Canada-United States Trade Center Occasional Paper No. 11
Alan D. MacPherson, Series Editor

COMPETITIVENESS: INFORMATION AND INTERMEDIATE SERVICES

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October 1991

ACKNOWLEDGEMENTS: The author owes sizable recognition to Drs. Barry Lentnek and Alan MacPherson of the University at Buffalo for very invigorating discussions of some issues treated here. A version of this paper was presented at the North American meetings of the Regional Science Association, Boston, in November, 1990.

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PURPOSE AND SUMMARY

One of the pathbreaking elements of the Canada-United States Free Trade Agreement (FTA) was its inclusion of trade and investment in services. Because of its non-tangible nature, service trade is less affected by traditional forms of trade liberalization, such as lowering of tariffs or removal of restrictive product standards. The chief barriers to service trade include restrictions on foreign ownership of service establishments, restrictions on cross-border movement of personnel, and prohibitions on international flows of data. The FTA established the principle of national treatment (companies abide by the rules of their country of operation, regardless of their parent country), liberalized temporary crossing of employed personnel, and maintained the two countries' liberal policy on data flow.

Intermediate services, whose clients are governments or other businesses, play a double role in international trade. Their output can be traded directly, or their output can add to the international competitiveness of their clients' products. This double role is also present in the inter-regional trade of goods and services. Indeed, Harrington [1989] has argued that, in some regions, the largest service-sector impact of the FTA will be the increased local demand for intermediate services to support international competitiveness and adaptation to change.

In addition to relative intangibility, many of these intermediate services are characterized by a dependence on information as a major input. The economic implications of information intensity (high costs of original production and low marginal costs of dissemination) and the geographic barriers to competition influence the distribution and nature of these services across local regions. Inter-regional variation in information services, in turn, influences the international competitiveness of regional products. The theoretical circumstances under which these influences work form the major topic of this paper. A brief theoretical exposition is followed by a discussion of the methodological problems faced in measuring the quality and availability of services within a region or a country. A set of conclusions concerning the economic and geographic concentration of intermediate services is also presented.

INTERMEDIATE SERVICES AND REGIONAL ECONOMIC DEVELOPMENT

For over a decade, regional scientists have studied the relationship between intermediate services (also known as "producer services") and regional development. At least two relationships have been established. First, these services often have clients outside their own local regions, thereby bringing income to their regions. Second, these services are important resources for other local establishments, thereby adding to the competitiveness of these establishments and providing indirect export income. Harrington et al [1990] reviewed many of the empirical studies of extra-regional sales by producer-service establishments. Most studies focused on differences in the export propensity of different service activities. Others focused on the differences in the relative size of service activities in different places. The studies indicate that the broad sector "finance, insurance, and real estate" is often a source of extra-regional income. Within this sector, particular non-deposit-bank activities and particular insurance activities seem to have especially great variation across places. In addition, particular business services (accounting, engineering, other research) seem to offer high potential for export-led regional growth. With regard to the second link, the use of specialized services may be especially important for regional economies. The role of service provision in the economic competitiveness of goods production and service production is increasingly well documented [Marshall, 1982; Wood, 1987; MacPherson, 1988a; 1988b; Marshall, 1988: Ch.3; Tucker and Sundberg, 1988]. The extent to which a region's productive activities can find and make use of appropriate, efficient, and effective services may well be more important to overall economic well-being than whether those services are exported or imported. However, like all assertions regarding issues as complex and heterogeneous as producer services and regional economic well-being, this asserted link is dependent upon a host of circumstances:

regional, economic, and organizational. This paper develops the conditions under which these concerns are reasonable. I use a conceptualization that high-level intermediate services rely heavily on generating, gathering, and using information, and then making that information work for clients. In many cases, the information is available directly to the clients, but the service provider's function -- the real value added -- is the selection and packaging of information.

MARKET STRUCTURE OF INFORMATION-INTENSIVE SERVICES

Market-structure characteristics of information-intensive services: supply

The information intensity of many producer services provides a key to understanding the spatial competition and strategic choices of service providers. Technical information is the basis for engineering and management consultancy; customer information is an important part of accounting and commercial banking; market-making is the key to competition in finance. Two types or levels of information are relevant: general, often technical information relevant to the field of endeavor (engineering, management, computer networking, corporate law) and marketing information relevant to a service-provider's context and client base.

Both types of information require human and non-human inputs. Highly skilled workers are needed to create new products, to refine existing products, and to design systems for the management of information and the delivery of products. Skilled workers are needed to apply these systems to particular cases: the individual consultant, the loan officer, the account manager. The systems themselves play a key role, however, and represent huge expenses for service providers. Such systems also provide the service vendor with potentially major economies of scale. By systems, I refer to both the elaborate hardware and generalized software for acquiring, storing, transferring, and manipulating computerized data, and to the proprietary software and operating procedures that allow individual service providers to pool human resources, off-the-shelf systems, and their own information into value-added for clients.

I have defined two types of information inputs, general- technical and client-specific. I have also defined two complements to this information: human and systems. The mix of information types and of human and systems inputs varies by service industry, by particular service product, and by competitive strategy. For example, Steiner and Teixeira [1990: 16] noted

> Consumer lending and corporate lending require fundamentally different skills. Traditional corporate lending requires credit analysis skills (to avoid risk) and relationship management skills (to make the sale). The business system focuses on obtaining low-cost funding and providing enough "service" to get the business. ... All this is different from consumer lending...[in which] relationship management skills are not required.... No traditional credit analysis or industry specific skills are needed. Instead, ... resources are needed for operations: processing managers, computer facilities, distribution and communication channels, and systems technology.

Information is notorious for its high cost of original production and low marginal costs of dissemination [Arrow, 1962]. These characteristics imply marginal costs that fall steeply with increased output, yielding a natural monopoly to the first large producer of these services. However, the dichotomy I have proposed in the types of information inputs -- general/technical and context/client-specific -- provides a tension in the provision of these services. Economies of scale in the generation and use of general information collide with the specificity of client needs and contexts, yielding such hybrid organizational forms as separately managed offices of international accounting or management-consulting firms. Indeed, these organizational forms are themselves a form of flexible specialization, in which a core of general expertise, information, and systems is augmented by market-specific branches.

What, then, prevents the observation of monopoly (or, some form of quasi-monopoly through joint-ownership or franchise arrangements) as the usual market structure of information-intensive service provision? One very direct prohibition of total monopoly is by government fiat. Many national governments impose barriers to international provision of services within their borders. The rare government, such as the US, enforces competition within its domestic service industries.

Economic forces countervail against service monopolies, as well. Costs of transport in providing face-to-face contact with clients (important in some industries) encourages spatial decentralization [Lentnek et al., 1990], though not necessarily corporate deconcentration.

Competitors may divide the market through product differentiation in image/trademark, focus, or product mix. Finally, there is the possibility of industry fragmentation by the willingness of smaller producers to accept very small profits in return for independence. However, in all these cases, a large producer benefitting from efficient, centralized information-handling and dissemination could underprice smaller competitors in order to gain additional market share (and thereby lower unit costs). It is the necessity of context/client-specific information and inputs that prevents the full use of the scale economies stemming from general/technical information and inputs.

Market-structure characteristics of information-intensive services: demand

Let us look to the microeconomic model of the firm for some guidance as to the demand schedule for information-intensive services. The price offered by firms for services should not exceed the marginal revenue product of those service inputs. This, in turn, increases with the perceived productivity of additional service inputs and the revenue circumstances of the firm: what is the firm's sales price and volume, and how much output and profit would be added by the firm's purchase of additional services? This reasoning suggests that payment for services would be greater for clients that are large, dominant, not already intensive users of the service, but benefit greatly from the service. In principle, this should hold whether the service is provided within the user firm or is purchased via a market linkage.

If a firm cannot bear the high cost of a service, the cost can be reduced by:

(1) buying a service based on less specific and more general information inputs, so that for the service provider, the lower fixed costs are spread over more potential clients, or
(2) buying a service based on less, or on older information, so that for the service provider, the fixed costs are more easily amortized.

This set of choices lead us to the next section's investigation of dimensions along which information-intensive service products may be distinguished, within the same service industry.

There is a complicating element in this analysis. That is the information required to assess the characteristics of intermediate services. On the one hand, such information adds to the cost of acquiring the service, represents a barrier to the use of intermediate services, and increases the effect of interregional differences in service characteristics. This difficulty is reduced, but not eliminated, when services are produced internally. On the other hand, adequate information on some services (especially advisory services such as strategic or financial consulting) is impossible a priori. Certain services are clearly experience rather than search goods, in Nelson's [1970] terminology.

Specialization versus quality

There are two very related, but separable dimensions. "Specialization" refers to the specialized nature of a service, the particular attributes that distinguish a given service from other, similar services. It may be possible to order these attributes, but this is not necessarily the case. "Quality" refers to the effectiveness of the service: how likely is it to achieve the desired effect? The values for this variable can be ordered. In the marketplace, quality also has a brand-name or reputation element. While this is unusual for producer goods, many of the services with which we are concerned exhibit great imbalance in expertise between the buyer and seller (since expertise is being sold), and the buyer looks for indicators such as reputation and trade name.

In Lancaster's [1979] analysis of product differentiation, specialization, as used here, is the degree to which the particular mix of product characteristics corresponds to the mix of characteristics desired or needed by the consumer. There is a cost to the consumer in a mismatch of characteristics, but there may be economies of scale in producing a product with a particular set of characteristics. If the total size of the relevant market for the product is not sufficiently large, not all combinations of characteristics may be available to the consumer. Quality here corresponds to Lancaster's "vertical product differentiation, in which the absolute quantities of all additional characteristics per unit of the good are increased or decreased" [p. 28].

From a supply perspective, greater specialization requires higher fixed costs for the information and human capital, while generally serving a narrower market (because of the specialization). Higher quality requires higher fixed costs for information and operating procedures (including quality control), and requires more costly human capital (more highly trained workers, longer on-the- job training). The human inputs represent higher fixed costs (centralized development and management) and higher variable costs (providing direct client services). What are the competitive-structure implications of these characteristics: how might we expect the competitive structure of very specialized or very high-quality services to differ from their more basic (but still information-intensive) counterparts?

Summary of market-structure characteristics

The provision of a variety of specialized services necessitates the charging of a higher price to gain returns on higher fixed costs from a relevant market that is smaller than minimum economic scale. Client firms will pay this higher price to the extent that the specialized information/analysis/service is more productive, and to the extent that the client's own market situation allows or forces the use of higher-priced inputs. Higher quality services must charge a higher price to reflect higher fixed and marginal costs. Client firms will pay this higher price based on the contribution of the service to the firm's value added, and the response of the firm's revenues (sales quantity or price) to increases in the effectiveness of the service inputs.

INTERREGIONAL DIFFERENCES IN THE PROVISION OF INFORMATION-INTENSIVE SERVICES

The role of distance in service provision

Distance adds to the costs of servicing clients by adding to the marginal costs of direct client contact. The need for direct client contact varies by type of service, and the frequency of direct contact varies across particular products and client relationships. Costs are time and transport, including the opportunity costs of the time delay in decision making to be assisted by the service.

These costs increase the spatial decentralization of certain service activities [Lentnek et al., 1990]. From the client perspective, distance from a (set of) service provider(s) increases the costs and reduces the likelihood of sufficient information for selection of a distant service provider.

The roles of regional differentiation in service provision

Regional differences affect the supply and market structure of information-intensive services in at least three ways. First, collection and analysis of information across regions is costly, increasing the fixed costs for a service provider who attempts to provide services relevant across regions or countries. Second, differences in the local supply of highly skilled workers may increase the difficulty of deploying such people in high-quality service production in certain regions (see, for example, Coffey and Polese [1987: 78]). Third, interregional differences in the density of demand, coupled with the costs of distance in the provision of certain services, affect the supply of services available at reasonable cost in different regions. Regions or countries with a low density of demand for a particular service with the characteristics outlined above provide less profitable markets for providers of that service, especially if the costs of providing the service locally or the costs of distance (borne by provider and client) are great.

A fourth important difference among regions affects the demand structure for intermediate services. The demand for these services is a derived demand, and its level depends on the level and price of demand for final products. The perceived need for the service, and the price that is willing to be paid for the service, can vary by region or country. If potential clients face primarily local competition, whole regions can exist in a competitive equilibrium without, or with low quality or specialization, services of various kinds. Such regions combine the problems of being costly to service and being unable to bear the costs of specialized or high-quality services.

Market responses

These supply and demand characteristics provide service firms with a range of options, combining the dimensions of specialization, quality, market area, and internalization. To group these dimensions to form a small selection of options, we might list:

(1) a small range of service characteristics at low cost to a local market;

(2) a wide range of or client-specialized and/or high-quality services at high cost to a small, local market of clients that can bear the high costs;

(3) a wide-range of specialized and/or high-quality services at low markup to a large market (including an "export" market); or

(4) client-specialized and/or high-quality services to a captive, internal client [Stanback et al., 1981; Stern, 1985; Pederson, 1986; Harrington, 1989].

A service provider's choice among these options depends upon its own size, the nature of the inputs (labor, information) available to it, the size, density, and competitive structure of its local region, and the economic feasibility of internal expansion (economies of scale and scope). Hepworth [1990] reviewed these arguments for internal versus external production of information-based services and for agglomerated versus dispersed patterns of service production. He concluded that detailed, longitudinal studies within firms are necessary to understand the varied ways in which firms manage information generation and dissemination (including alternatives to the usual intra-firm versus specialized service-firm distinction). Again, the key here is the information-intensity of some services. Other services are not particularly new-information-dependent, and their providers would not face the same strategic choices.

Regional implications

According to the analysis above, what are the circumstances under which a region may face a lack of specialized or of high-quality information-intensive services?

(1) The service in question can be produced with differing ranges of specialization resulting from the use of more- or less-specialized information, analysis, operating systems, and client packaging.

(2) The service in question can be produced with differing levels of quality resulting from the use of more or less current or accurate information, more or less advanced analysis, operating systems, and responsiveness to the client's needs.

(3) A substantial part of the cost of service provision is the marginal cost of region-specific information or the marginal cost of direct client service.

(4) Many of the region's industrial actors obtain the service within their larger and far-flung corporate (or government) organizations.

(5) Other of the region's firms compete in low-profit or purely regional lines of business.

These circumstances, combined with the basic scale economies that characterize this set of intermediate services, create corporate and spatial concentration of these services. Most especially, the more specialized and higher quality services will be available very unevenly across national and sub-national regions.

What are the regional economic effects of such unevenness? The direct effects include employment and prestige. More important, of course, is the possibility that actors in a deficient region cannot obtain specialized or high-quality services (of particular types), and therefore suffer under smaller revenues, lower profit margins, or slower growth than might occur in a better-endowed region. This is not necessarily the case, however. This result depends upon a set of circumstances.

(1) Local activities that are part of interregional organizations do not obtain sufficient specialized services from the rest of the organization.

(2) Local, indigenously owned activities find it uneconomic to seek and obtain specialized services remotely, because of the difficulty of searching or the costs of remote servicing.

(3) Local activities face competition, locally or in other regions, from activities that do have access to more specialized, efficient, or effective intermediate services.

RESEARCH DIFFICULTIES

If the reasoning developed above is upheld empirically, there are measures that could be taken to mitigate negative regional economic development, such as regional clearinghouses to match service demand and supply, public grants or subsidy to firms needing specialized expertise, or public support for training of local service professionals (including mid-career retraining). Before public policy can consider such measures, methodology must be developed to test this line of reasoning. The rest of this section presents some of the methodological problems involved.

Key variables

Products. First, a set of similar products must be identified, offered by several service providers. Cash management accounts for clients of commercial banks are one example, export marketing assistance is another (export trading companies, freight forwarding, or assistance with selecting foreign sales representatives/distributors). Features and fees must be compared, along with estimates of the resources devoted to the products by the providers. The resources will generally be tied to other aspects of the providers' operations, so that the characteristics that give rise to economies of scope must be inspected. The key questions to be discerned are:

a. Behind the cosmetic differences in the way that service providers package their comparable products, are there differences that can be estimated along the dimensions of specialization or quality, as defined above?

b. To what extent do these differences reflect differences in the resources used by the provider -- either specifically for the product investigated, or across products of the provider? What are those resources that differ across the competing products and providers?

Search. The second issue of study is the ways in which client firms select among competing products (including products of the same provider).

a. How are competing products identified?

b. What are the dimensions of comparison? Criteria such as timeliness, performance, and guarantees may be considered quality attributes, while uniqueness of the product is a specialization issue. Price, in terms of fees or other considerations, is the element against which other attributes are traded.

c. Considering each product type in turn, under what client circumstances is proximity a greater expressed concern?

Regional characterization. The third set of questions is the regional distinctions in the products offered and selected.

a. Is there a tendency for higher quality or more specialized products to be offered by larger, multi-locational service providers?

b. Is there any relationship between the type of product offered by such providers in a region, and the region's size or economic salience?

c. Are there identifiable differences in the types of product available locally, from large or small providers, in different regions?

d. Do smaller client firms, or client firms operating in lower-profit parts of their respective industries, make use of lower-quality or less-specialized services? Does the extent and nature of this relationship vary across regions? Does it vary with the range of service-product types offered in the clients' regions?

Research Design

The proposed research requires careful study of one segment of a service industry, followed by interviews with service providers and client firms in a range of regional settings. The data requirements include: (a) for particular service providers, their organizational characteristics, locations, product characteristics, and inputs attributable to the particular products; and (b) for particular service users, their locations and organizational characteristics, and their purchases and sources of particular services. It is probably not necessary to ask the service providers for names of their clients, as the relationships of interest are between products and inputs, products and regional characteristics, and clients and products -- not specific provider and clients. This avoids one of the most difficult aspects of such research: the reluctance of service firms to divulge client information.

O'Farrell and Hitchens [1990] have suggested an alternative approach to similar questions of quality of service products. Quality can be measured by results for the client. Did the client perceive good results from use of the service, and would the client use the provider's service again? These questions fall prey to two sets of problems. The first is the impossibility of comparing the results of using the service actually used with the counterfactual case of results had the service not been used. The second problem is the incomparability across clients. These are key problems, because the reason for our interest in these services is their effect on users. In Wood's words, "their economic contribution, including that to efficiency, can therefore only be evaluated in relation to the improved performance they bestow on the operations of their customers

[1987: 70]. Despite these problems, the overall research agenda on the roles of intermediate services should include both methodological approaches.

In addition, O'Farrell and Hitchens proposed to compare the quality of service products offered by pairs of similar providers, one in Southeast England and one elsewhere in the UK (replicating their methodology for the assessment of manufactured products, presented in O'Farrell and Hitchens [1989]). Such a methodology could usefully be employed in the present case, though not without modification. The attributes of service products are sometimes difficult to discern. However, attribute listings are often provided by service providers as part of their marketing efforts. These can be noted, along with assessments of the yield, effectiveness, or success of the product, and prices can be compared.

CONCLUSIONS

The waves of mergers that have changed competitive structures in the accounting, commercial banking, investment banking, and other sectors reflect increased economies of scope and scale in servicing multinational corporations, as well as technological changes in the management of companies and of information. Increased international and especially bilateral competition has made these economies and technological changes more irresistible for service companies in Canada and the US.

To understand these mergers and their limitations, it is useful to focus on the structural implications of information as a major input of these activities, and of packaged, tailored information as their major output. The implications of concentration and integration are mitigated by the complementary requirements for specialized information. Concentration and integration, as well as the opposing tendencies of separation and specialization, are mirrored (albeit imperfectly) in the geographic distribution of these activities.

This paper has made more explicit the relationship between competitive structures and geographic tendencies. Under particular circumstances, we may find public and private organizations in relatively peripheral regions at a disadvantage in the use of intermediate services. These circumstances have been deduced from the information intensity of certain service activities. Analogous circumstances (based on different key supply and demand characteristics) may lead to regional disadvantage in the availability of "materials-handling services," which may be even more important to peripheral regional economies [Wood, 1987: 73]. The hypotheses deduced here require difficult empirical testing and modification, so that we can move beyond our awareness of the importance and the economics of advanced services to an awareness of the impact of their structure on regional economies.

REFERENCES

Arrow, K.J. 1962. Economic welfare and the allocation of resources of invention. National Bureau of Economic Research, ed., The Rate and Direction of Inventive Activity. Princeton: Princeton University Press.

Coffey, W.J. and Polese, M. 1987. Intrafirm trade in business services: implications for the location of office-based activities. Papers of the Regional Science Association 62: 71-80.

Harrington, J.W. 1989. Implications of the Canada-United States Free Trade Agreement for regional provision of producer services. Economic Geography 65(4): 314-328.

Harrington, J.W., Lombard, J.R., and MacPherson, A.D. 1990. Interregional trade in producer services: review and synthesis. Paper presented at the annual meeting of the Association of American Geographers, Toronto, April.

Hepworth, M.E. 1990. Geography of the Information Economy. New York: The Guilford Press.

Lancaster, K. 1979. Variety, Equity, and Efficiency: Product Variety in an Industrial Society. New York: Columbia University Press.

Lentnek, B., MacPherson, A., and Phillips, D. 1990. Optimum producer service location. Unpublished manuscript, University at Buffalo, Buffalo NY 14261.

MacPherson, A. 1988a. New product development among small Toronto manufacturers: empirical evidence on the role of technical service linkages. Economic Geography 64 (1): 62-75.

MacPherson, A. 1988b. Service-to-Manufacturing Linkages and Industrial Innovation in Toronto. Unpublished doctoral dissertation, Department of Geography, University of Toronto.

Marshall, J.N. 1982. Linkages between manufacturing industry and business services. Environment and Planning A 14: 1523-1540.

Marshall, J.N. 1988. Services and Uneven Development. Oxford: Oxford University Press.

Nelson, P. 1970. Information and consumer behavior. Journal of Political Economy 78: 311-329.

O'Farrell, P.N. and Hitchens, D.M. 1989. The competitiveness and performance of small manufacturing firms: an analysis of matched pairs in Scotland and England. Environment and Planning A 21: 1241-1263.

O'Farrell, P.N. and Hitchens, D.M. 1990. Producer services and regional development: key conceptual issues of taxonomy and quality measurement. Regional Studies 24 (2): 163-171.

Pederson, P.C. 1986. The role of business services in regional development: a new growth center strategy. Scandinavian Housing and Planning Research 3: 167-182.

Stanback, T.M., Bearse, P.J., Noyelle, T.J., and Karesek, R.A. 1981. Services: The New Economy. Totowa, NJ: Rowman and Allanheld.

Steiner, T.D. and Teixeira, D.B. 1990. Technology In Banking: Creating Value and Destroying Profits. Homewood, Ill.: Dow-Jones-Irwin.

Stern, R.M. 1985. Global dimensions and determinants of international trade and investment in services. R.M. Stern, ed., Trade and Investment in Services, Canada/US Perspectives. Toronto: Ontario Economic Council.

Tucker, K. and Sundberg, M. 1988. International Trade in Services. London: Routledge.

Wood, P.A. 1987. Producer services and economic change: some Canadian evidence. K. Chapman and G. Humphrys, eds., Technical Change and Industrial Policy. Oxford: Basil Blackwell.