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The Influence of Regional Development Incentives and Infrastructure on the Location of Small and Medium Sized Companies in Europe

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Summary. Greater levels of economic integration within Europe will bring more intense competition, not least for small and medium sized enterprises (SMEs). This paper identifies the key factors in the SME location decision from a survey of almost 1400 companies. The most important factor was the availability of regional development assistance, followed by the quality and size of the labour supply, including wage levels, and the potential for future expansion. Infrastructure was found to be relatively unimportant as a locational determinant. These factors apply with considerable uniformity to different industrial sectors, but there are major differences between countries within the European Community (EC).

1. Introduction

The Policy Context

It has been argued extensively that the measures currently seeking to encourage greater competition across Europe will lead to greater efficiency in the allocation of goods and services and hopefully a higher level of Community gross domestic product (Cecchini, 1988). The removal of barriers to trade and the encouragement given to the free mobility of capital and labour offer the potential for great benefits to all members of the European Community (EC). However, what is also probably equally clear, but which has perhaps received less attention, is that the infusion of competitive power associated with greater liberalisation will mean that some companies in some industries, in particular regions, will become relatively uncompetitive and will be forced to rationalise or close. While over the longer term capital and labour released by the associated rationalisation will find new uses, in the interim these resources may be underutilised, which may lead to the exacerbation of existing disparities between the rich and poor countries within the EC (Tyler, 1990).

It is in this context that the European Commission has sanctioned a large expansion in the level of resources devoted to assisting the process of structural reform across the member states of the EC. Some 42bn ECUs have been allocated to the structural funds over the next 5 years.

This expansion of resources is to be welcomed if it helps to bring about a

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convergence in the economic disparities which exist between regions across the EC; indeed it might be argued that if such a convergence does not occur it is going to be very difficult to persuade the 'losers' from increasing economic integration that it is in their interests to see the process continue to its natural conclusion. The secret to the attainment of European harmony in the 1990s is that the 'winners' compensate the 'losers' so that they are all better off. In practice this will mean that the EC support funds will have to be targeted in an efficient and effective way to mitigate the adverse effects of rationalisation across the traditional industries of Europe and to ensure that any loss of economic activity is replaced with new activities.

It is in this context that there is considerable debate as to the appropriate form which regional measures might take. This paper seeks to assist in the process of identifying the most appropriate policies to help the development of small and medium sized enterprises (SMEs) in the depressed regions of the EC. It owes its origins in the realisation by the authors that there did not appear to be a comprehensive assessment across the member states of the EC of the perceptions of SMEs as to the importance they give to various types of regional policy incentives in relation to other factors which influence their location.

The paper is structured in the following way. Section 2 describes the research approach adopted to identify the key factors in the SME location decision. Section 3 represents the key findings of the research and section 4 assesses the importance of these results in the formulation of future European regional policy targeted on the SME sector.

2. The Research Approach

The objective of the study was to ascertain the factors which influence the location decision of SMEs in the assisted areas of the EC and to identify the relative importance which these companies give to various forms of regional policy assistance.

Although there have been a number of studies which have investigated some aspects of company locational behaviour there are many gaps which remain in the state of current knowledge. One such shortfall is a lack of knowledge as to the relative importance of known locational influences by industrial sector. A large part of the available literature has concentrated on the manufacturing/production sector, with very little attention devoted to producer services. The paucity of research in this area is most surprising given the increasing regional policy role assigned to the producer service sector by national governments throughout the 1980s.

A further shortcoming is that there is no systematic Europe-wide survey which has assessed within a common framework the perceptions of companies as to the important location-motivating factors and which has concentrated on the SME sector, although some general conclusions for all types of company have emerged from the recent IFO study (IFO, 1990). Because there has not been a comprehensive analysis it has not been possible to assess the importance of regional policy incentives relative to other factors affecting location across Europe, such as, for example, access to customers. This is a significant gap because it is clear that there are significant changes occurring in the internal organisation of production within companies which are also altering their external locational requirements. An example of this is the impact of Just-In-Time inventory procedures and the degree to which these are leading companies to locate near their markets. As Europe becomes ever more integrated the need for a Europe-wide assessment of these factors becomes more obvious, particularly given the concentration on SMEs in recent years.

It is also of interest to note that much of the location research material relating to the influence of regional policy on the location of manufacturing investment has

assessed how changes in the relative strength of regional policy instruments have influenced the volume of companies moving to assisted areas. Examples in the UK are Moore and Rhodes (1976), Moore *et al.* (1986), Ashcroft and Taylor (1977, 1979), Twomey and Taylor (1985) and Fingleton and Tyler (1990).

Some work has focused more on the interaction of regional policy and other locational influences.

However, what is also required is an assessment of how successful individual policy investment, other than financial incentives and physical controls, has been in influencing location. In this context the role of infrastructure is of great relevance, and it is of significant policy relevance to be able to assess the importance of infrastructure provision in relation to conventional financial inducements. Some useful attempts have been made in this direction in industrial countries, notably by Buck (1987) in the Netherlands and Sanz and Cannabal (1987) in Spain.

In summary, the key research deficiencies with respect to the locational needs of companies would appear to be:

—little evidence of a systematic kind which covers the whole of the EC, both north and south, and which focuses on the SME sector;
—relative ignorance as to the needs of the producer service sector;
—little knowledge of the relative importance of factors identified as relevant to the location decision, which would allow a relative weight to be given to policy and non-policy factors;
—a need for a thorough appraisal of the role of infrastructure in the package of location influences, and in particular the emphasis placed on infrastructure in relation to conventional financial inducements in regional policy instruments.

In order to attempt to overcome some of these deficiencies a comprehensive and systematic study of the factors important in the location decision of SMEs in both the manufacturing and producer service sectors was undertaken. The study covered all the countries in the EC and involved a substantial survey of companies, as well as interviews with companies and government officials involved in regional policy.

At the outset there were certain key requirements which the research approach had to be able to meet. One of the most important was that the SMEs on which the research was targeted were selected from a comprehensive data base of companies currently located in the assisted areas of the EC, with a good coverage across the areas which had qualified for assistance. A second requirement was that the survey embraced those industrial sectors in each country which had been eligible for regional policy assistance in the recent past.

Thirdly, it was important to contact a large number of companies, and the most cost-effective means of doing this was through a postal questionnaire, backed up by a number of face-to-face interviews of important case-studies. The questionnaire had to embody a common framework reflecting the key research issues, but at the same time needed to be in a language and format which would be familiar to companies in the country concerned.

Fourthly, it was essential to have an up-to-date picture of the regional policy incentives on offer in each country, the recent experience of policy-makers in the countries concerned and their experience in seeking to influence the SME sector in the process of stimulating economic development in assisted areas.

European Study Teams

The starting point in meeting these requirements was to establish a team of specialists from each member state who were familiar not only with the workings of regional policy measures in their own country but also with previous work which had sought to assess the impact of these policies on the investment behaviour of

Table 1. Sample frame for the European survey of companies, by country and industrial sector

Country	Region	Industrial activity	No. of companies contacted
UK	South Wales North Wales Cumbria Scotland Merseyside Midlands Newcastle Sheffield	Extraction Manufacturing Construction	1 950
Federal Republic of Germany	Schleswig-Holstein Lower Saxony Rhineland Pfalz Saarland Bavaria Hessen North Rhine South West	Extraction Manufacturing	1 900
Ireland	Donegal North West North East West Midlands Mid West South West	Manufacturing	900
Denmark	North Jutland South Jutland Bornholm Langeland	Manufacturing Services	1 500
The Netherlands	Friesland Groningen Orvijssel South Limburg Gelderland North Limburg	Extraction Manufacturing Services	1 500
Greece	All regions	Extraction Manufacturing Services	1 500
Spain	Galicia Asturias Castilla-Leon Extremadura Castilla-La Mancha Andalusia	Extraction Manufacturing Services	1 300
Portugal	All regions Azores Madeira Islands	Extraction Manufacturing Construction Services	900
Belgium	Flanders Wallonia Brussels	Extraction Manufacturing Construction Services	900
France	All regions	Manufacturing Services	1 900
Italy	All regions Sardinia Sicily	Extraction Manufacturing	1 900
Total			16 150

Table 2. Response to the survey, by country

Country	No. of companies contacted	No. of responses	Response rate (per cent)
UK	1 950	240	12.3
France	1 900	116	6.1
Ireland	900	107	11.9
Italy	1 900	141	7.4
Spain	1 300	67	5.2
Portugal	900	83	9.2
Federal Republic of Germany	1 900	163	8.6
Denmark	1 500	133	8.9
Belgium	900	50	5.6
Greece	1 500	129	8.6
The Netherlands	1 500	142	9.5
Total	16 150	1372	8.5

companies, and in particular their location decision. The international study team which was assembled to undertake the research embraced experts in the European Commission who had extensive knowledge of regional policy issues in each of the countries of the European Commission. The team is listed in Appendix 1.

Questionnaire Design

Considerable attention was given to producing a questionnaire which covered the relevant analytical considerations necessary to enable the influence of national regional policies on the SME location decision to be disentangled from the effect of other industrial policies and non-policy factors. The first draft questionnaire was piloted by each member team in their country and adjustments made where it was felt that the questionnaire might be open to misinterpretation by industrialists, particularly in cases where individual countries had substantial programmes of local development policies, as well as national regional policies. Adjustments were made to the overall questionnaire for each of the 11 countries but the same broad analytical framework was retained across all countries. The final scope of the questionnaire was as follows.

(i) Company location and effects of regional policy:
  —background information on company;
  —factors influencing location;
  —type and effects of regional assistance.
(ii) Characteristics of the company:
  —industrial sector;
  —location of main markets;
  —employment structure.
(iii) Infrastructure:
  —views on quality of regional infrastructure improvement;
  —effect of infrastructure on companies' competitiveness.
(iv) Regional policy measures:
  —views on changes to regional policy measures.

The Sample Frame

In establishing the sampling frame of companies in each representative country it was important to target recipients of regional policy measures who had experience of such instruments in their business development. It was necessary in forming the sample frame to try and ensure that a representative mix of different types of company was identified which reflected the industries on which regional policy had

been targeted in each country, as well as the specific regions in each country which received regional policy assistance. Table 1 outlines the regions and industries selected for the sample frame for each member state and the number of companies contacted.

In total over 16 000 companies in areas and industrial sectors targeted by regional policy were included in the sample frame. All questionnaires and relevant information on the study were printed and mailed from Cambridge, UK, during June 1989.

Quotas Achieved

After a second postal questionnaire had been sent to selected countries where the response rate was below average, a total of 1372 responses was received from the 11 member states, an average response rate of 8.5 per cent. Table 2 presents the quotas achieved, by country.

The interview programme. A key part of the survey methodology was to probe the decision-making process of a wide range of different sorts of company and to understand how regional policy and other factors influence the behaviour of firms. To this end the company interview programme covered the main industries and areas in receipt of regional assistance and allowed a more in-depth analysis of the effects on business development. A range of companies was selected in each country for in-depth study. The interview questionnaire followed the same structure as the postal questionnaire to allow compatible analysis. Table 3 presents the quotas achieved for each country during the interview programme.

Government agency interviews. The final element of the survey methodology was a set of interviews conducted with representatives from a range of government agencies concerned with the formulation, implementation and monitoring of regional policy. These interviews were undertaken by the European study teams in each member state and, as with the company interviews, the objective was to identify those aspects of current and previous policies thought to be most useful in achieving their objectives.

Table 3. Response to the interview programme, by country

Country	No. of interviews
UK	38
France	26
Italy	42
Denmark	13
The Netherlands	13
Ireland	20
Belgium	20

3. Key Findings

This section presents the key findings from the survey of companies across Europe and details the factors which the companies perceive to be of importance in their location decision. The first part presents the characteristics of the sample of companies which responded, focusing on size, age, status and ownership and size. The second part assesses the locational influences identified according to degree of importance. The final part analyses the factors felt to be of importance in the location decision by key characteristics of the company and uses probit analysis to do this.

Sample Characteristics

(i) The size of companies, by principal sector. A principal objective of the survey was to concentrate on the small and medium sized enterprise. The majority of the service companies which responded to the survey had less than 30 employees, with over 70 per cent having fewer than 100 employees (Table 4).

The companies in the production sector

Table 4. Size of the companies, by sector

	Service sector		Production sector	
No. of employees	No.	Percentage	No.	Percentage
<30	186	53	225	26
30–50	59	17	108	12
51–100	45	13	189	22
101–200	32	9	116	14
201–500	19	5	157	18
>500	13	3	67	7

were, in general, larger in terms of employment than those in the service sector (Table 4). Approximately 25 per cent had fewer than 30 employees, with 60 per cent having fewer than 100 employees. In contrast to the service sector, 32 per cent of companies had between 100 and 500 employees.

(ii) Age structure. The sample of companies contained a wide distribution of companies by age. Table 5 presents the broad age structure of the companies. Nearly 30 per cent of the companies had been established in the 1980s and 56.8 per cent of the companies had been established in the last two decades. There were some very old, established companies, with 6 per cent over 90 years old.

Table 5. Age structure of the companies

Date of operation in the area	Percentage
Before 1900	5.8
Before 1950	19.7
Before 1960	26.9
Before 1970	43.2
Before 1980	68.9
To 1989	100

(iii) Status of company at time of operation. The majority of companies responding were new businesses when they began operations in their present location (over 66 per cent). Table 6 presents the evidence. The next largest proportion (over 15 per cent) were expansions of companies already in the local area. Some 10 per cent were relocations from elsewhere in the region, with a further 7.5 per cent from elsewhere in the country concerned. Only a very small number of companies had come from abroad and this is not surprising given the small size of the companies.

(iv) The ownership characteristics of companies. The majority (just over 60 per cent) of the companies in the sample were single-site operations with no other operations elsewhere. A further 17 per cent were the headquarters of companies which had branches elsewhere outside the region. Some 22 per cent of the companies were branch plants of companies with their headquarters elsewhere (Table 7).

The Factors Influencing the Location Decision

The company responses were analysed in terms of the factors influencing the location decision according to degree of importance. Table 8 summarises the key findings. The most important factor was the availability of regional development assistance. This response was the most frequent amongst those companies which perceived that they were in regional policy assisted areas. Not all companies, even though they were in areas which had a history of policy assistance, appeared to perceive this, and an analysis of the responses indicated that the majority of these companies pointed to

Table 6. Status of the companies at time of operation

Status of company	No.	Percentage
New business	802	66.1
Expansion of company already in local area	186	15.3
Relocation from elsewhere in region	124	10.2
Relocation from elsewhere in country	91	7.5
Relocation from abroad	10	0.8
Total	1214	100

Table 7. Ownership characteristics of the companies

Ownership of company	No.	Percentage
Branch of larger company	217	22.0
Parent plant with branches elsewhere	171	17.4
Single-site operation	597	60.6
Total	985	100

Table 8. Factors influencing the location decision according to degree of importance

	Degree of importance		
Factor	Most important	Second most important	Third most important
Availability of regional development assistance	23.9	4.8	4.6
Level of wage costs	5.9	8.1	3.4
Quality and size of labour supply	11.5	13.8	6.7
Access to customers	18.8	10.6	4.9
Access to suppliers	4.1	4.8	4.4
Refused permission to expand in another area	3.7	3.3	2.5
Good conditions for future expansion	9.7	14.3	13.3
Attractive environment	4.5	5.5	7.2
Level of rents	1.9	2.4	5.5
Quality of public transport	0.5	1.2	1.6
Quality of infrastructure	2.4	3.6	6.8

the second most important factor referred to, which was access to customers. Two further factors emerged as being of relatively high importance; these were the quality and size of the labour supply (including the level of wage costs) and the availability of good conditions for future expansion. This finding might be expected given the relatively small size of the companies. It was also of interest to note the

lack of response to the infrastructure factor; this factor is analysed further later in this section.

Response by broad sector. The responses were disaggregated further according to whether they were made by companies in the industrial or producer service sectors. Tables 9 and 10 summarise the key findings. There was a greater awareness, and hence identification, of the relative importance of regional development assistance amongst the production companies than amongst the producer service companies. Given the traditional focus of regional policy on the industrial sector in most EC countries this is to be expected. The most critical location factor for service companies was access to customers, followed by regional development assistance, good conditions for future expansion and the labour-related factors of quality, size and wage cost. For the production sector access to customers and the quality and size of the labour supply were ranked approximately equally, followed by potential for future expansion and wage costs.

Factors affecting the location of companies, by size. Given the focus of the research on the SME sector it was important to disaggregate the responses according to the broad size bands of small, medium and large. Small companies were those in the employment band of 1–200 employees. Medium companies were in the size band of 201–500 employees. The results are presented in Table 11. Access to customers

Table 9. Factors critical to the location of service companies

Factor	No.	Percentage
Access to customers	105	27
Availability of regional development assistance	62	16
Good conditions for future expansion	43	11
Quality and size of labour supply	30	8
Level of wage costs	22	6
Attractive environment	18	5
Refused permission to expand in another area	15	4
Level of rents	15	4
Access to suppliers	13	3
Quality of infrastructure	9	2
Quality of public transport	2	<1

Table 10. Factors critical to the location of production companies

Factor	No.	Percentage
Availability of regional development assistance	239	26
Access to customers	139	15
Quality and size of labour supply	126	14
Good conditions for future expansion	83	9
Level of wage costs	61	7
Access to suppliers	42	5
Attractive environment	37	4
Refused permission to expand in another area	36	4
Quality of infrastructure	24	3
Level of rents	1	<1
Quality of public transport	1	<1

Table 11. Factors affecting the location of companies, by size (per cent)

Factor	Small	Medium	Large
Availability of regional development assistance	22	26	25
Level of wage costs	4	8	9
Quality and size of labour supply	10	13	18
Access to customers	25	15	9
Access to suppliers	4	5	3
Refused permission to expand in another area	3	5	1
Good conditions for future expansion	9	12	9
Attractive environment	7	3	4
Level of rents	3	1	—
Quality of public transport	1	1	—
Quality of infrastructure	3	1	7

Table 12. Location factors and characteristics of companies (per cent)

Factor	1	2	3	4	5	All
Availability of regional development assistance	24	19	24	45	30	25
Level of wage costs	6	4	2	9	30	6
Quality and size of labour supply	12	11	10	8	30	12
Access to customers	21	18	15	12	10	19
Access to suppliers	4	6	1	4	—	4
Refused permission to expand in another area	2	4	12	9	—	4
Good conditions for future expansion	9	16	14	6	—	10
Attractive environment	5	3	3	2	—	4
Level of rents	2	1	7	1	—	2
Quality of public transport	<1	1	—	1	—	1
Quality of infrastructure	3	4	2	1	—	3

Note: 1, New business; 2, expansion of company already in local area; 3, relocation from elsewhere in region; 4, relocation from elsewhere in country; 5, relocation from abroad.

stands out as the location factor most frequently referred to amongst the small companies, perhaps not unexpectedly. The availability of assistance is next. Amongst the medium sized companies there would appear to be more awareness of the availability of regional development assistance, with 26 per cent of all responses pointing to this. Access to customers, quality and size of the labour market supply and good conditions for future expansion are very evenly identified. On the basis of a very small response the availability of regional development assistance and the quality and size of the labour supply were pointed to most frequently by the large companies.

Location factors and the status of companies. A further disaggregation of the responses was undertaken according to whether the company was a new business, an expansion of a company already in the local area, a relocation from elsewhere in the region, a relocation from elsewhere in the country or a relocation from abroad. The results are presented in Table 12.

For the new business sector the availability of regional assistance and access to customers stood out as the two most frequent responses, with the labour supply and good conditions for future expansion next. Perhaps one of the most significant differences between the types of responses was between the small number of relocations from abroad and the rest. The availability of regional development assistance,

together with the labour market variables of cost and supply, were equally identified by the relocations from abroad.

Not surprisingly, good conditions for future expansion was a factor referred to by the relocation companies. The number of companies pointing to the need for access to customers fell away as the local nature of the company changed (i.e. from basically local new business to those companies coming from abroad).

Importance of location factors in northern and southern EC countries. A further important disaggregation of the responses was by northern and southern states within the EC. The northern states embraced the UK, Germany, France and Belgium. The southern states comprised Greece, Portugal, Spain and Italy. The responses disaggregated by this breakdown are given in Figure 1. A number of differences are apparent. The availability of regional assistance was a more significant response for southern states than for those in the north. Access to customers was identified by more companies in the northern than in the southern states.

It was of interest to note that the level of wage costs was referred to by both groups of companies in similar proportions, as was the quality of labour factor.

The most important factors influencing the location of companies, by individual country. The most important factors influencing the location of companies were disaggregated by country of response. Obviously in some cases the number of companies responding was very small. The results are presented in Figure 2. For the availability of regional assistance factor the most frequent response was amongst the Italian and Greek companies. The least frequent response was from companies in Portugal and Belgium. In the case of Portugal this may well reflect the virtually total coverage of the country with assistance of some sort and an inability to distinguish a separate regional policy.

Access to customers was referred to most frequently in Belgium, with less variation amongst the other countries. Access to suppliers was similarly heavily referred to in Belgium. Being refused permission to expand had a very large variety of responses across countries, with the most frequent being for Italy. The quality and size of the labour supply was referred to most in Belgium, whilst the level of wage costs was identified more frequently in Portugal.

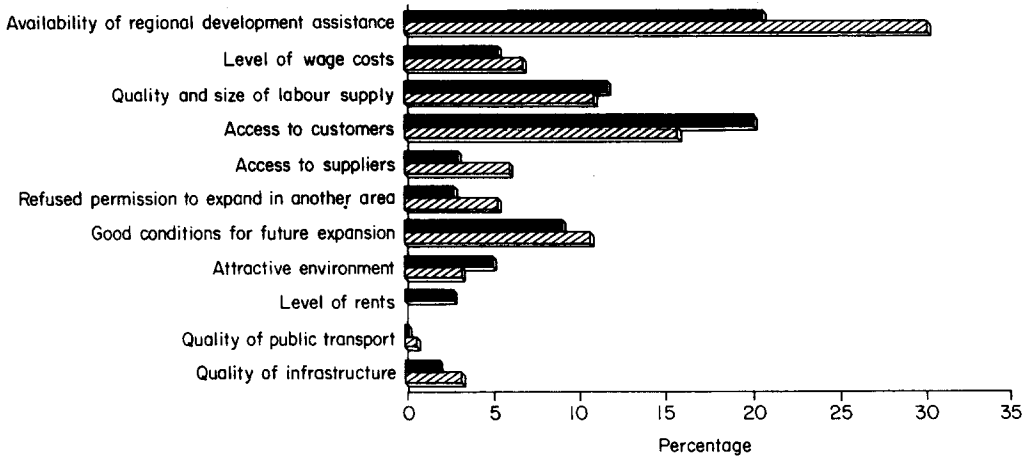

Figure 1. Importance of location factors in (■) northern and (▨) southern EC states. *Source:* PACEC.

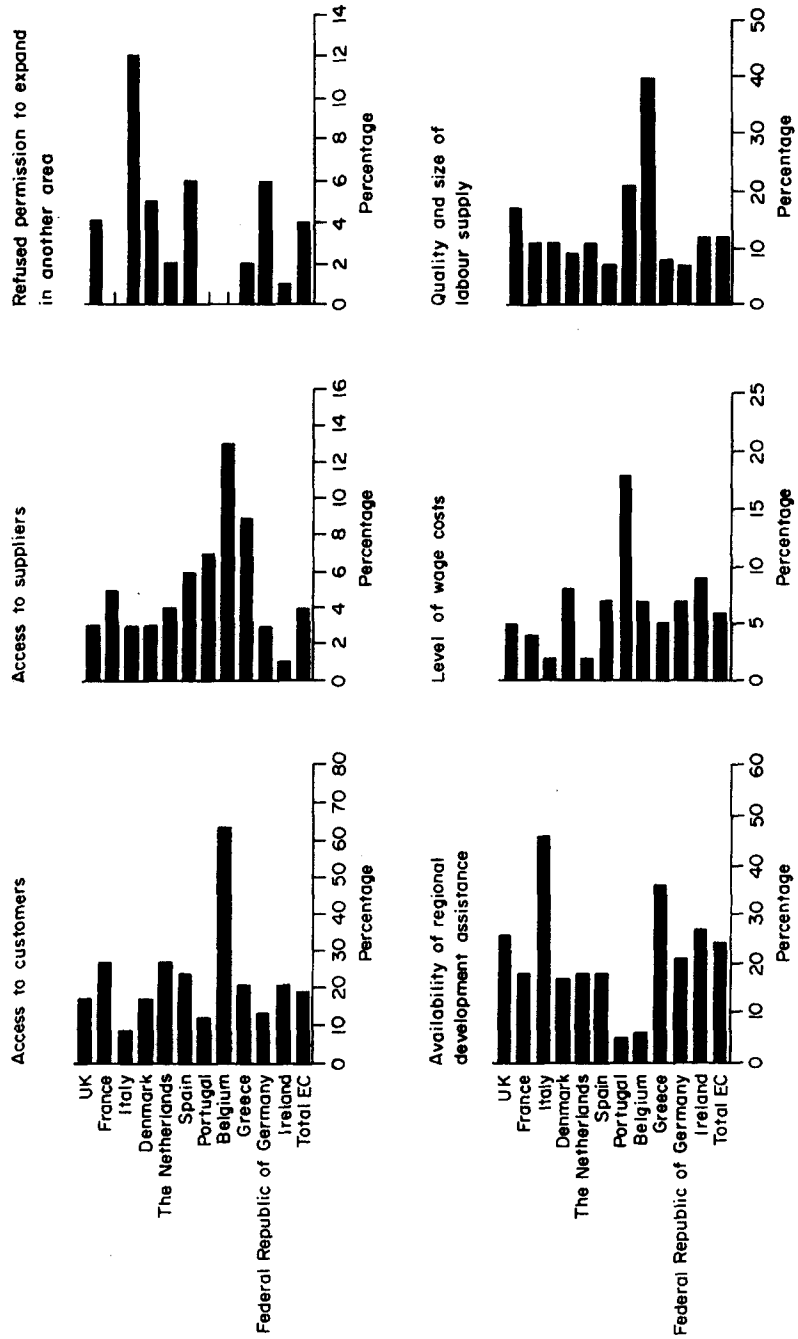

Figure 2. Most important factors influencing location of companies.

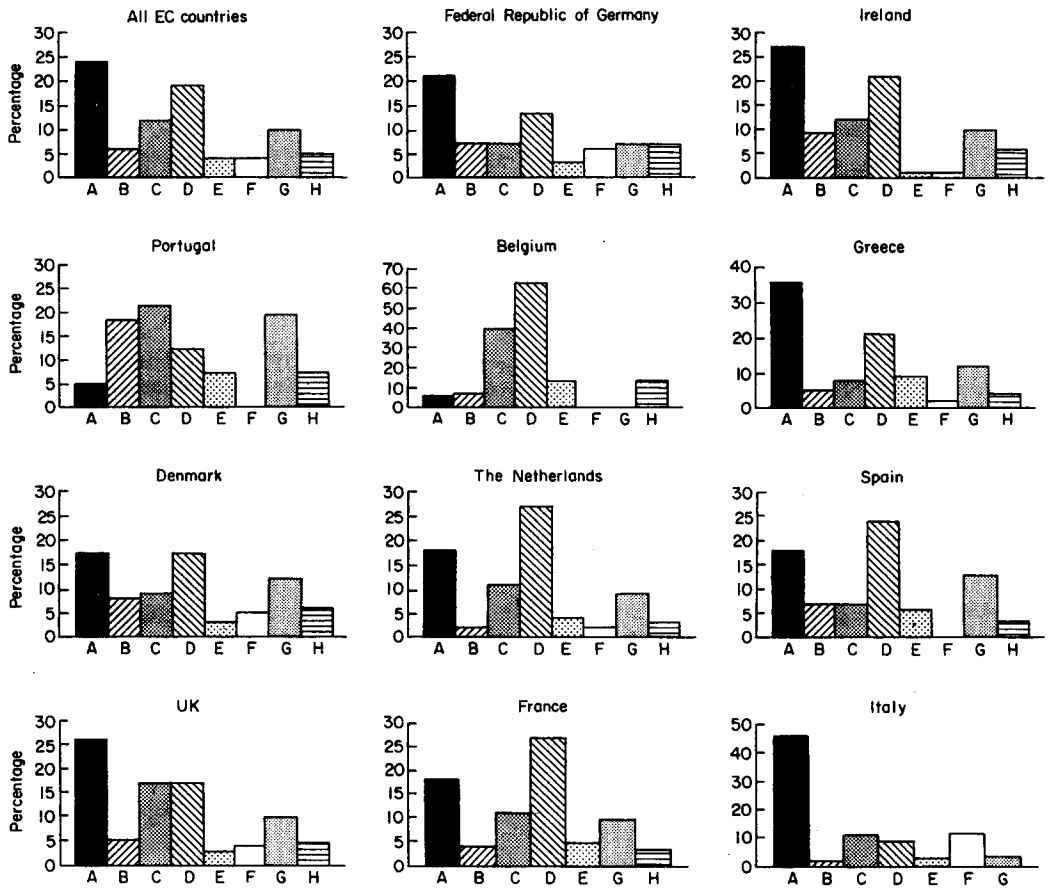

Figure 3. Relative importance of location factors in EC states. A, Availability of regional development assistance; B, level of wage costs; C, quality and size of labour supply; D, access to customers; E, access to suppliers; F, refused permission to expand in another area; G, good conditions for future expansion; H, attractive environment.

The relative importance of locational factors in individual EC states. A further dimension which could be analysed was how the locational preferences differed by member state, although again in some cases the response rates may inhibit detailed analysis. A number of findings emerged and they are summarised in Figure 3.

Influence of regional policy on movement destination. Those companies in the sample which had moved from elsewhere were asked to identify the influence of regional policy on their movement destination. The results are shown in Figure 4. Some 43 per cent of companies stated that they had been very much influenced, while a further 38 per cent identified some influence. The analysis was extended to incorporate the extent of the relocation move considered. Table 13 presents the findings. In line with general expectations the influence of regional policy increased with geographical distance moved.

The quality of infrastructure. One finding which emerged from the analysis of company responses was the relatively low importance placed by the SME sector on general infrastructure. This finding is in marked contrast to the recent IFO (1990) work which embraced all company sizes. In order to assess further the role of

Table 13. Extent of influence of regional policy on movement destination

Movement destination	Very much influenced	Some influence	No influence
Another site in local area	35	40	25
Another site in the region	50	40	10
Another region	46	38	16
Another country	47	29	24

infrastructure a detailed set of questions was put to the SME companies.

The first set of questions was designed to assess how companies rated the infrastructure at their location. The results are presented in Table 14. In general companies rated the general utility infrastructure at their sites highly, with some 59 per cent stating that this was excellent or good and only 10 per cent stating that it was poor. Environment, housing/health and shopping/leisure were rated predominantly as good rather than poor. For all these factors, that companies in general found these infrastructure qualities good tends to suggest that certain conditional thresholds were being met, reinforcing the view that there are certain thresholds in the acceptability of these types of infrastructure after which companies focus more heavily on other locational factors. This view was reinforced by the results of the interview programme with companies.

What is perhaps more surprising is the relatively poor showing on the quality of roads (particularly associated with public transport), railways, airports and local education/training facilities. Some 9 per cent thought the roads excellent, 30 per cent good but 27 per cent poor. The numbers referring to public transport as poor outweighed the excellent/good response. The rather negative response to these key infrastructure factors suggest that they are certainly areas where improvements could be made, presumably with an associated improvement to the operational efficiency of the companies concerned.

The Characteristics of Companies Responding to Different Locational Factors

In the previous section we used simple cross-tabulations to highlight the fact that firms of different descriptions have different attitudes to the most important factors

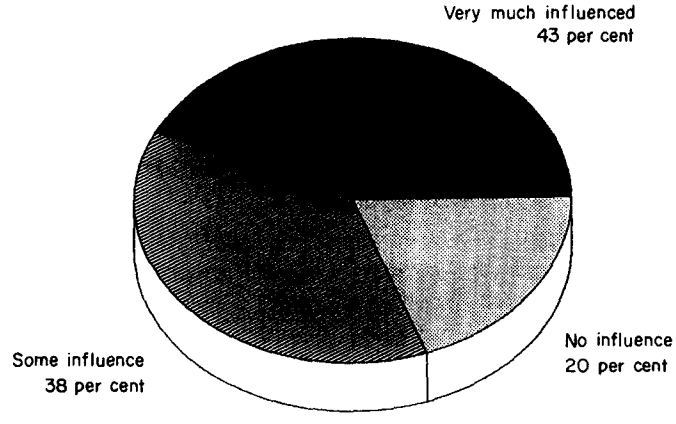

Figure 4. Influence of regional policy on movement destination. *Source:* PACEC.

Table 14. Companies rating as excellent, good or poor the quality of infrastructure in region (per cent)

Aspect of infrastructure	Excellent	Good	Excellent/good	Poor
Gas/electricity/water	21	38	59	10
Public transport	4	22	26	30
Roads	9	30	39	27
Railways	7	25	32	25
Airports	8	22	30	18
Education/training	8	27	35	22
Environment	16	36	52	14
Housing/health	6	31	37	16
Shopping/leisure	9	33	42	16

governing location. So, for instance, we show that firms located in southern Europe are much more likely to cite the availability of regional development assistance as the most important factor in location than are their northern counterparts. The difficulty, however, with this type of simple cross-tabulation is that it may conceal more complex and subtle relationships in the mass of data. There is a need, therefore, to examine the data base in more detail, using techniques which can disentangle efficiently the various factors which might influence location decisions. The technique chosen was that of probit analysis.

The questions to answer. The regional policy questionnaire asked companies to state which of 11 possible influences were the most important in determining location at their present site. Eleven dummy variables were created for each record, taking the value 1 if the firm selected the appropriate choice as the most important factor in determining location and 0 otherwise. These dummy variables are as follows:

REG DEV availability of regional development assistance;
WAGES level of wage costs;
LABOUR quality and size of labour supply;
CUSTS access to customers;
SUPPLY access to suppliers;
NPOS EXP refused permission to expand in another area;
POS EXP good conditions for future expansion;
ENVIRON attractive environment;
RENTS level of rents;
TRANSPRT quality of public transport;
INFRA quality of infrastructure.

In addition, we had available a series of descriptive statistics about the nature of each firm in the survey. For each of the above responses to the location question we were interested in asking whether the probability of giving that particular answer to the question differed systematically for different types of firms in different locations.

Variables in the data base. The data base used for the regressions contained a number of variables for use as explanatory factors. These were as follows.

SOUTH A dummy variable indicating a company based in Greece, Ireland, Italy, Portugal or Spain.
POST80 A dummy variable signifying that the firm located in its present area after 1980. This variable was chosen because after careful experiment with the data base it was found to be the only date description to possess any explanatory power at all.

AA — A dummy variable signifying that the area was designated for regional development assistance at the time the firm located in it.

A set of five dummies describing the status of the company when it began operating in the present area:

NEW — a new business;
EXPAND — an expansion of a company already located in the area;
REL LOC — a relocation from elsewhere in the region;
REL NAT — a relocation from elsewhere in the country;
REL OS — a relocation from overseas.

A set of three dummies describing the company as:

BRANCH — a branch of a larger company;
PARENT — a parent plant with branches elsewhere;
ONE SITE — a single-site operation;
WITHASS — a dummy signifying that financial or other direct assistance was obtained by the company at the time of its last relocation under regional policy development measures.

A set of eight dummies describing the sector in which the firm operated:

FINL — financial or business services;
SERVICES — other services;
HOTEL — hotels or leisure;
MANUFAC — manufacturing;
CONSTR — construction;
MINING — mining or energy;
RET WHOL — retailing or wholesaling;
TRANS — transport or distribution.

A set of variables indicating the proportion of sales and purchases made in different areas. These variables indicated the degree of local linkages experienced by different firms. The sales and purchase variables each sum to 100:

S LOC — percentage of sales in local area;
S REG — percentage of sales in region;
S NAT — percentage of sales in country;
S OS — percentage of sales overseas;
P LOC — percentage of purchases in local area;
P REG — percentage of purchases in region;
P NAT — percentage of purchases in country;
P OS — percentage of purchases overseas.

EMPLOY — Total current employment at this site.

A set of variables indicating the proportions of the workforce made up of managers, professionals and skilled and unskilled workers:

MANAGER — percentage of managers in workforce;
PROF — percentage of professionals in workforce;
SKILL — percentage of skilled manual workers in workforce;
UNSKILL — percentage of unskilled manual workers in workforce.

Two dummies indicating the proportion of employment drawn from the local labour market and from elsewhere:

EMP LOC — percentage of workers recruited from the local labour market;
EMP OTH — percentage of workers recruited from elsewhere;
LGROWTH — the natural log of the ratio of total current employment to total employment in 1980. This variable indicated the rate of growth of employment on site over the last decade.

Description of model used. A set of 11 dummy variables was created for each record, one for each of the 11 possible key location factors, set equal to 1 if the firm gave that particular answer and 0 otherwise.

A series of 11 probit equations was then estimated, one for each response. Each equation took the form:

$$\Pr(\text{Answer variable}=1)=\Phi(a_0+b_1x_1+b_2x_2+\ldots)$$

where $\Phi(.)$ is the cumulative normal distribution, x_1, x_2, etc. are explanatory factors and a_0, b_1, b_2, etc. are parameters to be estimated.

The fact that the 11 answers are mutually exclusive possibilities might suggest that it would be appropriate to estimate all 11 equations simultaneously using a multinominal logic procedure. This was, however, considered to be impractical: the large number of choices and explanatory factors, combined with the fact that our data base contained details only of the firms, not of the properties of the choices themselves, would have required us to estimate 290 parameters simultaneously, which far exceeded the capabilities of the software available. It was therefore decided to estimate each equation separately.

A stepwise procedure was used to ensure that only explanatory factors which were significantly correlated with the dependent variable were included in the equation. This stepwise procedure was as follows:

(i) correlation coefficients were calculated for the dependent and explanatory variables and the explanatory factor most highly correlated with the dependent variable was added to the regression;
(ii) the probit regression was estimated and the residuals from this equation retained;
(iii) the correlation coefficients between these residuals and the remaining explanatory factors were calculated and the most highly correlated variable added to the regression;
(iv) stages (ii) and (iii) were repeated until the parameter for the next variable included failed a *t*-test of significance at the 10 per cent level;
(v) if at any point the inclusion of a new variable caused a variable already in the regression to fail a *t*-test at the 10 per cent level, that variable was excluded and the regression was rerun.

As all the explanatory factors are dummy variables except current employment size and employment growth, the results are presented in terms of significant differences from a 'base case' which is defined by the dummy variables omitted from the regressions. The omitted dummies were: NEW, BRANCH, FINL, S LOC, P LOC, MANAGER and EMP LOC. Hence the 'base case' company has the following characteristics:

(i) based in northern Europe;
(ii) the firm located at that site prior to 1980;
(iii) not in an area designated for assistance;
(iv) a new business at the time of location;
(v) a branch plant of a larger company;
(vi) did not receive assistance at the time of location;
(vii) operating in financial or business services;
(viii) 100 per cent of sales and purchases made in the local area;
(ix) all the workforce made up of managers;
(x) 100 per cent of employees recruited locally.

The findings. The results of our analysis are presented in Table 15. Each row of this table presents one of the 11 equations, while each column represents an explanatory factor. Parameters are only presented if the appropriate explanatory factors were found to make a significant contribution to the regression using the procedure outlined previously. We must remind the reader that, for the dummy variables, if a variable is not significant then this characteristic makes no difference to the likelihood of the response by firms *relative to the 'base case'* defined by the omitted variables.

To understand the full policy implications of the results it is necessary when looking at the table to examine both the

Table 15. Significant variables in probit regressions

	SOUTH	POST80	AA	EXPAND	REL LOC	REL NAT	REL OS	PARENT	ONE SITE	WITHASS	SERVICES	HOTEL	MANUFAC	CONSTR
REG DEV	0.484		1.007			0.481				0.713				
WAGES			−0.413		−0.867		1.118							
LABOUR									−0.221	−0.394			0.304	
CUSTS			−0.366	−0.300					−0.275		0.351		−0.420	
SUPPLY														
NPOS EXP					0.952	0.696								
POS EXP			−0.188	0.314										
ENVIRON												0.403		
RENTS					0.878					−0.408				
TRANSPRT														
INFRA														

	MINING	RET WHOL	TRANS	S REG	S NAT	S OS	P REG	P NAT	P OS	EMPLOY	PROF	SKILL	UNSKILL	EMP OTH	LGROWTH
REG DEV															
WAGES					0.007	0.007									
LABOUR					0.003	0.004								−0.008	0.180
CUSTS				−0.005	−0.012	−0.014									
SUPPLY						0.004		−0.006	−0.006						
NPOS EXP					−0.006		−0.009								
POS EXP															
ENVIRON									−0.008						
RENTS				−0.038						−0.004				0.009	
TRANSPRT															
INFRA															−0.201

rows and the columns. Looking across the rows allows us to see which factors significantly affect the likelihood of one particular factor being ranked highest in terms of its influence on location. Looking down the columns highlights the competing nature of the answers presented. As the answers are mutually exclusive, if one explanatory factor significantly increases the likelihood of a particular choice it must necessarily reduce the aggregate probability of the other choices.[1]

For the most part, intuitive explanations can be found for the results of the analysis, although as with all studies of this type some variables are found to be significant when it is hard to find any reasonable explanation (see Appendix 2).

Availability of Regional Development Assistance

Three particular factors were found to increase significantly the likelihood of firms rating the availability of regional development assistance most highly. These were that the firm was located in southern Europe, that the firm received assistance at the time of relocation and that the relocation was a move from elsewhere in the country.

These results imply that firms moving over long distances within countries are more likely to see regional development assistance as the key location factor than firms moving short distances, and also that awareness of the scheme increases the likelihood of valuing it. The reason for the contribution of the SOUTH variable is less clear.

Level of Wage Costs

Four variables were found to have a significant impact on the likelihood of the level of wage costs being cited as the key location factor. A company relocating from elsewhere in the region reduced the likelihood of this response. On the other hand, firms relocating from overseas and firms with larger percentages of sales in the national or overseas markets were significantly more likely to rate wage costs as the most important location factor.

The significance of the three positive parameters seems clear. On balance, we find that firms prepared to relocate over long distances and with relatively weak ties to the local economy will make their location decisions on the basis of the appropriate local operating conditions. If these conditions are not met at one site another will be chosen. Hence, these firms are more likely to be highly sensitive to local wage levels than new business start-ups and firms with stronger local ties; it is likely that the location decision for many of these firms will be determined more by the area of residence of the key entrepreneurs or by the location of key customers.

The large negative parameter attributed to relocations from elsewhere in the region compared with new businesses or local expansions suggests that some other factor is reducing the significance of wage costs to this group. Looking down the column for regional relocation we see that these firms are significantly more likely than average to cite restrictions on expansion at their present site as the key location factor. This may imply that these firms want to remain in the region they already operate in, but need to move site to expand. If the regional variation in wage rates is relatively small then this would cease to be an important factor in the location decision.

Quality and Size of Labour Supply

Seven factors were found to influence significantly the likelihood that the quality and size of labour supply would be selected as the most important location factor. Single-site operations receiving financial assistance were found to be less likely to make this choice. This may reflect the fact that single-site firms are less sensitive to local economic conditions in choosing location than their multi-site counterparts for the reasons outlined above, and that

assistance may shield the firm from local conditions.[2]

Faster growing firms were found to be significantly more likely to value labour quality and supply, which is to be expected, as were firms which recruited more of their workforce locally.[3] Manufacturing firms were also found to be more likely to value labour supply most highly, which may reflect a greater need for trained workers.

Positive parameters for the proportions of sales made nationally and overseas rather than locally reinforce the earlier argument that firms with weaker local ties are likely to be more sensitive to local economic conditions in their location decisions.

Access to Customers

Firms were found to be significantly less likely to cite access to customers as the key location factor if the relocation was due to expansion within the local area, for single-site operations, for the manufacturing sector and for all levels of sales outside the local area. The probability of this answer was found to be significantly higher for the service sector. The factors for the service and manufacturing sectors are plausible intuitively, as is the finding that firms with a high proportion of local sales are more likely to choose access to customers as the key driver of the location decision.

Access to Suppliers

As might be expected, firms with higher proportions of purchases within the locality or region were found to be more likely to consider access to suppliers as the key location factor. The significance, however, of the positive parameter for a higher proportion of overseas sales is not obvious.

Good Conditions for Future Expansion

The data base contains two alternative answers on expansion possibilities, the first being restrictions on expansion elsewhere (a push factor), and the second being expansion opportunities at the new site (a pull factor). It is interesting to note that no explanatory factor proved itself significant in both equations.

Firms relocating from outside the local area but within the country were found to be more likely than average to find restrictions on expansion important. This can be explained reasonably in terms of firms being forced to move through local restrictions. These restrictions may be specific to the locality, forcing firms to move further afield to expand.

Firms expanding within the local area were found to be more likely to choose expansion opportunities as the key location driver, although it is not clear why these firms should value expansion possibilities more than firms relocating from elsewhere.

Attractive Environment

The only characteristics of firms which appeared to affect the probability of choosing a good environment as the most important location factor were operations within the hotel and leisure sector (a positive factor) and the proportion of purchases made overseas (a negative factor). The positive parameter for the leisure sector is to be expected but it is hard to find a reason for the significance of the latter.

Level of Rents

The likelihood of citing the level of rents as the key location factor was found to increase for relocations within the region and firms employing a larger proportion of their workforce outside the local area, and to decrease with employment size and for firms receiving financial assistance.

The result for employment size suggests that rents are less important as a proportion of total costs for larger firms. Likewise, it may be argued that firms receiving financial assistance may pay less attention

to the level of other costs. The coefficient for relocations within a region is consistent with the previous discussion relating to the importance of wages and expansion restrictions. Firms relocating within a region may be doing so because of restrictions on expansion at their previous site. In the search by firms for a new site in the same region, wage variation may be slight and therefore unimportant, but variations in rent levels may be substantial and therefore very influential in determining the ultimate location destination.

Quality of Public Transport and Infrastructure

The stepwise regression technique failed to identify any explanatory factor in the data base which was significantly correlated with the choice of transport quality as the key location factor. Moreover, the only significant factor for infrastructure quality indicated that faster growing firms were less likely to choose this as the main determinant of location, a result which has no obvious practical interpretation.

These results do not imply that transport and infrastructure quality are unimportant in determining location choice, merely that there is no statistically significant evidence to support the hypothesis that some types of firm value transport and infrastructure quality more highly than others.

4. Relevance to Future Policy Formulation

The main conclusions from the probit regressions were as follows.

—Firms which are aware of the existence of regional development assistance, either because of an earlier grant or because of the assisted status of the area they operate in, are more likely to consider the availability of such assistance as the key location factor.

—Firms with weaker local linkages are more likely to place emphasis on local labour market conditions. This is probably due to these firms having greater flexibility in where to locate.

—It would appear that intraregional relocations are more likely to be caused by restrictions on expansion (push factors) at one site than exceptional opportunities for expansion at another (pull factors).

—The evidence supports the hypothesis that overseas relocations are strongly influenced by relative wage costs.

—Very little significant difference could be detected between industry sectors in their ranking of the key locational influences. Services were found particularly to value access to customers while customer access was less likely than average to be the prime concern of manufacturers who are themselves above averagely sensitive to labour quality and supply.

—No significant differences could be detected in the sample in the importance of transport or infrastructure by type of company. Some descriptive factors which we might have expected to influence choices proved to have little or no explanatory power. These included company size and the skill composition of the workforce. In general this finding tends to emphasise the general homogeneity of company location requirements except in extreme cases (perhaps companies associated with high technology, etc.).

These findings have a number of implications for the future formulation of both national and EC regional policy towards the SME sector. One factor is the surprising homogeneity of response between SMEs across different sectors as to their ranking of the key locational influences. There is, however, more variation by country, reflecting the inherent geographical advantages of some areas in relation to others (i.e. low wage costs standing out in the case of Portugal). Small sample sizes do, obviously, inhibit too much generalisation. The emphasis on many relocations

being prompted by push rather than pull factors reinforces the view that policies targeted on accommodating indigenous expansion may be particularly helpful.

The results on the quality of infrastructure as a location-inspiring factor need to be interpreted very carefully, and point to the need for further work. It is of interest to note, however, that whilst infrastructure itself is often ranked relatively low in companies' direct perceptions of the most important locational influences, further questioning reveals that many companies are frequently relatively dissatisfied with the quality of much important local infrastructure, reinforcing the view that the quality of infrastructure passes a broad threshold but becomes more of a concern as companies become established in an area and are more aware of its inadequacies. The appropriate form which policies might take needs to be tailored and customised to the area concerned.

Notes

1. This is not to say that an explanatory factor cannot increase the probability of more than one answer. This is, of course, possible and indeed occurs in our results.
2. If this is the case, however, one might have expected to find firms receiving assistance to be less sensitive to wage levels than to labour supply.
3. A negative parameter for EMP OTH, indicating that an increasing proportion of employment outside the local area reduces the likelihood of being sensitive to local labour supply.

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Appendix 1

UK

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Italy

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Appendix 2. Regression Results

Table A1. Summary statistics

Dependent variable	REG DEV	WAGES	LABOUR	CUSTS	SUPPLY
Mean of dependent variable	0.25062	0.05745	0.12655	0.18775	0.04378
Standard deviation of dependent variable	0.43355	0.23281	0.33268	0.39077	0.20471
Estimated R^2 of regression	0.20475	0.03890	0.03085	0.13069	0.02115
Log-likelihood	−543.48	−208.91	−292.00	−315.04	−174.54
Restricted (slopes=0) log-likelihood	−682.94	−225.83	−306.10	−362.69	−180.68
Chi squared[a]	278.90 (4)	33.834 (5)	28.197 (7)	95.293 (8)	12.276 (3)
Significance level	0.32173E-13	0.86767E-07	0.20258E-03	0.32173E-13	0.64965E-02

Dependent variable	NPOS EXP	POS EXP	ENVIRON	RENTS	INFRA
Mean of dependent variable	0.04589	0.10140	0.04568	0.02055	0.02432
Standard deviation of dependent variable	0.20936	0.30198	0.20888	0.14193	0.15409
Estimated R^2 of regression	0.04672	0.00797	0.01328	0.08333	0.00411
Log-likelihood	−157.35	−393.01	−184.89	−78.791	−148.56
Restricted (slopes=0) log-likelihood	−174.50	−398.05	−190.96	−102.37	−150.54
Chi-squared[a]	34.309 (4)	10.076 (2)	12.150 (2)	47.154 (5)	3.9634 (1)
Significance level	0.86318E-08	0.64880E-02	0.22997E-02	0.97048E-11	0.46501E-01

[a] Degrees of freedom in parentheses.

Table A2. Importance of regional development assistance

Variable	Coefficient	Standard error	*t*-ratio	Significance level
CONSTANT	−2.08925	0.118991	−17.558	0.00000
SOUTH	0.484463	0.899702E-01	5.385	0.00000
AA	1.00745	0.108074	9.322	0.00000
REL NAT	0.480837	0.150985	3.185	0.00145
WITHASS	0.712927	0.106655	6.684	0.00000

Table A3. Importance of wage costs

Variable	Coefficient	Standard error	*t*-ratio	Significance level
CONSTANT	−1.82116	0.172575	−10.553	0.00000
AA	−0.412828	0.134513	−3.069	0.00215
REL LOC	−0.867191	0.387173	−2.240	0.02510
REL OS	1.11785	0.474805	2.354	0.01856
S NAT	0.678106E-02	0.243618E-02	2.783	0.00538
S OS	0.722283E-02	0.235756E-02	3.064	0.00219

Table A4. Importance of labour quality and supply

Variable	Coefficient	Standard error	*t*-ratio	Significance level
CONSTANT	−1.27938	0.188336	−6.793	0.00000
ONE SITE	−0.221243	0.120038	−1.843	0.06531
WITHASS	−0.394234	0.119515	−3.299	0.00097
MANUFAC	0.304092	0.144998	2.097	0.03597
S NAT	0.344058E-02	0.200409E-02	1.717	0.08602
S OS	0.434200E-02	0.200733E-02	2.163	0.03054
LGROWTH	0.180465	0.874090E-01	2.605	0.03896
EMP OTH	−0.828258E-02	0.483288E-02	−1.714	0.08657

Table A5. Importance of access to customers

Variable	Coefficient	Standard error	*t*-ratio	Significance level
CONSTANT	0.592297	0.221532	2.674	0.00750
AA	−0.366305	0.113947	−3.215	0.00131
EXPAND	−0.299909	0.169659	−1.768	0.07711
ONE SITE	−0.275271	0.119957	−2.295	0.02175
SERVICES	0.351491	0.213279	1.648	0.09935
MANUFAC	−0.420421	0.127204	−3.305	0.00095
S REG	−0.486007E-02	0.268089E-02	−1.813	0.06985
S NAT	−0.116152E-01	0.216733E-02	−5.359	0.00000
S OS	−0.141244E-01	0.244520E-02	−5.776	0.00000

Table A6. Importance of access to suppliers

Variable	Coefficient	Standard error	*t*-ratio	Significance level
CONSTANT	−1.45808	0.138127	−10.556	0.00000
S OS	0.427269E-02	0.221882E-02	1.926	0.05415
P NAT	−0.596807E-02	0.238397E-02	−2.503	0.01230
P OS	−0.641118E-02	0.270651E-02	−2.369	0.01785

Table A7. Importance of restrictions on expansion at old site

Variable	Coefficient	Standard error	*t*-ratio	Significance level
CONSTANT	−1.58409	0.141920	−11.162	0.00000
REL LOC	0.952159	0.190663	4.994	0.00000
REL NAT	0.696385	0.218926	3.181	0.00147
S NAT	−0.567984E-02	0.257343E-02	−2.207	0.02731
P REG	−0.916824E-02	0.429324E-02	−2.136	0.03272

Table A8. Importance of ability to expand at new site

Variable	Coefficient	Standard error	*t*-ratio	Significance level
CONSTANT	−1.23195	0.745187E-01	−16.532	0.00000
AA	−0.187892	0.984861E-01	−1.908	0.05642
EXPAND	0.313672	0.124001	2.530	0.01142

Table A9. Importance of environment

Variable	Coefficient	Standard error	*t*-ratio	Significance level
CONSTANT	−1.61465	0.879707E-01	−18.354	0.00000
HOTEL	0.402986	0.177607	2.269	0.02327
P OS	−0.757408E-02	0.290349E-02	−2.609	0.00909

Table A10. Importance of levels of rents

Variable	Coefficient	Standard error	*t*-ratio	Significance level
CONSTANT	−1.47156	0.195366	−7.532	0.00000
REL LOC	0.877630	0.254979	3.442	0.00058
WITHASS	−0.407695	0.217197	−1.877	0.06051
S REG	−0.375146E-01	0.132399E-01	−2.833	0.00461
EMPLOY	−0.416112E-02	0.177810E-02	−2.340	0.01927
EMP OTH	0.918081E-02	0.497267E-02	1.846	0.06486

Table A11. Importance of infrastructure quality

Variable	Coefficient	Standard error	*t*-ratio	Significance level
CONSTANT	−1.94442	0.753447E-01	−25.807	0.00000
LGROWTH	−0.200890	0.100953	−1.990	0.04660