_{ir} = f\ (A_{ir},\ S_{ir},\ I_{ir},\ B_{ir})$$

Where : W = percentage growth of industrial employment (1962-1970)

A = unemployment rate (1965)

S = industrial structure, measured as the share of steel and chemical to total employment (1963)

I = degree of industrialization, measured as the percentage of labour force employment in industry (1963)

B = population density (1965)

i = industry subscript

r = regional subscript.

Since positive residuals imply greater employment growth than expected on the basis of the model, and since this is attributed to regional policy, one would expect the twenty assisted areas in the top half of the list of forty regions as measured by the size of the residual. In fact, van Duijn found that only eleven appeared there, although, of the nine regions with the largest positive residuals, seven were assisted areas while, of the nine regions with the largest negative residuals, seven were non assisted. In Vanhove's study, only five of the nine assisted areas displayed positive residuals.

The obvious main limitation to this approach is the presumption, similar to that made in trend projection and shift-share, that only the policy effect is, by and large, contained in the residual. The latter will, of course, not only contain random error, but also any error due to omitted variables, model misspecification etc.[1] To the extent that systematic influences are not included in the model, this will invalidate the presumption of the approach that the only systematic influence operating through the residuals is regional policy. Thus, one cannot be certain that the residuals, ranked by size, reflect the degree of policy success. In addition, by explicitly excluding policy variables which can be expected to directly influence the dependent variable and which are likely to be correlated with some of the independent variables, this will result in biased estimates of the regression coefficients and residual variances.

Vanhove and van Duijn note these problems but justify the use of this approach in terms of the difficulties associated with deriving measures of policy strength. The limitations of the approach explain why they do not attempt to quantify the policy effect by subtracting estimated from actual employment change. Instead, they prefer to draw "softer" conclusions such as policy has been more successful in region A than in region B; the approach does not allow them to say how effective it has been in either region.

In addition, not only is this approach largely confined to examining the impact of the regional policy package as a whole, but it is also unable to take account of differences or changes in the strength of policy over time or between areas - the only distinction really made is that of policy or no policy.

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1. In both the Vanhove and van Duijn studies, such problems can be expected to arise. Independent variables are generally measured in terms of levels and dependent variables in terms of rates. In particular, both specify linear relationships between W and I, when a non-linear one appears more appropriate. A large share of industrial to total regional employment can be expected to induce further industrialization in a region only up to a certain stage of development whereafter it will lose ground to tertiary development.

Dummy Variables: A second way by which policy has been treated within the explicit modelling approach is to introduce a dummy variable to take account of the effect of a particular policy instrument (MacKay, 1976; Ashcroft and Taylor, 1979) or of the effect of policy as a whole (Erfeld, 1979). The dummy variable is then used to distinguish between policy (or instrument) off (D = O) and policy on (D = 1) periods or between non-assisted (D = O) and assisted (D = 1) areas. Again, as was noted for the approach using regression residuals, the use of dummy variables was regarded as a second best way of incorporating policy components given problems of directly measuring their strength.

The distribution component of Ashcroft and Taylor's generation - distribution model of industrial movement can be used to illustrate this approach. Their model is:

$$\frac{MDA}{M} = f\ (A,\ II,\ SDA,\ IDC,\ D)$$

Where : $\frac{MDA}{M}$ = share of moves going to the Development Areas

A = Development Area attractiveness (measured as the ratio of regional unemployment to unemployment in the South East)

II = investment incentives

SDA = Special Development Area policy

IDC = Industrial Development Certificate

D = Local Employment Act (1960) dummy variable where D = O, 1952-1959, 1963-1971 and D = 1, 1960-1962.

The expectation here, in using a (shift) dummy, is to determine whether the value of the equation intercept is significantly different between the periods when the instrument was and was not in operation. Thus, if the value of the intercept is significantly different between these two periods, then an effect for that instrument is established.

The acceptability of using the dummy variable approach to incorporate regional policy depends on the extent to which the dummy variable incorporates only the availability or non-availability of regional incentives and, accordingly, on the comprehensiveness of the specificication of the non-policy component of the model. To the extent that other

systematic differences between non-assisted and assisted areas or between policy off and policy on periods are not explicitly included in the model, these will be picked up by the dummy variable which will then not accurately reflect the effect of policy.

In terms of the treatment of policy, little distinction can be made between the dummy variable approach and those others discussed above which treat policy as a residual. Like them, the dummy variable approach only makes the crude distinction between policy and no policy, thereby allowing no distinction to be made within the assisted areas or within policy on periods in terms of the strength or intensity of policy. Thus, Erfeld (1979) is unable to take account of the differences in the preferential rates of award which vary between assisted areas as well as between applicants.

Intervening Variables: In this approach an indirect rather than direct relationship between policy and the dependent variable is postulated, whereby policy influences the latter only via its effect on another, "intervening" variable which directly influences the dependent variable. Thus, rather than saying that investment incentives have a direct influence on investment, this approach says that incentives influence investment only via the former's influence on the assisted-non assisted area cost of capital difference (Graziani, 1973) or via their effect on the regional rate of interest (Erfeld, 1979).

Graziani, in examining investment in the Mezzogiorno, hypothesises this to be influenced by two main factors, demand and regional policy. Using a dual population hypothesis to differentiate between multinational/ multiregional firms in the Mezzogiorno and local firms, the model for the latter group is:

$$I_L = f\ (\Delta YM,\ DCK)$$

Where : I_L = gross industrial investment in the Mezzogiorno by local firms

ΔYM = change in gross industrial product in the Mezzogiorno

DCK = cost of capital difference between the North and the South, on the assumption that local firms raise their capital externally.

For the multinational/multiregional group of firms, ΔYM refers to the North and DCK is calculated on the assumption of internal financing. In this example, the effect of policy on investment is therefore defined as operating through its effect on the North-South cost of capital difference.

Erfeld uses a somewhat similar approach as one of the variety of ways of investigating the effect of regional incentives on investment in Germany. Erfeld's "intervening" variable mechanism is the regional rate of interest so that policy is seen as influencing investment via its effect on lowering the regional rate of interest. The latter is defined as:

$$RZINS_t = (1-FOERDER_t)\ NZINS_t$$

Where : RZINS = regional rate of interest
NZINS = national rate of interest
FOERDER = preferential rate of regional policy
t = time subscript

and RZINS is then inserted into a variety of investment models to test for the effect of policy.

Thus, both of these examples measure the effect of policy in terms of its impact on some other, non-policy variable which then enters regression models of regional investment as an independent variable.

The major problem of this approach is that it unnecessarily constrains the mechanism(s) by which policy achieves its effect. The above examples therefore require the assumption that incentives influence investment only via their effect on the cost of capital. To the extent that incentives influence investment via other routes (e.g. via a liquidity effect) the effect of policy will be inappropriately defined.

Direct Measurement: The final way by which policy has been treated in explicit models is to enter policy variables into regression models as independent variables, directly measured according to their value or strength. By comparison, the regression residual and dummy variable approach measure policy only in its simplest form - the availability or

non availability of incentives - while the "intervening" variable approach, although measuring the strength of policy, predefines the route or mechanism whereby policy will influence the dependent variable.

Within the direct measurement category, a distinction can be made between "volume" and "strength" measures of policy. Of the "volume" or scale measures, one approach has been to use a scaling or points system, where a region is awarded points for particular policy-related attributes. Where this approach has been used, it has generally been used to examine the influence of infrastructure (Paelinck, 1972; Spanger and Treuner, 1975; Bartels and Roosma, 1979) - a major element of regional policy in some countries, but one which has been largely ignored in evaluation studies.

Paelinck's reduced form model is:

$$E_i = f\ (D_i,\ S_{L_i},\ P_i,\ G_i)$$

Where E = employment growth
D = population growth
S_L = employment share in agriculture in adjacent regions
P = population growth in adjacent regions
G = regional policy variable
i = regional subscript

Here, Paelinck examines the influence of infrastructure on employment in the Dutch regions by awarding points (0, 0.5, 1) for the following aspects - assisted area status and presence of development nuclei, existence of particular types of infrastructure, existence and strength of public and semi public service sector and existence of regional centres. Apart from the problem that, in the above example, questions can be raised in terms of whether or not all of the indicators used reflect elements of policy, thereby casting doubt on whether the estimate derived reflects only the effect of policy, a general weakness of this approach is revealed - the arbitrariness of the weighting or scoring system. Thus, for example, an equal score given to assisted area status and presence of a regional centre, implies that they have the same weight in influencing regional development. Alternatively, can we

be sure that the different scores given to factors adequately reflects the different roles they play in regional performance?

A second group of examples using "volume" indicators of policy refers to those cases where measures of policy output such as expenditure in regional incentives (Bölting, 1976; Erfeld, 1979) or the number of refusals or approvals for IDC policy (Beacham and Osborne, 1970; Bowers and Gunawardena, 1979) are used to define particular policy instruments. Bölting, for example, uses a variety of investment models to examine regional investment performance and the influence of investment incentives. Policy enters his model as follows:

$$I_{r_t} = f(\ldots II_t \ldots)$$

Where I_{r_t} = gross investment in region r in year t

II_t = expenditure on regional incentives in year t.

A problem implicit in this approach to measuring the policy component of the model is that this approach specifies a uni-directional causation between investment and incentives expenditure whereby an increase in the latter should result in an increase in the former. It is equally possible, however, that an increase in investment gives rise to an increase in expenditure on regional assistance, e.g. when growth results in over-heating in some areas thereby stimulating movement to the assisted areas and thus reversing the specified causation, causing policy to become endogenous rather than exogenous.[1] Such a problem can also be expected to arise when the strength of policy reacts to the state of the economy, a feature particularly observable in the case of disincentive policies such as the IDC, given fears that their strict application in periods of low growth could result in an unacceptably high level of resource costs (Nicol, 1979).

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1. A similar problem arises in other studies, outside the explicit modelling approach, which also use volume or scale measures of policy. Louis (1976), for example, regarded policy as having been effective when the ratio of policy associated employment to total employment in a region exceeded the ratio of policy on to policy off average employment growth rates for that region. In addition, the use of policy associated (as opposed to induced) employment can lead to the conclusion that policy was effective even, for example, when regional incentives were regarded as a windfall gain (and, therefore, not influencing decisions).

"Strength or intensity measures of policy can be regarded as transformations of the raw data provided by policy, but in a way, unlike the "intervening" variable approach does not necessarily predefine the route by which the instrument achieves its effect. Thus, for example, investment incentives have been measured in terms of their net present value, labour premia as a proportion of the wage bill and disincentives in terms of refusal rates (i.e. the share of refusals to applications). This approach to measuring the strength of policy within explicit modelling is quite common, with examples being found in most countries of the European Community (Moore and Rhodes, 1976, 1976a; Bodson, 1977; Del Monte, 1977; Van Hammel, Van Delft and Hetson, 1977; Ashcroft and Taylor, 1977, 1979; Bowers and Gunawardena, 1979).

The following example from Moore and Rhodes (1976) which examines the effect of regional policy on the movement of firms to the Development Areas can be used to illustrate this approach. Their model is:

$$MDA_t = a + bMU_t + cIDC_{t-1} + dII_{t-1} + e\ REP_{t-1}$$

Where : MDA = movement of firms to the Development Areas
MU = male unemployment, a proxy for the pressure of demand
IDC = Industrial Development Certificate, measured in terms of the (employment) refusal rate
II = regionally differentiated investment incentives, measured in net present value terms
REP = Regional Employment Premium, measured in terms of an index of its initial (1967) value.
t = time subscript.

Apart from the above "typical" example of the explicit modelling approach with the strength of policy directly measured, the following two examples of combinations of explicit modelling/direct measurement and other approaches can be given.

Moore and Rhodes (1976a) combine explicit modelling and shift-share standardization by including the structurally adjusted employment series as an independent variable in their model of indigenous employment:

$$AIE_t = a + bMU_t + cEIE_t + dII_{t-1} + eREP_{t-1}$$

Where : AIE = actual indigenous employment
MU = male unemployment
EIE = expected indigenous employment (i.e. the adjusted indigenous employment series)
II = investment incentives
REP = Regional Employment Premium.

In Italy, Del Monte (1977) combines explicit modelling with both trend and standardization. Trend enters as an independent variable in the model while the effect of structure enters via the transformation of the dependent variable from actual to expected employment. His basic model is:

$$\Delta L = f\ (T,V)$$

Where : ΔL = the differential employment shift in employment, derived by applying shift-share to the actual employment series.
T = trend. In explaining the growth or change of ΔL, he therefore assumes, by incorporating time as a variable, that the dependent variable experiences autonomous growth.
V = value of regional incentives.

Given this description of the explicit modelling approach and the various ways by which policy has been incorporated, we can now turn to a discussion of, initially, how the approach in general and, subsequently, each of its sub-categories, fares in relation to the "desirable attributes".

Certainly the explicit modelling approach has the major advantages over the others examined in that it has the highest potential to perform two tasks. First, it has the highest potential to comprehensively define the counterfactual position or non-policy world. In principle, and based on a priori reasoning, all the major factors expected to influence the dependent variable can be entered as independent variables in the model and tested for significance and explanatory power. Secondly, to the extent that the models specified are theoretically acceptable, not only

measurement but explanation can be provided of the process under investigation. However, once attention is turned to the ways by which policy has been incorporated in this approach, considerable differences between the four sub-categories are found.

The regression residual approach can be seen as displaying little superiority over the trend and standardization approaches. Like them, no explicit treatment is given to policy, the only distinction that can be made is that of policy or no policy, no possibility existing to incorporate other variations in the availability, scale or intensity of policy over time or between (and within) assisted areas, and the effect of policy is derived as a residual. Similarly, the obvious limitation of explicitly excluding policy from the regression model is the presumption that the regression residual reflects, by and large, the effect of policy and only policy. The residual will, of course, not only contain random error, but also any other errors due to omitted variables, model misspecification and so on. Thus, to the extent that other systematic influences are not included in the model, this will invalidate the presumption that the only systematic influence operating through the residual is regional policy, thereby casting doubt on the reliability of the policy conclusions drawn from this approach. Thus, one cannot be certain that the residuals, ranked by size (as in the Dutch examples) reflect the degree of policy success. The final point to be made concerning this approach is that it is not well suited to disentangling the effects of the policy package to provide an idea of the relative success of the various instruments of policy.

While the use of dummy variables to include the effect of policy can be regarded as an explicit treatment of policy with the effect of policy then directly estimated, this approach still suffers from some of the deficiences noted above for the other approaches. Again, the only division made is that between the availability and non-availability of regional aids, no other differentiation being possible. Thus, for example, Erfeld's (1979) use of this approach does not allow any distinction to be made between the differential rates of award which apply between and within assisted areas, nor the fact that awards are of a discretionary rather than automatic nature, so that firms expanding in a given area get up to the maximum rate for that area depending on their characteristics. Apart from this, the implicit assumption of this procedure is that the dummy

variable reflects only the availability or non-availability of policy as a whole or of a particular instrument. To the extent that the non-policy part of the model is not comprehensively defined, then other systematic influences between non-assisted and assisted areas or policy off and policy on periods will be reflected in the dummy variable, again raising questions as to whether the estimate derived reflects an accurate measure of the policy effect. And, if the effect of the package is to be disentangled, the only possibility is to keep adding more dummy variables. Finally, this approach, like the others already discussed, provides little insight as to how policy derives its estimated effect.

In comparison to the latter point, the "intervening" variable approach can be regarded as lying at the opposite extreme. The main feature of the use of "intervening" variables is that they concretely specify the mechanism through which policy operates. It is here, however, that the disadvantage of this approach is found - the uncompromising specification of the policy or instrument action mechanism unnecessarily constrains the approach. The examples provided of this approach therefore imply that the only way by which incentives influence investment is via their effect on the cost of capital. No other mechanisms are permitted. Thus, for example, to the extent that incentives influence investment in the assisted areas via a liquidity effect, the estimate of the instrument effect will be inaccurate. It can also be noted that in the studies using this approach, only a very partial treatment is given to incentives. Thus, Erfeld (1979) ignores any effect of infrastructure and, in addition, faces the above noted problem concerning the discretionary nature of regional awards, having to assume that all firms in a given area receive the maximum award. Similarly, Graziani's (1973) approach ignores not only infrastructure, but also labour subsidies and the Authorization (a locational control policy).

Many of the above difficulties, lying in the nature of the approach used, can be avoided by the direct measurement approach where each policy instrument can be measured and entered as a separate explanatory variable. However, a distinction should be made between the scale and intensity approaches to direct measurement. A problem implicit in the scale approach is that the specified direction of causality can be reversed. In principle, measures reflecting the strength of intensity of policy are preferable in that such problems can be avoided. This is not to say, of course, that

strength measures are free of problems. However, the discussion at present has been confined to questions of potential and to problems implicit in the approaches per se. Problems arising from the way in which the various approaches have been operationalized are the subject of the next section.

Before doing so, however, it is useful to present an overview, as seen in table 1, of the extent to which these approaches have been used within the Community.

Table 1 : The Incidence of Macro Evaluation Studies

APPROACH		COUNTRY									
		B	Dk.	Fr.	FRG	Irl.	It.	Lux.	NL	UK	Tot.
Trend	"Naive"	-	-	-	-	-	-	-	-	3	3
	Regression	-	-	-	1	-	-	-	-	-	1
Standard-ization	Shift-Share	-	-	-	-	1	-	-	-	9	10
	Anal. of Variance	-	-	-	-	-	-	-	-	1	1
Explicit Modelling	Regression Residual	-	-	-	-	-	-	-	2	-	2
	Dummy Variable	-	-	-	1	-	-	-	-	2	3
	Intervening Variable	-	-	-	1	-	1	-	-	-	2
	Direct Measurement	1	-	-	3	-	1	-	3	6	14
Total		1	-	-	6	1	2	-	5	21	36

Here, it can be seen that the majority of research, in terms of both number and types of approaches, has been conducted in the UK, with West Germany and the Netherlands being the only other countries with any substantial research in the field of applying macro methods to estimate the effect of regional policy. In addition, the major approaches used have been

explicit modelling/direct measurement (14 examples) and shift-share standardization (10 examples).

Once attention is focused on the "impact" variables examined, it can be noted that in all countries where macro studies have been found, examinations of the effect of policy on employment have been conducted and the majority have also investigated the policy effect on investment. However, in terms of the movement of industry, a very notable feature is that only in the UK are such studies found.

Table 1 reveals that considerable work in the field of macro evaluation of the effects of regional policy still remains to be done. In particular, four areas for future research can be pointed out:

- In only three member states do more than five studies exist. This reveals a general need to conduct evaluation in those countries where few or no evaluations have been conducted.

- Many gaps exist in the application of particular approaches/techniques to evaluation.

- A considerable gap exists in terms of the focus of the studies. These have concentrated on employment and investment and, outside the United Kingdom, there has been no research at all on the movement of industry.

- At the qualitative rather than the quantitative level, the individual country reports reveal that many criticisms can be raised in relation to the way in which the studies have been conducted, so that there is considerable scope for improvement in this respect.

1.4 The Implementation of Evaluation Approaches: A Critique

In the above section, attention has been focused on the nature of the approaches and techniques which have been used to estimate the effects of regional policy. In particular, we have examined how they derive measures of the policy effect, the assumptions and qualifications implicit in these approaches and how each fares in relation to a number of "desirable attributes" which an evaluation methodology should preferably possess.

In this section we move away from the potential or theoretical capabilities of approaches to more practical aspects - in particular, the ways in which the various approaches have been implemented. An investigation of the operationalization of these approaches will subsequently, in the following section, allow us to determine whether the potential of the various approaches to isolate the effect of policy has, in fact, been realized in practise and, accordingly, to determine whether or not a preference hierarchy within the various approaches can be established.

1.4.1 Trend Projection

The major deficiencies of this approach to measuring the effects of policy rest more with the nature of the approach per se rather than with the ways in which it has been operationalized. Thus, while an obvious preference for the trend via regression over the "naive" trend procedure may be found, the problems implicit in the approach per se apply equally to both implementation modes.

In terms of the operationalization of this approach, one obvious point to note is that the reliability of the policy estimate must come increasingly into question the shorter the base period, the longer the projection period used and the further we move away from the policy off period.

1.4.2 Standardization

If the standardization approach is to accurately specify the counterfactual position and, accordingly, derive reliable estimates of the policy effect, two conditions must be fulfilled:

- the influence of all major non-policy forces influencing the "target" variable must be standardized for
- in doing so, the effect of policy must not, however, be included in the adjusted series.

Focusing initially on the use of shift-share to implement the standardization approach, a noteworthy feature of all the studies examined is that they neutralize the examined series for the effect of only one force. Thus, to the extent that other non-policy forces also have a significant impact on the "target" variable, this aspect of the use of shift-share will result in an inaccurate specification of the counterfactual position. This feature of the shift-share studies examined can be likened to explicit modelling approaches where the non-policy world is defined in terms of a single independent variable. Accordingly, discussion of this aspect will be postponed to the following section where the operationalization of the explicit modelling approach is discussed. It should be noted, however, that the shift-share studies examined have generally discussed the role of non-policy factors which have not been standardized for and have brought evidence to bear to suggest that these could not have been expected to operate in a manner which could be linked to the timing, direction and magnitude of the emergence and development of the gap between the actual and expected series.

In terms of ensuring that part of the policy effect is not included in the adjusted series (which would thereby lead to an underestimation of the policy effect) two main problems have generally not received adequate attention:

- First, common to all uses of shift-share and also valid for the trend projection approach is that no allowance is made for any effect of policy on national aggregates. To the extent that policy also plays a macroeconomic role, the counterfactual position, and consequently the

estimate of the policy effect, will be inaccurately established. Theoretical arguments suggesting that regional policy is an instrument of macroeconomic policy, based on the overheating argument, have already been established (Moore and Rhodes, 1975). And, at the quantitative level, there is evidence to support this contention - Rees and Miall (1979) for example, suggest that regional incentives have increased aggregate UK investment by some 4% to 8%.

- Secondly, part of the policy effect has sometimes been removed by the standardizations conducted. One example of this is the shift-share used by Blake (1976) and subsequently Ashcroft (1979) where standardized investment is derived as follows:

$$s_i = \frac{e_i}{n_i} I_i$$

Where: s = standardized investment for Scotland
e = employment in Scotland
n = national employment
I = national investment
i = industry subscript

However, this "capital intensity" standardization will lead to biased results since it can be expected that a successful regional policy will influence the $\frac{e_i}{n_i}$ term (Begg et al., 1976). A second example can be taken from MacKay's (1979) study of movement, where expected movement is derived as follows:

$$\hat{M}_{r_t} = \frac{\overline{M}_r}{\overline{FC}} FC_t$$

Where: $\hat{M}$ = expected movement

$\overline{M}$ = average annual movement over the policy off period

$\overline{FC}$ = average annual level of factory completion over the policy off period

FC = actual level of factory completions

r = Development Areas subscript

t = time subscript, referring to policy on years.

MacKay's "factory demand" model can be regarded as implicitly based on an investment demand model, focusing specifically on factory expansion. The model suggests that movement is associated with major expansions, so that the more firms that are interested in adding to capacity, the greater is the opportunity of policy to encourage movement. The standardized movement series will, however, include part of the policy effect since policy, particularly the IDC and Advance Factory Programme (AFP), can be expected to influence the FC_t component of the standardization. The IDC will act to depress factory completions in the controlled areas to the extent that, rather than stimulating movement, it results in abandonment, increased use of vacant premises or the realization of the project via rationalization. Similarly, the AFP (and perhaps incentives) will add to factory completions in the assisted areas.

The analysis of variance approach to conducting standardization was considered by the authors (Buck and Atkins, 1976) to be superior to the shift-share approach in that the latter allowed tests of the statistical significance of the components to be conducted and derived a differential component (with which the policy effect is associated) with no random error. However, whether or not these features of the approach are sufficient to establish a preference for the analysis of variance over the shift-share approach is another matter.

First, we have already noted that the analysis of variance approach looks for a systematic (i.e. industry-wide) policy effect when this may not be the case. Secondly, since analysis of variance splits the total variance of a variable into components which may be attributed to specific, additive components, associating the policy effect with improvement in the differential component therefore denies that policy has any influence on structure. Yet a major theme of regional policy in some countries has been to promote the relocation of firms in growth sectors to the assisted areas which, over time, and depending on the success of policy, can be expected to have an impact on structure.

In comparison to these two restrictions of the analysis of variance approach, the following comparisons can be made with the shift-shares conducted by Moore and Rhodes where:

- the policy estimate is derived from a differential component which includes random error (which is acceptable so long as the counterfactual position is appropriately specified)
- their standardization provides a differential component which can incorporate any effect of policy on structure. This follows since they use constant (1963) regional weights. Thus, in preceding and subsequent years, the residual of actual minus expected reflects not only the differential shift but also differences in actual regional structures from those pertaining in 1963. This procedure becomes questionable, however, when the distance from 1963 is substantial.

1.4.3 Explicit Modelling

The problems found in the operationalization of the explicit modelling approach to policy evaluation can be discussed under the following headings:

- Theoretical considerations
- Model Comprehensiveness
- Proxies and measures of variables
- Model specification.

Theoretical Considerations

One of the major advantages of the explicit modelling approach is its potential to explain as well as measure. A general point of criticism of the use of the explicit modelling approach in practise is that, perhaps with the exception of investment models, the reader is often at difficulty to find a clear theoretical rationale underlying the model used and the choice of independent variables.

Particularly notable in this respect are models of the movement and location processes which have no obvious basis on any explicit theory of the firm. In such models, firms are as "black boxes" reacting to various stimuli (e.g. labour and premises availability, market factors, regional policy) all of which are external to the firm. No considerations are given

to factors internal to the firm which could be expected to influence movement and location decisions (e.g. organizational structure; Bade, 1979, 1979a). In addition, micro research in this area suggests the movement and location decisions are made in a satisfying manner, which argues for some examination of more behaviouralistic aspects in policy evaluation models.

Similarly, often no or only weak justifications are presented in support of the choice of independent variables, so that the reader often gets the feeling that variables are chosen on the basis of statistical or ad hoc rather than theoretical criteria.

Model Comprehensiveness

A second major advantage of the explicit modelling approach is its potential to examine all of the major forces expected to influence the "impact" variable. Thus, in terms of non-policy forces, explicit modelling has the potential to comprehensively define the counterfactual position by including independent variables for each of these expected influences. Similarly, each of the individual policy instruments can be included in this manner to examine whether all or only some of these have played a significant role.

Examining first of all the non-policy components of the models, a feature noted in relation to the standardization approach, but also typical of many regression models (particularly in Italy and the UK), is the use of only one independent variable to represent the non-policy component of these models, particularly, but not exclusively, in movement models. Given that the processes examined can be expected to be relatively complex ones, doubt can often be cast on the appropriateness and realism of defining the non-policy world in terms of a single variable.

Two examples in the British context can be used to illustrate forces which have either not been examined, or at least adequately examined, but which can be expected to influence the "impact" variables:

The first of these relates to some measure of a region's spatial structure

or urban hierarchy. The justification for the inclusion of such a variable is that since the mid 1960's, the conurbations, as a whole, have experienced absolute decline of manufacturing employment so that, if one groups urban areas in terms of type and size, a strong, negative relationship is found between position on the urban hierarchy and employment performance (University of Cambridge, 1980). Today, the major spatial division in Great Britain is in terms of centre versus periphery rather than non-assisted versus assisted areas (Fothergill and Gudgeon, 1978) which suggests that the number and size of conurbations within a region could be expected to exert some influence on that region's performance.

A second example relates to time series studies and the treatment of trends in factors such as investment, employment, capital-labour ratios etc. In Britain, manufacturing employment has been in absolute decline since the mid-sixties, although the manufacturing investment trend was still rising over the study periods examined. In movement studies, the trend implicit in the non-policy components of the models helps explain disagreement in results. Thus, for example, Moore and Rhodes (1976) use an unemployment proxy for the pressure of demand and, since the trend in unemployment over the study period was upwards, the role played by this force in stimulating movement declined over time ("leaving" policy to play a larger role in explaining movement). Alternatively, the non-policy component of Ashcroft and Taylor's (1977, 1979) movement (generation) models is investment-based and, since the trend in investment was upwards over the study period, this acts to increase the role of non-policy forces stimulating movement and, in consequence, explains why their model leads to a much lower policy result.

While it may be argued that, for example, unemployment or other pressure of demand proxies contain both cyclical and trend components, it is, econometrically, more desirable to give separate treatment to separate forces. Moreover, the grouping of these two forces under one variable will lead to the expectation that, for a given level of aggregate demand and policy strength, the same level of movement would be expected regardless of whether the sector was growing or declining.

Turning to the comprehensiveness of the policy components of the models, similar problems are often found although a distinction must be made with

respect to the way in which policy enters the model. The regression residual approach and most of the dummy variable approaches have been used to measure the overall policy effect when, ideally, it is preferable to estimate the effects of the individual components of the policy package.

The "intervening" variable approach has been used in ways which either give only a partial treatment of policy or which treat policy in a too generalized manner. Thus, for example, Graziani (1973) examines only the effect of investment incentives, thereby ignoring three other main policy components - infrastructure, labour premia (e.g. social security concessions) and disincentives (the Authorization). Erfeld's (1979) intervening variable similarly excludes infrastructure policy and requires him to treat investment incentives as if these were automatic awards when, in fact, they are discretionary ones.

However, even when the direct measurement approach is examined, no examples are found of studies which include all the major policy instruments. Thus, in the Netherlands for example, none of the studies include a measure of the Selective Investment Regulation, a disincentive policy. Similarly, in Britain, none of the studies examined include the Advance Factory Programme (AFP), although micro movement studies suggest that the availability of suitable premises was often an important factor in determining their choice of location. The AFP may, however, present econometric problems of two types. First, it may be highly correlated with the IDC policy, a justification used by Moore and Rhodes who regard the AFP as the other side of the coin from the IDC, so that the effect of the former is included in the estimate of the IDC effect. Secondly, a problem arises as to whether the AFP should be treated as an exogenous variable or whether it is a policy measure which responds to the effectiveness of policy and therefore is better treated as an endogenous variable. The non-identification of the effects of such instruments is often, therefore, understandable but nevertheless a potentially serious deficiency.

Measures and Proxies of Variables

The choice of proxy for, or most appropriate way to measure, particular influences is a problem typical of applied research. Our comments on this aspect of the implementation of explicit modelling can be grouped under three headings - endogenous variables, exogenous, non-policy variables and policy variables.

In relation to endogenous variables, two British examples can be used to illustrate problems in their measurement. First, Ashcroft's (1979) investment model uses the ratio of actual to expected (i.e. standardized) investment as the dependent variable in the following model to estimate the policy effect on investment:

$$\frac{A}{E} = f\ (RU,\ LEA,\ IDC,\ II,\ REP)$$

Where: $\frac{A}{E}$ = the ratio of actual to expected investment in Scottish manufacturing industry.

RU = relative Scottish unemployment, a proxy for the relative pressure of demand in Scotland

LEA = a dummy variable for the 1960 Local Employment Act; 1951-1959 and 1964-1971 = 0; 1960-1962 = 1.

IDC = Industrial Development Certificate

II = investment incentives

REP = Regional Employment Premium.

In this example, Ashcroft combines the explicit modelling and shift-share approaches to test the extent to which policy, among other factors explains the ratio of the actual to the expected series. In calculating the expected series, Ashcroft uses the "capital intensity" standardization performed by Blake (1976), but it has already been noted that this standardization procedure will lead to incorrect estimates of the policy effect since this expected series is not totally neutral of the policy effect.

Whereas the above procedure, ceteris paribus, has an inbuilt tendency to underestimation of the policy effect, the following example from Moore and Rhodes (1976a) has a bias towards overestimating the policy effect:

$$AIE_t = a + bMU_t + cEIE_t + dII_{t-1} + eREP_{t-1}$$

Where : AIE = annual change in actual indigenous employment
MU = national male unemployment rate
EIE = actual change in expected indigenous employment
II = investment incentives
REP = regional employment premium

The hypothesis here is that indigenous performance, by sector, moves closely in line with national performance once allowance has been made for a regionally differentiated cycle (MU), differences in structure (EIE) and regional policy. It has been pointed out, however, that the procedure by which the dependent variable (AIE) has been calculated leads to an inbuilt tendency to exaggerate the effect of policy (MacKay, 1976a). AIE is calculated by subtracting policy-induced employment in moves from total employment change (at constant pressure of demand). This causes the effect of changes in the pressure of demand to fall on the indigenous sector, yet there is little theoretical (or empirical) support to justify this; rather, the evidence suggests a strong relationship between pressure of demand (or investment demand) and the immigrant sector.[1]

An interesting example of the problems associated with choosing between competing proxies for non-policy variables can be taken from British studies of industrial movement where three alternative pressure of demand proxies have been used:

- (male) unemployment (Moore and Rhodes, 1976)

- vacancies (Bowers and Gunawardena, 1979)

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1. The above employment example can also be used to illustrate a problem common to most uses of regression models of employment - that of time lags. Generally, an average reaction lag is used, implying that employment in period t is associated with the strength of policy in, say, period t-1. However, the policy effect on employment in period t is composed of the initial effect of policy on that period by way of new starts and indigenous expansion plus the build-up of employment due to new starts and expansions generated by policy in previous periods. While this suggests the use of distributed lag structures, this problem may not be a significant one in the case of indigenous employment (as in the above example) since we are dealing largely with in situ expansion (which will have a shorter reaction lag and completions profile than for immigrant employment) and the prevention of contraction (where the adjustment or change is completed within the time unit).

- spare capacity (Ashcroft and Taylor, 1977)[1].

The importance of choosing the most appropriate pressure of demand proxy is particularly significant here since this is the only non-policy variable in the models and since the results are quite sensitive to the choice of proxy (Nicol and McKean, 1980). It is increasingly accepted that, since the mid-sixties, the relationship between unemployment and other demand indicators has significantly altered and there is some evidence to suggest a preference for spare capacity over the other proxies (Taylor and McKendrick, 1975).

Similar problems are found with the selection of proxies for the (non-policy) attractiveness of the assisted areas. Ashcroft and Taylor (1979), for example, find that, in their distribution model (which focuses on the share of all moves going to the Development Areas), the only non-policy variable, relative unemployment was not statistically significant, suggesting only policy factors stimulated movement into the Development Areas (once firms had decided to move). This is a result which conflicts with the evidence of micro studies of movement which suggest that non-policy aspects such as labour and premises availability played a more important role than policy In trying to find an appropriate measure for Development Area attractiveness, the aim is to find a proxy which suitably represents the way in which firms perceive this. There is no obvious theoretical justification for preferring an unemployment ratio to say, a differential or, alternatively, it may be that what is important is the level of unemployment rather than any relationship between unemployment in the Development Areas and the rest of the country.

Similar examples of relatively ad hoc approaches to choosing proxies are found, for example, in the studies of Vanhove (1961) and van Duijn (1975). Both proxy industrial structure by the share of total employment in the chemical and metal industries, on the grounds that these two industries reflect the economic base of a region. Thus, the higher is the share of employment in these two sectors, the stronger is structure and, in consequence, the stronger will be the growth of industrial employment. However, the concept of economic base theory and this approach to measuring

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1. Here we refer to their test of the pressure of demand model. The authors preferred approach is based on an investment demand model.

it can be generally regarded as highly questionable.

In addition, van Duijn proxies the availability and cost of land for industrial development by population density; the higher is the latter, the more scarce and more costly will be development land. Here, one must ask questions as to the relevance of regional population densities. It is not so much density, but rather the distribution of population and the nature of the urban hierarchy which are the important factors. In addition, density considerations may not be a useful proxy for what van Duijn is trying to measure given the existence of zoning or land use planning regulations.

Finally, focusing on regional policy variables, the general problems associated with the alternative approaches to treating policy have already been noted, with the conclusion that direct measurement (in strength or intensity terms) is the most preferable of the approaches. Even here, of course, the problem of the most appropriate measure of a policy instrument arises. The treatment of the British IDC policy can be used to illustrate such problems. The intensity or strength measure used for the IDC is that of its refusal rate - refusals as a percentage of applications. In this respect, three points of criticism can be mentioned:

- First of all, a refusal rate measure focuses only on formal decisions; it excludes a variety of routes, some intentional, some not, whereby expansion in controlled areas is constrained and relocation to the assisted areas is promoted - informal refusal, quid pro quo, discouragement and verbal steering (Nicol and Wehrmann, 1977).
- Secondly, there is the presumption that a higher refusal rate is indicative of a tougher policy but this need not be the case; a relaxation of the control (in terms of a higher exemption limit, below which IDC approval is not required) can lead to an increase in the refusal rate (Nicol and Wehrmann, 1977; Ashcroft, 1979).
- Finally, the refusal rate measure used is that calculated on an employment basis, i.e. the expected employment associated with refusals as a percentage of that for all applications. However, in movement studies, which examine the number of moves into the Development Areas, a more appropriate measure of the IDC would be the refusal rate measured in

project or numbers terms - i.e. the number of refusals as a percentage of the number of applications. The choice between numbers and employment - based refusal rates can be expected to influence results since the employment refusal rate is generally substantially higher than that for numbers (reflecting a more stringent treatment given the larger projects).

Model Specification

The final set of comments on the explicit modelling approach concerns aspects of model specification. In particular, and with very few exceptions, the regression models use additive specifications, which imply that the different variables are substantially independent of each other. The use of an additive specification obviously comes into question if we attempt to isolate the effect of influences which are interdependent. It is unlikely that the pursuance of regional policy objectives and the state of the economy are independent or that the effect of disincentives and incentives are largely independent of each other. Additive specifications therefore allocate an effect to one variable which may have resulted from a set of combined interactions. Strictly interpreted, such a specification implies that a given strengthening of policy would result in an equivalent increase in, say, movement to the Development Areas, irrespective of whether or not the pressure of demand changed. Again, this is unlikely; indeed, it is highly probable that reductions in the pressure of demand reduce the return to a given level of intervention.

Examination of correlation coefficients in models of more than two variables provide no insight into whether or not multicollinearity problems exist; indeed, the problem warrants more sophisticated econometric investigation. Some of the financial incentives examined apply only to a limited number of years while the relationship between variables changes as we move from passive to active policy phases. In Britain, for example, the IDC and unemployment are not closely related if the fifties and sixties are taken as one period, but are strongly related over the period of active policy (MacKay and Segal, 1976) while unemployment has no significant impact on movement in the passive policy period, but does have an effect in the policy on period. This points to the possibility of interdependency between

these two variables, particularly when it is remembered that, in administering the IDC control, the government is aware of the possible resource cost dangers of stringently applying the control in low growth periods (Nicol and Wehrmann, 1977). To the extent that such interdependencies do exist, this may help explain the contradiction found when the results of British macro and micro movement are compared; the former tend to show that unemployment-based explanatory variables play either relatively minor or insignificant roles, yet the latter are fairly unanimous that labour availability was a major push and pull force.

1.5 A Hierarchy of Evaluation Approaches?

An obvious question arising from the discussion of the previous section is that of whether or not it is possible to define a distinct preference for some approaches over others in terms of the reliability of their estimates of the effects of regional policy. And, insofar as this is possible, to what extent do such preferences hold in practise, once account has been taken of the ways in which the approaches have been implemented? The intention of this section is to integrate the previous discussion of the approaches in terms of their potential to derive reliable estimates of the policy effect (section 1.3) and the more practical problems concerned with implementing these approaches (section 1.4) in order to see whether the above questions can be answered - i.e. can we place more confidence in the results derived from one approach/technique in comparison to some other?

In relation to the "desirable attributes" discussed in section 1.2, the trend projection approach has a low "score". No explicit treatment is given to policy and the estimate of the policy effect is derived as a residual - that part of change not attributable to trend factors. Similarly, little information is provided as to explaining how policy has achieved its observed effect and the approach is not well suited to disentangling the effects of individual policy instruments. Indeed, the prime concern of the approach lies with the specification of the hypothetical policy off position and we are required to accept that the only major factor explaining the difference between the hypothetical policy off and actual policy on positions is regional policy. The approach therefore rests heavily on the

assumption that other things remain equal. In terms of the two ways by which this approach has been implemented, there is an obvious preference for using regression to fit the trend line. However, discussing the alternative implementation approaches can make only a limited contribution since the major deficiences or drawbacks lie with the approach per se.

As previously noted, many of the problems of the trend projection approach apply equally to shift-share standardization. In addition, all the studies discussed have not accurately specified the counterfactual position, generally because only one variable has been standardized for, no account has been taken of any nationwide or macroeconomic (as opposed to redistributive) policy effect and because the formula used to standardize the series examined generally provide an adjusted series which is not totally neutral of the policy effect. Thus, since the latter is derived as a residual, this casts doubt on the accuracy of the policy effect.

The use of analysis of variance to perform the standardization does have the advantages that the policy effect is estimated excluding random error and that the components of change can be tested for statistical significance. However, these advantages are insufficient to suggest a clear preference for the use of analysis of variance over shift-share. On the one hand, both implementation procedures rest on the same questionable implicit model - that, e.g. differences in regional growth rates are due to differences in industrial structure and regional policy. And, both derive estimates of the policy effect from the movement of the differential component. The latter, however, is a catch-all for all non-structural forces, one of which might be regional policy. On the other hand, the analysis of variance procedure has two further drawbacks; it presumes that regional policy does not influence regional industrial structure and it seeks a systematic policy effect, i.e. an across the board, industry-wide effect, when it is unlikely that this is the case.

In comparison to trend projection and standardization, the explicit modelling approach has many potential advantages. In particular, it can allow explicit treatment of policy, direct estimation of the policy effect, a comprehensive definition of the counterfactual position, separation of the individual instrument effects and explanation as well as measurement. Unfortunately, no examples are found where all of these potential advantages are realized. Thus, for example, some studies attempt a fairly com-

prehensive specification of non-policy forces but give a less than adequate treatment to regional policy while, for others, the reverse is found, e.g. all major policy instruments are measured according to their strength or intensity, (which can be regarded as the most preferable of the various procedures examined) but the non-policy world is poorly defined or the model inaccurately specified. In relation to the approach in general, many of the studies examined face one or more of the following problems - lack of clear theoretical rationale for the choice of the model used and variables included, questionable proxies and measurement of variables, inadequate specification of non-policy influences and inappropriate model specification, particularly the use of additive specifications which ignore interdependencies within and between groups of variables.

In terms of the way in which policy is treated within the explicit modelling approach, considerable variations exist. Estimating the policy effect via the regression residual can be regarded as inappropriate since the model used is falsely specified, albeit deliberately so. Explicitly excluding a variable (i.e. regional policy) which is expected to influence the dependent variable is, econometrically speaking, a very unsound practise, since it results in biased estimates not only of the regression coefficients, but also of the residual variances from which the policy effect is derived! In addition, the regression residual, regardless of whether or not it is biased will not only include random error but all other errors due to other omitted variables, measurement error and mis-specification error. Given these criticisms, no preference for this approach (either in theory or practise) over trend projection or standardization can be justified. The same conclusion is valid for those cases where regional policy instruments included in the model as explanatory variables, but measured in volume terms (e.g. expenditure on regional assistance) since this procedure causes policy to become endogenous to the model although it is specified as an exogenous variable. Similarly, the use of points and scoring systems are equally suspect as a way of measuring policy given the arbitrariness of the system used.

By comparison, the dummy variable and intervening variable procedures can be regarded as superior insofar as these difficulties do not arise. One problem with the use of dummy variables is the reliability of the

presumption that they pick up the effect of policy and only policy. The severity of this problem depends on the accuracy and comprehensiveness of the model; a poorly defined model might mean that the dummy variable picks up the effect of some other force which systematically varies between assisted and non-assisted areas or between policy off and policy on periods. A second problem is that this procedure can only make black and white distinctions, e.g. between policy off and policy on, so that no account is taken of the changing strength of policy over time or variations in its intensity between areas. Finally, rather than look at the policy package as a whole, the only way dummy variables can be used to examine individual policy instruments is to keep adding dummy variables for each new instrument and even this is only possible in time series analysis.

The major difficulty of the "intervening"variable approach to measuring and treating regional policy is that it unnecessarily constrains the mechanism via which policy achieves its effect. While it is quite possible that a given instrument may achieve its effect in a variety of ways (disincentive policies being an obvious example), this procedure allows only a single mechanism. In practise, two further problems are associated with the use of intervening variables; they are either used in models which examine the effect of only one policy instrument (suggesting an incomprehensive definition of the policy component of the model) or have been used in a way which treats a set of policy instruments (e.g. financial assistance) in an inaccurate manner - e.g. by presuming that all firms in a given area get the same level of assistance, which is not the case when incentives are discretionary rather than automatic, or when some parts of the area have higher maximum award rates than others.

The final procedure examined is that of measuring policy instruments according to their strength or intensity. In principle, this is the most preferable approach, but even here, many problems arise as to the most appropriate way of measuring the strength of the various instruments. Thus, for example, the use of refusal rates to measure the strength of disincentive policies is based only on formal decisions information which ignores a variety of other ways in which these instruments can pursue their objectives. It is not clear whether the movement of refusal rates over time accurately proxies the changing strength of these other, non-refusal related, mechanisms over time. Similarly, measuring the strength

of incentives in present value terms implies specific assumptions on the way investment decisions are made and on the way in which incentives enter the decision process. If an insignificant effect is found in the model, this could mean that incentives do not influence these decisions; alternatively, it could mean that the way in which incentives influence decisions has been misspecified and that incentives could have an effect via some other mechanism.

This discussion of macro evaluation approaches has shown that in setting out to measure the effects of regional policy, the researcher has a considerable array of approaches at hand, ranging from relatively simple trend extrapolation to sophisticated regression modelling. Certainly, in terms of sophistication and the potential to perform particular tasks, a clear preference for some approaches over others can be defined. Such preferences arise because a given approach is able to avoid the problems associated with others and/or is able to perform desirable tasks which the others cannot. In doing so, however, a new set of problems arise - specific to the implementation of that approach - which, if not adequately resolved, can easily negate its theoretical or potential superiority. Thus, it has been shown that a clear preference exists for the use of the explicit modelling approach with policy variables measured according to their strength, yet the above noted criticisms of various aspects of the implementation of this approach does not allow us, with any degree of confidence, to suggest that the results thereby derived can be expected to be more reliable than those derived from some other - theoretically less superior - approach. However, the explicit modelling approach does have the highest potential to achieve reliable and accurate results, so that future evaluating research should concentrate on improving the use of this approach.

While the above conclusion is a rather bleak and negative one, some comfort can be taken from the fact that the approaches examined display a considerable degree of robustness. As will be discussed in more detail in section 2, the rather curious conclusion emerges that, in those countries where a sufficient number of studies exist to allow comparisons, there is a fair degree of consensus as to whether or not policy can be regarded as having been effective. Thus, for example, the majority of British

studies find that policy had a significant impact on employment, investment and movement, a conclusion which holds, by and large, across the complete spectrum of approaches and implementation procedures used, despite their varying degrees of sophistication. There is, however, considerable disagreement as to the actual magnitude of the policy effect and, in particular, how this is best apportioned between the individual instruments of the policy package.

Section 2 : The Results of Macro Evaluation Studies

Although the major focus of this paper is on the methodologies which have been used to measure the effects of regional policy, it is also of interest to examine the results derived by the studies examined. In particular, and bearing in mind the findings and conclusions on these methodologies, it is of interest to focus on results, particularly where, for any one country, a number of studies have had the same focus, since this will allow us to comment on the extent to which the results of varying approaches are in harmony in terms of the size of the policy effect.

While it is of course interesting to examine what effects policy has had, it must be borne in mind that this report does not and cannot conduct a comparative evaluation of the regional policies of the Member States in terms of their effects. To do so would require a comprehensive evaluation, for example using cost-benefit analysis, of the Member States' regional policy packages. Not only does this study focus on a much more limited and partial definition of evaluation, but, in addition, we are seldom able to compare like with like. Apart from obvious differences in terms of approaches, techniques, the focus of the study (e.g. employment, investment etc), the time periods covered and so on, some studies examine the effect of the regional policy package while others focus only on one of its major instruments.

In consequence, this section can only report the results of evaluation studies and can investigate features such as the level of agreement or disagreement on the size of the policy/instrument effect, the sensitivity of result to the approach/technique used and whether or not one approach tends to lead to systematically higher/lower results than another. The extent to which such comments can be made is of course severely limited since the existence of more than one study on a particular "impact" variable is a prerequisite to conducting such comparisons. Thus, these comparisons can only be conducted for Germany, the Netherlands and the United Kingdom. Elsewhere, we can only report the size of the effect identified.

2.1 Belgium

Only one study (Bodson, 1977) has been found for Belgium. However, it presents no results in terms of the absolute size of the policy effect. Rather, conclusions on the impact of policy on the evolution of regional labour markets are derived by examining the econometric results of the model, i.e. in relation to the coefficient signs and the significance of variables.

In general, the effect of policy was regarded as limited but coherent. Policy had a stronger effect on the male labour market, particularly in relation to reducing unemployment and migration.

The Special Industrial Areas programme had a positive influence on the labour market while grants resulted in a growth of male and female wages, a slowing down in the rate of decline of the activity rate for young men but, in consequence, operated to constrain the growth of the female activity rate .

2.2 Denmark

No macro evaluation studies have been found for Denmark.

2.3 France

Only one study (Louis, 1976) has been found for France, but, as in the case of Belgium, no quantitative estimates of the policy effect are presented. Louis calculates two indicators:

- R_1 : The share of employment/investment associated with grants and loans to total employment for a given year
- R_2 : The difference in the annual average rates of employment/investment growth, 1962 - 1972 and 1954 - 1962

and associates a positive effect of policy in those cases where $R_1 > R_2$. The results of this approach suggest that policy played a stronger role in the 1962 - 1972 period, particularly after 1968 when policy was

considerably strengthened. The influence of grants was significant only in the Nord, Lorraine, Limousin, Rhône-Alpes and Aquitaine regions.

2.4 The Federal Republic of Germany

Four macro studies have been found for the Federal Republic of Germany, although some of these examine the effect of policy on more than one "impact" variable. Three studies examine the effect of policy on investment (Recker, 1977; Bölting, 1976; Erfeld, 1979) with one study focusing on employment (Recker, 1977) and one on the establishment of new firms (Spanger and Treuner, 1975). The results of these studies are summarized in table 2.

Table 2 : A Summary of the German Macro Results

Reference	Approach	Result
I N V E S T M E N T		
Recker	Trend via Regression	DM 2,044M - DM 5,032M 1970-1972
Bölting	Explicit Modelling/ direct	Effect of policy roughly equals the amount of expenditure on incentives.
Erfeld	Explicit Modelling	
	- Direct	Only significant but high effect on one sector.
	- Dummy Variable	Only significant but high effect on one sector.
	- Intervening Variable	Significant throughout. Policy effect not separable.
E M P L O Y M E N T		
Recker	Trend via Regression	57,500 to 116,000 jobs, 1970-1972
E S T A B L I S H M E N T O F N E W F I R M S		
Spanger and Treuner	Explicit Modelling/ Intervening Variable	Policy effect not separable.

Initially, it can be seen that only Recker derives an absolute measure of the size of the policy effect, in this case determined by the gap between the actual and reference developments. In the studies by Bölting and Erfeld, the regression coefficients on the policy variables are interpreted as efficiency coefficients, allowing some estimate of the size and importance of the policy effect to be derived. In the study by Spanger and Treuner, the size of the R^2 in indices with high values given to the policy element is used to allow comment on the effect of policy.

Examining, first of all, investment, Recker arrives at the result that some DM 2,044 million to DM 5,032 million (based on the maximum and minimum reference developments respectively) can be attributed to the effect of policy for the 1970 - 1972 period. Bölting's results are based on the size of the coefficient on the policy variables which, within his various models, has a value of around unity. This can be interpreted as follows; the size of the policy effect is more or less given by the amount of money given in the form of incentives. The results of his model 2 show that subsidies to the value of DM 1 million resulted in a total investment of DM 1,083 million (at the level of the 178 labour market areas) and DM 1,466 million (at the level of the 72 planning regions).

In other words, DM 83,000 and DM 466,000 of investment would be financed by firms themselves per DM 1 million of investment incentives.

Erfeld, like Bölting, used a model of investment with policy included in a direct manner. By the use of this approach he found that incentives had a significant impact on investment only on one sector (iron, steel and non ferrous metals). In this case, however, the coefficient on the policy variable, at around 4.3, was high and this can be translated into the equivalent policy effect as in the case of Bölting, i.e. DM 1 million of subsidies should stimulate DM 4.3 million of investment. When a dummy variable rather than a direct approach is used to measure the policy effect, Erfeld finds that policy had, again, a significant impact only on one sector, in this case steel fabrication, machinery and vehicles. The regression coefficient on the policy dummy variable had a value of over 27. This regression coefficient

is interpreted as the actual value of policy induced investment, i.e. DM 27 million.

Finally, using an intervening variable approach, Erfeld found that the variable, the "regional rate of interest" had a significant impact on all six broad sectors examined, particularly in sectors producing investment or production goods (parameter values going up to a value of 10) and much lower in food and luxury goods sectors (parameter values around unity).

In terms of employment, Recker, using the same approach as for investment, calculated a policy effect of between 57,500 and 116,000 jobs (relating to the maximum and minimum reference developments respectively) for the 1970 - 1972 period.

Finally, Spanger and Treuner examined the extent to which the establishment of new firms (i.e. births and not relocations) could be related to the attractiveness of locations. The latter was defined in terms of a variety of factors, such as infrastructure indicators. Regional policy enters this approach as an infrastructure component, since the effect of an area being assisted or not is hypothesised to influence the birth of new firms via its effect on increasing the attractiveness of the area. A total of 36 different indices, each based on different combinations and/or weightings of a variety of components, were tested, the test benchmark being the value of the R^2 for each regression. Spanger and Treuner found that in the indices where the policy variable (i.e. whether or not an area was a development centre) was given a high value (i.e. 3), a high R^2 resulted (over 0.90) in three of the four cases. However, it is not possible to separate out the policy component from those other components of the indices yielding a high R^2. Thus, while it can be concluded that, in relation to the birth of new firms, infrastructure plays a significant role, it is not possible to determine if, or to what extent, policy played a role in the attractiveness of areas due to their level of infrastructure provision.

In examining these results, the one study on employment (Recker) shows policy to have had a substantial impact on the creation of employment, while that on the birth of new firms does not allow the possibility of

separating out the policy effect.

It is only within the investment focus that some comparisons can be made. Both Bölting and Recker arrive at relatively similar results. Recker estimates the policy effect at DM 2,044 million to DM 5,032 million for the 1970 - 1973 period. Bölting only provides an "efficiency" coefficient for policy of around unity. So if we examine the amount of expenditure on investment incentives, some DM 800 million to DM 1,000 million per annum, we can derive a policy effect for the 1969 - 1971 period (Bölting's) of some DM 2,400 million to DM 3,000 million, which lies within Recker's minimum and maximum ranges. In both of these studies therefore, policy appears to have had a low effectiveness, the effect being more or less equivalent to the expenditure on investment incentives.

Two of Erfeld's three approaches tend to confirm this finding; his explicit modelling approach (à la Bölting) shows policy to have had a significant effect in only one (of six) sectors and a similar conclusion, albeit for a different sector, results from his dummy variable approach. Only in the intervening variable approach does policy display a significant impact throughout all sectors, but here the policy effect cannot be isolated from the intervening variable.

These examples show that the policy effect is sensitive to the approach adopted, although the bulk of the evidence does not warrant the conclusion that German regional policy has been effective. However, the critical comments made with respect to these approaches in the report on Germany suggest it would be unwise to place strong reliance on any one of these studies. For the time being, therefore, the effectiveness of regional policy in Germany must remain an open question.

2.5 The Republic of Ireland

Only one macro study (Moore and Rhodes, 1976b) was found for the Republic of Ireland. Using the shift-share approach, the policy effect was calculated at some 11,000 jobs in the Designated Areas for the 1960 - 1972 period (15,000 1960 - 1974). This is indeed a very substantial effect, amounting to an 80% - 100% increase in manufacturing employment in these areas as at 1960.

2.6 Italy

Only two studies have been found in Italy, those by Del Monte (1977) who examined the effect of investment incentives on employment and by Graziani (1973) who focused on the impact on investment. Both studies adopted the explicit modelling approach with Del Monte using the direct measurement approach whereas Graziani used the intervening variable approach.

In relation to employment, the policy effect was estimated at around 124,000 manufacturing jobs for the 1953 - 1971 period. Policy therefore led to a 12.6% increase in manufacturing employment yet, despite this, the share of manufacturing to total employment in the Mezzogiorno remained fairly stable over the 1951 - 1971 period.

In terms of investment, Graziani examines the local and multiregional/ multinational sectors separately, but does not provide any quantitative estimate of the size of the policy effect. He does show, however, that his intervening variable - the North-South difference in the cost of capital, via which the effect of policy is hypothesised to operate - was significant in the equations for both of the investment groups. For 1968, it is estimated that a 1% cost of capital difference is equivalent to an additional 698 milliard Lire for the local sector and to an additional 228 milliard Lire for the multiregional/multinational sector. However, Graziani does not provide any estimate of the cost of capital difference attributable to policy and, in consequence, any estimate of the policy effect.

2.7 Luxembourg

No macro evaluation studies have been found for Luxembourg.

2.8 The Netherlands

Five macro studies have been found in the Netherlands, all of which use variations of the explicit modelling approach. Four studies focus on the effect of policy on employment and one on the impact on investment. The approaches used in these studies and a summary of their results are shown in table 3.

Table 3 : A Summary of Dutch Macro Results

Reference	Approach	Results
	E M P L O Y M E N T	
Vanhove, 1961	Explicit Modelling - Regression Residual	In 5 of the 9 assisted areas, positive residuals were found; policy therefore successful in 5 assisted areas.
Van Duijn, 1975	Explicit Modelling - Regression Residual	In 7 of the 20 assisted areas, large positive residuals found; policy therefore considered as successful in these 7 areas.
Paelinck, 1973	Explicit Modelling - Points System	25,000 jobs in the North region, 1960-1967. This represents 42% of the net increase in employment.
Bartels and Roosma, 1979	Explicit Modelling - Dummy Variable	Regional policy had little effect on the growth of service sector employment.
	I N V E S T M E N T	
Van Delft, van Hammel and Hetson, 1977	Explicit Modelling - Direct	Policy induced a "reallocation" of investment of 1,700 million Guilders in the North and of 1,100 million Guilders in the South (1960-1974). The share of total investment attributed to policy was 17% in the North and 5% in the South for the 1970-1974 period.

Examining employment first of all, the results suggest that policy has had some effect, with the exception of the service sector study by Bartels and Roosma. Using the explicit modelling/regression residual approach, Vanhove suggests that policy had a significant effect in 5 of the 9 assisted areas examined in the period 1950-1960 (i.e. positive residuals were found for 5 assisted areas). Van Duijn, using the same approach, tentatively concludes, on the same basis as Vanhove, that policy had a significant impact in 7 of the 20 assisted areas, for the period 1962-1970. The study by Paelinck concluded that policy was responsible for the creation of around 25,000 jobs in the Northern region in the 1960-1967 period, representing 42% of the net employment increase in this area for this period. The only study which was unable to identify a significant policy effect was that of Bartels and Roosma who examined the service sector and reached this conclusion on the basis of an insignificant coefficient on the policy (dummy) variable.

Only the study by Van Hammel et al., examined investment. The model used is one whereby policy only has a redistributive effect so that gains in one region must be offset by losses elsewhere. The North and South regions respectively gained investment to the totals of 17,000 million Guilders and 1,100 million Guilders over the 1960-1974 period as a result of regional policy. In the North, the share of policy induced to total investment was 17.5% (1960-1964), 15.2% (1965-1969) and 17% (1970-1974), the respective shares for the South being 1.1%, 6.1% and 5%.

In terms of the comparisons which can be made within the employment studies, only that by Bartels and Roosma finds no evidence of an effective policy, but this study concentrates on the service sector and perhaps such a result is to be expected to the extent that the main effort of policy has been placed on the manufacturing sector. In this respect, the Vanhove and van Duijn studies have fairly similar results, although they apply to different decades, while the study by Paelinck certainly provides evidence of a strong policy effect.

2.9 The United Kingdom

Over half of all the evaluation studies examined are found in the UK and these are fairly evenly distributed in relation to the main impact variables, employment (4), investment (4) and the movement of firms (5). Indeed, studies of the effect of policy on the movement of firms have only been found in the UK. In addition, a considerable variety of approaches have been applied to the evaluation of policy. Below, we will examine only the policy effect at the aggregate assisted area levels, although the national report provides details at the level of the individual regions. Examples will, however, be taken for individual regions in order to illustrate particular points.

Employment

The results of studies on the effect of policy on employment are summarized in table 4 below.

Table 4 : The Effects of Regional Policy on Employment

Reference	Approach	Policy Off Period	Policy On Period	Total Policy Effect[1]	Annual Average
	COMPOSITE DEVELOPMENT AREAS[2]				
Moore & Rhodes (1973)	Shift-Share	1951-62	1963-70	150,000 (220,000)[3]	21,400 (31,700)
Moore & Rhodes (1976)	Shift-Share	1951-59	1960-71	200,000[4] (300,000)[3]	18,200 (27,300)
	Explicit Modelling	1951-59	1960-71	279,000-321,000[5]	25,400-29,200
Buck & Atkins (1976)	Anova	1951-62	1963-71	100,000	12,500
Moore, Rhodes & Tyler (1977)	Shift-Share	1951-59	1960-71	195,000 (210,000)[6]	17,700 (19,100)
			1972-76	46,000 (86,000)[6]	11,500 (21,500)[7]

1. Figures in parenthesis refer to adjusted estimates to include the effect of such factors as excluded areas and sectors as well as of pressure of demand and multiplier effects.
2. Different authors use different geographic coverages. Moore and Rhodes (and Tyler) use Scotland, Wales, Northern Ireland and the Northern region whereas Buck and Atkins exclude Northern Ireland.
3. Adjustments here are made for the shipbuilding and metal manufacturing industries, other Development Areas and multiplier effects.
4. This figure includes an adjustment for the pressure of demand.
5. This figure is made up of a number of components. a) The indigenous employment effect is derived from the AIE model discussed in section 1. b) The immigrant employment effect is derived by a regression model estimating the number of firms moving to the DAs due to policy and the employment effect of these is derived by multiplying number of moves by average size of move. c) To these two components are added adjustments for excluded sectors and a multiplier effect.
6. Adjustments are made for the pressure of demand, but not for excluded areas, sectors etc.
7. The authors of this study derive the annual average effect for the 1972-76 period by dividing the total effect, 86,000 by 5 (= 17,200) i.e. by including both end years. Our calculation, for reasons of conformity takes 1972-76 as a four year period.

First of all, it should be noted that many of the results in table 5 are not directly comparable with each other due to differences in the degree of sectoral and geographic coverage as well as in relation to whether or not allowance has been made for the pressure of demand and multiplyer effects. Thus, for example, Buck and Atkins conclude that their total result of 100,000 jobs (1963-1971) is not too dissimilar from the unadjusted result of 150,000 jobs (1963-1971) derived by Moore and Rhodes (1973).

The results suggest that, in the sixties, the total policy effect ranged from 100,000 to 321,000. This is, indeed, a considerable range and, to some extent at least, would be narrowed if all the studies had the same coverage. The results clearly suggest, however, that policy has had a significant effect although the actual size of this effect is still somewhat unclear. In the only study which also examines the seventies (Moore, Rhodes and Tyler, 1978) there is clear evidence of a declining policy effect, this being 11,500 jobs per annum in the 1972-1976 period as opposed to 28,600 and 24,600 for the periods 1968-1972 and 1964-1967 respectively. (These figures are the unadjusted estimates).

Two further points can be made in relation to the employment results:

- In the only study (Moore and Rhodes, 1976a) which separates out the effect of the individual policy instruments, it is shown that the three major instruments - Industrial Development Certificate, investment incentives and the Regional Employment Premium - have all had a significant effect, being responsible for 85,000-95,000, 162,00 - 177,000 and 32,000-49,000 jobs respectively in the 1960-1971 period. Adjusting these figures to take account of the differing lengths of operation of these instruments during the sixties, the following annual average results emerge:

  II = 20,250 - 22,125
  REP = 8,000 - 12,250
  IDC = 7,700 - 8,600

- In terms of the policy effect on the immigrant and indigenous sectors, it is shown by Moore and Rhodes (1974, 1976a) that the largest effect has been in the immigrant sector. Over the sixties, policy induced immigrant employment was some 60% of total policy induced employment,

a conclusion resulting from both the shift-share and explicit modelling studies.

In comparing the results of these studies in relation to the approaches adopted, we have already noted the problems arising due to the differing degrees of comprehensiveness of the studies. Nevertheless, there is certainly a fair degree of consistency, particularly in the work of Moore and Rhodes (and Tyler) and, at least, all approaches show policy to have had a substantial effect.

Investment

The results of the effect of policy on investment are shown in table 5. In this case, we have included the results for Scotland as well as for the Development Areas as a whole in order to illustrate certain points.

Table 5 : The Effects of Regional Policy on Investment

Reference	Approach	Policy Off Period	Policy On Period	Regional Policy Effect (£M)[1] Total	Annual Average
COMPOSITE DEVELOPMENT AREAS[2]					
Moore and Rhodes (1973)	Shift-Share	1951-62	1963-70	300-400	43-57
Rees and Miall (1979)[3]	Shift-Share	1953-58	1959-76	1774	104
			1963-70	724	103
SCOTLAND					
Begg et al.[4] (1976)	Shift-Share/ Trend Projection	1951-59	1960-71	220	20
Ashcroft (1979)	Shift-Share/ Trend Projection[5]	1951-60	1961-70[6]	37	4
	Explicit Modelling		1961-71	345	34
Rees and Miall (1979)[3]	Shift-Share	1953-58	1961-70	532	59

1. Different price measures have been used in calculating the size of the policy effect. Moore and Rhodes, Begg et al. (and apparently, Ashcroft) use current prices, whereas Rees and Miall use constant (1975) prices.

2. Moore and Rhodes include Scotland, Wales and Northern Ireland, whereas Rees and Miall include Scotland, Wales and the Northern region.

3. The Rees and Miall estimates are derived as the net sum of their yearly estimates.

4. Begg et al's results relate to their, preferred, growth standardization method.

5. Ashcroft's shift-share is based on the results by Blake (1975) who uses the capital intensity standardization approach. It should be noted that Ashcroft conducts a shift-share study for the purposes of comparing this with his preferred, explicit modelling, approach.

6. Ashcroft provides results for both 1970 and 1971 as end years, but prefers to use 1970 as the end year for his shift-share approach since 1971 was a year of low pressure of demand and since the approach adopted cannot account for changes in the pressure of demand in any one year.

At the aggregate Development Area level we see that the two studies lead to quite different results, £47 million to £57 million and £103 million per annum. These studies do suggest a significant policy impact, but the true size of this effect is as yet not clear. A final point to be made at the aggregate Development Area level is that, unlike employment, the policy effect in the seventies has been maintained, this being £159 million per annum for the 1972-1976 period in comparison to £154 million per annum for the 1968-1971 period.

For Scotland, the four studies examined lead to widely differing results, these being sensitive to two main elements:

- The approach/technique adopted.
- The terminal years used for the study.

Ashcroft's trend/share approach provides the only negative result found in all the British studies, minus £0.5 million per annum (1961-1971) but this turns to £4 million if 1970 is used as the terminal year. This arises because the pressure of demand in 1971 was comparatively low. The shift-share approach of Rees and Miall provides by far the highest result, £59 million per annum. The other two approaches, Begg et al's. shift-share and Ashcroft's explicit modelling lead to annual average results of £20 million and £34 million respectively.

Again, the majority of the evidence suggests that policy has had a substantial effect on investment, but just how much cannot be said with any degree of certainty. Of particular concern here, is the apparently high sensitivity of the result to the approach/technique used.

Movement of Firms

Five studies examining the impact of policy on movement into the development areas have been found. Four of these use the explicit modelling approach (Moore and Rhodes, 1976; Ashcroft and Taylor, 1977 and 1979 and Bowers and Gunawardena, 1979) the remaining study (MacKay, 1979) using the shift-share approach. In addition, Moore and Rhodes and Ashcroft and Taylor also use the "naive" trend approach to give a rough idea of the

policy effect and use this as a check on the rough order of magnitude of the results derived from their modelling approaches. These results will not be reported here, except to say that they correspond closely to the results derived by the other approaches.

Within the four explicit modelling approaches, a distinction can be made between the two types of models used:

- pressure of demand models (Moore and Rhodes, Bowers and Gunawardena)[1]
- investment demand/generation - distribution models (Ashcroft and Taylor).

The details of the distinctions between these two approaches to modelling the movement process are discussed in detail in the UK report.

The results of these studies are shown in table 6.

Initially, it can be seen that all studies suggest that policy has played a substantial role in causing firms to relocate to the Development Areas, suggesting an effect of 500 to 980 moves, so that policy was responsible for some 43% to 87% of all moves. The estimate derived from the shift-share approach (62%) lies more or less in the middle of the range defined by the explicit modelling approaches.

At the level of the individual instruments of policy, there is again general agreement that all of the instruments examined have played a substantial role. In this respect, however, two points should be noted:

- First, the introduction of both the Regional Employment Premium and the Special Development Area programme in 1967 prevents these instruments being used in the same model. Moore and Rhodes and Bowers and Gunawardena include REP, whereas Ashcroft and Taylor prefer to use the SDA.
- Secondly, there is considerable disagreement in terms of the absolute size of the effect due to each instrument and therefore their ranking.

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1. While these two studies use the same basic pressure of demand model the Bowers and Gunawardena model measures the pressure of demand by vacancies (Moore and Rhodes - unemployment) and the IDC policy by number of refusals (Moore and Rhodes - refusal rate).

Table 6: The Effects of Regional Policy on the Movement of Industry

Reference	Pressure of Demand Models				Investment Demand/Generation-Distribution Models					
	Moore and Rhodes (1976a)[2]		Bowers and Gunawardena (1979)[2]		Ashcroft and Taylor (1977)[3]		Ashcroft and Taylor (1979)[3]		MacKay (1979)[1,3]	
Period Studied	1960 - 71		1963 - 70		1961 - 71		1961 - 71		1960 71	
	Total	An.Av.	Total	An.Av.	Total	An.Av.	Total	An.Av.	Total	An.Av.
IDC	495-506[4]	45-46	371	53	430(G)	43	470-610(G)[5]	47-61	-	-
					75+(D)	7.5+	153-198(G)[5]	15-20	-	-
II	288	36	378	54	164(D)	20	222(D)	28	-	-
REP	160-104	40-26	188	94	-	-	-	-	-	-
SDA	0-80	0-20	-	-	126(D)[6]	31	45(D)	11	-	-
LEA	-	-	-	-	-	-	50(D)	17	-	-
Total Regional Policy Effect	943-978	86-89	937	134	500(D)[7]	50	470-515(D)	47-51	700	64
Share of Policy Induced to Total Moves	84%-87%		75%[8]		46%		43%-48%		62%	

G = Generation effect

D = Distribution effect

1. Following the discussion in the text, MacKay's standardization approach can be interpreted as implicitly based on an investment-demand model.
2. These studies provide annual average results so that the total is calculated by multiplying the annual average result for each instrument by the number of years that instrument was in operation over the study period (e.g. II, 1963-1971 = 8 years).
3. These studies provide total results so that annual averages are calculated by the reverse procedure as in 2 above.
4. Moore and Rhodes say that the IDC operated over a 12 year period (i.e. 1960-71, inclusive of both end years). In the above table, the total IDC effect is calculated over an 11 year period to allow comparison with the other studies and since the years of operation of other instruments in Moore and Rhodes are calculated for a period inclusive of only one end year (i.e. II, 1963-71 = 8 years).
5. The different results are due to different IDC policy off values. When the policy off refusal rate is zero, G = 610 and D = 198; when it is 4.9%, G = 470 and D = 153.
6. The authors note that the SDA effect is likely to be overestimated since total movement into the SDAs over 1967-71 was around 120.
7. This figure is based on the authors' own estimates rather than our calculations.
8. These authors used a different movement series from the others examined in the table. On this basis, total movement into the Development Areas over the study period was 1247.

Indeed, the UK report shows that, for the movement studies, the total size of the policy effect, as well as how this is apportioned between the individual instruments of policy, is often quite sensitive to the following features of the ways in which the explicit modelling approach has been implemented:

- The type of model used to model the movement process.
- Proxies for variables, in particular the pressure of demand.
- The inclusion/exclusion of particular policy instruments.
- The definition of the policy off value of the IDC.
- Time lag structures.

In conclusion, it is certainly quite clear that regional policy in the UK has had a substantial effect. Particularly comforting in this respect is that this conclusion generally holds for all of the three "impact" variables analysed and for all the approaches used. Where uncertainty still exists, however, is on the actual size of the policy effect and how this is apportioned between the individual elements of policy.

Section 3: Micro Studies

Whereas the macro approach to evaluation is concerned with the application of statistical techniques to aggregate data, the micro approach seeks to cast light on the role of regional policy by asking firms, via the use of questionnaire and/or interview techniques, what factors influenced a particular decision, for example, why they moved into an assited area. In doing so, information is provided on the role of regional policy as a factor influencing such decisions.

Initially, two differences between the macro and micro approaches should be noted:

- First, whereas macro studies have been conducted with the explicit objective of estimating the effect of policy, micro studies, in general, have been initially concerned with identifying the forces and factors behind a particular decision. In doing so, they are, of course, then able to comment on the role of policy.

- Secondly, whereas macro studies can provide an absolute estimate of the size of the policy effect, micro studies are limited to discussing the role of policy relative to other forces influencing a given decision or behaviour. Thus, by the use of some ranking device such as number of mentions or firms' assessment of whether a particular factor played a major/minor role in the decision, it is possible to comment on the role of policy relative to other forces in influencing particular decisions. The micro approach cannot therefore determine, for example, the number of firms moving into assisted areas due directly to regional policy but rather can say whether policy played a stronger role than, for example, labour availability, market considerations and so on.

The remainder of this section is organized as follows; first, the role of micro studies in the evaluation of regional policy will be examined, followed by a discussion of the methodology and associated problems of this approach. Subsequently, the micro studies examined in this project will be discussed and categorised. Finally, the results of these studies will be reported and, in addition, compared to the results derived from the macro approaches.

3.1. The Role of the Micro Approach in the Context of Evaluation

Insofar as the principle focus of this paper is that of the approaches which have been used to derive an estimate of the absolute size of the policy effect, then it is obvious that the macro approach must be used; the nature of the micro approach allows only a relative measure of the role of policy. The above focus together with this feature of the micro approach therefore predetermines the roles which micro studies can play within a partial evaluation of regional policy, roles which are different from, but complementary to, the macro approach. In this respect, the micro approach performs two major functions; as a check on the results of macro studies and as an input into the design of particular macro approaches.

Before discussing these functions, however, it is important to note that the usefulness of the micro approach in these respects is highly dependent on the extent to which they provide a reliable picture of the real world as perceived by businessmen. The problems associated with the micro approach in this respect is the subject of the next section. To the extent that questionnaires or interviews are unable to provide an accurate picture of how decisions were actually made, the usefulness of the micro approach in evaluation is necessarily questionable.

The first of the two roles which micro studies can play is that of acting as a check on the results derived by macro approaches. Given the problems already discussed in relation to the macro approach, both in principle and in practise, a greater degree of credence can be placed on macro results when these are supported by the results of micro studies, for example, when both macro and micro studies show policy to have played the major role in terms of the movement of firms into the assisted areas. When macro and micro studies, however, arrive at conflicting results, it is difficult to suggest

which result, if any, is more likely to be the accurate one.

The second role of the micro approach is that of using the information derived from micro studies as an input into the macro approach. In this respect, this role is confined to those macro approaches which attempt to explicitly model particular processes, such as regional employment performance, investment behaviour or firm movement. In essence, micro studies are important in this respect since they provide empirical evidence to set against the relationships suggested by theory. From this theoretical and empirical base, hypotheses can be formulated and models constructed to test these relationships and to identify the policy effect. The empirical evidence provided by micro studies can be seen as performing two roles in this respect:

- First, in relation to the process which the macro approach attempts to model. Taking an example from firm movement, since most of the micro studies have this focus, micro studies concerned with the way in which location decisions are made may be able to provide evidence to support the adoption of a particular model of the movement process. Thus, if such micro decision - process studies would reveal that location is treated as part and parcel of an investment decision with investment appraisals being conducted for a variety of locations, this could warrant the adoption of an investment - based model of movement. Similarly, if such a study would show that the initial stimulus to move was on the basis of deficiencies or constraints at the present location, this could warrant the adoption of a model which separately treated the decision to move and the decision (where) to locate.
- Secondly, in relation to the variables, particularly non-policy variables, which could be included in the macro model. Thus, micro studies which focus on the reasons or factors which induced a move to the assisted areas give an indication of the likely key variables which could be incorporated and tested in a model of movement. Where a micro study reports that a given factor played a major role yet this proved to be statistically insignificant in a macro model, two possibilities are open; the factor is either inaccurately reported or revealed in the micro approach and/or poorly proxied or modelled in the macro approach. In this latter aspect, the measurement of variables, micro studies may also be able to play a role; for example, when micro evidence

suggests that firms generally do not apply discounted cash flow techniques in investment appraisal, the merits of measuring the strength of investment incentives in terms of their discounted value may be questioned. In addition to these functions, the use of a wider definition of evaluation, such as the relative merits of different courses of action, would permit further roles for the micro approach. In particular, information on the process by which decisions are made and the factors influencing them could allow comment on the relevance of policy and the appropriateness of policy design, thereby permitting greater insight into why policy has had the effect that has been observed and how this could be improved.

3.2 The Methodology of the Micro Approach and its Associated Problems

The basic methodology of the micro approach is that of collecting information on a particular topic by means of questionnaire and/or interview. Once the data has been collected, the general approach to its examination has been relatively simple, with researchers generally describing the pattern of answers and subsequently drawing out conclusions. In only a few cases is the survey data then used as an input into a more macro method, i.e. where it is then statistically analysed and used to test hypotheses.

However, despite the basic simplicity of the approach, micro studies are faced with a variety of difficulties, some which can be relatively easily overcome, others not, which causes one to be cautious in accepting their results. Here, we focus on those problems of survey-based research which are common to this general approach. As these difficulties are well known, they can be dealt with quite briefly.

First of all, the vast majority of studies examined do not set out explicity or principally to test hypotheses concerning the effectiveness of regional policy. Rather, their aim has been that of providing information on particular factors of interest to policy makers and researchers, such as the factors causing movement and determining choice of location. Only those studies which include policy as a factor have been included in this report. While this general feature of the studies examined (i.e. they aim to provide

information rather than to test hypothesis) does of course allow comments to be made in relation to the role and effectiveness of policy, this characteristic of micro studies often results in either a poor or simplified specification of the policy element or they do not ask the questions which require to be asked to allow clear conclusions to be drawn on the role of policy. For example, none of the studies examined asks the question, "Would you have moved to an assisted area had there been no regional policy?" There may, of course, be a number of difficulties in interpreting the answers to such a question.

Having decided on the purpose of the study, the next major task, and one which can result in difficulties, is that of defining and selecting the firms to be interviewed or questioned. The major choice here is in terms of a sample survey versus the complete population. Choosing the complete population is generally only possible when the population is of manageable proportions since this approach is time consuming and expensive. An obvious prerequisite, of course, is the ability to be able to identify all those cases with the desired characteristics - e.g. those manufacturing firms which moved to an assisted area. A register of the population is doubly important when the population is to be surveyed by means of postal questionnaire, where response rates are generally low, so that one can test for response bias. The majority of studies examined have surveyed samples of the population and here a major problem can arise in relation to the representativeness of the sample. These difficulties are, however, not immutable; representative samples can be obtained by means of stratifying the sample but, again, this requires knowledge of the prevailing population which is not always available. Problems of bias can therefore arise again. In a number of the studies examined no or little information is given on sample selection or the nature of the sample. A third difficulty relates to the design of the questionnaire or interview schedule. The technical question of drawing up a questionnaire to obtain the information desired without influencing the respondent is an inherent problem of survey research. To obtain the desired information, questions must be clearly

phrased, easily understood, capable of a reasonably quick response and must avoid leading the respondent. This is by no means an easy task. A first choice is that of whether to have an open or structured questionnaire, in this case the latter providing a list of possible answers, the former not. The trade off here is one of either leading the respondent or forcing him/her to frame answers within the confines of the potential answers (structured questionnaire) as opposed to hoping he/she will be aware of the purpose of the question, know the answer and not require prompting (open questionnaire).

In relation to the questions asked, a number of problems can arise. First, the use of non-mutually exclusive questions creates difficulties in interpreting answers. For example, in asking if constraints at the present location stimulated movement, it is unclear whether financial or physical (or both) constraints are implied. Secondly, in movement studies, questions on the attributes of the location chosen or examined generally also contain site-specific components, so labour availability and local authority response can be grouped together when they play different roles in terms of location, the former being region-specific and the latter site-specific. Thirdly, questions are often posed at different levels of generality, so some factors are only broadly defined, for example, market potential, while others are more explicit, e.g. availability of skilled or female labour. In relation to policy, this is often specified in a collective form, with no distinction made between the various instruments of the policy package. In other cases, the effect of a policy element, not directly specified in the questionnaire, may overlap with other factors, for example labour costs and labour subsidies or the availability of premises and locational control or factory provision policies. Finally, often important questions are not asked. In relation to movement studies, we have already noted one, "Would you have moved to the assisted areas in the absence of policy?" - the micro question associated with the macro concept of establishing the counterfactual position. In addition, the majority of movement studies take as their starting point the fact that the firm did move and focuses, therefore, only on those factors influencing the choice of location. Factors determining the necessity to move and, more

important, whether firms would have preferred to expand where they already were and the reasons why are often not examined. Concentration only on actual movers is therefore somewhat one-sided; attention is focused on locational determinants rather than on the determinants of whether a firm will move or has to move. If the forces influencing movement and location differences are different, and if macro studies wish to model these processes separately, then information on both of these decisions is necessary. In addition, focusing only on actual movers can lead to some bias in the results, in particular the overestimation of the components of assisted area attractiveness since this is not set against those cases (i.e. potential but non-movers) for whom these influences played no role.

The fourth major area where problems in the micro approach can arise is in relation to the respondent. Ideally, the respondent should be one of those who took part in the decision in question, but often the time between the decision and the study is such that the relevant person is no longer with the firm or that he can no longer remember the details. The problems of contacting the appropriate respondent are obviously compounded when a postal questionnaire is used.

The final major difficulty associated with the micro approach relates to the interpretation of the answers given by the respondent. The problem of ex post rationalisation permeates survey research. Thus, a rationale may be subsequently attributed to irrational decisions so that the decision on where to locate may be explained in terms of the costs of alternative locations when in fact the decision was based on factors such as golf courses or the preferences of the managing director's wife. In addition the respondent may provide answers which he feels the questioner wishes to hear or which conceal the real reasons for the decision. For example, he may have gone to an area because of its low labour costs, but might not mention this for fear that he is accused of exploitation. In other cases, the way in which the decision was made may be such that it cannot be easily incorporated in the structure of the questionnaire. Thus, for example, when asked to rank the factors in order of importance, the interdependency of these factors may cause him to opt for one main cause when, in fact, a variety of features led to a general consensus for a particular location. The problems associated with separating out the components or elements

of a decision can therefore lead to significance being attributed to factors which were largely unimportant. In relation to policy, respondents might say that policy was important in case this would influence the future availability of incentives. Finally, where hypothetical questions are asked, e.g. "If policy took a certain form, would this increase your willingness to relocate?", it is perhaps best to treat the responses also as hypothetical.

3.3 A Typology of Micro Studies

Since micro studies all have the same basic methodology, the most appropriate way to categorize micro studies is in relation to the purpose of the study, i.e. the particular decision, behaviour or feature they seek to examine. In this respect, six main categories are found:

- Studies of Locational Determinants
- Studies of the Location Decision Process
- Studies of the Investment Decision Process
- Studies on Costs, Performance and Satisfaction at the New Location
- Studies asking Hypothetical Questions.

The extent to which these types of studies have been conducted within the community is shown in table 7. It should be noted that while the studies have been classified according to their prime focus, a number of studies contain elements relevant to two or more of these categories. A classification is only an ordering device, which allows one to separate out the main features and roles of the different types of studies. Before proceeding to examine these, it should be noted that virtually all the studies examined are related to the movement of industry, the only major exception being those few studies which focus explicitly on the investment decision.

Table 7: A Typology of Micro Studies[1]

Purpose of the Study	Incidence									
	B	DK	F	FRG	Irl	It	L	N	UK	Total
Locational Determinants	1	4	7	3		2		4	8	29
Location Decision Process			1	4					1	6
Investment Decision Process				2					3	5
Costs Performance Satisfaction		1				1		1		3
Hypothetical Questions		2								2
Total	1	7	8	9	0	3	0	5	12	45

1: Note that the total number of entries does not correspond to the number of studies examined, since, in some cases, the study had two main foci.

3.3.1 Locational Determinants

Studies of locational determinants seek to identify the factors which influence location decisions. In general, they focus attention on "push" factors (those factors stimulating movement away from the existing location) and "pull" factors (those factors determining the choice of a new location). In many instances, there is of course a considerable overlap between push and pull factors; a firm moving out of one location because it cannot obtain labour will obviously seek a new location where labour is available. In drawing up a questionnaire, care must be taken, therefore, that the distinction between push and pull factors is not too rigid since, particularly in relation to policy, this could influence the results. For example, to have locational controls act only as a push factor and incentives only as a pull factor causes the roles of these instruments to be predefined rather than to identify these roles as a result of businessmen's perception of the roles they played. It is quite conceivable, at least in theory, that controls could also have a pull effect and incentives an effect on the generation of investment and movement.

Only a few studies examine a third group of factors - "keep" factors, i.e. those forces which cause the firm to realize its expansion in situ. The lack of examination of keep factors causes the majority of studies on locational determinants to take as their starting point the fact that firms decided to move, i.e. they examine only actual movers. Little attention is given to potential, but non-movers, i.e. to those expanding firms which decide not to move but rather expand in situ. This can be considered as a major deficiency in this type of micro study given the locational inertia which generally characterizes location decisions. At best, macro movement studies examine only movement and location decisions, following the general push and pull components of the micro approach to modelling movement; the first, generation, stage is to explain the constraints which cause firms to move out of their present locations and the second stage explains the locations they subsequently choose in relation to the latter's attractiveness. The starting point of micro and macro studies is therefore that investment which moves (MI) whereas additional information

on the movement process could be obtained by also focusing on potential but non-movers (i.e. on all expansions, regardless of whether or not they move). The starting point of the investigation would then be share of investment which moves (i.e. $\frac{MI}{I}$) .

In relation to the role of this type of micro study as an input into the macro modelling approach, locational determinant studies can obviously provide information on the variables which influence their decisions. In addition, they can also provide information on the process to be modelled; for example, whether or not it is worthwhile to treat the decisions to move and locate as separate decisions determined by separate forces.

3.3.2 Location Decision Studies

The main distinction between location decision and location determinant studies is that the latter focuses principally on the factors influencing decisions whereas the focus of the former is on the way in which decisions are made. Studies of the location decision process are founded on a behavioural-theoretic approach to the study of decision making and therefore require a detailed investigation of the nature of decision making in modern industry. Thus, the nature of the organization, the motivations of the decision maker(s) and the appraisal of alternative strategies are among the many areas which must be investigated to gain insight into the process of decision making. As can be seen from table 7, this type of study has not been conducted very often, yet it can be regarded as essential if the movement process is to be understood and modelled. Macro movement models imply a particular rationale to the location decision process, so that it is essential to investigate whether this rationale is found in practice. For example, some macro movement models treat movement via an investment approach; it is therefore important to know whether location and investment decisions are fully integrated, so that the decisions to move and locate are taken on the basis of the appraisal of alternative strategies in relation to profitability, costs, revenue etc., or whether location enters the decision at a late stage, i.e. when it is found that the preferable strategy - in situ expansion - is not possible and whether the firm then enters into a comparative examination of alternative locations or chooses the first acceptable location found.

3.3.3 Investment Decision Studies

Since all movement is associated with investment, a study of the investment decision process can provide valuable insights for policy makers and researchers. Apart from the obvious area of identifying the extent to which investment and location decisions are seen as interdependent, investment decision studies could help in deciding between competing approaches to modelling movement and could provide a useful backcloth against which to evaluate the results of macro studies. Thus, for example, if it was found that investment and location decisions were highly integrated, but that the financial appraisal took no account of investment incentives, then considerable doubt could be cast on macro studies which showed incentives played a major role in explaining movement into the assisted areas.

This type of study, like the location decision process, generally requires an in-depth examination of firms by means of interview. Such studies are therefore necessarily limited in their coverage, being more in the nature of case studies rather than sample surveys. The limited amount of studies of this type at present can obviously lead to questions on the representativeness of their results and this can only be remedied by more research into these fields before one can begin to generalize.

3.3.4 Studies of Comparative Costs, Performance and Satisfaction

Whereas the previous types of studies are concerned with the move itself, this type of study focuses primarily on post-move performance. The value of this type of study lies in the fact that if policy directly aims to promote relocation to the assisted areas, we should therefore be concerned with whether the firm regards the move as a success and whether or not it would be prepared to do so again. In some cases, these studies focus on the move itself and the implications of this for the viability of the firm, while others also examine the degree of satisfaction with inducements. The value of this type of study lies in the information it can provide on the extent to which policy causes resource costs (e.g. stimulating movement which becomes inefficient and unprofitable) and particularly where dissatisfaction is found in relation to both policy and non-policy factors. The latter type of information can be very useful to policy makers, suggesting ways in which policy could be improved to match the needs of firms. The link between this type of micro study

and the macro modelling approach is rather weak; the main area of usefulness lies rather within the wider definition of evaluation where some insights can be given into elements such as the resource costs of policy and the appropriateness of policy design.

A major problem of this type of study is its relative nature, i.e. it is based on comparisons of actual experience in relation to expectations or to the situation at the old location. In some instances, these are likely to be very subjective which create difficulties in attempting to quantify costs or performance. Where detailed company records are available, the opportunities for a more objective assessment and comparison are greater, but studies conducted on this basis are likely to be quite demanding on time and manpower.

3.3.5 Studies of Hypothetical Situations

Studies of this type ask firms to respond to hypothetical questions in relation to such things as the conditions an area would have to display before it would be considered as a possible location or whether a different form of regional policy would be likely to increase their propensity to move. The value of this type of study is that an area could find out in which aspects conditions could be improved to increase its attractiveness while policy makers could perhaps gain insight into the extent to which policy is appropriately geared to the perceived needs of businessmen. The major problem associated with this type of study is of course that hypothetical questions lead to hypothetical answers. Thus, while firms might respond that a higher incentive value or different type of incentive would increase their willingness to relocate, no certainty can be attached to these answers since the modification of policy may not lead to any major change in willingness to move.

3.4. The Results of Micro Studies: A Comparison of Micro and Macro Results

The vast majority of micro studies examined focuses on actual or potential relocation to the assisted areas, either in terms of the factors influencing the decisions to move and locate or the process by which such decisions are reached. Such studies can provide valuable insight into the effectiveness of policy as seen from the perspective of businessmen; for the purposes of this report our interest lies in the extent to which policy played an important role in such decisions and how important policy was in relation to a list of factors which did or could influence these decisions.

In the previous section we noted that, taking the view that micro research can be used as an input into the macro evaluation of policy, three roles could be found for micro studies. However, since almost all of the micro studies examined focus on movement, and since macro movement studies are only found in the United Kingdom, the scope of this section is limited to discussing the following two points:

- First, to report on the results of micro studies in relation to what they say on the extent to which policy influenced the location decision and to comment, on this basis, on the role and effectiveness of policy.
- Secondly, to compare the results derived from micro and macro studies to determine the extent to which these are in harmony or yield rather conflicting pictures of the role of policy. Since macro movement studies have been conducted only in the United Kingdom, this comparison of micro and macro results can, for the other countries, only be made in a very partial way; we can only examine whether or not micro movement studies and macro employment or investment studies yield similar or dissimilar conclusions on the significance of the role of policy. Especially in these cases, it has to be noted that the link between movement and employment, for example, is a very partial one; movement will, of course, generally generate employment, but movement is only one of the avenues by which regional employment performance is improved.

In terms of the other roles of micro studies as inputs into the macro approach, a discussion on this topic can only be conducted for the United

Kingdom and, since this has already been carried out in the British report, it will not be further discussed in this comparative report.

3.4.1 Belgium

The only micro study found for Belgium was that of Merenne-Shonmaker (1975) who primarily set out to examine the process of industrial development (i.e. the means of employment growth - creations, expansions, transfers) in two provinces - Liege and Limbourg. The prime focus was not, therefore, to examine the role of regional policy or to determine the reasons why firms moved into these provinces. However, in conducting the study, some light was thrown on these topics.

First of all, in Limbourg, some 60% of the firms setting up in or relocating to the province did so within its assisted areas, the equivalent result for Liege being 50%. While this, in itself, says little on the role of policy, Merenne-Shonmaker concludes the major factors influencing choice of location were, in decending order of importance:

1. labour availability
2. land
3. labour relations
4. infrastrucutre
5. regional policy

These results show that policy, in terms of its ranking, did not play a major role in attracting firms to the assisted areas of these provinces. This conclusion is, in general, not too dissimilar from the one macro study for Belgium (Bodson, 1977). However, apart from differences in coverage and focus and critical questions which can be raised concerning these studies (see the Belgium report), one should not generalize from these results given the sparcity of evaluation work which has so far been conducted in Belgium.

3.4.2 Denmark

Of the six micro studies examined for Denmark, four were concerned with the factors influencing the decisions to move and locate. The decision to move was repeatedly related to internal problems of the firm, where lack of space and problems in relation to labour availability were the most often mentioned factors which acted as a constraint to in situ expansion. Regional incentives as a push factor were never mentioned.

The factors determining the subsequent choice of location and their ranking are reported in table 8. It can be seen that labour, site, buildings, markets, transportation, personal preferences and raw materials were the major determinants of locational choice. Regional incentives were generally ranked quite low as a pull force, their highest ranking being 5, but,in two of the four studies, it was as low as 10.

In general, these studies concluded that policy did not appear to play any significant role in terms of area attractiveness or as a pull factor. Policy did not appear to contain measures which could be expected to significantly affect the motivation of firms to invest, move out of one area or move to an assisted area. Indeed, one study (Landsplanungs-Valgets Sekreteriat 1966) directly asked whether policy influenced the decision to invest; of the 763 investments examined over the 1950-1964 period, only 6 (0,8%) said that incentives had made the investment possible. Also, in comparing the studies conducted in the sixties and seventies, the strengthening of policy in the seventies is apparently not matched by any increase in the potential of policy to play a substantial role in influencing movement and location decisions.

Again, we must be cautious in generalising from these studies. Firstly, no macro studies were found so we cannot say whether these conclusions are supported by macro evidence. In addition, the samples used in the micro studies contained firms with very different locational histories while the small number of studies makes it difficult to make worthwhile

Table 8 : Ranking of Location (Pull) Factors: Denmark

Study	Landsplanudvalgets Sekreteriat (1966)	Henrikson (1967)	Kolind & Matthiesen (1975)	Jeppsen (1975)	
Time Period	prior to 1964	prior to 1966	1970-1975	prior to 1975	
Sample Size	108	85	22[1]	54[2]	19[3]
Rankings	1. Access to Raw Materials	1. Labour Market Conditions	1. Labour Availability	1. Market Proximity	1. Supply of unskilled labour
	2. Owners Place of Residence	2. Site Factors	2. Local Authority Interest	2. Access to Raw Materials	2. Cost of Site
	3. Site Factors	3. Local Authority Interest	3. Availability of Site/Buildings	3. Supply of skilled labour	3. Wage Level
	4. Transportation	4. Availability of Buildings for Sale	4. Personal References	4. Supply of unskilled labour	4. Personal References
	5. Market Accessability	5. Transportation	5.5 Regional Incentives	5. Access to Large Towns	5. Supply of skilled Labour
		6. Regional Incentives			6. Regional Incentives
	10. Regional Incentives			10. Regional Incentives	

1. These rankings are based on the answers from ten firms moving out of the Copenhagen area.
2. This group consists of those firms who would have (hypothetically) moved to an assisted part of the study area.
3. This group represents those who would have (hypothetically) moved to a non-assisted part of the study area.

comparisons over time, particularly in terms of whether the strengthening of policy was matched by an increase push and/or pull effect.

3.4.3 France

In France, eight micro studies have been examined. In most of these studies it was concluded that policy played little role in relation to the decisions to invest (i.e. little inducement effect) or to move (i.e. little generation effect). Only the disincentive policies play some push role. This, together with the (perhaps associated) shortage of space plus windfall gains from real estate sale, were often important factors causing firms to move out of Paris. Such moves, however, generally located in the ring outside Paris. As a pull factor, increasing the attractiveness of the assisted areas, only one study (SOFDI, 1970) found policy to have played a significant role in the decision to locate while two other studies (Chesnais, 1975 and SERES, 1968/9) found the availability of regional aid played some role, although this was by no means the major factor determining the new location.

In general, growth and the problems of realizing this in situ were the major push forces while the choice of the new location was principally influenced by market vicinity, infrastructure and contacts with other establishments (for large establishments) and by labour availability and relations (for the others). For international firms, the major locational determinants were labour and raw material availability. For these, policy may have played some role in the choice of the country, but not in terms of the eventual location chosen.

Such a conclusion must be questioned; it is difficult to conceive that policy plays a role in the selection of a nation but not in the selection of the location within that nation. Regional policy only plays a direct role in relation to the assisted areas, so if a firm decides to go to a country because of its attractive regional policy it must simultaneously decide to locate in an assisted area. The confusion in the above result

may however lie in the fact that public policy rather than just regional policy was the focus of consideration.

Micro studies do not, in general, suggest that policy has had a major or highly significant impact on the movement or location decisions.

The only comparison which can be made between these macro studies and the one macro study examined in France is that both suggest that the impact of policy has declined since the early seventies. In this respect the micro studies show that the previous importance of labour (particularly labour costs) in the assisted areas has declined and that there is now an increased tendency for (larger) firms to locate plants in the low labour cost countries of the third world.

3.4.4 Federal Republic of Germany

Seven of the eight micro studies examined for Germany provide information on the factors which influenced locational choice. These are reported in table 9. From this table it can be seen that regional policy, as a push factor, is generally ranked fourth or lower; in one study (Georgi/Giersch, 1977) policy is seen as the second most influential factor, while in another (Freund/Zabel, 1978) policy has third place on the ranking of pull factors. However, it should be noted that those studies where policy is given a high rank (Georgi/Girsch, rank 2; Freund/Zabel, rank 3; Wolf, rank 4) were also those studies focusing only on firms which moved to the assisted areas and received regional assistance. In general, the major factors influencing the choice of location have been the availability of sites and buildings, labour availability and (traffic) infrastructure.

These micro results suggest that policy has had little ability to induce new investment or to generate movement. It is likely that, for a number of firms, incentives have represented a windfall gain. However, policy does appear to have had some steering or pull effect, but here, it was never the major influential factor. Rather, it appears policy plays a role at a second stage of the location decision; firms select a number of po-

Table 9 : Ranking of Locational (Pull) Factors: The Federal Republic of Germany

Study	Freund/Zabel (No. 2)	Georgi/Giersch (No. 3)	Brinkmann/Schliebe (No. 4)	Wolf (No. 5)	v. Ballestrem (No. 6)	Fürst/Zimmermann (No. 7)	Brede (No. 8)
Time Period	1970-1975	1959-1977	1970-1977	1945-1970	1966-1971	1966-1970	1955-1964
Size of Sample	29	90	3019	129	283	346	912
Ranking of Pull Factors	1. Availability of building sites 2. Good traffic conditions 3. Investment incentives 4. Cheap building sites 5. Availability of skilled workers 6. Short distance to the market 7. Low utility development costs 8. Availability of unskilled workers 9. Interest of town in the problems of the firm 10. Low energy costs	1. Traffic infrastructure 2. Public assistance 3. Building sites and buildings 4. Labour market 5. Market and supply factors 6. Infrastructure	1. Building sites and buildings 2. Availability of labour 3. Market and transport 4. Private and other reasons 5. Public assistance 6. Raw materials	1. Availability of building sites (good in quantity a. quality) 2. Availability of labour 3. Low prices for building sites 4. Regional incentives 5. Existing buildings 6. Good traffic connections to the market 7. Other reasons 8. Good traffic connections to the market of input factors 9. Special depreciation allowances 10. Motorways nearby	1. Labour availability 2. Availability of building sites 3. Prices of building sites 4. Traffic conditions 5. Building sites with utilities 6. Existing buildings and installations 7. Help with the acquisition of building sites 8. Building costs 9. Help with the installation of utilities 10. Short distance to the market . . . 14. Soft loans and credit guarantees . . . 16. Investment grants, special depreciation allowances	1. Good traffic conditions 2. Availability of building sites 3. Low prices for building sites 4. Availability of unskilled workers 5. Availability of skilled workers 6. Low utility development costs 7. Investment grants/ depreciation allowances 8. Soft loans 9. Interest of the town in business 10. Industrial sites existing	1. Labour 2. Possibilities of spatial expansion 3. Building sites 4. Market 5. Taxes and public assistance 6. Transportation costs 7. Agglomeration advantages 8. Personal preferences 9. Natural determinants 10. Distance to competitors . . .

tential locations which fulfil their minimum requirements (in terms of buildings, labour infrastructure), and, once this selection has been made, policy may play a role in causing the firm to locate in the assisted areas rather than in some other acceptable, but non-assisted areas. The steering capacity of incentives is therefore likely to be highest for those types of activities with minimal locational requirements, for example, branch plants.

In comparing the results of micro and macro studies conducted in Germany, neither warrant the conclusion policy that has been an unmitigated success. However, the macro studies, taken together, do suggest a somewhat higher effectiveness of policy than is the case for the micro studies. The former does present a positive picture on the effects of policy, although in some cases the effect cannot be regarded as very substantial. Micro studies all suggest that policy was not the major factor influencing the decision on where to locate, although it is possible that it played a more significant role in the selection between assisted and non-assisted area locations which fulfilled the main requirements of the firms. Micro studies suggest that policy is unlikely to have a major direct effect (e.g. in inducing investment or in generating movement) but may have indirect effects in terms of increasing liquidity and influencing the location of new plants. The latter lends some support to the macro study by Recker (1977) who found that the main effect of policy was a redistributional one (steering projects from non-assisted to assisted areas) and the efficiency coefficient of incentives, reflecting the degree to which additional investment is induced, is considerably below unity.

3.4.5 The Republic of Ireland

No relevant micro studies were found for Ireland.

3.4.6 Italy

Two micro studies have been found in Italy, one examining the location decisions of international firms (Business International, 1974) and the other investigating the reasons why Italian firms located in the Mezzogiorno (Confindustria 1971).

The Business International Study suggests policy played little role in attracting international investment into Italy; rather, the major factors were market considerations and labour availability and cost. However, where incentives did play a role was in steering such investments to the Mezzogiorno once they had decided to locate in Italy. This is the role that we would expect regional policy to play at the international level. This conclusion is supported by the response to questions assessing the firms' satisfaction with their decisions; incentives (and labour costs) were regarded as untrustworthy motives for investing in the South, unless these were accompanied by solid market opportunities. In relation to the components of the incentives package, loans, grants and tax holidays were regarded as the most important.

The Confindustrial study concludes that policy played a very significant role in relation to the decision to locate in the South; the authors of this study feel that had there been no incentives, firms to a large extent would not have decided to locate or expand in the South. However, they provide no information to support this contention; for example, no list of the factors determining locational choice and the frequency by which these were mentioned is presented. Only in the case of the firm having decided to locate in the South are questions asked in terms of the factors determining the actual location within the South. Here, markets, infrastructure provision and the availability of premises are the prominant factors; differentiation of policy within the South (i.e. it is available everywhere in the South, but in some areas higher awards are available) plays a minor role in this respect, being ranked eighth and ninth for southern and northern firms respectively. The authors do not, however, discuss whether or not the intra-South variations in the value or strength of policy are substantial.

The main focus of the study was on the roles and relative merits of the components of the incentives package. The main role of policy is seen in terms of influencing the location decision, and here grants and soft loans

were seen as the major elements. In relation to the subsequent performance of the firm once it located or expanded in the South, policy had little effect, although in those cases where it did play some role, tax concessions and social security concessions were the main factors. This is as would be expected; only those elements of policy which taking the form of a continuing (rather than one-off) subsidy can be expected to influence running costs and the subsequent conduct of the firm. Thus, if the development of firms which moved to the South is to be maintained, policy should move in the direction of improving infrastructure and the quality of the labour force.

In Italy, despite the limited amount of macro and micro analysis of the effects of regional policy, there is a considerable degree of harmony in their results. Both groups of studies show policy to have had some not insignificant effect. In addition, the macro and micro studies investigating the behaviour of types of firms (international, multiregional, local) lead to similar conclusions. For international and multiregional firms, it is the level of demand in the North (i.e. markets) which determines the decision to locate in Italy, but having decided to locate in Italy, differences in the cost of capital (regional policy) plays a major role in the eventaul choice of location. It should, however be noted that while the micro studies show that tax holidays and, to a lesser extent, labour premia (social security concessions) play an important role in some cases, these elements of policy have not yet been included in the macro approach, the latter having confined itself to examining only the role of grants.

3.4.7 Luxembourg

No micro studies have been found for Luxembourg.

3.4.8 The Netherlands

In assessing the results of micro studies in the Netherlands, it is important to distinguish between the SISWO study and the other four micro studies examined since the former examined firm movement in the 1959-1962 period whereas the others covered the 1960s and/or 1970s. The important distinction in this respect is the changing importance of labour market considerations as a pull factor for mobile investment. In the fifties and earlier sixties, shortage of labour appeared as the second most important push factor, after lack of space for expansion. Since the mid-sixties, however, interregional labour market imbalance has narrowed, as reflected in the other four micro studies where labour market considerations are either not mentioned as pull factors (Pellenberg and Boer) or no longer play as important a role as in the past (Poolman, Potters and Wever, and DeGoede and van Mels). Rather, these latter four studies mention the possibilities for expansion, floorspace availability and price and accessibility as the main pull factors, as shown in table 10.

Common to all studies, however, is the insignificant role played by regional policy. In two studies, it was never mentioned as a factor with any major influence on the location decision (Pellenberg; Poolman, Potters and Wever) while in the other studies it was ranked fourth, sixth and eleventh. It should be noted that the highest ranking given to policy (4th, in the SISWO study) was in the only study for the late fifties - early sixties period, where, as is often the case in studies in other countries, policy played a complementary role to market (particularly labour market) forces. As the importance of labour market considerations, as both push and pull factors, declined, so too has the ability of policy to act as a steering device. Again, the only role policy may have played, since the mid-sixties is that of influencing the final decision between assisted areas and non-assisted areas which satisfy the requirements of the firm, particularly, space and accessibility.

In comparing the results of micro and macro studies in the Netherlands, the two groups of approaches appear to be in general disagreement as to the effectiveness of policy. As we have noted above, the general view of the micro studies is that a high degree of effectiveness cannot be ascribed to policy, yet the majority of the macro studies suggest that policy has had some effectiveness and in some cases (Netherlands Economic Institute, 1971-1973 and Central Planning Bureau, 1973-1978) a quite substantial effect.

Table 10 : Ranking of Location (Pull/Factors) : The Netherlands

Study	Pellenbarg (1976-1979)	SISWO (1970)	Boer (1977)	Poolman, Potters & Wever (1978)	DeGoede, van Mels (1976)
Period	1974-1975	1959-1962	1960-1976	1960-1976	1960-1974
Sample Size	50	151	34	94	64
Rankings	1. Possibility for Expansion	1. Labour Availability	1. Price of Building and Land	1. Possibility for Expansion	1. Accessibility by Truck
	2. Floorspace Availability	2. Low Rents and Land Price	2. Room for Expansion	2. Labour Market Considerations	2. Accessibility by Private Transport
	3. Organisational Considerations	3. Accessability	3. Centrality of Location	3. Contacts with Regional Government	3.5 Availability of Space
					3.5 Availability of Labour
		4. Regional Investment Subsidy	4. Housing Availability	4. Low Rents	
		5. Market Proximity	5. Floorspace Availibility		
			6. Investment Subsidies		
					11. Investment Premium

3.4.9 United Kingdom

For the United Kingdom, twelve micro studies have been examined. Eleven of these provide information on and rankings of the major factors causing firms to locate in the assisted areas, but it should be noted that one of these (Townroe, 1971) focuses primarily on the location decision process while three others (Law, 1964; Luttrell, 1962 and Morley and Townroe, 1974) examine, in particular, the relative costs on performance of firms which moved into the assisted areas.

Virtually all these studies identify the growth of output, i.e. expansion, as the main reason underlying the realization of a new plant in a new location. In many of the studies examined, over 70% of respondents give this as the main reason for relocation. In the late fifties and sixties, therefore, the vast majority of moves which took place were in response to the pressures imposed by expansion. In addition to growth pressures, factors such as the ending of a lease, difficulties with respect to planning and location controls, increased rent and company reorganization are often mentioned, but these factors generally assume minor significance.

The majority of studies examined focus on those firms which actually moved and therefore examine only a sub-set of potential movers. For example, all firms which expand can be considered as potential movers, but, in the end, many of these are able to or prefer to expand in situ. The concentration of studies on actual movers has meant that an examination of the factors favouring in situ expansion has been neglected. If one accepts that, in general, firms prefer to expand in situ rather than to realize that expansion in the form of a new plant in a new location, then movement can be regarded as resulting from a variety of restrictions which prevent in situ expansion. In this respect, and in conjunction with expansion, the most important push or constraint factors causing relocation (i.e. acting against in situ expansion) mentioned in the studies examined were, in decending order of importance, the unsuitability of existing premises, problems in terms of labour supply, refusal or expected refusal of an Industrial Development Certificate (IDC) and problems of access to markets. Differences in this generalized pattern do of course emerge when individual studies are examined.

The principle focus of many of the micro studies is that, having decided to move, which factors determine the new location chosen by the firm? In this respect, it is obvious that many of the push factors, which stimulated movement, will also become pull factors, influencing location. In terms of these pull factors, labour availability has been shown to have been of overriding importance, as is shown in table 11, which lists the major pull factors reported in the studies examined. The desire to locate to areas with a plentiful labour supply was even stronger for those firms which moved to assisted areas. Only in a few studies was labour availability not the most important factor, and in these cases labour availability was generally the second most important factor , the margin between first and second factors being often extremely small.

Regional incentives were generally ranked second in importance to labour availability and the significance of regional policy may have been even stronger than the reported results suggest. Some confusion arises due to the specification of policy in the questionnaires. In some cases, only incentives are mentioned, apparently leaving two important elements of policy which are poorly treated. The first of these is the government's Advance Factory Programme, the significance of this being revealed by the importance often given to the cost and availability of premises. Thus, where the Advance Factory Programme is not explicitly specified, its influence could be incorporated under non-policy factors. The second element where confusion arises is that of the IDC policy. Where this has been examined, it has generally been in the form as a push force, with no pull role being considered. Yet for firms which faced or expected difficulties with in situ expansion due to IDC policy, the availability of IDC approval in alternative locations could also play an important pull role. The only study which considers this pull role of the IDC (Department of Trade and Industry, 1973) concludes that the availability of an IDC was the second most important pull factor.

These results certainly suggest policy has played an important role in influencing locational choice, but that policy has not had such a strong influence on stimulating movements. Market factors, especially labour availability, were the major push and pull factors but, in such a situation where market forces are acting in harmony with regional objectives, the

Table 11 : Ranking of Location (Pull) Factors : United Kingdom

STUDY	TIME PERIOD	SAMPLE SIZE	RANKINGS			
Cameron and Clark[1] (1966)	1958 - 1963	29	1. Labour Availability	2. Local Authority Cooperation	3. Market Accessibility	
Cameron and Reid[1] (1966)	1958 - 1963	15	1. Labour Availability	2.5 Accessibility 2.5 Local Authority Cooperation		4. Transport Facilities
Dept. of Trade and Industry[1] (1973)	1964 - 1967	632	1. Labour Availability	2. IDC Availability	3.5 Market Accessibility 3.5 Government Inducements	
Keeble[1] (1968)	1940 - 1964	112	1. Labour Availability	2. Government Pressure/ Inducements	3. Availability of Factories	
Loasby[1] (1961/1967)	1945 - 1961	200	1. Proximity to Present Location	2. Site (nature and cost)	3. Availability of Labour	
Mc Govern[1] (1965)	1945 - 1963	100	1. Labour Availability	2. Government Incentives	3. Advance Factories	
Murie et al. (1973)	1965 - 1969	71	1. Availability of Premises	2. Labour Supply	3. Financial Inducements	
Spooner[1] (1972)	1939 - 1967	84	1. Attractiveness of Area	2. Labour Availability	3.5 Other Labour Advantages 3.5 Proximity	
Townroe[2] (1971)	1969	59	1. Labour Availability	2. Contact with Original Markets	3. Access to Local Services	
Law[3] (1964)	1932 - 1962	28	1. Labour Availability	2. Financial Incentives	3. Availability of Factory	
Morley and Townroe[3] (1974	1966 - 1968	29	1.5 Accessibility/ Transport 1.5 Government Inducements		3. Labour Availability	

1 : These studies focused specifically on locational determinants.
2 : This study focused primarily on the location decision process.
3 : These studies focused primarily on relative costs and performance in assisted areas.

studies show that policy can play a major complementary role in terms of strengthening both market push and pull forces, especially the latter, thereby acting to increase the market forces-related attractiveness of the assisted areas. Virtually all the studies examined were, however, conducted in periods of growth, so that, perhaps even without policy, many firms might have made the same locational decision. Since the early seventies the economic climate changed so that policy, which has also become weaker, has had to operate within a more hostile environment and one where market forces no longer act, at least to the same extent, to the assisted areas' benefit. Unfortunately, we have found no micro studies for this later period so that we cannot comment on the extent to which the above results remain valid in the present situation.

In comparing the results of the micro and macro studies for the United Kingdom we can compare micro studies directly with macro movement studies, whereas for the other countries, with no macro movement studies, we have had to be content with rather partial comparisons in relation to the overall effects of policy.

There is certainly a broad degree of agreement in the micro and macro movement studies that regional policy has played some, not unimportant role in influencing movement into the assisted areas. In general, however, it appears that the macro studies provide a more optimistic picture than do micro studies. The macro studies suggest that the share of moves going to the assisted areas which can be attributed to policy lies in the range of 43% to 87%, so that all macro studies, with the exception of Ashcroft and Taylor, suggest that policy has been the most important factor in stimulating movement into the assisted areas. Even in the case of Ashcroft and Taylor, the share of policy induced moves is just under 50%. In comparison, the vast majority of micro studies give policy an important, but secondary role. In addition to this, the features of the macro approaches used suggest that policy would have had this effect, regardless of the state of the economy whereas the micro studies throw doubt on such a conclusion since policy was only able to play the important role it did, as revealed by the micro studies, since it acted to complement market forces.

A further area of disagreement, perhaps even more substantial, is found in relation to the role of non-policy factors. The most appropriate macro studies to be examined in this respect are those of Ashcroft and Taylor since their approach distinguishes between the generation of moves (the movement decision) and the distribution of moves (the location decision). While the approach adopted has many merits, Ashcroft and Taylor (1979) find that non-policy factors (in this case, the only one being relative unemployment in the Development Areas - i.e. a proxy for labour availability) had apparently no effect in stimulating movement into the assisted areas, a finding totally in contradiction to the micro studies where this factor played the most important role. In other regression models of movement (Moore and Rhodes, 1976 and Bowers and Gunawardena, 1979) the distinction between movement and location decisions is not made, so that labour availability in these models relates to both push and pull forces. Even here, however, policy played the major role in attracting moves to the Development Areas.

In conclusion, therefore, there is certainly a substantial level of agreement between macro and micro studies, perhaps more so than in other countries, that policy did play an important role in stimulating movement to the assisted areas, yet the above comments suggest that one must be extremely cautious in accepting the results of these studies given, in particular, the considerable disagreement between micro and macro studies in relation to the importance of non-policy factors, particularly the role of labour availability.

Section 4 : Measuring the Effects of the Regional Development Fund : A Discussion

The previous sections have examined the various approaches which have been used to measure the effects of national regional policy. In this section, we turn to a discussion of the applicability of these approaches to measuring the effects of the Community's Regional Development Fund (RDF) in terms of its effect on employment or investment in, or industrial movement to, the assisted areas of a given Member State. Since our eventual concern lies with deriving quantitative estimates of the effect of the RDF, only macro approaches (and, in particular, explicit modelling) are considered.

Of particular relevance to the discussion of the applicability of national level evaluation methodologies to measuring the effects of the RDF are the following two aspects:

- First, the extent to which the Fund is used to supplement rather than substitute for national expenditure on regional assistance. If the Fund achieves no additionality, the above discussed methods cannot be applied to derive estimates of its effect.

- Secondly, and on the assumption that additionality is achieved, attention has to be focused on the most appropriate ways of incorporating the Fund in some model to derive an estimate of its effect on some "target" variable. In particular, attention must be given to the treatment of infrastructure given the major share of RDF expenditure going to this type of investment.

4.1 Evaluation and Additionality

In terms of the approaches discussed in section 1, the regional policy effect can be defined as that effect (e.g. number of firms moving into the assisted areas) which would not have come about in the absence of policy. The macro approaches examined above define this effect in terms of the quantitative specification of the state of affairs had there been no policy (i.e. the counterfactual or hypothetical policy off position)

and the gap between this and the actual state of affairs is attributed to the effect of policy.

In doing this, a distinction must be made between the number of, say, projects associated with the effects of regional policy and the number of projects induced by regional policy. It is of course the latter which macro approaches attempt to estimate. The difference between induced and associated projects can be seen as a "dead weight" effect, i.e. those receiving assistance which would have in any event been realised, even in the absence of regional assistance. Following the above definition of the regional policy effect, the latter must obviously exclude any "dead weight" effect.

Thus, in seeking to measure the effects of the RDF, we are looking for an effect that would not have arisen in the absence of the RDF. In examining the applicability of macro evaluation methodologies to measuring the effects of the RDF, a discussion of the vexed topic of additionality is therefore essential.

If the RDF is implemented in such a way that it acts in addition to (i.e. over and above) national regional policy, then it may be possible to apply one or other of the above discussed macro approaches to estimate its effect. Thus, if the existence of the RDF results in a net addition to national expenditure on regional assistance, then we can look for an RDF effect in terms of one that would not have arisen in a no - RDF situation. In such a case, there will be an RDF effect which is identifiable and which can be separated out from the effect of national regional policy assistance.

If, however, the RDF is implemented in such a way that it substitutes for, rather than acts in addition to, national regional policy, then macro approaches used to measure the effects of national regional policy cannot be used to estimate the effects of the RDF. This follows since, if the Fund is used in a substitutive manner, then those projects assisted by the Fund would have been assisted from national regional policy had there been no Fund. In such a situation the actual and counterfactual (i.e. Fund and no Fund) positions would be identical, i.e. there would be no effect which would not have arisen in the absence of the RDF since it has not been implemented in a manner resulting in a net increase in

expenditure on regional assistance. This is not to say, of course, that the RDF has no effect; rather, it means that the Fund does not have an effect which could be identified and separated out by way of the policy off - policy on approach which characterizes the use of macro approaches to measuring the effects of national regional policies.

Thus, the first stage of any discussion on the effects of the RDF must be concerned with defining if, and to what extent, additionality is achieved. Only then, and on the assumption of a significant degree of additionality, can we move onto the second stage - that of incorporating the RDF into some evaluation model.

The RDF seeks to achieve additionality in two main ways:

- First, in terms of a "global additionality effect" whereby more projects receive regional assistance in comparison to a no-Fund situation. The main way in which the Fund can do this is via a budgetary effect whereby the availability of Fund monies allows projects to be assisted which would not have been (at least in a given fiscal period) in the absence of the Fund since some budgetary limit or ceiling for national expenditure on regional policy would have been reached.

- Secondly, in terms of a "topping up" effect whereby more assistance can be made available to a given project. Thus, the existence of the Fund might allow a project to receive a grant of, say, 30% of eligible costs in comparison to a no-Fund situation where that project would have received, say, 25%. Additionality would then be achieved when, in comparison to the situation where the Fund existed, the no-Fund position would have been one where either the project was not realized at all or where a smaller project would have been realized.

It should be noted that the Fund seeks to achieve additionality primarily via the "global additionality" effect, i.e. by making assistance available to more projects. The Commission would not like to see "topping up" become a major practise given, in particular, the discrimination between projects that would be involved and because of the need to take account of the principles of the Community's regional assistance co-ordination system. The first annual report on the RDF (1975) lists examples of how the various Member States have used the Fund, the majority of these being in terms of the "global additionality effect" (where the Fund has allowed

either an increase in expenditure or its maintenance when it would otherwise have been cut) although there are cases where the Fund has been used via the "topping up" route.

However, for the purposes of measuring the effects of the RDF, such statements on how a given country has used its allocation from the Fund cannot, in themselves, be taken as irrefutable evidence that additionality has been achieved and the degree to which it has been achieved. This is particularly so given the substantial body of feeling which regards a considerable part of the Fund as being used in a substitutive rather than additional manner.

While the above discussion has shown the ways by which the RDF could achieve additionality, it is by no means clear that additionality is achieved, at least to any major degree. Thus, while the potential exists to achieve additionality, the practise, particularly the implementation of the Fund, raises questions as to whether, and the extent to which, the Fund actually does result in a net increase in national expenditure on regional aid. The identification and quantification of the extent to which the Fund achieves additionality is not, initially, a purely arithmetical matter but one which requires a detailed investigation of the implementation of the Fund before the counterfactual situation (what would governments have spent and what would have been the situation in the assisted areas in the absence of the Fund) can be determined. There has been, however, very little detailed investigation of the implementation of the Fund, but such research can be regarded as essential since it could help to, first, identify the degree and nature of additionality and consequently the appropriateness of national-level evaluation approaches and, secondly, it could provide pointers to an alternative implementation to allow a higher degree of additionality.

For these reasons, therefore, it is not possible at present to determine the appropriateness of the national-level evaluation methodologies to an evaluation of the RDF. One can, however, point to some of the relevant questions which have to be answered and the hypotheses which can be formulated and tested to determine the degree of additionality achieved by the Fund. Of particular interest is the examination of the potential additionality of the Fund following two features of national aid systems:

- The extent to which national regional aid budgets are open-ended or fixed.

- The extent to which national aid systems are characterized by automatic or discretionary award systems.

Consider, for example, a regional policy system where the budget was open-ended and automatic awards are given. In such a case, all eligible projects would receive national assistance. If operating within the confines of such a system, the Fund could not claim any additionality since, with or without the existence of the Fund, all eligible projects would be assisted anyway. In respect to the Fund, therefore, there would be no difference between the actual and counterfactual situations, so that the national level evaluation methodologies would not be able to identify or isolate out any effect attributable to the Fund, i.e. that which would not have come about in the absence of the Fund. In the national policy system defined above, this conclusion would be supported by the way in which the Fund is implemented, in particular, the criteria by which projects are selected for Fund assistance. In this respect, since the projects receiving Fund assistance are proposed by the national governments, on the basis of the criteria used to decide on the eligibility of projects for national regional assistance, the Fund cannot have an additionality effect.

Where the incentives system is automatic but the budget is fixed, the Fund could have an additionality effect. In this situation, it is possible that eligible projects could not gain national regional policy assistance (at least in that fiscal period) simply because the budget had already been used up and could not be extended. In such a situation, the Fund could indeed allow projects to be aided which would not have been aided in the absence of the Fund. To examine the extent to which additionality could arise via this route, one would first of all have to determine whether the budgets associated with automatic award systems are indeed fixed, or whether the legislative requirement to give an award to all eligible projects requires the budget to be open-ended. Again, in the latter case, the Fund would have no additionality.

Whereas the above discussion, concerning automatic award systems, relates largely, although not exclusively, to "global" additionality, the discussion of discretionary award systems relates more to additionality via

"topping up". Discretionary award systems have two main forms: firstly, where the basic incentive instrument itself is discretionary or where, in addition to the basic incentive (e.g. an automatic award) there is, in addition, a discretionary award. An example of the latter is found in Great Britain where the basic element is the automatic Regional Development Grant and, in addition to this, it is possible that firms may gain Selective Financial Assistance, the decision as to whether or not to award this, as well as the rate of award, being discretionary. Discretionary award systems, in relation to the RDF, pose major difficulties both in relation to the ability to identify whether the Fund has been used in an additional manner as well as to the potential to isolate out and identify the investment or employment effect directly induced by any additional use of the Fund.

In relation to discretionary award systems, the two major problems which arise in connection with the Fund are:

- First, the difficulty of determining the award a firm would have received in the absence of the Fund. Governments may argue that the existence of the Fund allowed them to make a discretionary grant offer of, say, 25%, to a firm when, without the Fund, it would only have been able to offer, say, 20%. To establish, however, that this would in fact have been the case presents extremely intractable problems.

- Secondly, and closely related to the above point, is the extent to which the additional offer, made possible by the existence of the Fund, was the factor which caused the firm to decide to move to or expand in the assisted areas. Using the above example, one would have to show that, had there been no Fund, a 20% offer would not have led to the same result and that the government, realizing this, would not itself have increased the discretionary award to 25%.

Again, in investigating the above problems, account would also have to be taken of whether or not budgets are open-ended, de facto or de jure.

The above discussion can be summed up by the following diagram which simply provides a framework within which the potential additionality of the Fund could be investigated.

Potential to Achieve Additionality

Nature of Budget	Nature of Award System	
	Automatic	Discretionary
Open-Ended	No Additionality	Possible Additionality
Fixed	Possible Additionality	Possible Additionality

For the two additionality routes discussed above, "global/budgetary" and "topping up", the diagram shows that in the case where an automatic award system is combined with an open-ended budget, no additionality can arise since all eligible projects will receive regional aid regardless of whether or not the Fund exists. In all other cases, there is at least the potential to achieve some additionality and we have noted above some of the questions which require to be answered to determine whether, and the extent to which, the Fund has achieved an additionality effect in these situations.

Thus, while it is often felt that the Fund has resulted in little or no additionality, an implementation study along the lines noted above is required before the additionality question can be satisfactorily answered and before the applicability of national evaluation methodologies to the RDF can be fruitfully discussed.

The above discussion has been framed in terms of measuring the national effects of the RDF, e.g. the employment effects attributable to the RDF in the assisted areas of a given country. While there would obviously be considerable interest in performing such a study, an alternative, geographic focus for a study of the effects of the RDF can be suggested. Since the objective of Community regional policy is to reduce spatial imbalance within the Community (i.e. between rather than within countries) an appropriate focus for an evaluation of the RDF would also be its effect on the above-noted objective. The counterfactual position for such a focus would then be the extent to which regional disparity within the Community would have been greater in the absence of the Fund.

4.2 Incorporating the RDF into an Evaulation Study

On the assumption that RDF additionality can be established, we can turn to the discussion of incorporating the RDF into some macro evaluation methodology, where the implicit focus would be that of identifying the national (rather than Community) effects of the RDF.

In terms of the trend projection and standardization approaches, a priori support for an RDF effect would be provided when the gap between the actual and counterfactual positions increased at or around the time when the RDF came into operation. However, we have already noted the assumptions and limitations of these approaches, so that the discussion here focuses on the incorporation of the RDF into some form of explicit model which seeks to explain the performance of some "impact" variable, e.g. in terms of entering the RDF as an independent variable in a model of , say, regional employment.

In using the explicit modelling approach, a first problem to be solved is that of deriving an appropriate measure of the value or strength of the RDF as it applied to a given country. If, for example, we were to measure the RDF in volume terms, the use of a country's total or gross receipts from the Fund would require the following two related assumptions to be made:

- First, that the Fund is used in such a way that it achieves total (i.e. 100%) additionality. Thus, to the extent the Fund does not achieve perfect additionality, total receipts have to be accordingly reduced to determine the effective (i.e. additional) amount of money received from the Fund. This implies:
- Secondly, that the counterfactual or no-Fund position would be one where the national budget for regional aid would have remained unchanged. If, however, countries were to make payments to the RDF out of their national regional policy budgets, then the counterfactual position for the national regional policy budget would be one where it would have been higher than it actually is given the existence of the Fund. In such a situation one would have to examine net receipts (i.e. receipts minus contributions) from the Fund. It is unlikely, however, even if this were the case, that net

receipts could be calculated since a country's contribution to the Fund is probably not separable from its total payment to the Community's budget. It should also be noted that in a situation where the counterfactual national regional policy budget would be higher than the actual one, the application of macro approaches to countries in a negative net receipts position would lead to the conclusion that the Fund had a negative inpact on that country's assisted areas. Thus, before we can begin to measure the RDF, the above noted study of additionality would also be required to define not only the degree of additionality but also the appropriate counterfactual position in terms of national regional policy budgets.

A second point requiring investigation in measuring the impact of the Fund follows from the division of Fund monies between private investment and infrastructure projects. In 1976, for example, 75% of all the projects assisted by the Fund were in the infrastructure category (equalling 55% in terms of the value of investment financed). It is likely that the share of infrastructure to total projects has been increasing as a result of the effects of the economic crisis.

The high share of infrastructure - related to total assistance provided by the Fund results in particular problems in measuring the effects of the Fund. An example of a model of firm movement into the assisted areas can be used to illustrate some of these problems, e.g.

$$M_{AA} = f\ (NF, AAA, NRP, RDF)$$

Where M_{AA} = moves of firms into the assisted areas

NF = national factors, such as the state of the economy and trend factors

AAA = assisted area attractiveness in terms of e.g. labour and premises availability

NRP = national regional policy instruments

RDF = Regional Development Fund

The first point to be noted here is that the existence of the Fund can stimulate movement into the assisted areas via two routes:

- by providing additional assistance (either global/budgetary or topping up) to individual firms to move into the assisted areas (RDF_1)
- by increasing the attractiveness of these areas by improving regional infrastructure in terms of such factors as advance factories, industrial estates and road, telephone, airport and port facilities (RDF_2).

Thus, it is necessary to give separate treatment to infrastructure and private investment assisted by the Fund.

Secondly, in terms of that part of the assisted area attractiveness variable relating to infrastructure, it is necessary to separate this into three components. If we take the example of factory availability, any attractiveness of the assisted areas in this respect may be due to:

- market or non-policy factors
- the provision of premises as an instrument of national regional policy
- the provision of premises via the RDF.

Measuring the RDF_1 variable (assistance to private industry) need provide no intractable problems provided the additionality problem has been resolved. However, in terms of the RDF_2 variable (infrastructure investment) it has been shown in section 1 that not only has there been little treatment given to infrastructure as a variable but also, where studies do treat infrastructure, many problems can be raised in relation to the way in which this variable has been dealt with. The use of index or points systems can be regarded as inferior to some form of direct measurement. However, as noted in the discussion of an instrument such as the Advance Factory Programme in GB, even a direct measurement approach to defining the strength of policy does not solve all problems. In particular, we noted the problem of whether the provision of Advance Factories can be treated as an exogenous variable or whether it is better seen as a measure which responds to the effectiveness of policy. In addition, it would be no easy task to disaggregate a factory availability effect into the three noted components, even if we ignore the problem of additionality.

In this section, an introductory examination of the potential of applying national level evaluation approaches to measuring the effects of the RDF has been discussed. The first and main point to be made is that we have to ensure that we are looking for an effect which actually exists. Given the characteristics of the approaches to measuring the effects of regional policy, this means that the RDF must produce an effect which would not have arisen in its absence. Thus, the prerequisite for the application of any of the above-discussed evaluation approaches is a detailed examination of the implementation of the Fund to identify if, to what extent and in what circumstances additionality is achieved. Without this, there would be no sense in inserting the RDF as an independent variable in a model of regional performance since this would seek to separate out the effect of the RDF from national regional policy when no such separable effect may exist. It is only after substantial additionality can be shown that one can move to the more technical phase of model specification, and even here we have suggested that considerable research will be required before a satisfactory model can be specified.

Summary and Conclusions

The objectives of this study have been:

- To examine and classify the types of approaches which have been used to evaluate the regional policies of the Member States of the European Community.
- To critically assess these evaluation approaches and to make clear the assumptions and procedures on which they are founded.
- To discuss the results of these studies.
- To comment on the appropriateness of the approaches, used to evaluate the regional policy of a country, to evaluate the regional policy of the Community, with particular reference to the Regional Development Fund.

In this report, the term evaluation is defined in a partial way. Thus, when we talk of the evaluation of regional policy, our focus lies on the methodologies used to identify and quantify the effects of policy in terms of employment and investment creation and in terms of stimulating the movement of firms into the assisted areas. Our concern lies therefore with the evaluation approaches and techniques which have been used in relation to regional policy rather than the results of these evaluations per se.

The initial division made in relation to the approaches used to examine the effects of policy is that of classifying studies as macro or micro approaches.

- Macro approaches are characterized by the application of statistical techniques to aggregate data. Macro studies seek, therefore, to separate out and quantify the effect of regional policy on some impact variable (which policy directly promotes, e.g. investment) from the effect of those other forces which can be expected to influence the impact variable. The macro approach is therefore able to say that x,ooo jobs were created by (rather than associated with) regional policy or that y% of all the firms which moved to the assisted area did so because of regional policy, and that these x,ooo jobs or y% of firms would not have been created in or moved to the assisted areas in the absence of regional policy.

- Micro approaches are characterized by the use of interview and/or questionnaire techniques where firms are asked to comment on the extent to which a variety of factors, including regional policy, influenced a particular decision, e.g. whether or not to move to an assisted area. Whereas the macro approach can provide a quantitative estimate of the size of the policy effect, the micro approach provides a qualitative picture, presenting information on whether and to what extent policy played a decisive role in the decision and where policy stands within the hierarchy of factors which influenced their decision. It is considered that both macro and micro approaches play useful roles in the evaluation of policy, even when evaluation is narrowly defined as it is in the context of this study. The macro and micro approaches are certainly different, but it is felt that they are also very complementary. Taking the standpoint of this report, i.e. the emphasis on quantifying the size of the policy effect, only the macro approach can perform this task. In this respect, micro studies can be regarded as performing a valuable input into the development of the macro approach in three broad respects:

  - In providing information on the nature of the (e.g. movement) process which the macro approach attempts to model.

  - In providing information on the factors which businessmen considered to play an important role - this can aid the selection of the appropriate variables for a model.

  - In providing a check on the results of macro studies.

  The results of macro approaches are often highly sensitive to the approach or technique used or to specific features of its implementation. One may therefore be able to place a greater degree of credulity on the results of a macro study when these are broadly supported by micro evidence.

Section I of this report focuses on the macro approaches which have been used to measure the size of the regional policy effect. The essence of the macro approach is to pose and answer the question, "What would have been the (e.g. employment) position in the assisted areas had there been no regional policy?" This situation has been termed the counterfactual or hypothetical policy off position. Figuratively speaking, the size of the policy effect is provided by the gap between the actual and counterfactual positions.

A variety of approaches and techniques have been applied to quantifying the effects of regional policy and an appropriate framework within which these approaches and techniques can be examined and compared is that of investigating the way in which these are used to establish the counterfactual position and the comprehensiveness by which they do so, i.e. the extent to which allowance is made for the impact, on the "dependent variable", of all those forces expected to have a significant influence.

The approaches which have been used to measure the effects of policy within the Member States have been classified into three broad groups and the first part of this section is concerned with these approaches and how these have been implemented (i.e. the techniques used to do so) and the ways in which they separate out and quantify the effect of policy.

These three groups of approaches have been termed the trend projection approach, the standardization approach and the explicit modelling approach.

One way of distinguishing between these approaches is in terms of the way in which they determine the counterfactual position.

The trend approach to establishing the counterfactual position is to examine an assisted area series over a period of no (or passive) policy and to project this trend into a period of active regional policy. This approach rests, firstly, on the ability to subdivide a period into active and passive policy phases, secondly, on the assumption that, other than the introduction (or strengthening) of regional policy, no significant change occurred in those factors which influence the variable under examination and, thirdly, that an improvement in that variable can be identified which occurred around the time when policy became active.

In practice, two different techniques have been applied to conduct trend-based evaluations of regional policy:

- A "Naive" trend calculation where, for example, if the assisted areas gained 100 moves per annum in a period of no regional policy, this is taken as the counter-factual position. Thus, if the assisted areas gained 200 moves per annum, in an active policy phase, the policy effect by this approach would be estimated at 100 moves per annum.

- A regression projection whereby the regression technique is used to fit a trend line to the assisted area observation in the policy off period and this is then projected into the policy on period.

The standardization approach to establishing the counterfactual position is to neutralize the assisted area series of one or more non-regional policy forces which are expected to influence that series. The resultant, adjusted series represents the counterfactual position. Since the influence of all major non-policy forces has been taken out of the series, the gap between the actual and counterfactual positions represents the effects of policy. In this approach, as with the trend approach, the policy effect is calculated as a residual since it is that defined as being left over once the series is adjusted for the impact of other forces.

In principle, the standardization approach can be used, in a step by step manner, to neutralize the series of a number of forces. In practice, the approach has been used to neutralize the series only for one force - e.g. the effect of industrial structure (i.e. an assisted area concentration of industries which are nationally declining). The underlying hypothesis of the approach is that regional, e.g. employment performance (N_{AA}) is determined by two major forces, industrial structure (IS) and regional policy (RP), i.e.

$$N_{AA} = f(IS, RP)$$

The standardization approach therefore transforms this series to provide a series ($\overline{N}$) which is neutral of the effects of structure. Again the gap between the actual and adjusted (or counterfactual) series represents the size of the policy effect, i.e.

$$N_{AA} - \overline{N}_{AA} = g(RP)$$

The shift-share technique has been applied to implement this approach. This technique allows an e.g. employment series to be broken down into two major components of change, a structural component reflecting the extent to which structure (as defined above) is responsible for the observed employment situation and a differential component, reflecting the extent to which regional employment performance is determined by a region's industries, standardized for structure, growing faster or slower than the national average.

This latter component is calculated as a residual and, according to this approach, is the component which reflects the impact of policy.

Standardization has been implemented in two ways: by the application of an arithmetic formula and by regression analysis.

The third approach to evaluation is to construct and operationalize a model of the forces expected to influence the variable under examination (e.g. the movement of firms into the assisted areas). This approach has been termed explicit modelling since it explicitly states the process by which and factors which are expected to influence the variable under investigation, both in relation to policy as well as to non-policy factors. Regression analysis is the technique by which this approach has been implemented. In this case, the counterfactual position is established by rerunning the model with policy off values for regional policy instruments (i.e. zero if they did not exist or their (lower) policy off values) to present what the situation would have been like in the absence of policy.

Within this approach/technique, regional policy (as a whole or in terms of its individual instruments) has been incorporated in four different ways:

- Directly, with the instruments entering as independent variables whose value is measured in relation to their strength (e.g. the refusal rate for locational control policies or the discounted present value of incentives) or value (e.g. expenditure on regional aid).
- As an intervening variable, where the effect of, e.g. incentives (II) is seen as operating on investment (I) only via the impact of the former on some intervening variable, e.g. cost of capital (CC). In other words, the above, direct approach specifies:

  $$I = f(II)$$

  whereas this approach specifies an indirect relationship between I and II, i.e.

  $$I = f(CC) = g(II)$$

  The effect of incentives on investment is here identified by the effect of incentives on the cost of capital.
- As a dummy variable. Here, a simple distinction is made between policy off and policy on periods or between non-assisted and assisted areas by inserting policy as a dummy variable in the model.

- As a residual. In this case, a model is specified, explicitly excluding policy variables, so that an estimate of the effectiveness of policy is derived by an examination of the regression residuals.

In addition to the above three broad approaches which have been used to evaluate policy, there are numerous instances where two or more approaches are combined. Having described the approaches and variations of them which have been used, the remainder of section 1 is concerned with a critical appraisal of these approaches. This appraisal is specific to the approaches; critical comments on how these approaches and techniques have been used in practice are discussed subsequently.

The procedure adopted to conduct this critical appraisal of evaluation approaches is that of, initially, developing a set of criteria against which the approaches can be compared and examined. To do so, we have developed a list of "desirable attributes" of the major features an evaluation approach should possess if they are to be able, to an acceptable degree, to identify, quantify and explain the policy effect. The "desirable attributes" chosen are:

- whether the policy effect is treated in an explicit or implicit manner;
- whether the policy effect is directly estimated or calculated as a residual;
- the ability of the approach/technique to isolate out the effects of policy from all other explanatory forces;
- the ability to clearly define the counter-factual position;
- the level of explanation provided by the approach;
- the ability to perform tests of significance;
- the ability to disentangle the total policy effect to establish the effect of individual instruments within the policy package.

While the distinction between a number of these "desirable attributes" is often a fine one, it is shown that the overlap between some of these attributes is not total, thereby allowing us to make further differentiation between a number of approaches or techniques. Thus, for example, not all approaches which directly identify the policy effect (as opposed to deriving this as a residual) are equally able to isolate out this effect from that of the other explanatory variables used.

Having developed these "criteria" the next step is to compare the approaches/techniques against each of these criteria to outline the major pros and cons associated with each approach and, in particular, to highlight the assumptions and procedures on which the resultant policy effect estimate is based.

In relation to the "desirable attributes", there is to some extent a hierarchy within the approaches/techniques, at least in terms of their potential to achieve them. In particular, the explicit modelling/regression method, within which policy variables are directly included as explanatory variables, measured according to their strength or value, has the potential to achieve the "highest score" in relation to possessing the "desirable attributes" of an evaluation study. Indeed, this is seen as the only approach capable of achieving a high score in relation to all seven of the "desirable attributes" examined.

In practice, however, it is most unlikely that such a relatively clear hierarchy of the approaches, or a clear superiority of one over another, exists. The potential superiority of one approach over another generally arises since it is able to overcome some of the disadvantages of another approach and/or perform other desirable tasks which the other cannot, or cannot do so well. However, in overcoming one set of problems, a different set of problems generally arises, which, if not adequately resolved can negate the theoretical or potential superiority of that approach. And, unfortunately, it is not always possible to rely on theory or other empirical evidence to resolve such problems. Thus, for example, some forms of explicit modelling may be preferred to the trend or standardization approaches since the former explicitly includes policy in the model, directly estimates the policy effect and provides more insight into the process by which policy influences the variable under examination. In doing so, however, other important problems arise such as the choice between competing theoretical bases, proxies for variables or ways of valuing variables. The significance of this new set of practical difficulties is revealed by the fact that, within a given approach, the result is often highly sensitive to the features of the way in which the approach has been implemented. Thus, for example, within the explicit modelling approach where policy enters directly as an explanatory variable, the results of, for example, movement studies, can be shown to

be sensitive to such factors as the model of the movement process selected, the proxy used for a particular variable, the choice of time lag structures and so on. Thus, in practice, to develop a hierarchy within the approaches would require the existence of a preference framework to allow one to decide whether estimating the policy effect as a residual or using a poor proxy for an important variable was the lesser of two evils. Since such a framework does not exist and since the outcome of an evaluation study can be highly sensitive to the approach/technique used or to the particulars of the implementation of a given approach, it would be unwarranted to blindly equate the technical sophistication of the approach to the reliability of the estimated result. Not only this, but in a number of instances, major factors which can be expected to influence the behaviour of the variable being examined are often omitted from the model. Thus, even in relatively sophisticated approaches which obtain acceptable econometric results and suggest a relatively effective policy, considerable doubt can still be cast on the results given their failure to at least examine the potential significance of factors which could be expected to play a significant role. At present, therefore there is no foolproof way of conducting an evaluation study; the potential of an approach to perform a good evaluation study has, therefore, often not been realized in practice.

As such, the conclusion of this section is that a high degree of credence can best be placed on the results of an evaluation study when these results are in broad agreement with the results derived from other macro approaches/techniques as well as from the results of micro studies. To derive a relatively firm conclusion on whether or not policy has had a substantial impact therefore requires a considerable volume and variety of research and only the United Kingdom and, to a lesser extent, the Netherlands and the Federal Republic of Germany, qualify in this respect. The picture of the extent to which evaluation studies have been conducted within the Member States, and the nature of the approaches used, reveals four broad areas where evaluation research can still usefully be conducted:

- In only three countries have more than two macro evaluation studies been conducted.
- Considerable gaps exist in terms of the application of particular approaches and techniques.

- Considerable gaps exist in the focus of the studies - most of the research has focused on employment, with much less work done on investment, whereas only in the United Kingdom has there been research into the effect of policy on the relocation of industry.

- At the qualitative rather than quantitative level, considerable scope exists for improvement in the operationalization of approaches/techniques.

Section 2 considers the results of the macro studies examined in this report. Although the major focus of this report is on the methodology of evaluation, it is of interest to report on the results of the studies examined, particularly in order to comment on the extent to which (where a number of studies exist) the results are in broad agreement with each other. It should be noted that the results discussed cannot and should not be used to comment on the relative effectiveness of the regional policies of the Member States. In addition, we have reported the results of these studies, a critical discussion of them being found in the respective country report.

In Denmark and Luxembourg, no macro studies were found, with only one each for Belgium, France and the Republic of Ireland and two in Italy. For Belgium and France, the respective studies suggest some limited but consistent policy effect (in these cases no quantified estimates of the size of the policy effect were presented) whereas, in Ireland, policy has apparently had a very substantial role, some 11,000 jobs (1960-1972) being attributed to regional policy. This effect represents some 80%-100% of the net increase in manufacturing employment in the assisted areas as at 1960. In Italy, the employment effect of policy in the Mezzogiorno was estimated at some 124,000 manufacturing jobs (1953-1971), policy resulting in a 12,6% increase in manufacturing employment in the South. In relation to investment, it is felt that via the effect of incentives on the cost of capital, policy has significantly stimulated investment, although no quantified estimate of the policy effect has been provided.

In terms of the number of studies conducted, the Federal Republic of Germany and the Netherlands represent the middle group, with four and five macro studies having been conducted respectively. In the Federal Republic, the

majority of evidence does not warrant the conclusion that regional policy has been highly effective. The investment studies by Bölting (1976) and Recker (1977) both reach a somewhat similar conclusion, the effect of policy being more or less equivalent to the expenditure on incentive awards, i.e. little additional investment was generated. Such a conclusion is supported by two of the three approaches adopted by Erfeld (1979) which show that policy had a significant impact on only one of the six industrial groupings examined. In comparison to this, however, Recker (1977) suggests that policy created some 57,000 to 116,000 jobs in the 1970-1972 period, the majority of these resulting from diversion from the non-assisted areas. In the Netherlands, a more optimistic picture of the effectiveness of policy is provided. In terms of employment the studies by Paelinck (1971-1973) show that policy created some 25,000 jobs in the North over the 1960-1967 period, representing 42% of net manufacturing employment growth in this region. The studies by Vanhove (1961) and van Duijn (1975) suggest that policy has had a significant employment effect in approximately half of the country's assisted areas. In terms of investment, policy generated some 1,700 million guilders and 1,100 million guilders of investment in the North and South respectively over the 1970-1974 period. It is only in relation to the service sector that Dutch regional policy has had apparently little effect (Bartels and Roosma, 1979).

By far the majority of evaluation work has been conducted within the United Kingdom. The most important conclusion which these studies derive is that regional policy as a whole as well as its major instruments have had a significant impact, a conclusion which is by and large found regardless of the approach/technique adopted and regardless of the focus of the study (investment, employment or the movement of firms into the assisted areas). Where dissimilarity or disagreement lies is more in relation to the absolute size of the policy effect and how this is apportioned between the instruments of the policy package. In terms of employment, some 12,000-29,000 jobs per annum in the sixties have been estimated as directly attributable to policy while, for investment, the policy effect has been estimated at some £ 50 million to £ 100 million. Of interest, is that while the employment effect of policy in the seventies has been falling, in comparison to the sixties, the investment effect does not display this downward trend. In terms of the share of firm movement into the assisted areas due to policy, a majority of studies place this in the range of 43% to 87% (some 450 to 900 moves) over the sixties.

It must again be repeated, however, that while the majority of studies show that regional policy has been able to create employment and investment in the assisted areas, in some cases more substantial than in others, there remain many areas of uncertainty in relation to the type of evaluation approach adopted and to the way in which these approaches have been operationalized. Caution must therefore be used in accepting these results as a good indicator of the effectiveness of policy, even in those countries (e.g. the United Kingdom, the Federal Republic of Germany and the Netherlands) where there is some broad level of agreement on the effectiveness of policy.

Section 3 of this report examines micro studies on the effectiveness of policy, the vast majority of these being concerned with the (push) factors which caused firms to move (wholly or partly) from their original locations and the (pull) factors which induced them to locate in an assisted area. Whereas macro studies have explicitly set out to measure the effects of policy, micro studies have generally been concerned with understanding the process by which movement and location decisions are reached and particularly with identifying the important push and pull factors. In doing so, they of course allow comment to be made on the role played by regional policy in relation to these decisions.

The general view given by micro studies of industrial relocation is that regional policy does not play a prime role in either the decision to move or the decision on where to locate. Rather, in terms of the decision to move, it is pressures internal to the firm following the need/desire to expand (e.g. availability of labour, availability/suitability of premises) which prevent in situ expansion. In choosing the subsequent location, it is the availability (and price) of such factors as labour and premises, together with market, organizational and transport and infrastructure considerations which generally play the decisive role. Policy does not therefore generally act as a major push factor (even in these countries with locational control systems); and, as a pull factor, it also plays a secondary role in that it can influence the choice of between alternative locations all of which satisfy the necessary preconditions for the firm. Thus, even as a pull factor, policy acts to complement and strengthen the attractiveness of the assisted areas, but, in the absence of market-related attrac-

tiveness (e.g. relative availability and price of labour and premises) it is unlikely that policy itself could play a significant role in steering mobile projects to the assisted areas, except perhaps in those cases where financial incentives would solve firm's short term liquidity problems.

In general, regional policy has not been highly ranked amongst the factors determining firms' location decisions. With the major exception of the United Kingdom, regional policy as a pull factor hardly ever receives a ranking above 4 and often much lower, although there are the occasional exceptions. By comparison, micro studies within the United Kingdom have generally placed policy as the second or third most important locational pull factor. In a number of cases, however, it may be that the nature of the questionnaire has resulted in a downward bias in relation to the importance of the policy effect. A typical example of this possibility is where firms give a high rank to the availability or cost of premises. In many countries, this (i.e. the provision of premises or some subsidization of their cost or rent) is an important element of policy, yet where such an instrument of policy does not directly enter the questionnaire, its effect is likely to be incorporated under other, non-policy, headings.

In addition to reporting on the results of micro studies, section 3 also considers the extent to which these are in agreement with the macro studies for each country. Before commenting on this, it has to be noted that the reliability of the results obtained from micro studies depends highly on the extent to which they can be regarded as providing an accurate picture of what actually happened at the time of the movement/location decision. In this respect, there are many difficulties with micro studies which consequently require caution to be used in accepting their results. A major problem, for example, is that micro research is often conducted some considerable time after the move has taken place which leads to problems, first of all, in finding the person or persons who actually made the decision and, secondly, when they can be found, they may not fully remember the situation. In addition, problems in terms of the validity of the results can arise when a logical economic rationale is used to explain the decision which in fact was taken in an (economically) irrational way, or when answers are given which are expected to satisfy the researcher, or

when answers are falsified, for example, when the firm will not say that cheap labour was a major factor, for fear that accusions of exploitation are made.

Strict comparisons of macro and micro results can only be made for those countries where there has been macro research which focused on the movement of firms, and this is found only for the United Kingdom. Elsewhere, in comparing macro and micro results, one can only talk about the broad effectiveness of policy. Even here, no comments can be made for Denmark, Ireland and Luxembourg due to the lack of macro or micro studies and little can be said for Belgium, France and Italy given the small number of studies found there.

Where considerable macro and micro research has been conducted, considerable variation between the countries is found. In the Federal Republic of Germany, neither group of studies suggest a major policy impact, although the macro studies, taken together, do suggest a somewhat higher impact. In the Netherlands, there is considerable disagreement, with macro studies suggesting a fairly effective policy whereas the results of micro studies suggest that policy has played only a relatively minor role. Finally, in the United Kingdom, macro and micro studies suggest an effective policy, but the more optimistic picture is provided by macro studies. Of particular interest, however, is that while micro studies ascribe a major role to non-policy pull forces, particularly the availability of labour, the latter is given a much less significant role in macro studies; indeed, in some cases, it is ascribed no role whatsoever.

Finally, section 4 of the report discusses the topic of the applicability of national regional policy evaluation approaches to evaluating the regional policy of the European Community. In this respect, the discussion is confined to the Regional Development Fund, and the applicability of macro approaches.

A major feature of the macro approach to the evaluation of national regional policies is that they seek to answer the question of how the situation in the assisted areas would have been in the absence of regional policy. Figuratively speaking, it is the difference between such a position

(the counterfactual situation) and the actual position which represents the size of the policy effect. Within such an approach, one has therefore to start with the assumption that the situation would have been worse in the absence of policy.

In terms of the Fund, a major question relates, therefore, to whether or not it results in a net addition to total expenditure on regional policy and therefore results in an effect which would otherwise not have arisen had there been no Fund. Thus, before macro approaches can be applied to the evaluation of the Fund, the latter has to be shown to display considerable additionality. If there is no additionality (i.e. if the Fund is used to substitute for rather than used in addition to national expenditure on regional policy) then the actual and counterfactual situations will be similar and macro approaches will not be able to identify and separate out the effect of the Fund. If there is only a relatively minimal degree of additionality, it is likely that the macro techniques would not be able to statistically identify that additionality and, accordingly, the related effect.

In relation to additionality, the position is somewhat confused; most Member States have described how the Fund has been implemented to achieve additionality, yet there is a considerable body of opinion suggesting that there is little or no additionality. Determining the degree of additionality is not something which can be done on the basis of arithmetic calculations. Rather, a study of the implementation procedures associated with the Fund is required and this section discusses the areas to be examined and some of the important questions to be answered before the additionality of the Fund can be clarified. This must be regarded as a precondition to any attempt to apply national level macro approaches to an investigation of the effects of the Fund.

The final topic of this section is to examine, on the assumption of significant additionality, how the Fund could be incorporated into an evaluation model to determine the Fund's role in stimulating, say, movement into the assisted areas of a given Member State. Particular attention is given to the role of infrastructure given that this represents the major type of project assisted by the Fund.

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M = macro study

m = micro study

o = other references

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