

BUSINESS ADVICE: THE INFLUENCE OF DISTANCE

ESRC Centre for Business Research, University of Cambridge  
Working Paper No. 167

Robert Bennett  
Department of Geography  
University of Cambridge  
Downing Site  
Downing Place  
Cambridge  
CB2 3EN

William Bratton  
Department of Geography  
University of Cambridge  
Downing Site  
Downing Place  
Cambridge  
CB2 3EN

Phone: 01223 339957

Fax: 01223 333392

E-Mail: [rjb7@hermes.ca.ac.uk](mailto:rjb7@hermes.ca.ac.uk)

Fax: 01223 333392

E-Mail: [William.Bratton@spectrumsc.co.uk](mailto:William.Bratton@spectrumsc.co.uk)

Paul Robson  
ESRC Centre for Business Research  
University of Cambridge  
Austin Robinson Building  
Sidgwick Avenue  
Cambridge  
CB3 9DE

Phone: 01223 339818

Fax: 01223 333392

E-Mail: [pjr1003@cus.cam.ac.uk](mailto:pjr1003@cus.cam.ac.uk)

June 2000

This Working Paper relates to the CBR Research Programme on Small and Medium-Sized Enterprises

## **Abstract**

This paper examines the external advisors used by small businesses to help them solve their problems, focusing on distance between client and advisor. The analysis is based on a new stratified random sample survey of small businesses in manufacturing and services in five representative locations in Britain. The paper reports the distance between client and advisor, cost and extent of site visits by the advisor, focusing on differences between types of advisor, fields of advice, types of firm by size and sector, and types of location. The analysis demonstrates the importance of localization: 60.5% of advisors are drawn from within 10km of the client, and 81.5% from within 25km. The high degree of localization is shown to be chiefly dependent on accessibility and advisor location. The general pattern of client-advisor relations is demonstrated to be modelled accurately by a standard spatial interaction model. A key finding is that the spatial pattern of the location of the supply of advisors, particularly the size of the business centres in which they are located, must be taken into account *simultaneously* with the role of distance in order to explain the pattern of choice of business advisors.

**Keywords:** Business services; Business consultancy; Business networks; Localization

**JEL Codes:** R19, L29, L89

## **Acknowledgements**

This research has been supported by the University of Cambridge Isaac Newton Trust, the ESRC Cambridge Centre for Business Research, Leverhulme Trust Personal Research Professorship and the ESRC through a studentship No. S00429637024. We are also very grateful for help in accessing local business directories from the local business organizations in each sample area.

Further information about the ESRC Centre for Business Research can be found on the World Wide Web at the following address: <http://www.cbr.cam.ac.uk>

# **BUSINESS ADVICE: THE INFLUENCE OF DISTANCE**

## **1. Introduction**

The supply of external business advice is now a major aspect of business development. The final product of a business and its quality is increasingly reliant on a number of external specialist advisors for its conception, production or distribution and marketing (see e.g. Daniels and Moulaert, 1991). For example, survey evidence for 1997 (Cosh and Hughes, 1998) shows that 95% of firms used specialist external advice in at least one field of activity over the previous 3 years, with 88.3% using 2 or more, and 78% using 3 or more externally supplied sources of external advice. Weighting the sample proportions to those of the size distribution of all British businesses suggests that 86% of all small businesses under 500 employees (but excluding the self employed) used external advice over 1994-97.

The role of transaction costs, specialisation and locality have all been suggested as important influences on the choice of advisor which would lead to distance from the potential sources of supply being significant. Other things being equal, it might be expected that closer suppliers of advice would be chosen rather than more distant ones because they have lower transaction costs as a result of being cheaper or easier to access. Closer advisors should also have lower search costs, as it is easier to obtain information, both in order to find the advisor and assess their quality. Closer-located advisors also have the potential to be more highly trusted either because they are local, and hence it may be easier to interact with them, or because they are part of local networks of relationships that encourage interaction, or because they have better local knowledge. Despite these expectations, there has been relatively little previous attempt to investigate the possible role of distance in influencing choice of business advisor. This paper seeks to fill the gap, using the evidence of a new survey developed for this purpose.

The paper first reviews previous research which has sought to assess the degree of localization of business advice. It then defines the theoretical approach used, based on spatial interaction models. The main body of the paper presents the methodology of the survey and the chief dimensions of analysis: the role of distance; differences between advisors; differences between fields of advice; the role of supplier location; and the influence of competition between centres of supply.

## **2. Previous Research**

Whilst there has been a rapidly expanding literature on the role of advice in small business development, there has been relatively less attention paid to the role of distance as a possible influence on choice of supplier. Nevertheless there have been some important earlier studies that do indicate that distance influences choice of advisor.

For example, in a study of 357 manufacturing firms in 10 sectors in the urban centres and economic regions of Birmingham, Leeds and Manchester, Marshall (1983, Tables 5, 6 and 7) found that although there were statistically significant differences in the extent of externally sourced insurance, legal, computing and stockmaking services, there was a strong concentration of sourcing to close locations of advisors, with little difference in the spatial extent of sourcing: most sources of external services are within the same region (77-81%), with quite a high proportion (10-21%) within the same local authority area. An important finding was that the supply of external sources comes either predominantly from the locally largest centre, or from other large centres in other parts of the country: 27-47% is sourced from the nearest regional centre, and a further 18-40% from other regional centres including London. Similarly, in an analysis of external advice in 1989-91 to firms in mid Wales, Hitchens et al. (1994), found that one third of suppliers were located locally, with the main locations outside Wales being the regional centres of Birmingham and London. These results are suggestive of

the role of a hierarchical supply structure of advisor locations that is found in the larger business centres of regional significance. We return to this later. However, the studies by Marshall and Hitchens et al. appear to confirm, strongly that for a range of specialist services, most advisors are sought in relatively close proximity to the businesses. Moreover, Daniels' (1984) study showed that between 40% and 50% all business inputs of selected office services are derived from the same city, concluding that office services have "an essentially local character of client distribution". Also, Marshall and Green (1990) demonstrate in detailed case studies of 10 motor vehicle after-market organisations in the West Midlands that if specialist services are not available locally, firms tend to develop their own capacity and supply internally. This suggests that localisation is both supply and demand driven.

Other evidence supporting this conclusion is O'Farrell et al. (1993), who confirm a high level of within-region sourcing of advice for manufacturing business in both Scotland (61%) and South East England (70%), whilst O'Farrell et al. (1992, Table 7) find that travel time and cost are the main constraining features differentiating Scotland and the South East in terms of the extent to which service firms can compete for new business. Similarly Oakey and Cooper (1989) have found a focus on local purchasing linkages in high technology businesses in South East England and Scotland, whilst Curran and Blackburn (1994) find 35% of manufacturing firms buying 50% or more of their purchases within 10 miles of their premises. Coe (1998) finds for computer service firms that 22% of sales are to clients in the same county and 59% within the same county or region, with generally higher localisation for small firms. By field, Coe also finds higher localisation for computer training, data processing, and reselling, rather than for software, systems integration or consultancy. Similarly, Coe and Townsend (1998) find that there is a regionalised focus for supply of business services in the South East economy, although they dispute the extent to which this is strongly localized or depends on local business networks.

The importance of distance is also confirmed in studies of business advice in other countries. For example, van Dinteren (1987) found in a survey of firms in Dutch cities of 50,000 to 200,000 population that the same city accounts for between 10% and 70% of the sources of external advice, depending on the service field, and is highest for advertising, legal, financial and accounting services. The percentage of advisors either within the same city or its hinterland of up to 30 km is an average of 58%, and ranges downwards from 83% for legal services, 82% for other services, 73% for accountancy, 49% for consulting engineers, 44% for advertising, and 33% for computer services. Firm organisation is shown by van Dinteren to be an important influence on the extent of external sourcing: external advice is more heavily used by the largest firms, and those which are subsidiaries or are autonomous firms. Illeris (1989, 1994) reviews a range of studies in different countries that assess the role of distance and within-region sourcing and concludes that home-region interactions account for 60-80% of supply. In Austria 89% of services are supplied from within the metropolitan region to clients in Vienna, with cooperative agreements accounting for about one third of proximity relationships (Tödtling and Traxler, 1995). Comparing the USA and the Netherlands, Tordoir (1994) found that from 40 to 96% of services were supplied within the same region, with local sourcing increasing with city size, i.e. higher for New York than Baltimore or more provincial cities. Similarly, high frequency of use (for financial, insurance, accounting and facility services) was associated with high localization.

Harrington et al. (1991) conclude that more distant sourcing of advice is related to the more expensive, lower level of standardization, and more technical services. Schamp (1987) found in Germany that services used with high frequency tended to be more localised (as did Tordoir, 1994), whilst those with low levels of technical content could be sourced over long distances. Similarly, for advice on technology transfer, Illeris and Rasmussen (1992) found highly specialized advice to be sought on a nation-wide basis in Denmark.

However, highly focused consultancy advice, that was often interrelated with a broad range of management, financial and marketing aspects of the client, required close proximity, allowing frequent and detailed interactions. Illeris and Rasmussen found that 50% of advisors for this type of advice were located within 40km, and 80% within 90km, of the client. Similarly Tordoir (1994) finds higher localization in what he terms 'sparring' relations (that involve intensive two-way exchange between client and advisor) than 'jobbing' relations (one-off specialist advice) or sales relations (off-the-shelf standardised services).

In each of these studies an important conclusion to be drawn is the need to assess separately different types of service. A simple broad category, such as "financial advice" or "computer services", can disguise crucial differences in the locational requirements of that service (Illeris, 1994; Tordoir 1994; Coe and Townsend, 1998). However, whilst Moulaert and Tödtling (1995, p. 268) conclude that there is growing internationalisation and broadening of spatial extent, the supply of business advice is still "strongly oriented to clients in the same region". Within this framework, there is some argument about whether growth in demand offers the chief force of change. For example Keeble et al. (1991), O'Farrell and Moffatt (1995) and Tordoir (1994) demonstrate that it is development in internal organization of the firm rather than changes in supply that stimulates use of external advice. Tordoir's results suggest that 60% of the variance in external service use is explained by this demand side development, with major differences between firms by size and internal organization.

In contrast, the role of the supply side, especially the influence of distance of clients from sources of supply, has been argued to be a key aspect of business service location in studies by Krmeneč and Esparza (1996), Lentnek et al. (1992) and Phillips et al. (1998). These authors draw on the demand structure of businesses, supplier-competition between places, and spatial prices related to transport

and interaction costs. Such approaches are consistent with agglomeration concepts in emphasising the role of central locations where intensive face-to-face exchanges are more easily possible. These investigators have sought to construct theoretical models which draw upon spatial interaction theory to define optimum models for business service supply location relative to demand. However, there have as yet been few empirical applications of these models, except in North America, where Lentnek et al. (1992), Phillips et al. (1998) and Goe et al. (2000) have applied this framework to comparison of high frequency/low-cost/low-duration services (such as photocopy repairs) with low frequency/high cost/high duration services (such as management consultancy or R & D). Goe et al. (2000) in particular demonstrate the importance of frequency and duration of contacts in focusing suppliers into major centres of demand. Also, Krmeneč and Esparza (1996) have shown how interactions vary with distance and position in the urban hierarchy for nine categories of business service suppliers in the Chicago metropolitan region. In Britain, Marshall (1983), Daniels (1984), and Howells and Green (1988) strongly indicate a focus of supply of advisors in regional centres. Similarly service supply firms have been shown to be heavily concentrated in London and a small number of regional centres by Keeble and Bryson (1996) and Keeble et al. (1991). Daniels (1995) and Howells and Green (1988) find approximately one third of all producer services employment to be located in London, with over 50% in London plus the major conurbations. Bennett et al. (1999) show that 76% of all business firms are located with the 126 largest business centres, whilst Bennett and Graham (1998) demonstrate a hierarchical structure of these business service centres. These results are consistent with the labour market assessments of Howells and Green (1988), and with the location-allocation models of Krmeneč and Esparza (1996), although none of these studies are able to test for distance relations between customers and suppliers in any direct sense.



The importance of these supply-side approaches reminds us that the demand and supply sides interact: localization may be a derived demand-side objective of businesses in seeking external advice, but the available supply may force choices from further afield. Furthermore, supply-side constraints are likely to be more intense the more specialist the service required. We develop an approach that allows these interactions to be tested.

### **3. Empirical Assessment**

#### **3.1. Survey methodology**

The assessment of the influence of distance on choice of advisors is developed below using a specially designed new survey. This is a stratified sample of SME businesses in three size classes (5-10 employees, 20-30 employees, and 50-100 employees), in two broad sectors of (i) manufacturing, constrained within the 1992 SIC categories of food and drink; textiles; pharmaceuticals; machinery, parts and tools; electrical equipment; precision and optical equipment; and (ii) the services sectors of road haulage, shipping and freight forwarding; computer and related services; R & D; business and management services; advertising; marketing and design; and cleaning services. The choice of this relatively small range of sectors constrains the scope for variation within the manufacturing and service sectors but does allow a contrast of industries with low skill and high skill needs, as well as low capital and high capital intensity, and high and low export levels. The sample stratification is designed to allow controlled comparisons of size and sector to be drawn.

The survey was undertaken by telephone between November 1997 and February 1998 by one researcher, thus removing operator variation. The sampling frame was drawn by random selection within strata from broad ranging local business directories in five areas. The areas were chosen to represent major local contrasts in types of economy defined within the boundaries of their TEC/LEC areas:

Manchester (a major commercial centre for business services and a conurbation); Oldham (a small, old industrial centre close to a regional centre and within a conurbation); Derby (a medium-sized city with a mixture of old and new industries; relatively distant from a conurbation); Dundee (a medium-sized city with a mixture of old and new industries but in a relatively peripheral location); Thames Valley (a dispersed industrial area, high growth economy with a services and distribution focus relatively close to London). It cannot be claimed that the final sample drawn is fully representative of the British economy, but it does provide a stratified framework within which to compare major inter-firm and locality differences, and averages across the sample areas are likely to be broadly representative of major parts of the British economy as a whole.

The final sample contains 210 respondents drawn equally (40) from each area, with a top-up of 10 further respondents from Thames Valley which are used to supplement an area with greater economic complexity and geographical dispersion. The 210 respondents nominated 200 cases of advice delivered. There were only 12% refusals to participate in the survey, with no statistically significant pattern of these, or of the non-respondents to the advice questions, by size, sector or location.

The survey asked respondents to nominate examples of significant advice “received in the last 3 years”. From their complete list of external advisors (determined in a previous question) they were asked to nominate the “top 3 preferred suppliers of advice or consultancy services” and to describe the service received from each in detail. In each case open-ended questions on the type of supplier, type of problem which advice was used to address, and location of supplier, were used, as well as structured questions about the employee numbers, profits etc. of the business. The intensity of the relation with the advisors was primarily addressed through questions designed to determine whether or not a site visit or written contract was used, and the total cost of the service. These two criteria (site visits and written

contracts) have already been demonstrated to be very sensitive discriminatory measures of intensity of advice in other surveys (see Bennett and Robson, 1999b).

In the assessment below the analysis is divided into two main subsections, first assessing the relation between demand and distance, separately evaluating the effect of different types of area, advisor and field of advice; and second, assessing the influence of competition between locations that act as alternative potential centres for offering advice.

### **3.2. Demand and distance**

The general pattern of location of advisors relative to clients shows a strong cluster of suppliers within 10km of the client, with a rapid distance decay after this point (see Fig. 1). The cumulative total of suppliers at a given distance, also shown in Fig. 1, demonstrates that 60.5% of businesses use advisors within 10km, 71% within 15km and 81.5% within 25km. Hence the overwhelming majority of advisors are located relatively closely to their clients. This cumulative graph is very similar to that reported by Illeris and Rasmussen (1992) for Denmark, but with an even higher degree of localization in our British case.

There are, however, a number of long distance advisors, and these are predominantly located at considerable distances from the client, in the most extreme case 260km away (this is an advisor in London to a client in Oldham). The spatial pattern of clients and advisor locations is shown for each of the sample areas in Fig. 2. Whilst the pattern is complex, particularly in the dispersed area of the Thames Valley, the strong focus of location of advisors towards the local centre(s) of supply is extremely evident. These maps can be compared with similar spatial patterns for consumer retail shopping (e.g. Berry, 1967, Figs. 1.9, 1.12 to 1.16); the resemblance is very close. The higher degree of localisation where larger centres are closer to the

client also accords with Daniels' (1984) findings for office services, and Coe and Townsend (1998).

There are some important contrasts to note between our sample areas. As shown in Table 1, the mean distance for advisors from their clients varies between areas from 13.6 to 38.2km, and the median from 5.5 to 29.9km. By comparing the maps in Fig. 2, the differences appear to arise from the rather different influences of the main local centres, and the local centres compared to other major nearby centres or regional sources of supply. In the case of Manchester and Oldham, for example, the major commercial centre of Manchester dominates among the location of suppliers. It appears with such a concentration of suppliers nearby that there is either little need to go further afield, or that more distant centres find it difficult to compete with the close by large regional centre. This is again similar to the findings of Daniels (1984) and Coe and Townsend (1998), although even in Manchester and Oldham, advisors in London and other centres such as Huddersfield and Northampton do play a role for some inputs.

In the case of Derby and Dundee, longer distances to advisors arise because the local centre, although relatively large, is not able to dominate like Manchester. A more complex pattern of competition between several similar-sized centres results in Derby (with the supply centres of Derby, Northampton, Rotherham and Leicester all similar in size). In the case of the Dundee area, a centre similar in size to Derby, a stronger focus on advisors from Dundee itself appears to arise because of its relative peripherality and isolation from other major sources of advisors. However, even here competition from large centres such as Glasgow and Edinburgh at considerable distances is evident.

The Thames Valley case is a complex hybrid. It also has a strong focus on localized advisors, but these are spread over many of the relatively small centres of supply that exist across the area, with no strong focus on any one. However, because of this dispersion of

competition, and because of the relative proximity of London which contains a huge national concentration of business advisors, many clients use London irrespective of their relative distance from it, resulting in the highest mean and median distance to advisors for this area. This pattern is similar to that found by Coe and Townsend (1998) in their study of parts of the South East economy.

The maps thus show the importance of the context of local spatial structures, even within the constraints of our relatively small range of sample areas. This is consistent with the Fik and Mulligan (1990) competing central places model (CCP), particularly in showing the importance of the dominance of the locally largest centre(s) and the major regional sources of supply. This is a finding in common with Marshall (1983), O'Farrell et al. (1993), van Dinteren (1987), Coe and Townsend (1998) and other studies. It confirms the importance of assessing choice of advisor and his/her location in the context of the spatial market that frames the location of other similar business service suppliers who are potential competitors. We develop this aspect later below within the framework of a spatial interaction model.

### **3.3. Advisors and distance**

The differences in distance to advisors of different types is shown in Table 2, which reports the types of advisor used and the mean distance from their clients. The pattern of use of advisors cannot be taken as nationally representative because of the stratified sample structure, even though its results do closely follow larger scale surveys (such as that of the Cambridge ESRC Centre for Business Research analysis, reported in Bennett and Robson, 1999b). However, the distances travelled can be taken as a representative within the strata of the sample.

Overall the results demonstrate a very strong variation between distance and advisor type. One of the longest distances relates to

accessing trade and professional associations, which are almost all located in the national centres (London or Glasgow). Hence this is a rather special case. For the other advisors, the longest distances are for solicitors and consultants, which have nearly twice the average distance as the next group of suppliers: customers, DTI etc. Private sector advisors as a group have an average distance of 23.1km to their clients. The most localized advisors are the Chambers of Commerce and the public sector local bodies of Business Link (Business Shop in Scotland) and the TEC/LEC. Each public sector source is, of course, largely constrained to operate only within a defined geographic area. This is a constraint that also operates for Chambers through a convention of low internal competition between areas. The longer private sector distances are thus more indicative of the free market of supply. It might also be argued that, in the private sector, distance increases with the relative degree of specialization of the advisor, suggesting that a wider search process may be required the greater the degree of specialization of the advice that is required. Thus the large distances for solicitors and consultants may reflect a search for specialism. However, we have no strong evidence to confirm this. The verbal description of the service provided to each client shows a wide range of specialism required from each source and type of advice. It is probably more the case, therefore, that rather than specialisation, it is the relative availability of the private sector advisors that is more important, or their 'brand' benefit of being in a more prominent centre, i.e. the relevant consultants, solicitors and other advisors are more likely to be found in the larger centres which are generally at greater distances from clients.

The requirements of the mode of delivery of advice are also important. Fig. 3 shows the general pattern to be one in which site visits increase with distance from advisors, but the pattern is confused. The proportion of advice of each type which is based on site visits, shown in Table 2, demonstrates that a high level of site visits is used overall. This probably reflects the nature of the advice covered in the survey which focussed on the top three "preferred

suppliers". Generally the most localised through the site visit mode of delivery are Chambers, DTI, consultants, accountants and TECs/LECs. Surprisingly among the least localised are friends and relatives. Customers, trade and professional associations and banks also make low use of site visits. There is little relation between mean distance to advisor and the proportion of advisors making a site visits (Spearman rank correlation coefficient of only -0.22, not significant at the 90% level). This tends to suggest that each supplier is characterised by a mode of service delivery which is at most only partly related to distance, and that suppliers are chosen for their specific strength rather than solely on the basis of distance. This in turn suggests that the general pattern of location of suppliers constrains choice to advisors predominantly from major centres and that distance then reflects the general distance to supply centres.

In order to assess the degree of specification and intensity of the service delivered, Table 2 also reports the average cost by supplier type. This varies from £4811 for business consultants down to zero. The average cost is £1428 across all types of advice received. Suppliers appear to fall into three groups: (i) those that do not charge at all for their services: Chambers, TECs/LECs, customers and friends; (ii) those that have a low rate of charging probably largely based on cost recovery: banks, Business Link and the DTI, and (iii) those that make substantial charges: accountants, consultants, solicitors and professional associations. The costs for advice are quite strongly related to mean distance to advisor, which does suggest that specialisation is positively related to the distance required to find an appropriate advisor (Spearman rank correlation coefficient of 0.73, significant at 95%).

Fig. 4 shows the general relation of cost of advice to distance to advisor. There is a strong positive association. Costlier services appear to support higher transport and transaction costs. This is in line with the suggestions of Harrington et al., (1991), Illeris and Rasmussen (1992), Tordoir (1994), and Goe et al (2000). There is

also a positive relation between cost and site visits. As is to be expected a more intensively delivered service costs more, but this relation is not statistically significant (Spearman rank correlation 0.29, not significant at 90%).

### **3.4. Fields of advice and distance**

The distance of advisors from clients by field of advice also varies strongly. Table 3 shows that the greatest distances relate to product and service design, which is arguably one of the most specialist areas, perhaps therefore giving further support to the possibility that larger distances are required to find advisors with higher degrees of specialisation. However this is not fully borne out by the extent to which this field requires site visits. Other fields which generally have a relatively high degree of specialisation are business structure; establishing, buying and selling the business; and growth advice. These do have relatively longer distances associated with them. Staff training and development is the most highly localized, followed by finance, marketing and advertising, the latter of which might have been expected to be highly specialist and hence sourced very widely, but in our sample appears highly focused on localized marketing initiatives. The focus of our sample strata on small business of less than 100 employees may explain this and suggests that most marketing and advertising is relatively locally focused.

The degree of specialisation and intensity of interaction can again be examined through the proportion having site visits and the average cost of the services. Site visits are most frequent for advice on growth, strategy, exporting, premises and machinery, IT, and establishing, buying and selling the business. These are chiefly the services with the largest distance to advisor. Similarly, short travel distances are associated with low proportions of site visits, particularly for personnel, general advice and marketing advice. The relation between the distance and site visits is, however, not strong (Spearman rank correlation 0.39, not significant at 90%).



However, as with advisor types, there is a strong positive and significant relationship between distance and average cost for different fields of advice (Spearman rank correlation 0.57, significant at 90%). The highest cost services, which are IT advice, establishing, buying or selling the business, and premises, plant and machinery advice, are thus significantly more likely to be sourced at larger distances. In contrast, general business advice (largely through public sector suppliers) which is free, and exporting and personnel advice which is very low cost, are significantly more likely to be sourced locally. Their localisation in part derives from their public sector supplier constraints on trading out of area (which also affects how Chambers of Commerce operate).

### **3.5. Type of firm and distance**

We would expect different types of firm to have different sensitivities to distance, either because the associated transaction costs they are willing to bear may be lower for smaller firms, or because the degree of specialisation of the advice they need may increase with firm size. Table 4 reports the difference between sectors and size categories of firms in terms of the level of use and distance to advisors. There are few differences in level of use of different advisors between the sectors. But, by firm size, use levels show some important contrasts: use is generally lowest from private sector advisors for the smallest firms, but higher from the smallest firms for use of public sector advisors, customers and friends/family.

The distance to advisor varies considerably by sector, being higher for manufacturing firms for advice from solicitors and customers, but lower for advice from consultants, and trade and professional associations. By firm size there is little evidence for arguments that the smallest firms are most localized in sourcing advice. Localisation by the smallest firms does apply to the use of solicitors, but is not important for any other advisor. The pattern is generally mixed with little significance in supplier distance by firm size, indicating that

suppliers are chosen on the basis of need or supplier location irrespective of firm size.

The use levels and distance of advisors by main fields of advice is shown in Table 5. Again, there are few sectoral differences in use levels or distance to advisor, the only important differences in distance being where service firms are much less localized for advice on IT; growth; and establishing, buying and selling the business. They have significantly shorter distances for advice on finance, premises and machinery, business structure, and general advice. By firm size there are few significant differences either in levels of use or distance to advisor, although the smallest firms do have the shortest distances for 7 out of the 12 service fields, even though use levels are lowest for the smallest firms in only 2 fields.

In general the analyses in Table 4 and 5 suggest few systematic differences between types of firm in the distance to advisor, by either firm size or sector, although use levels do vary by size between public and private sectors, being lower for private sector advisors for the very smallest firms. Given the range of sizes of firm surveyed, which include micros of 5-10 employees as well as larger SMEs of 50-100 employees, the relatively small level of contrasts is, however, a surprising result. Whilst there are differences between firms by size, and to a much lesser extent by sector, these patterns are not strong or very systematic. Instead advice varies chiefly by source and field of advice. There is certainly no evidence to suggest that the smallest firms are systematically either less able, or less willing, to consult advisors at greater distances if they wish. They indeed do so, particularly for advice from consultants and customers, and in the fields of exporting.

Whilst sample size constrains our interpretation, it is clear for each way we analyse the data that there is a relation between supplier specialisation/intensity (measured by cost) and distance, and that the key distinctions are between supplier types in their portfolio of advice

and their intensity of service. This is similar to the results of the larger scale study by Bennett and Robson (1999 a,b) that also confirms supplier type as the main source of variation in how advice is sought and delivered. We demonstrate below that taking account of spatial competition is a further key dimension that needs to be added to analysis.

### **3.6. Distance and competition between centres of supply**

It is already evident in our discussion that choice of advisor, although appearing to be heavily influenced by distance, also seems to be influenced by the size of the market centres in which advisors are located and the relative distance of these centres from the client. Hence, a form of relationship between suppliers and clients similar to that in a retail situation, appears to be relevant. In the retail situation, distance to supplier is usually found to be the weighted sum of the attractiveness of the centre in which the supplier is located, and the trade-off of competition from other suppliers in other centres at different distances.

In the following, we use a spatial interaction model to predict the probability of interaction between clients in each of our sample locations and their advisors. Although primarily associated with consumer retail shopping behaviour, spatial interaction models have been successfully applied to a wide range of phenomena (see e.g. Wilson, 1974). Indeed, Birkin et al. (1996) suggest application to a number of business service phenomena, including the location of car dealerships etc. Lentnek et al. (1992, 1995) and Phillips et al. (1998) have also developed spatial interaction models for business services, including some of the advisory services examined here. They suggest that the choice and intensity of use of advisory and other business services is constrained by the costs of acquiring supply (or meeting demand, depending on who is directly meeting these costs). The costs are made up of two parts: (i) transport costs and communication costs, and (ii) other transaction costs depending on the frequency,

duration, complexity, etc. of the service. Their argument leads us to test a standard spatial interaction model as a means to assess the influence of supply-demand effects of distance on choice of advisors.

In our estimates the locations of the advisors are given an attractiveness weighting defined by the total number of businesses in their area. The attractiveness of their location is defined from the classification of business centres developed by Bennett and Graham (1998) and Bennett et al. (1999). The total number of businesses in an area is based on data on the number of businesses in the Census of Employment 1993 defined at a detailed spatial level by postcode district. Although the Census of Employment excludes the self-employed, in 1993 for the first time a complete record was made of the location of businesses of all other sizes classes. Its characteristics are discussed at more length in Bennett et al. (1999).

The calculation of a spatial interaction model provides a set of theoretical probabilities for use of advisors in centres  $j$  by clients located in areas  $i$ . We compare this with our observed sample of actual interaction between  $i$  and  $j$  taking account of the other potential client-supplier interactions with other centres  $j$  which are not observed in our sample, by transforming the model into a table of probabilities of interaction between each client  $i$  and all centres  $j$ . Although the sample size is relatively small, this is a fully valid means of assessing the role of distance and competition for our sample.

The final model estimated involves testing two forms of the distance exponent, and also estimating the most appropriate weighting of the attractiveness of each business centre  $W_j$ . The two forms of distance exponent are given by:

Model 1:

$$S_{ij} = A_i W_j^\alpha e^{-\beta c_{ij}} \quad (1)$$

$$A_i = \left( \sum_{\substack{j \\ i \neq j}} W_j^\alpha e^{-\beta c_{ij}} \right)^{-1} \quad (2)$$

Model 2:

$$S_{ij} = A_i W_j^\alpha e^{-c_{ij}^\beta} \quad (3)$$

$$A_i = \left( \sum_{\substack{j \\ i \neq j}} W_j^\alpha e^{-c_{ij}^\beta} \right)^{-1} \quad (4)$$

Model 1 is the standard negative exponential form of the spatial interaction model (Wilson, 1974).  $S_{ij}$  is the number of interactions between businesses in area  $i$  and suppliers of business advice in area  $j$ ;  $W_j$  is a measure of the attraction at supply source  $j$ ;  $O_i$  is the number of businesses in area  $i$  (a total demand term); and  $c_{ij}$  is the distance or travel cost of interacting between  $i$  and  $j$ .  $A_i$  is a balancing term, which controls for the competition for flows of advice from area  $i$  with other sources of supply in areas  $j$  of various attractiveness  $W_j$  and distances.

Model 2 is an alternative in which the negative exponential distance is raised to a further power of the coefficient  $\beta$ . This is a form of the logistic, or Gompertz curve, which allows a flat curve near the origin, that then becomes negative exponential after a distance away from origin (see Wilson 1974, appendix). The decision to test model 2 as well as the standard form of model 1 was made because of the shape of the distance decay relation observed in Figure 1. This does have the shape of a logistic curve. However, Figure 1 does not take account of the competition of different centres. It may be that we observe a logistic shape in Figure 1 with flatness near the origin merely because of the importance of attractiveness of very local locations within 10-15km of the clients in our sample.

There are two coefficients to be estimated for each model,  $\alpha$  and  $\beta$ . These are estimated by grid-search methods using the correlation coefficient as a goodness of fit statistic. This tests the fit between the predicted probability of interaction and the observed proportion of interactions to each centre. The correlation coefficient is not used as a statistical inferential measure, but as a least-squares criterion to choose the best fit values for  $\alpha$  and  $\beta$ . An alternative measure of the summed mean absolute deviation, was also tested and found to give closely similar values of  $\alpha$  and  $\beta$  (within 5% of the same values). Hence, we believe our conclusions are generally robust to the choice of fit statistic used. The values of  $\alpha$  and  $\beta$  have a close peaking around the maximum fit of the two coefficients. The model thus appears fairly highly sensitive to the values of the coefficients, which in turn implies that the distance and centre size weight are important discriminatory measures affecting client choices.

There is a strong similarity of goodness of fit between the two alternative models. The standard negative exponential of Model 1 gives the slightly better fit of the two. However, the differences are so small for this small sample size that goodness of fit test cannot be used as a means to conclude that Model 1 is generally the more appropriate compared to Model 2. This is not, however, very relevant, since the actual values of  $\alpha$  and  $\beta$  that are estimated give almost identical distance decay curves for both models. The predicted distance decay pattern from the two models is shown in Fig. 5. Given the levels of variation expected in empirical cases, the differences between these two models are too small to be distinguishable. For developments below using the spatial interaction model, and in subsequent research, we choose to use the standard negative exponential model 1.

The form of the distance decay equation estimated from equation (1) and shown in Fig. 5 demonstrates that clients generally choose advisors with a high focus on their relative proximity. Other things being equal, the estimated model predicts that 50% of advisors would

be found within the first 1 km and 90% within 11 km. As a result we can now interpret the logistic form of the curve in Figure 1. The concentration within the first 10km is due both to the high impact of the effects of distance, and to the location of a local major centre within 10km for most sampled clients.

However, the spatial pattern of supply also affects choices of advisors, especially the high relative concentration of most advisors in urban centres of large size. Fig. 6 shows how the probability of choosing advisors in a given centre increases with the size of that centre. This is particularly strongly focussed for model 1. Thus interpretation of observed distance decay patterns for advice from suppliers (such as that in Figure 1) has to take account of both distance effects (Figure 5) and attraction effects of concentration supply centre (Figure 6).

Unfortunately our small sample size does not allow us to assess differences in the role of distance exponents and attractiveness weights for different types of advisor or types of firm. This requires larger-scale samples which is the subject of further research.

#### **4. Conclusion**

This paper has used a purpose-designed survey to assess the influence of distance on the degree of localization of external advice. While the sample size is relatively small (210 firms), the results are very clear.

First, there is a very marked relationship between distance from client and the location of the supplier of external advice. Over 60% of advisors are within 10km of their clients in our sample, and 81% within 25km. This is in line with other studies reporting similar analyses, for example those reviewed by Harrington et al. (1991) or Illeris and Rasmussen (1992) from Denmark, but we show an even higher degree of localisation than most previous studies. The survey framework asks respondents to assess the “three professional

suppliers of advice and consultancy that had made a major contribution to their business in the last three years". This focus of the survey clearly directs respondents towards relatively intensive exchanges and thus confirms the findings of Tordoir (1994) and Illeris (1989, 1994), that more intensive advice services tend to be most localised. The focus of the advice on relatively intensive services is confirmed by noting that 67% of all advice received had involved site visit(s).

A second and extremely important conclusion is that the spatial pattern of demand-supply interactions in seeking advice is very similar to that for consumer retail services. This is suggested in the mapped pattern of client-advisor links (Fig. 2), but is confirmed by the estimation of the standard spatial interaction model (equation (1)). Our results give a systematic basis to the empirical findings of Daniels (1984) and others who have found similar city-size and distance effects for advice services. The applicability of the spatial interaction model confirms a general pattern of supplier sourcing of advice that depends on the two interacting features of (i) distance, and (ii) the pattern of competing locations of suppliers in centres of different sizes at varying distances away from the client. As a result, suppliers of advice in larger centres at greater distance can compete effectively for clients with more local suppliers at shorter distance, depending on the ratios of centre size and distance. They probably compete successfully through higher levels of technical specialisation (as suggested by Harrington et al., 1991; and Tordoir, 1994), which is to some extent confirmed in the analysis of the types of service field at different distances, but is the subject of further analysis for our sample in later research.

As far as is known, this paper is the first to apply spatial interaction models to the pattern of use of business advice services. Our results confirm the suggestions by Lentnek et al. (1992), Phillips et al. (1998), and Krmenc and Esparza (1996) of the potential for such models. The results also enlarge on the explanation of the



mechanisms underpinning the high level of spatial concentration of business services in Britain observed by Howells and Green (1988), Keeble et al. (1991) and Daniels (1995). The use of spatial interaction models is a significant development, since most previous analysis have tended to focus on either the demand-side or the supply-side of external business services. Our approach demonstrates that *both* the demand side (which focuses the choice of advisors towards localization through strong distance effects) and the supply side (which constrains choice of advisor towards the main centres of supplier concentration in either local or regionally dominant locations) are important, and interact. Hence, both supply and demand effects need to be taken account of simultaneously in analyses of business services; something which has rarely been undertaken before.

Third, the analysis explains earlier findings of differences in level of choice of local suppliers derived from the extent of the local market. As found by Daniels (1984), a much lower level of localization occurs in smaller centres such as Carlisle, Preston or Plymouth, for example, than in large centres such as Bristol, Edinburgh and London. Thus the interaction of supply with local demand explains the contrast between the higher degree of localisation found in studies of large cities (such as Marshall, 1983) compared to Mid-Wales (such as Hitchens et al., 1994) or Ireland (Hitchens et al., 1996). Despite this finding, our analysis has not been able to confirm or refute a specific hierarchical pattern of demand and supply. However, the results of the analysis of supply centres by Bennett and Graham (1998) suggests that some effect of a hierarchy may be present, whilst Bennett et al. (1999) confirm that business service suppliers are more concentrated the larger the business centre considered. Hence, although further research is clearly required to assess the possible role and form of any supply hierarchies, our results do confirm that a form of either competing destinations (Fortheringham, 1983) or competing central places (Fik and Mulligan, 1990) does exist.

Our analysis thus demonstrates the importance of differences between the location of SMEs in influencing interactions with alternative concentrations of suppliers; i.e. the spatial structure of the supply system (where advisors are concentrated) acts as important influences on where advisors are chosen from. We have thus confirmed the importance of the influence of the spatial structure of supplier locations which produce a set of competition terms. These competition terms reflect not only alternative locations, but the different weights of locations as attractions for business demand, because of their concentration of different numbers or types of service suppliers and advisors.

Our results suggest that accessibility and hence transaction costs (or time) are a dominant force in the strong pattern of localization we observe among our respondents. Our results suggest a stark economic emphasis; that businesses treat the market for advice in a similar fashion to the way that consumers treat retail goods: purchase is based on convenience and ease of access on the one hand, and the location and concentration of suppliers on the other hand. In this sense we reflect similar conclusions to those of Coe and Townsend (1998), that localization of service supply has to be seen more as a regional rather than a local phenomenon, where the chief alternative sources of supply can be considered.

Finally, our analysis shows that differences between firms are generally less important than differences between the type of supplier in the role of distance, confirming conclusions from other surveys (e.g. Bennett and Robson, 1999 a, b). Whilst our sample size limits the conclusions that can be drawn, it is clear that sectoral differences between businesses generally have only limited influence on the level of use of the advisor as distance increases from the client. Size differences between firms have a small effect on the levels of use and distance for most types of advisors. Hence adviser type and distance appear to be the main explanatory variables of clients choice of advisor.

There may well also be scope to see in these findings forces of localization encouraging, or being stimulated by, the benefits of local trust-producing mechanisms. Certainly stronger localization, by reducing transaction costs, should also allow the development of stronger interpersonal relations between suppliers and their clients. The choice of advisor in the first place may also reflect the benefits of local trust environments. This set of hypotheses form the basis for part of the arguments for the embeddedness of SMEs within local contexts, as for example, argued by Bryson and Daniels (1998) or Grabher (1993). More closely located advisors should have the potential for higher trust, and may be drawn from local networks that encourage localization, or may benefit from higher trust because they have better local knowledge. However, further analysis of the results of the survey used in this paper, suggest that trust-based relationships and distance are not strongly statistically interrelated. This conclusion is reinforced in other findings (e.g. Bryson and Daniels, 1998; Clarke, 1995), whose more intensive research on client-advisor relations suggest predominately 'weak ties', with advisors chosen as one-off, problem-specific criteria. The pattern is however, complex, with trust mediated not only by local networks, but also by non-localised previous experience, personal recommendation and the extent of regulatory or self-regulating mechanisms that provide alternative signals to those of personal trust, that client demands will be met. This reinforces the findings in this and other surveys (e.g. Bennett and Robson, 1999 a,b) that supplier type (and hence service demand/problem type), and supplier networks (see e.g. Pinch and Henry, 1999) are key aspects in any explanation of advisor choice. Some suppliers of advice work in higher trust environments than others, in some cases of which the trust is more localized.

Clearly, further research is required on each of these issues, but our results strongly underpin a position that future research on business services should seek to analyse simultaneously both demand and supply structures in order to understand fully those forces that encourage localization.

## **TABLES AND FIGURES**

**Table 1. Mean and median distance and cumulative total of distances to advisor by area of location of business.**

Area	Mean	Median	Cumulative total of advisors at:	
	Distance (km)	Distance (km)	10km	25km
Derby	14.96	8.65	55.9	88.2
Dundee	22.54	8.84	76.3	76.3
Manchester	13.62	8.44	59.0	78.4
Oldham	21.43	5.51	76.5	88.2
Thames Valley	38.16	29.91	33.3	45.5
All	20.92	8.84	60.5	81.5

**Table 2. Mean and median distance and cumulative total of distances to advisor by area of location of business**

Advisor	Respondents using (%)	Mean Distance (km)	% Site Visit	Average Cost (£)
Accountant	44.5	16.5	85.9	1820.6
Bank	9.5	9.5	38.9	303.3
Solicitor	7.0	50.3	50.0	2805.0
Friends/Family	8.0	10.7	12.5	0.0
Customer	4.0	34.2	12.5	0.0
Consultant	9.0	48.9	93.8	4810.7
Chamber of Commerce	3.5	7.1	100.0	0.0
Trade & Professional Associations	1.5	46.3	33.3	1333.3
Business Link	6.0	9.7	54.6	67.5
TEC/LEC	5.0	8.7	80.0	0.0
DTI	2.0	29.6	100.0	250.0
All	100.0	20.9	67.4	1428.9
Subtotals				
Private	71.1	23.1	76.6	2129.0
Public & Chambers	16.8	11.3	76.7	72.8
Other	12.1	18.5	12.5	0.0

**Table 3. Types of fields of advice used, mean distance of advisor from client, cost and percentage of users requiring a site visit**

Field of Advice	Respondents using (%)	Mean Distance (km)	% Site Visit	Average Cost (£)
Personnel, recruitment and training	9.0	8.8	38.9	166.4
IT	4.5	27.1	77.8	5143.0
Marketing & advertising	9.0	16.8	56.3	1963.3
Growth	6.5	35.9	91.7	1072.7
Finance	29.0	15.8	66.7	596.8
Premises & machinery/equipment	6.0	21.8	80.0	3083.0
Establishing, buying & selling businesses	9.0	32.8	76.9	4460.0
Product or service design	5.0	42.9	50.1	614.3
Strategy	10.5	18.7	85.7	382.0
General	5.0	12.1	50.0	0.0
Business structure	3.5	30.4	57.1	1050.0
Exports	3.0	17.6	80.0	125.0
All	100.0	20.9	67.4	1428.9

**Table 4. Differences between firms by sector and size in level of use and distance between client and advisor by source of advice**

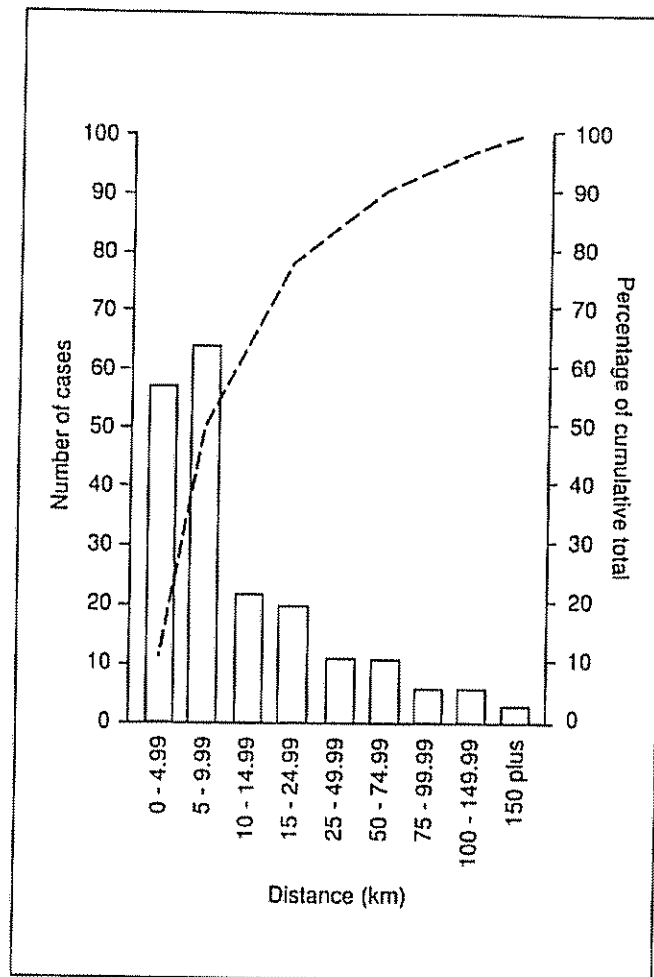
Advisor	% using:				Distance km:						
	Sector		No. of employees			Sector		No. of employees			
	Mfg	Service	5-10	20-30	50-100	Mfg	Service	5-10	20-30	50-100	
Accountant	44.3	44.7	41.5	50.0	44.2	18.0	14.7	11.6	22.6	15.2	
Bank	11.3	7.4	1.9	13.5	11.6	9.4	9.7	10.2	7.5	10.8	
Solicitor	6.6	7.4	1.9	7.7	9.5	65.1	34.8	7.9	93.4	50.3	
Friends/Family	6.6	9.6	13.2	0.0	9.5	6.2	14.2	14.4	n/a	7.8	
Customer	2.8	5.3	7.5	0.0	4.2	60.1	18.7	45.4	n/a	23.1	
Consultant	7.5	10.6	7.5	5.8	11.6	41.7	54.6	37.1	24.1	55.8	
Chamber of Commerce	1.9	5.3	5.7	1.9	2.1	10.7	7.8	7.8	3.1	7.8	
Trade & Professional Associations	1.9	1.1	1.9	3.8	0.0	14.8	109.4	1.3	68.8	n/a	
Business Link	7.5	4.3	9.4	9.6	2.1	11.7	5.6	8.7	12.0	6.1	
TEC/LEC	5.7	4.3	9.4	3.8	3.2	6.9	11.4	7.4	12.0	8.7	
DTI	3.8	0.0	0.0	3.8	2.1	29.6	n/a	n/a	54.4	4.5	
All	100.0	100.0	100.0	100.0	100.0	21.4	20.3	15.2	27.3	20.6	
<u>Subtotal</u>											
Private	71.2	71.0	51.9	80.0	76.8	23.7	22.3	15.2	27.1	23.1	
Public & Chambers	19.2	14.0	26.9	20.0	9.5	13.2	8.3	8.0	19.6	7.0	
Other	9.6	15.1	21.2	0.0	13.7	22.4	15.8	25.7	0.0	12.5	



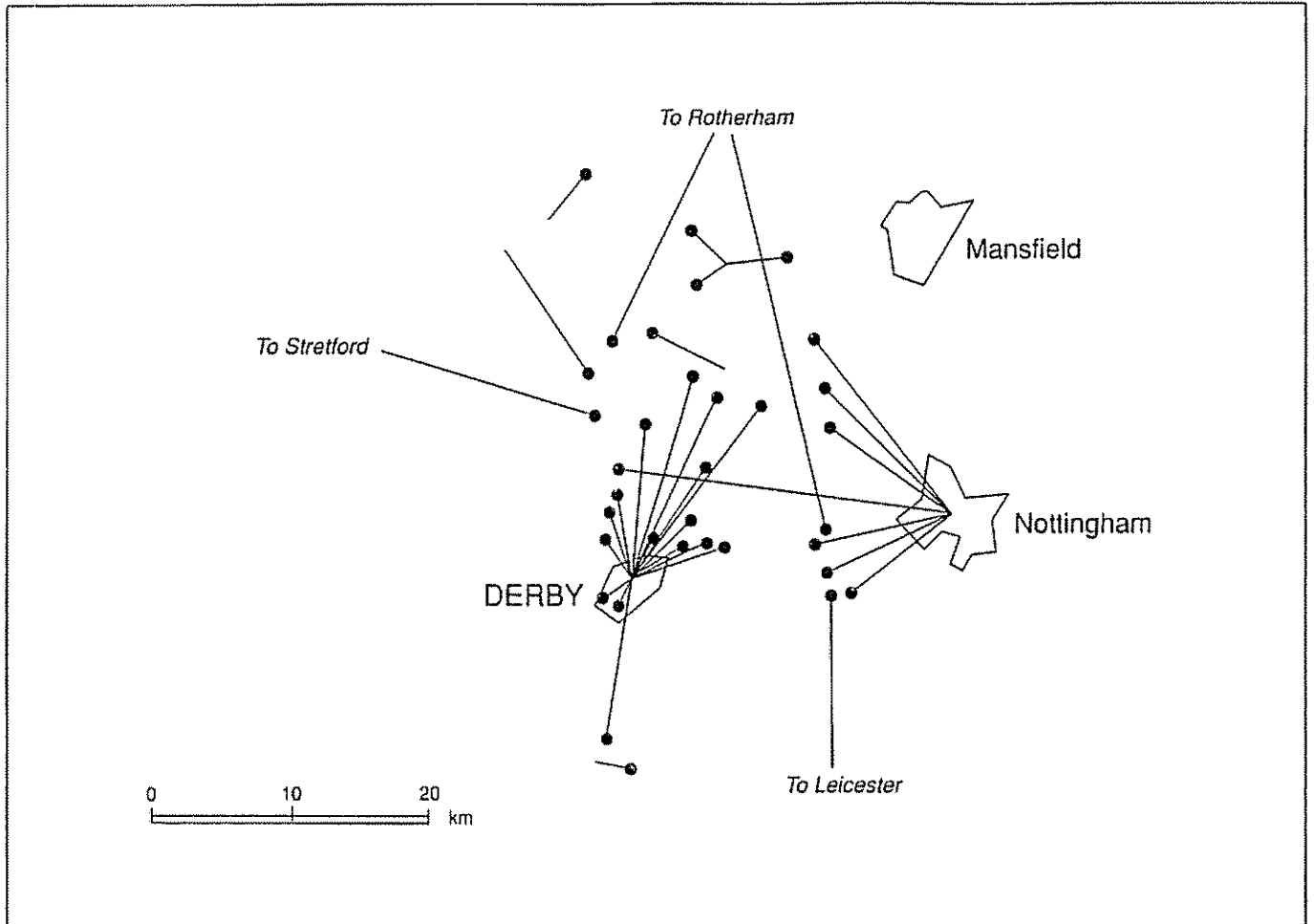
**Table 5. Differences between firms by sector and size in level of use and distance between client and advisor by field of advice**

Field of Advice	% using:						Distance km:							
	Sector		No. of employees		Sector		No. of employees		Sector		No. of employees			
	Mfg	Service	5-10	20-30	50-100	Mfg	Service	5-10	20-30	50-100	Service	5-10	20-30	50-100
Personnel	6.6	11.7	9.4	11.5	7.4	10.6	7.6	6.4	9.5	9.8				
IT	3.8	5.3	1.9	1.9	7.4	9.2	41.5	1.3	75.6	23.9				
Marketing & Selling	9.4	8.5	9.4	1.9	12.6	15.0	19.1	4.7	12.2	22.3				
Growth	5.7	7.4	9.4	1.9	7.4	24.1	45.5	27.4	5.3	45.8				
Finance	32.1	25.5	30.2	36.5	24.2	19.7	10.3	13.9	24.0	10.4				
Premises & Machinery/equipment	10.4	1.1	7.5	5.8	5.3	23.7	1.3	9.2	9.5	29.1				
Establishing, buying & selling businesses	5.7	12.8	3.8	9.6	11.6	24.4	37.0	10.9	47.1	30.3				
Product quality	4.7	5.3	7.5	1.9	5.3	45.5	40.3	48.5	109.4	25.1				
Strategy	10.4	10.6	9.4	11.5	10.5	19.0	18.4	20.7	28.6	11.8				
General	5.7	4.3	9.4	1.9	4.2	17.4	4.0	2.5	8.3	24.9				
Business structure	1.9	5.3	0.0	7.7	3.2	92.0	5.7	n/a	50.5	3.6				
Exports	3.8	2.1	1.9	7.7	1.1	16.2	13.1	23.5	14.4	9.8				
All	100.0	100.0	100.0	100.0	100.0	21.4	20.3	15.2	27.3	20.6				

Figure 1. Number of users of advice at different distances from the client, and the cumulative total with distance

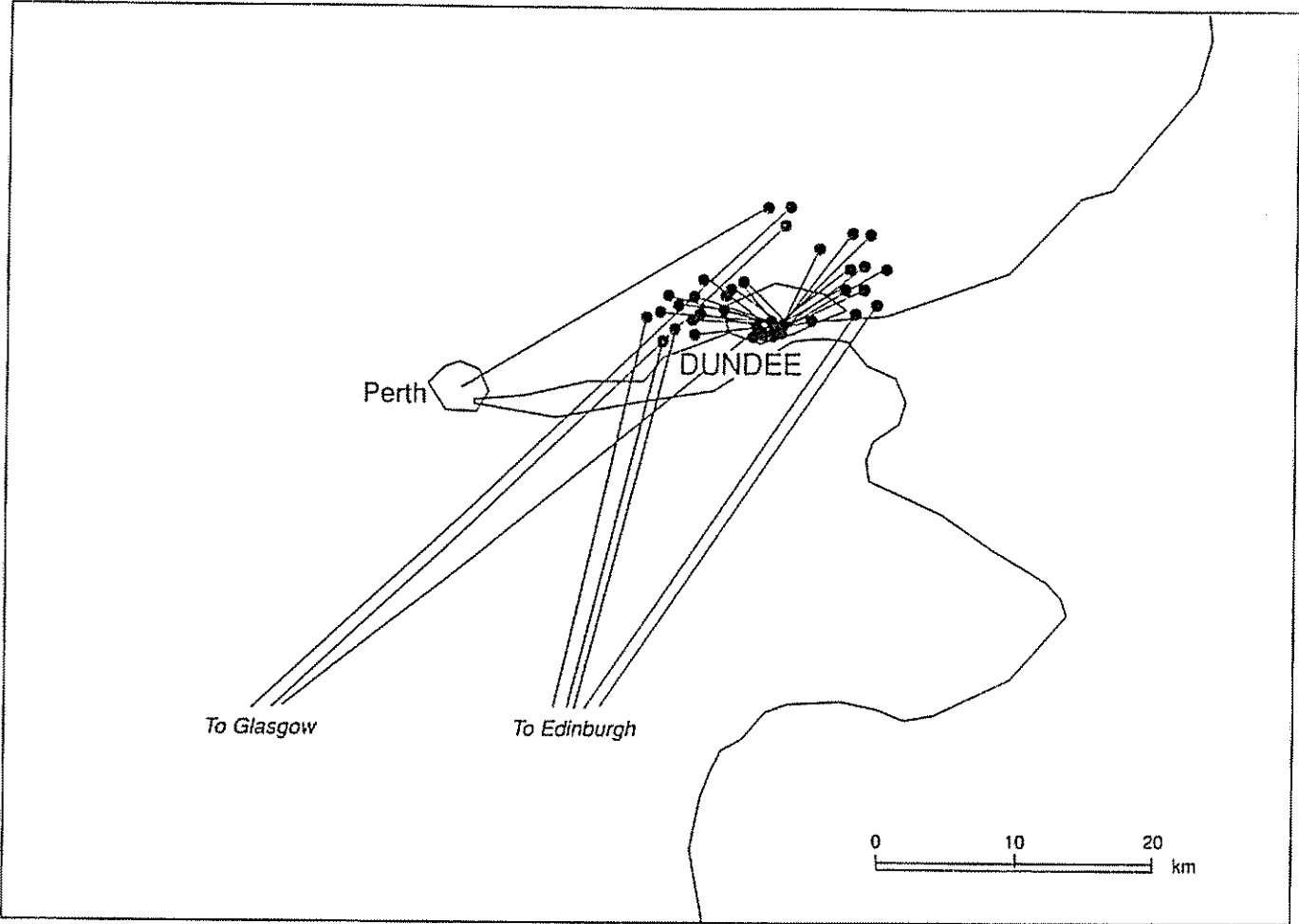


**Figure 2.A. Location of clients and suppliers of advice in Derby**



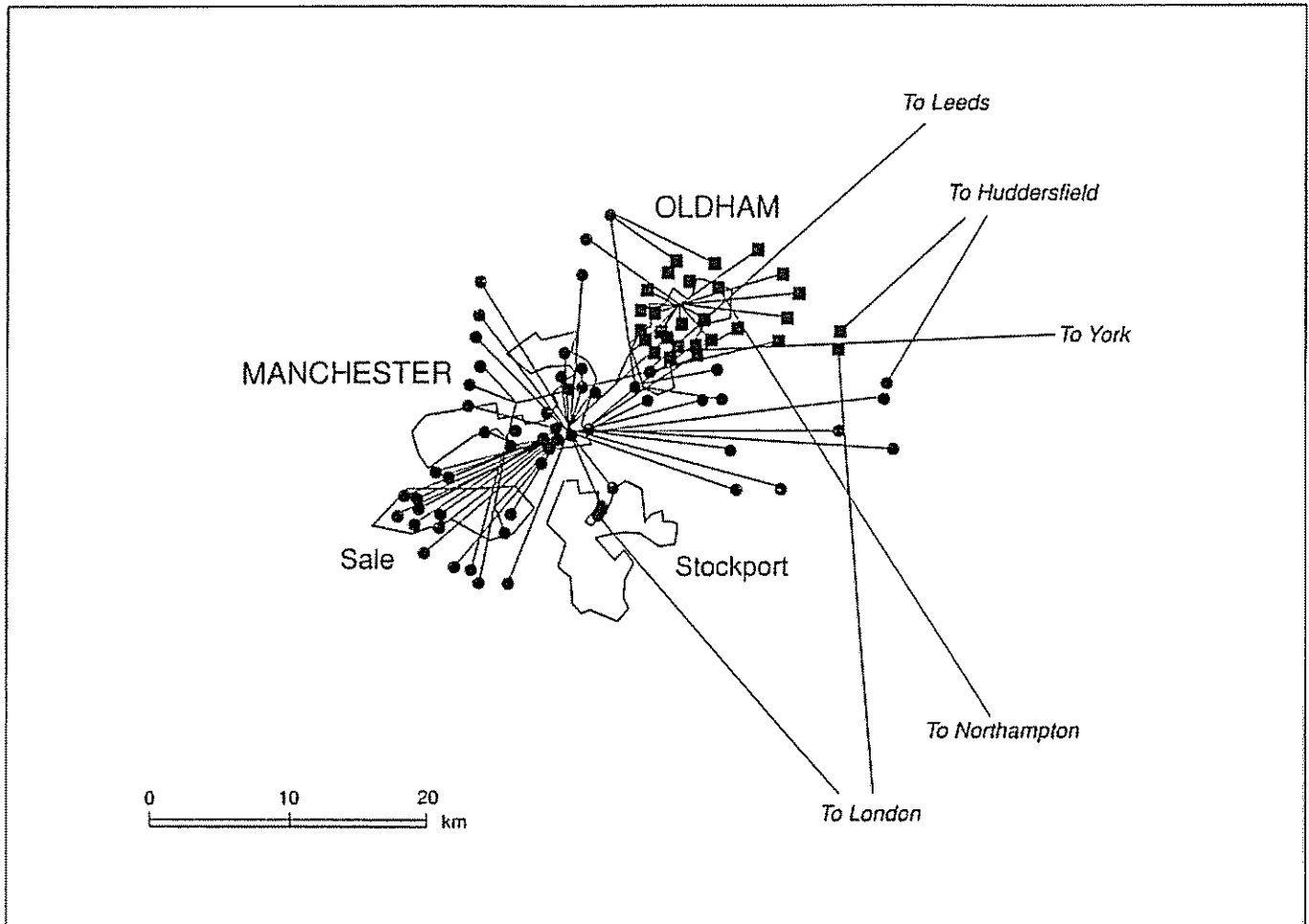
Solid circles or squares indicate the location of the client, the line connects to the location of the advisor.

**Figure 2.B. Location of clients and suppliers of advice in Dundee**



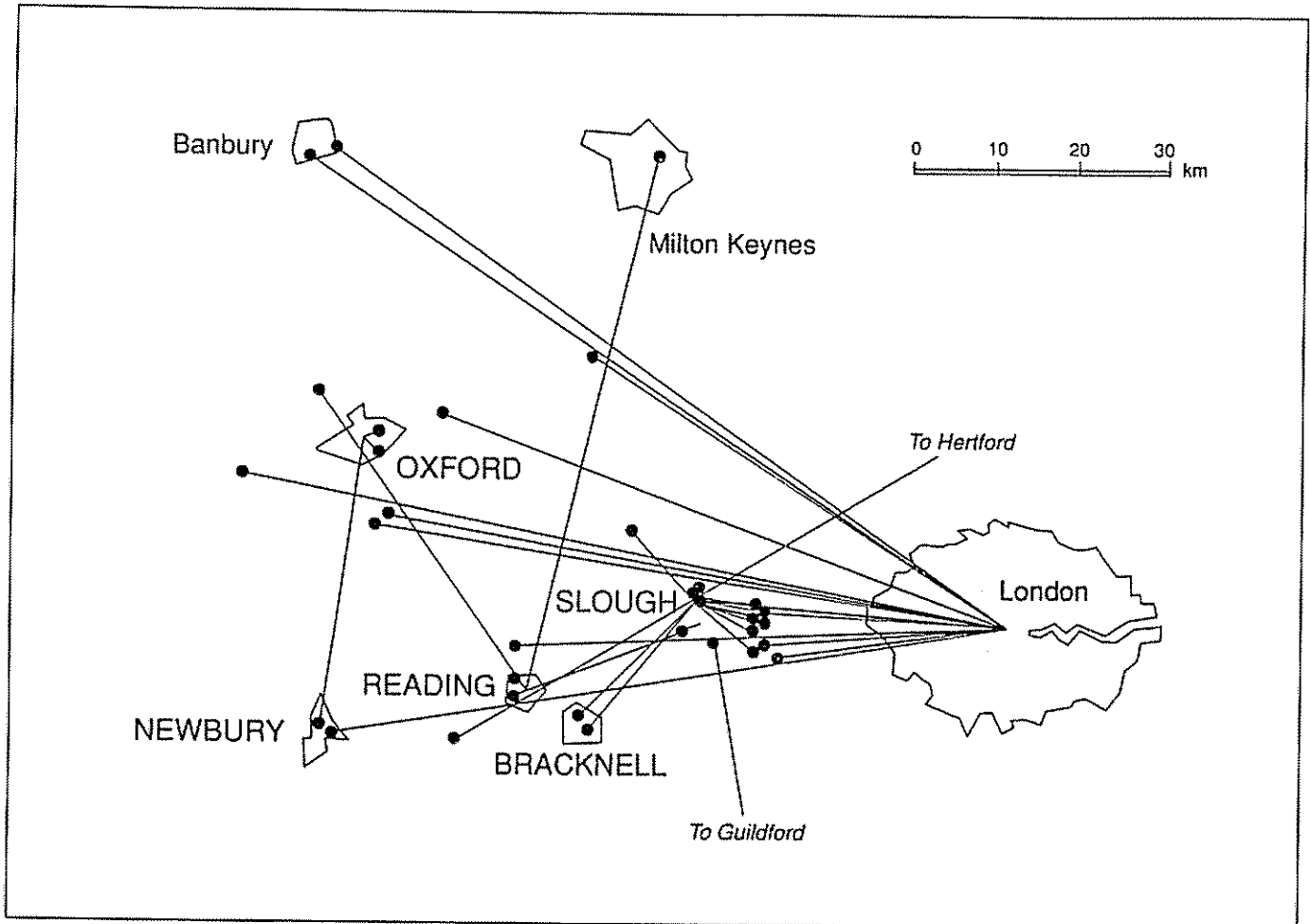
Solid circles or squares indicate the location of the client, the line connects to the location of the advisor.

**Figure 2.C. Location of clients and suppliers of advice in Manchester and Oldham**



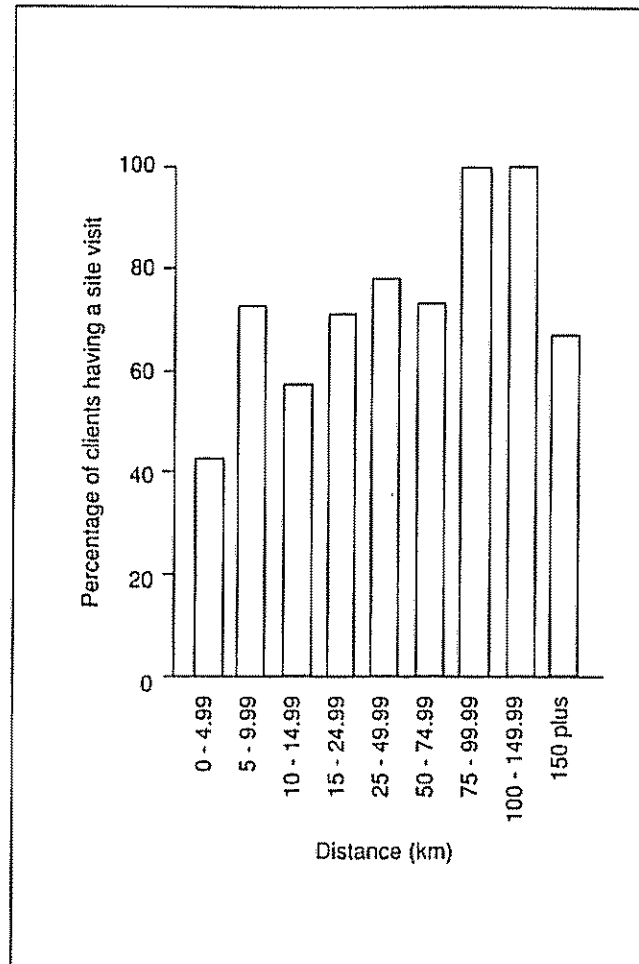
Solid circles or squares indicate the location of the client, the line connects to the location of the advisor.

**Figure 2.D. Location of clients and suppliers of advice in Thames Valley**

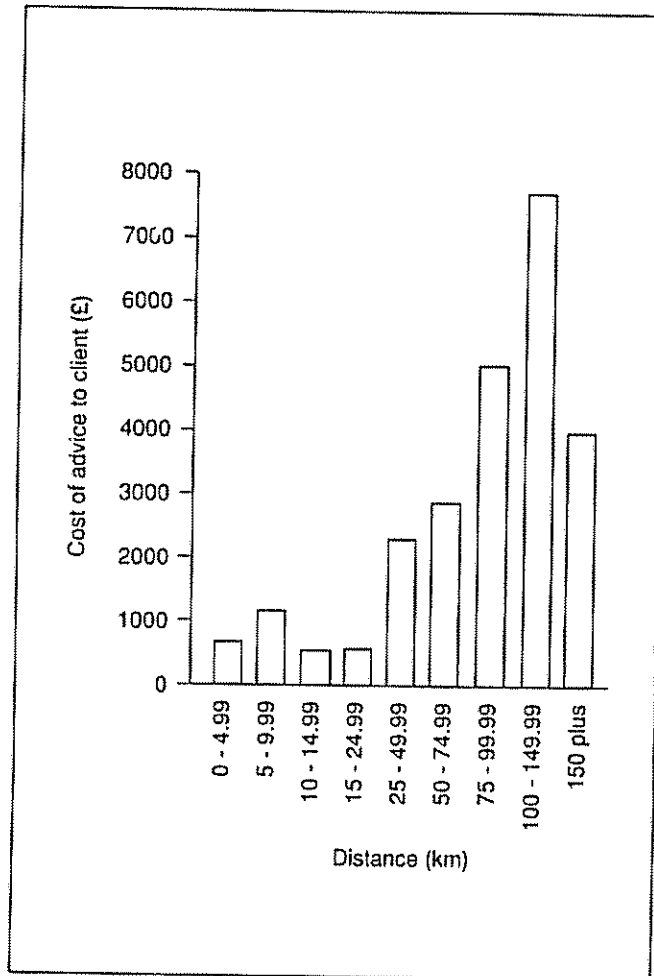


Solid circles or squares indicate the location of the client, the line connects to the location of the advisor.

**Figure 3. Percentage of clients having a site visit from advisors located at different distances**

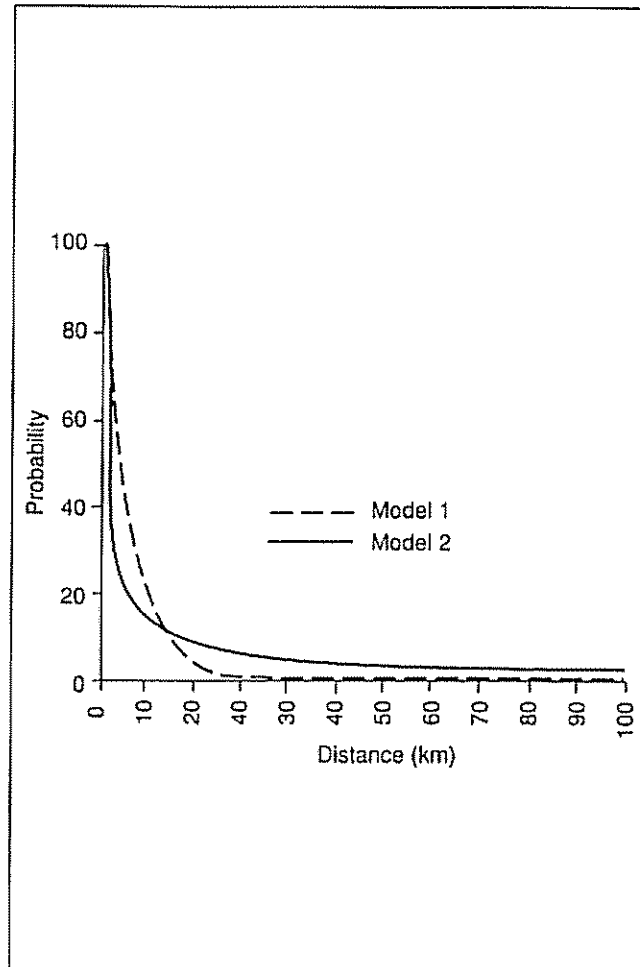


**Figure 4. Cost of advice to client from advisors located at different distances**



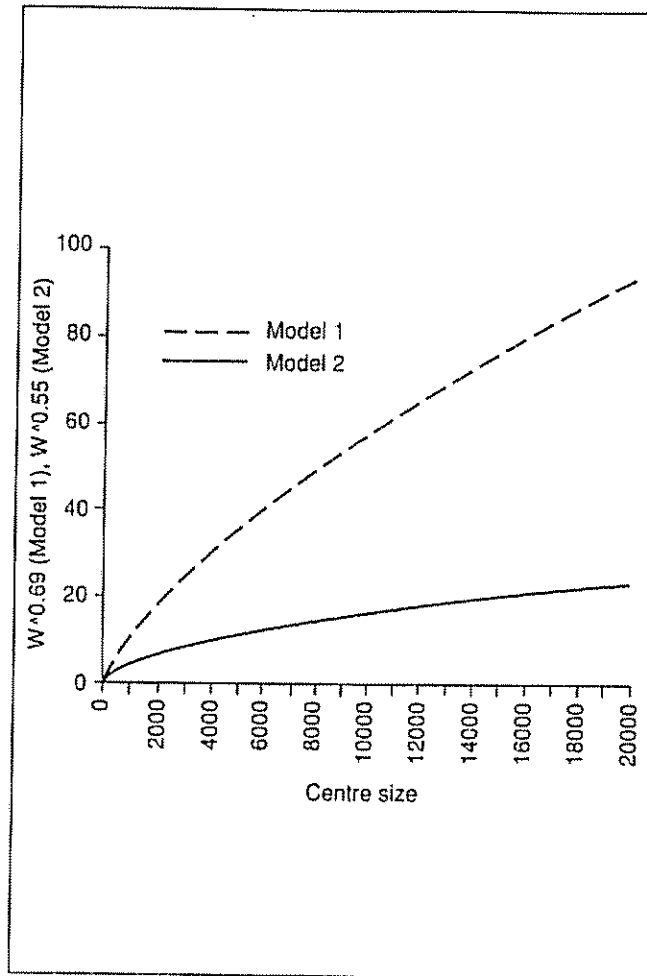


**Figure 5.**



Theoretical form of the logistic and negative exponential curves for distance decay probability of client-advisor interaction at a given distance. Model 1  $\beta = 0.21$ ; Model 2  $\beta = 0.33$ .

Figure 6.



Variation in probability of interaction between client and advisor depending on the size of the business centre in which the supplier is located. Model 1  $\alpha = 0.69$ ; Model 2  $\alpha = 0.55$ .

## References

- Bennett, R.J., Bratton, W.A., and Graham, D.J. (1999) The location and concentration of businesses in Britain: business clusters, business services, market coverage and local economic development, *Transactions, Institute of British Geography*, NS 24, 393-420.
- Bennett, R.J. and Graham, D.J. (1998) Explaining size differentiation of business service centres, *Urban Studies*, 9, 1457-1480.
- Bennett, R.J. and Robson, P.J.A. (1999a) The use of external business advice by SMEs in Britain, *Entrepreneurship and Regional Development*, 11, 155-180.
- Bennett, R.J. and Robson, R.J.A. (1999b) Intensity of interaction in supply of business advice and client impact: a comparison of consultancy, business associations and government support initiatives for SMEs, *British Journal of Management*, 10, 351-369.
- Berry, B.J.L. (1967) *Geography of market centres and retail distribution*, Prentice Hall, New Jersey.
- Birkin, M., Clarke, G., Clarke, M. and Wilson A.G. et al. (1996) *Intelligent GIS: location decisions and strategic planning*, Geoinformation International, Cambridge.
- Bryson, J.R. and Daniels, P.W. (1998) Business link, strong ties and the walls of silence, *Environment and Planning C, Government and Policy*, 16, 265-280.
- Clark, T. (1995) *Managing Consultants: consultancy as the management of impressions*, Open University Press, Buckingham.

- Coe, N.M. (1998) Exploring uneven development in producer service sectors: detailed evidence from the computer service industry in Britain, *Environment and Planning A*, 30, 2041-2068.
- Coe, N.M. and Townsend, A.R. (1988) Debunking the myth of localized agglomerations: the development of a regionalized service economy in South-East England, *Transactions, Institute of British Geographers NS* 23, 385-404.
- Cosh and Hughes, A. (eds.) (1998) *Enterprise Britain: Growth, innovation and public policy in the Small and medium-sized enterprise sector 1994-1997*, University of Cambridge: ESRC Centre for Business Research.
- Curran, J. and Blackburn, R.A. (1994) *Small firms and local networks: the death of the local economy?* Paul Chapman, London.
- Daniels, P.W. (1984) Business service offices in British provincial cities: Sources of input and destination of output *Tijdschrift voor Economische en Sociale Geographie*, 75 (2), 123-139.
- Daniels, P.W. (1995) The locational geography of advanced producer services firms in the UK, in Moulaert, F. and Tödtling, F. (eds.) *Progress in Planning* 43, 2-3, 123-138.
- Daniels, P. and Moulaert, F. (eds.) (1991) *The changing geography of advanced producer services*, Belhaven, London.
- van Dinteren, J.H.J. (1987) The role of business-service offices in the economy of medium-sized cities, *Environment and Planning A*, 19, 669-686.

- Fik, T. and Mulligan, G. (1990) Spatial flows and competing central places: towards a general theory of hierarchical interaction, *Environment and Planning, A*, 22, 527-549.
- Fotheringham, A.S. (1983) A new set of spatial interaction models: the theory of competing destinations, *Environment and Planning, A*, 15, 15-36.
- Goe, W.R. Lentnek, B., Macpherson, A. and Phillips, D. (2000) The role of contact requirements in producer service location, *Environment and Planning A*, 32, 131-146.
- Grabher, G. (ed.) (1993) *The embedded firm: on the socio-economics of industrial networks*, Routledge, London.
- Harrington, J.W., MacPherson, A.D. and Lombard, J.R. (1991) Interregional trade and producer services: review and synthesis, *Growth and Change*, 22, 75-94.
- Hitchens, D.M.W.N. O'Farrell, P.N. and Conway, C. (1994) Business Service use by manufacturing firms in Mid Wales, *Environment and Planning A*, 26, 95-106.
- Hitchins, D., O'Farrell, P. and Conway, C. (1996) Manufacturing use of Business Services in the two parts of Ireland, *Tijdschrift voor Economische en Sociale Geografie*, 87, 124-135.
- Howells, J. and Green, A. (1988) *Technological innovation, structural change and location in UK services*, Avebury, Aldershot.
- Illersis, S. (1989) *Services and regions in Europe*, Avebury, Aldershot.

- Illersis, S. (1994) Proximity between service producers and service users, *Tijdschrift voor Economische en Sociale Geografie*, 85, 294-302
- Illersis, S. and Rasmussen, J. (1992) *Regionalising af technologisk service: En evaluering af Industriministeriets initiativ 1998-1992*, Institut for Geografi, Samfundsanalyse og Datogi, Report 84, Roskilde.
- Keeble, D. and Bryson, J. (1996) Small-firm creation and growth, regional development and the North-South divide in Britain, *Environment and Planning A*, 28, 909-934.
- Keeble, D., Bryson, J. and Wood, P. (1991) Small firms, business service growth and regional development in the UK: some empirical findings, *Regional Studies*, 25, 439-457.
- Krmenec, A. and Esparza, A. (1996) Modelling interaction in a system of markets, *Geographical Analysis*, 25, 354-368.
- Lentnek, B., MacPherson, A. and Phillips, D. (1992) Optimum producer-service location. *Environment and Planning A*, 24, 467-479.
- Lentnek, B., MacPherson, A. and Phillips, D. (1995) A market coverage model for producer services, *Papers in Regional Science*, 74, 4, 389-399.
- Marshall, J.N. (1983) Business-service activities in British provincial conurbations, *Environment and Planning, A*, 15, 1343-1360.
- Marshall, J.N. and Green, A. (1990) Business reorganisation and uneven development of corporate services in the British urban and regional system, *Transactions, Institute of British Geographers*, NS, 15, 217-229.

- Moulaert, F. and Tödting, F. (eds.) (1995) The geography of advanced producer services in Europe, *Progress in Planning* 43, 2-4, 274 pp.
- Oakey, R.P. and Cooper, S.Y. (1989) High technology industries, agglomeration and the potential for peripherally sited small firms, *Regional Studies*, 23, 347-360.
- O'Farrell, P.N., Hitchens, D.M.W.N. and Moffatt, L.A.R. (1992) The competitiveness of business service firms in Scotland and South East England: a matched pairs analysis, *Regional Studies*, 26, 519-533.
- O'Farrell, P.N. and Moffatt, L.A.R. (1995) Business services and their impact upon client performance: An exploratory interregional analysis, *Regional Studies*, 29, 111-124.
- O'Farrell, P.N., Moffatt, L.A.R. and Hitchens, D.M.W.N. (1993) Manufacturing demand for business services in a core and peripheral region: does flexible production imply vertical disintegration of business services? *Regional Studies*, 27, 385-400.
- Phillips, A., MacPherson, A.D. and Lentnek, B. (1998) The optimum size of a producer service firm facing uncertain demand, *Environment and Planning, A*, 30, 129-142.
- Pinch, S and Henry, N. (1999) Paul Krugman's geographical economics, industrial clustering and the British motor industry, *Regional Studies*, 33, 815-827.
- SBRC (1992) *The state of British Enterprise: growth, innovation and competitive advantage in small and medium-sized firms*, University of Cambridge, Small Business Research Centre.

- Schamp, E.W. (1987) Business service for manufacturers: demand behaviour by enterprises in Lower Saxony, pp. 270-291, in F.E.I. Hamilton (ed.) *Industrial change in advanced economies*, Wolfebuno, London.
- Tödtling, F. and J. Traxler (1995) The changing location of advanced producer service in Austria, in Moulaert, F. and Tödtling, F. (eds.) *Progress in Planning* 43, 2-3, 185-204.
- Tordoir, P.P. (1994) Transactions of professional business services and spatial systems, *Tijdschrift voor Economische en Sociale Geografie*, 85, 322-332.
- Wilson, A.G. (1974) *Urban and regional models in Geography and Planning*, John Wiley, Chichester.