

Make or Buy: Internalization and Externalization of Producer Service Inputs in the Montreal Metropolitan Area

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Producer or intermediate-demand services enhance the efficiency of operation and the value of output at various stages in the production process. All firms, whether specializing in the fabrication of goods or in the provision of services, employ a range of producer services as inputs into their production functions. The more advanced or modern the "value chain" (such as, the production process) of a firm, the more numerous and more complicated will be the links in the chain and the greater will be the importance of service inputs (Porter 1985; 1990). Indeed, a wide range of empirical evidence has demonstrated that producer services occupy a major and expanding role both within firms (Britton 1990; Quinn 1993) and within national, regional and metropolitan economies (Beyers 1989; Coffey 1994).

A fundamental decision that each firm (and, indeed, each establishment within a firm) must face concerns whether to "make" or to "buy" a specific producer service input; that is, whether to provide a given service internally by assigning its own personnel to the production of the service or, rather, to contract-out the provision of the service to experts in the employ of external (either affiliated or free-standing) specialized establishments. The decision to internalize or to externalize given service inputs is one of the most important strategic decisions that an establishment must make, as this choice ultimately affects the establishment's cost structure, its modes of operation and organization, and possibly its location (Coffey and Polèse 1984; 1986).

The "make or buy" decision of individual establishments also has an impact upon the structure of an economy, as measured by official statistics on employment or output by sector of activity. For example, a lawyer hired in-house by a manufacturing establishment will increase the level of employment in the manufacturing sector, whereas the same lawyer working in a law firm, even though performing the same functions for the same manufacturing establishment, will augment employment in the producer services sector. ⁽¹⁾

In spite of its wide recognition as a fundamental aspect of "the service economy" and as an important element in both the organization and the functioning of enterprises, the propensity of establishments to make or to buy producer services has rarely been explored in a systematic manner. The purpose of the present study is to increase the understanding of this phenomenon by examining, from both conceptual and empirical perspectives, the make or buy behaviour of establishments across all sectors of activity. Our exploration of this issue begins in the next section with a review of the factors that can influence the decision to internalize or to externalize producer service inputs. After a brief section on definitions and methodology, we then examine empirical evidence drawn from a detailed survey of producer service consumption by establishments in the Montreal Census Metropolitan Area (CMA). We first present a descriptive analysis of internalization and externalization in the consumption of producer services, then attempt to identify some of the factors that underlie the make or buy decision. Our analysis concludes with some comments linking our empirical results to the producer services literature.

The Make or Buy Decision

Concern with the internalization and externalization of producer service inputs is by no means recent. This concern pre-dates the development of service industries research as an identifiable scholarly field. Stigler (1951) cited two major factors influencing the make or buy decision: complementarity and economies of scale. Complementarity refers to the extent to which service functions can be produced internally without raising a firm's cost of carrying out other functions. As Stanback et al. (1981) note, complementarity exists if services can be provided as a joint product, enabling better utilization of managerial or other scarce resources. Services are more likely to be provided internally to the extent that they are complementary, and to be provided externally to the extent that they are "rival" (Stigler 1951). Williamson's (1980) work on transaction costs amplifies this notion. A producer service should be internalized when it enables an organization to build firm-specific human capital or to make better use of such resources. Moreover, services are more likely to be internalized to the extent that they involve transactions that are specific to the firm and its particular resources. In terms of economies of scale, it is clear that engaging personnel to provide a service in-house can only be justified if a firm (and, more specifically, certain service-consuming functions within a firm) attains a certain scale or size of operations. Firms that are unable to attain this threshold for the maintenance of in-house service functions are required to purchase the necessary inputs from external establishments.

Greenfield (1966) contributed to the understanding of the make or buy decision by emphasizing specialization and standardization of service inputs as major influences upon the internalization/externalization choice. As the required service inputs become more specialized, it often becomes increasingly difficult for in-house staff to effectively perform the functions. In addition, increasing specialization diminishes the possibilities for achieving economies of scale in the performance of a specific service function; unlike more general tasks, which may often be grouped together and performed by the same individual, the specialization of inputs often implies a technical division of labour that

precludes combining functions. On the other hand, an increasing standardization of service inputs often enables different tasks to be performed by a single person and also permits tasks to be executed by less-specialized personnel; in sum, the conditions for internalization are more propitious where standardized inputs are required.

Coffey and Polèse (1984; 1986) also identify the importance of standardization as a factor in the make or buy decision, but their emphasis is upon the standardization of an establishment's outputs rather than inputs. They note that standardized outputs involving routine and programmed functions, while requiring some degree of specialized knowledge, are nevertheless characterized by service inputs having a stable composition and a predictable (and often frequent) level of demand. On the other hand, less standardized outputs are characterized by instability in terms of both the composition of inputs and the frequency of demand for these inputs; the service inputs involved are highly specialized, constantly shifting and often must be provided at very short notice. Therefore, a standardized output structure is more conducive to in-house production of intermediate services than is one involving a variable structure. In addition, these authors cite the importance of confidentiality as a criterion. In general, services that treat confidential information require a high degree of internalization, while those treating non-confidential information allow greater scope for external inputs. Thus, the degree to which internal and external service inputs are substitutable reflects the level of standardization and confidentiality of the production process.

Coffey and Bailly (1991) summarize the factors underlying the increasing utilization of external producer service inputs by firms across all sectors of the economy. The principal factors identified (some of which have already been mentioned in the preceding discussion) include:

- In-house technical limitations. Although firms are consuming greater quantities of producer services, the capacity of a given firm to develop the level of expertise required to effectively provide a particular service input may be restricted by knowledge, personnel or cost. These limitations are particularly important when keeping pace with technological change.
- Characteristics of the firm. Illeris (1989) notes that there are certain regularities in the demand for external services. Independent firms purchase more external services than branch plants; medium-sized establishments purchase higher proportions of external services than either their small or large counterparts; more sophisticated firms (firms that are exporting, growing and have changing markets or technologies) have a higher demand for external services. And, contrary to the conventional wisdom, the consumption of producer services is divided approximately equally between firms in the service producing sector and in the goods producing sector; such as, a large proportion of producer services are purchased by other service firms (Marshall 1988; Illeris 1989; Goe 1990; Perry 1990).
- Advantages of external economies. Firms are often able to purchase specialized producer services from outside sources for less than they can provide them internally due to scale economies in the specialized free-standing service firm. In

other words, firms seek "increasing returns via external economies" (Young, 1928).

- Non-standardization and unpredictability of demand. Where the required service inputs involve highly diverse and constantly shifting mixes of information and expertise, and where the demand for these inputs is both sporadic and unpredictable, it may not be economically feasible for a firm to engage sufficient personnel to deal effectively with the entire range of demand. Conversely, however, the need to deal with highly confidential information is a clear disincentive to purchase external services.
- Organizational strategy. There are certain economic and organizational advantages in maintaining a small and highly focused pool of human resources. Many firms seek to restrict their activities to core functions, those that they accomplish better than other organizations; the remaining service inputs are purchased externally.
- Avoidance of risks and fixed costs. Firms may reduce their costs of participation in social insurance programs and of other overhead through the externalization of service inputs. Similarly, the risks associated with unstable demand for particular services are transferred to the external service supplier.

The latter four factors, in particular, are explicitly related to the concept of flexible production, which has become one of the principal paradigms of industrial reorganization over the past five years; indeed, these factors help define the notion of flexibility in a production system.

In our view, the following three conditions, in addition to the above factors, are also likely to lead to externalization:

- Where complementary producer services have widely varying scales of production. Small firms may contract out certain tasks (for example, legal counsel or tax accounting) because they do not have the volume of demand required to economically employ the specialized personnel required to perform the function internally. Conversely, specialized sub-contractors can achieve internal economies of scale by pooling a wide range of external demand.
- Where segmented labour markets prevail. Here the possibility exists for some work tasks to be contracted-out from firms in high wage, primary labour market sectors (for example, technical and professional occupations) to firms in lower wage, secondary labour market sectors (for example, maintenance, security or data-input).
- Where the spatial agglomeration of producer service activities exists. In this situation, external transaction costs will fall due to close physical proximity, encouraging the social division of labour.

Finally, Beyers and Lindahl (1996), in the context of a discussion concerning competitive advantage in the producer services, present a comprehensive review of factors that lead establishments to externalize these activities. They identify three broad classes of factors:

- cost considerations, including issues such as minimization of transaction costs and the perception that external service provision is less expensive;
- quasi-cost considerations, involving flexibility, risk reduction, infrequent demand, predictability of costs and concentration on core skills; and,
- non-cost factors, largely involving lack of internal expertise, buyer/supplier dynamics, rising buyer sophistication, third-party information needs (for example, the need for independent audits and expert testimony in legal cases) and the growing complexity of management tasks.

They also note that the demand factors that lead firms to out-source are also regarded as the supply factors that motivate specialist producer service firms to expand the range and quantity of the services offered.

The remaining, empirical, portion of this study attempts to shed further light on some of these conceptual issues. Due to data limitations, however, not all of the points raised above can be addressed. Before turning to the empirical results, we provide some basic information on definitions and methodology.

Definitions and Data

This section provides background information on the operational definition producer services employed in this study, the spatial framework of analysis, and, the source and nature of the data utilized.

In the present study, the term "producer services" is defined in a broad manner so as to include both business services and certain high order activities from the finance and insurance sector. Table 1 identifies the specific activities included in the following empirical analysis.

The Montreal Census Metropolitan Area (CMA) is Canada's second largest metropolitan agglomeration, with a population of slightly more than 3.1 million inhabitants in 1991. The CMA, formerly Canada's largest and most important center of high order service activities, since 1971 has yielded its position as the country's principal metropolis to Toronto, assuming instead the role a regional (largely francophone) center. For certain purposes, the Montreal CMA has been subdivided into four concentric zones: the CBD, the remainder of the City of Montreal (such as, Montreal excluding the CBD), an inner suburban zone corresponding to the other municipalities on Montreal Island (such as, Montreal Island excluding the City of Montreal), and an outer suburban zone corresponding to the remaining municipalities in the CMA (such as, the CMA excluding the municipalities on Montreal Island).⁽²⁾

TABLE 1: Identification of Producer Service Activities

The data utilized in this study come from a detailed survey of producer service production and consumption in the Montreal CMA, conducted between December 1992 and April 1993. More precisely, two parallel surveys were conducted: the first, a supply side survey, examined service production in 324 producer service establishments; the second, a demand side survey, examined producer service consumption in 262 establishments across all sectors of the economy. The present study reports results drawn from the demand side (producer service consumption) survey. Both surveys entailed hour-long, in-person interviews with one or more high officials of the responding establishments. The demand side survey consisted of a structured questionnaire that sought information concerning four broad themes:

- the characteristics of the establishment (for example, organizational status, level of employment);
- the locational factors underlying the choice of the Montreal CMA and the present site;
- the consumption of producer services; and,
- the use of external producer services.

Not all of the rich and diverse information gathered in the course of these interviews is utilized in the present study. Establishments were selected by a stratified random sampling procedure based upon both the relative weight of the sample drawn in this manner, as well as the final set of responding establishments, accurately reflects the geographic and sectoral distribution of establishments in the Montreal CMA (see Table 2). The 262 completed interviews represent a response rate of 55.4 percent.

TABLE 2: Sectoral and Spatial Distribution of Establishments Surveyed, Montreal CMA

Note, in particular, that a major source of frustration for the research team was the inability of our survey to capture any useful information on the change in the internalization/externalization practices of establishments over time. While we originally sought this information, pre-tests of the questionnaire indicated that the level of response to change-related questions was low; in most instances, respondents indicated that the information was simply not available and/or that the personnel capable of describing the situation prevailing as recently as five years ago were no longer with the establishment.

Internalization and Externalization of Producer Service Consumption

In this section we present an analysis that attempts to shed light on a number of issues concerning producer service consumption by establishments:

- which producer service inputs are most widely utilized?;
- which producer services are most widely internalized and which are most widely externalized?;

- when acquired externally, by what means do establishments obtain (or, inversely, do producers deliver) their producer service inputs?;
- what are the principal reasons for the external acquisition of producer services?;
- what are the principal advantages to the establishment when externally acquired producer services are acquired?; and,
- which externally acquired producer services aid most in the efficiency and productivity of the establishment?

TABLE 3: Producer Service Consumption, All Sectors, Montreal CMA

Table 3 presents general information on producer service consumption by establishments across all sectors of the economy.⁽³⁾ Part A of Table 3 deals with the use of specific producer services by establishments; here the issues are simply whether an establishment consumes a given producer service, irrespective of whether the service is provided internally or obtained externally, and the frequency with which the service is employed. For all sectors combined, property insurance (98.4 percent of the 262 establishments surveyed), accounting (97.6 percent), legal advice (95.7 percent) and professional computer services (91.8 percent) are the most widely utilized service functions. The provision of property insurance is infrequent; the modal frequency category, which characterizes 87.1 percent of the establishments that consume this service, is between 1 and 5 times per year. On the other hand, the vast majority (80.7 percent) of establishments using accounting services, do so on a daily basis. Legal services are used most often on a weekly basis, but the low percentage of modal frequency (24.6 percent) indicates that the proportion of establishments employing this service on a weekly basis is not significantly different from that of other frequency levels. Finally, professional computing services are used on a daily basis by almost one-half of user establishments. At the other end of the spectrum, the consumption of brokerage and financial intermediary services is relatively rare, with only 16.1 percent of establishments having recourse to this service, whose modal frequency of demand, which characterizes 37.5 percent of user establishments, is 1 to 5 times per year.

The four producer service activities identified above are generally the most frequently utilized across the individual economic sectors; there are, however, exceptions. In the goods producing sector, personal insurance (92.0 percent) replaces professional computing services (86.0 percent) as one of the four most frequently consumed services. In high order service establishments the four most frequently used services are joined by personal insurance (97.2 percent) and advertising and sales promotion (94.4 percent). In the public and parapublic sector, human resource training occupies the fourth position (94.1 percent), while personal insurance (96.9 percent) is tied with professional computing and legal services for second position among "other service" establishments.

Part B of Table 3 examines the degree to which establishments make or buy producer services. Treating all sectors together, we find that the volume of internalized producer service inputs exceeds that acquired externally in the case of only five of the fifteen service activities: accounting (88.9 percent internal), personnel placement (72.1 percent), data processing (60.6 percent), professional computer services (54.7 percent) and

management advice (52.5 percent). On the other hand, the most highly externalized services are, in descending order: property insurance (98.3 percent of input volume), personal insurance (95.9 percent), major loans (94.9 percent) and legal advice (91.3 percent). For the group of fifteen services as a whole, on average, 36.6 percent of the service input volume is internalized and the remaining 63.4 percent is externalized.⁽⁴⁾ These patterns generally hold for the five individual consuming sectors, with several notable exceptions, principally within the goods producing and trade sectors. First of all, professional computer (44.1 percent) and management (39.8 percent) services tend to be less highly internalized within the trade sector. On the other hand, in the goods producing sector, engineering (65.9 percent), scientific and technical (54.2 percent), and human resource training (59.6 percent) tend to be more highly internalized. Considering the set of fifteen service activities as a whole, we find the highest degree of internalization in the goods producing sector (41.5 percent) and the highest degree of externalization (over 66 percent) in the trade and public and parapublic sectors.

Part B of Table 3 also enables us to distinguish between the proportion of externally acquired services that are obtained from independent versus affiliated establishments. As a general rule, external services overwhelmingly come from independent establishments; for all service activities across all sectors, an average of 92.3 percent of externally acquired services were obtained from non-affiliated establishments. Among the individual sectors, the lowest percentage of acquisition from an independent establishment is 57.4 percent for data processing services consumed by the high order service sector. The values for individual sectors are generally well over 80 percent; in a number of cases (for example, management consulting in the goods producing sector) the figure attains 100 percent.

The issue of the principal method by which producer services are acquired when obtained from external establishments is addressed in Part C of Table 3. Although not shown here, there is a surprising degree of regularity in the manner in which specific services are acquired, a regularity that cuts across the sectoral affiliation of consuming establishments. In eight of the fifteen service activities the principal method of delivery remains constant across the five client-sector categories; the same method is found in four out of five sectors in the case of an additional five service activities. This suggests that the nature of the service involved exerts a strong determining influence upon the method in which it will be delivered to the client. Part C of Table 3 column provides a useful summary of the principal method associated with each specific service type. Using this indicator we can observe that out of fifteen service types, six (professional computer services, advertising, accounting, engineering, scientific and technical services, and management consulting) mainly involve delivery by an on-site visit from an employee of the producing establishment. Delivery by mail or courier services accounted for the principal method in three services (pension fund management, property insurance and personal insurance), as did delivery by telephone in the case of three others (legal advice, personal placement, and brokerage services). A visit to the producing establishment by an employee of the client establishment was the principal method in the case of two sectors (human resource training and major loan services), while delivery via computer communications networks was the principal method in the case of one service (data

processing).⁽⁵⁾ Note, too, that in terms of the percentage of establishments that identified a given alternative as being the principal method of acquisition, the trends are clearer in the case of management (83.5 percent), accounting (80.2 percent) and engineering (78.5 percent) services, and less robust in the case of personnel placement (38.4 percent) and legal (41.1 percent) services.

TABLE 4: A Typology of Producer Service Delivery

The above results enable the construction of a simple typology of producer services based upon their method of acquisition or delivery (Table 4). A first distinction may be made between "in person" and "impersonal" (such as, primarily involving the use of transportation or communications technologies) services. The impersonal services include a range of activities involving more standardized functions (for example, data processing, insurance, pension fund management) as well as activities that entail the routine execution of directives (for example, brokerage and personnel placement). Somewhat surprisingly, legal advice appears in the impersonal services group, on the basis of its acquisition by telephone. This may suggest that much legal advice actually touches upon fairly routine, non-sensitive matters or, alternatively, that it must be acquired on very short notice. In addition, as we have seen, the percentage of establishments that indicated that the telephone was the principal method of acquiring legal services (41.1 percent for all sectors together) is relatively low, indicating that other methods may have been almost as important. Note also that, as a general rule, the percentages related to principal methods of acquiring a service are lower for impersonal services than for "in person" services, indicating the use of a greater diversity of methods of acquisition among the former. Within the "in person" services, a distinction can also be made between those that involve a visit to the client establishment by an employee of the producing establishment, and those that involve a visit to the producing establishment by an employee of the client establishment. We have labelled the former group "co-production" services (such as, those services whose production generally involves a high degree of interaction between the client and the producer), and the latter group "institutional" services (involving various types of financial and educational institutions, which appear to be relatively reluctant to employ on-site visits).

TABLE 5: Reasons for External Acquisition of Services, Montreal CMA (percentages)

Table 5 presents the principal reason cited by establishments for externally acquiring (rather than internally producing) four selected producer service inputs: professional computer services, legal advice, scientific and technical services, and management advice. Results for the five most frequently cited reasons are indicated. The "all sectors" portion of the table shows that the overwhelming consideration is the lack of sufficient in-house expertise to provide a high-quality service. This reason is most important for professional computer services (61.6 percent of respondents acquire this service externally) and least important in the case of management consulting services (50.5 percent). Two of the remaining four reasons are also frequently cited: an insufficient or irregular demand for the service (which is especially important in the case of

management advice) and the fact that it is less expensive to purchase the service externally than to attempt to produce it internally (relatively more important in the case of professional computer services). In a sense, these latter two reasons provide the rationale for why the service is not available in-house. In terms of the individual demand sectors, these same general patterns generally hold true, although certain minor exceptions may be observed.

Table 6 indicates the principal advantages to the acquiring establishment of the same four externally obtained producer services presented in Table 5. Looking at the aggregate responses for the "all sectors" group, it is clear that the most often cited advantage, associated with three of the four services in question, concerns improved internal management and control capacities. This same general tendency is repeated across the individual sectors of activity. Only in the case of scientific and technical services does the principal advantage differ, relating rather to innovations in the goods and services produced by the establishment (such as, product innovations). Note that in the goods producing sector, however, process innovation (such as, innovation in the manner in which an establishment produces its goods and services), is slightly more important than product innovation.

TABLE 6: Principals Related to Externally Acquired Services, Montreal CMA (percentages)

TABLE 7: External Service Used for Efficiency and Productivity, Montreal CMA (percentage)

Finally, Table 7 addresses the issue of which externally obtained services most aid the acquiring establishment to increase its levels of efficiency and productivity. Professional computing services emerges as the most frequently identified alternative across all sectors, although there is considerable variation in the strength of the response, which varies from 42.9 percent in the high order service establishments to 25 percent in the "other services" group. Advertising and sales promotion are also relatively important in the trade and "other services" (for example, personal and leisure services) sectors, as are human resource training in the high order services and public and parapublic sectors, legal advice in the high order services sector, and access to major loans in the goods producing sector. With the exception of legal services, the services mentioned here all fall into the "in person" category in Table 4.

Correlates of Producer Service Consumption Patterns

In the previous section, we presented a descriptive analysis of the consumption of producer services, establishing a general profile of the utilization of fifteen specific services by establishments across all sectors of the Montreal economy. While this information is both interesting and important in terms of building a better understanding

of producer service consumption (and of the internalization/externalization issue, in particular), it remains incomplete. A useful complementary analysis involves the identification of the structural and behavioral characteristics of client establishments that enable one to distinguish between their service consumption patterns. In particular, in this section we seek to identify the variables that may be associated with four specific elements of producer service consumption: 1) the utilization or non-utilization of specific services; 2) the frequency of utilization of specific services, 3) the degree of internalization or externalization of specific services; and 4) the method by which externally obtained services are acquired by the consuming establishment.

In the case of three of the above four elements (numbers 1, 2 and 4), our dependent variables are qualitative measures rather than continuous interval measures; this could lead to serious problems in inference if a linear multivariate regression model were to be employed. What is therefore needed is a statistical technique that can do the work of multivariate regression but that is not subject to its liabilities in the presence of a qualitative dependent variable (Aldrich and Nelson 1984). Practically, this type of problem may be handled by either logistic regression or discriminant analysis. We have chosen to employ the former in that it is the more appropriate in cases where one cannot assume that the independent variables are normally distributed (Press and Wilson, 1978).

Our analysis was performed using the stepwise "logistic" procedure of SAS, which employs a maximum likelihood estimation of parameters. Of the 222 variables in our data set, 17 were chosen as potentially significant correlates on the basis of our previous work on producer services and on the basis of the international service literature. These variables cover a range of structural and behavioral characteristics of the consuming establishments, including organizational status, number and types of employees, sector of activity, location, gross revenue, operating costs, and so forth. In the following sections, in order to facilitate the presentation of results, we have chosen simply to identify those variables that are most closely associated with the dependent variables rather than attempting to estimate statistical models.

Utilization/Non-Utilization of Specific Services

Part A of Table 8 presents the results of a logistic regression analysis that attempts to identify the correlates (but not necessarily the causal factors) of patterns of the utilization/non-utilization of fifteen producer services by client establishments. In other words, the dependent variable is a dichotomous one -- use or not use -- irrespective of whether the service is provided internally or acquired externally. This table tells us, for example, that the use of professional computing services tends to be higher among those establishments having lower percentages of management and professional personnel (WCOLLAR), and among those establishments that devote higher proportions of their total operating costs to paying salaries and benefits (SALARY). The indirect relationship between the proportion of white collar personnel and service use is initially surprising. In our view, however, this reflects the fact that many services of this nature are implicitly or informally provided by professional staff in the course of their normal tasks, without being formally recognized as professional computer services. Interestingly, the white

collar variable appears in the case of four other services, and is always inversely related to service use.

TABLE 8: Correlates of Producer Services Consumption (I), Montreal CMA

Organizational status is significant in the case of data processing and five other services. As a general rule, the use of these services tends to become more prevalent as the organizational structure becomes more complex. For example, as one moves away from an independent single-establishment enterprise towards a branch in a multi-establishment firm and towards a head office of a multi-establishment firm. Building type also emerges as a significant correlate in two cases. Here, service use tends to be directly related to single-use building types (office buildings in particular), declining in the case of multiple-use edifices. Geographic zone is also a correlate in the case of engineering services and major loans. The increased use of these services is generally associated with establishments located in the two suburban zones. The percentage of office (such as, secretarial and clerical) and sales personnel is significant in the case of advertising, engineering, and scientific/technical services. In the case of advertising the relation is direct, while it is indirect in the case of the latter two services; such as, the use of engineering and scientific/technical services is more prevalent when the percentage of grey collar workers is low. Part A of the table also indicates that the use of legal services and personal insurance are directly related to the percentage of employees holding a university degree, while the use of accounting services is inversely related to degree holders.

Frequency of Utilization

Using a similar framework, Part B of Table 8 identifies the correlates of the frequency of utilization of the fifteen specific producer services by the establishments in our sample. (Part A of Table 3 identifies the categories that the dependent variable can assume). We may observe, for example, that the frequency of utilization of professional computer services is related to both the organizational status of establishments and the type of building that an establishment occupies (most frequent utilization being associated with more complex organizational forms and office buildings). Each of these two correlates is also significant in the case of three other producer services (for example, management consulting, pension fund management). In terms of the remaining producer service activities, it is difficult to identify any major trends, although certain specific results are of considerable interest. For example, establishment size (level of full-time employment) is positively associated with the frequency of consumption of engineering, scientific/technical, and personnel placement services, while total operating cost is positively related to the frequency of consumption of legal, human resource training, and personal insurance services. And as in the case of the previous table, no significant correlates are associated with property insurance services.

Degree of Internalization/Externalization

TABLE 9: Correlates of Producer Services Consumption (II), Montreal CMA

Part A of Table 9 enables us to identify the correlates of the level of consumption of externally acquired producer services. Since the dependent variable (percentage of the volume of a given service that is acquired from external establishments rather than produced internally) is continuous rather than discrete, ordinary least squares regression has been employed to obtain the results presented. Only those variables with a level of significance greater than 95 percent are indicated. We observe, for example, that the degree of externalization of professional computer services by establishments is inversely related to both their number of full-time employees and the proportion of the latter that occupy "grey collar" (secretaries, clerks, sales personnel) positions. In the case of data processing services, externalization is inversely related to the proportion of both grey collar and white collar (management and professional personnel) workers; geographic zone is also significant (with externalization increasing among suburban establishments).

In the case of the remaining producer services, few broad trends emerge, although the degree of externalization generally tends to be inversely related to the level of full-time employment and to the proportion of employees holding a university degree, when the latter variables appear. In terms of specific results, the externalization of legal advice varies significantly across sectors (increasing among trade and public sector establishments); it decreases with the number of full-time employees, and with the percentages of the latter both exercising grey collar functions and holding university degrees. The proportion of externally acquired management consulting services consumed is inversely related to the number of years that an establishment has been located in the Montreal CMA, while older establishments tend to externalize a lower proportion of their insurance services. No significant correlates emerged in the case of four producer service activities.

Method of Acquisition

Finally, Part B of Table 9 reintroduces the logistic regression framework in order to examine the issue of the methods by which establishments obtain externally acquired producer services. Here, the dependent variable reflects a simple dichotomy: in-person (such as, involving a personal visit by the producer or the client to his/her counterpart) vs. impersonal (such as, involving the use of mail/courier services, telephone, fax or computer network) methods of acquisition. Significant results emerge in only nine of the fifteen producer service activities. Once again, it is difficult to discern any broad trends. The three most frequently appearing variables are sector, organizational status, and the number of years that the establishment has been located in the Montreal CMA. One may observe, for example, that the use of in-person methods of acquiring management consulting services is related to building type (most prevalent in office buildings), and inversely related to the percentage of employees holding a university degree. Similarly, in-person methods of acquiring data processing services are directly related to the number of years that an establishment has been located in the Montreal CMA and to the

percentage of grey collar employees, as well as to organizational status (in-person acquisition being most prevalent in independent establishments).

Conclusion

In this study, we have explored a number of issues concerning the internalization and externalization of producer service inputs by establishments across all sectors of economic activity within the Montreal CMA. In particular, our results enable us to empirically confirm certain (but by no means all) affirmations made in the literature relative to the make or buy decision by producer service consumers. First of all, it does appear that the most highly externalized services are those that are not firm-specific activities (for example, insurance, financing, legal advice), as suggested by the work of Stigler (1951) and Williamson (1980). Conversely, the more firm-specific functions (which, in addition, may possibly deal with confidential information) are among the most highly internalized services (for example, accounting, management expertise, professional computer services).

It is also clear that non-cost factors play a major role in the make or buy decision. This finding, which reinforces the recent empirical work of O'Farrell et al. (1993), Tordoir (1994), Wood et al. (1994), Perry (1990), and Beyers and Lindahl (1996) adds additional weight to the growing body of evidence indicating that pure cost considerations, while not entirely negligible (since out-sourcing permits the avoidance of certain risks and fixed costs), are not among the major factors influencing the externalization decision among consumers of producer services. In-house technical limitations and infrequent and/or irregular demand for a service appear to be much more important than cost as a motivation for externalization. In addition, quality is also an issue in that externally provided services provided by specialists are often of a higher quality than that which could be achieved in-house.

The analysis of correlates of producer service consumption patterns proved to be more indicative than definitive. Although statistically significant results were produced, the implications of these results are not always intuitively obvious; that is to say, while the appearance of certain of the identified correlates seems highly logical, the signification of others is more difficult to grasp. We note too that, in the manner of Sherlock Holmes' "curious incident of the dog in the night-time", the absence of certain variables is often of more import than the presence of others. For example, sector of activity was not a significant correlate in the case of utilization/non-utilization and frequency of use patterns (Table 8). This suggests that wide variations may exist within sectors in terms of the producer service inputs used and the manner in which the latter are employed in the production process. In spite of the lack of clear results in the present study, we feel that this multivariate, association-seeking approach should be more actively pursued. Future research on the internalization/ externalization issue needs to search for explanations rather than simply describing the observed patterns.

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Endnotes

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1. This very simple observation led certain authors (Gershuny and Miles 1983; McRae 1985) to question whether the rapid growth of the producer services sector has been more illusory than real, such as the result of a "displacement effect" by which internally produced services are simply transferred to external establishments. Recent empirical evidence concerning this issue is categorical, however; not only has producer service growth been found to be real, but output and employment growth have been achieved in internal and external producer services simultaneously. In spite of an increasing usage of external services by firms, the displacement of internally produced services is not a major factor in the growth of free-standing producer services. Illeris (1989) comes to this conclusion after reviewing a wide range of European research, as do Tschetter (1987), McCrackin (1985), Kutscher (1988) and Beyers (1989) in the context of the U.S. economy. Beyers (1989; 1990) argues that much more producer service growth resulted from changes in the types of services consumed and from technical change within service products and processes than from the simple displacement of functions.

2. The Montreal CBD is delimited by Guy St. on the West, Sherbrooke St. on the North, St. Lawrence boulevard on the East, and the St. Lawrence River on the South. Montreal and municipalities on Montreal Island are a unit of metropolitan government known as the Montreal Urban Community.

3. Due to space limitations, the results presented in Table 3 are aggregates of all economic sectors. Three additional tables, which disaggregate the results for Parts A, B and C by goods producing, trade, high order service, public and parapublic, and other services sectors, may be obtained from the authors. The discussion presented in this section indicates the major differences across these five sectoral groups.

4. This is an unweighted average, with each establishment having an equal weight, irrespective of its volume of producer service consumption.

5. Note that the facsimile machine (FAX), although listed as an alternative on the survey, did not emerge as a major method of acquiring producer services.

TABLE 1 Identification of Producer Service Activities

Business Services	Financial Services
Professional Computer Services	Major Loans
Data Processing Services	Pension Fund Management
Legal Advice	Brokerage and Financial Intermediary Services
Advertising and Sales Promotion	
Accounting and Bookkeeping	Property Insurance (buildings, property)
Engineering Services	Personal Insurance (life, health, personnel)
Scientific and Technical Studies/Advice	
Management Consulting	
Personnel Placement and Executive Search	
Human Resource Training	

TABLE 2 Sectoral and Spatial Distribution of Establishments Surveyed, Montreal CMA

Sector	CBD		Rest of Montreal		Inner Suburbs		Outer Suburbs		Total CMA	
	N	%	N	%	N	%	N	%	N	%
Primary, Manufacturing and Construction	2	5.7	15	18.5	21	26.3	13	19.7	51	19.5
Trade	2	5.7	14	17.3	22	27.5	14	21.2	52	19.8
High Order Services ¹	17	48.6	9	11.1	5	6.3	5	7.6	36	13.7
Public and Parapublic Services ²	4	11.4	34	42.0	26	32.5	27	40.9	91	34.7
Other Service ³	10	28.6	9	11.1	6	7.5	7	10.6	32	12.2
Total	35	100.0	81	100.0	80	100.0	66	100.0	262	100.0
Percentage of CMA Total	35	13.4	81	30.9	80	30.5	66	25.2	262	100.0

Note:

1. Includes business services and finance, insurance and real estate services.
2. Includes public administration, education and health and welfare services.
3. Includes personal, consumer, and leisure services, individual sectors of activity within the economy of the Montreal CMA and the location of establishments across the four geographic zones.

TABLE 3 Producer Service Consumption, All Sectors, Montreal CMA

Service Utilized	PART A: Amplitude & Frequency of Service Utilization			PART B: Internalization & Externalization of Services			PART C: Acquiring External Services	
	% using	freq. ¹	% freq.	Internal	External	External Indep. ²	Method ³	%
Professional Computer	91.8	D	48.7	54.7	45.3	88.3	from	74.4
Data Processing	65.5	D	53.3	60.6	39.4	85.8	comp	43.6
Legal Advice	95.7	W	24.6	8.7	91.3	95.2	tele	41.1
Adv. and Sales Promotion	76.9	M	24.5	39.5	60.5	91.9	from	47.5
Accounting	97.6	D	80.7	88.9	11.1	77.5	from	80.2
Engineering	53.3	A	46.3	35.1	64.9	94.0	from	78.5
Scientific and Technical	34.9	A	38.2	45.8	54.2	92.6	from	56.8
Management Consulting	54.9	A	45.0	52.5	47.5	92.4	from	83.5
Personnel Placement	71.8	A	42.4	72.1	27.9	97.1	tele	38.4
Human Resource Training	82.0	A	27.4	43.1	56.9	92.4	to	64.2
Major Loans	47.8	A	52.0	5.1	94.9	95.7	to	42.4
Pension Fund Management	43.9	M	36.4	21.1	78.9	79.5	mail	50.6
Brokerage & Intermediary	16.1	A	37.5	15.5	84.5	98.6	tele	47.2
Property Insurance	98.4	A	87.1	1.7	98.3	92.0	mail	42.2
Personal Insurance	88.2	A	46.4	4.1	95.9	94.4	mail	47.0

Note:

1. Modal frequency symbols: D=daily, W=weekly, M=monthly; B=6-10 times annually, A=1-5 times annually.

2. External Indep. refers to the percentage of externalized service inputs acquired from independent external establishments.

3. Methods of acquisition: from= employee of providing establishment visits client establishment; to= employee of client establishment visits providing establishment; mail= documents or information exchanged by mail or courier service; tele: information exchanged by telephone; fax= information exchanged by fax or telex; comp= information exchanged by computer communications networks (for example, e-mail).

TABLE 4 A Typology of Producer Service Delivery

In Person	Transportation/Communication
Co-Production: Visit From	Impersonal:
Professional Computing (74.4)	Mail or Courier
Advertising (47.5)	Pension Fund Management (50.6)
Engineering (78.5)	Property Insurance (42.2)
Scientific and Technical (56.8)	Personal Insurance (47.0)
Management (83.5)	Telephone
Institutional: Visit to	Legal Advice (41.1)
Human Resource Training (64.2)	Personnel Placement (38.4)
Major Loans (42.4)	Brokerage and Financial Intermediary (47.2)
	Computer Network
	Data Processing (43.6)

Note:1. Figures in parentheses is the percentage of establishments indicating that they used the method for the acquisition of a specific producer service.

**TABLE 5 Reasons for External Acquisition of Services, Montreal CMA
(percentages)**

	Professional Computer	Legal Advice	Scientific and Technology	Management Advice
Goods Producing				
Insufficient Internal Expertise	64.7	75.5	55.0	38.9
Infrequent/Irregular Demand	14.7	16.3	15.0	38.9
Cost	8.8	8.2	5.0	0.0
Greater Operating Flexibility	5.9	0.0	0.0	11.1
Innovations/Technologies	2.9	0.0	5.0	0.0
Number of Responses	34	49	20	18
Trade				
Insufficient Internal Expertise	67.6	62.2	50.0	50.0
Infrequent/Irregular Demand	10.8	20.0	22.2	33.3
Cost	13.5	8.9	16.7	7.1
Greater Operating Flexibility	5.4	2.2	0.0	0.0
Innovations/Technologies	2.7	2.2	0.0	0.0
Number of Responses	37	45	6	14
High Order Services				
Insufficient Internal Expertise	46.2	71.4	33.3	58.3
Infrequent/Irregular Demand	23.1	20.0	33.3	33.3
	15.4	5.7	0.0	0.0

Cost	3.8	0.0	33.3	0.0
Greater Operating Flexibility	0.0	0.0	0.0	0.0
Innovations/Technologies	26	35	6	12
Number of Responses				
Public & Parapublic				
Insufficient Internal Expertise	61.5	67.8	60.7	55.8
Infrequent/Irregular Demand	7.7	12.6	14.3	18.6
Cost	15.4	10.3	10.7	11.6
Greater Operating Flexibility	9.2	1.1	3.6	2.3
Innovations/Technologies	3.1	0.0	7.1	4.7
Number of Responses	65	87	28	43
Other Services				
Insufficient Internal Expertise	64.3	70.0	60.0	43.8
Infrequent/Irregular Demand	7.1	10.0	6.7	18.8
Cost	17.9	10.0	13.3	12.5
Greater Operating Flexibility	7.1	0.0	0.0	6.3
Innovations/Technologies	3.6	3.3	20.0	6.3
Number of Responses	28	30	15	16
All Sectors				
Insufficient Internal Expertise	61.6	69.1	56.0	50.5

Infrequent/Irregular Demand	11.6	15.9	16.0	26.2
Cost	14.2	8.9	9.3	7.8
Greater Operating Flexibility	6.8	0.8	4.0	3.9
Innovations/Technologies	2.6	0.8	8.0	2.9
Number of Responses	190	246	75	103

**TABLE 6 Principals Related to Externally Acquired Services, Montreal CMA
(percentages)**

	Professional Computer	Legal Advice	Scientific and Technology	Management Service
Goods Producing				
Product Innovations	5.9	2.4	15.0	5.9
Process Innovations	8.8	4.8	20.0	0.0
Increased Output	23.5	0.0	5.0	11.8
Increased Productivity	17.6	4.8	0.0	17.6
Improved Management & Control	35.3 34	69.0 49	5.0 20	58.8 18
Number of Responses				
Trade				
Product Innovations	5.4	2.8	33.3	15.4
Process Innovations	8.1	5.6	16.7	7.7
Increased Output	16.2	8.3	0.0	7.7
Increased Productivity	27.0	0.0	0.0	15.4
Improved Management & Control	37.8 37	61.1 45	33.3 6	38.5 14
Number of Responses				
High Order Services				
Product Innovations	4.0	3.1	33.3	8.3
Process Innovations	12.0	3.1	0.0	8.3
Increased Output	20.0	6.3	0.0	16.7
Increased Productivity	12.0	3.1	16.7	16.7

Improved Management & Control	32.0	65.6	0.0	41.7
	26	35	6	12
Number of Responses				
Public & Parapublic				
Product Innovations	4.7	3.5	28.6	12.2
Process Innovations	12.5	2.4	17.9	14.6
Increased Output	9.4	1.2	3.6	4.9
Increased Productivity	26.6	3.5	0.0	9.8
Improved Management & Control	29.7	87.1	14.3	56.1
	65	87	28	43
Number of Responses				
Other Services				
Product Innovations	7.4	3.8	30.8	26.7
Process Innovations	7.4	0.0	23.1	6.7
Increased Output	22.2	11.5	0.0	13.3
Increased Productivity	25.9	0.0	0.0	13.3
Improved Management & Control	25.9	57.7	23.1	33.3
	28	30	15	16
Number of Responses				
All Sectors				
Product Innovations	5.3	3.2	26.0	13.3
Process Innovations	10.2	3.2	17.8	9.2
Increased Output	16.6	4.1	2.7	9.2
Increased Productivity	23.0	2.7	1.4	13.3

Improved Management & Control	32.1	72.9	13.7	49.0
Number of Responses	190	246	75	103

TABLE 7 External Service Used for Efficiency and Productivity, Montreal CMA (percentage)

Service Utilized	Goods Producing	Trade	High Order Services	Public and Parapublic	Other Services	All Sectors
Professional Computer	32.0	36.2	42.9	31.9	25.0	33.3
Data Processing	0.0	6.4	2.9	11.0	6.3	6.3
Legal advice	6.0	4.3	14.3	6.6	12.5	7.8
Adv. and Sales Promotion	8.0	19.1	8.6	4.4	15.6	9.8
Accounting	6.0	4.3	0.0	2.2	0.0	2.7
Engineering	6.0	0.0	2.9	9.9	3.1	5.5
Scientific and Technical	10.0	2.1	5.7	2.2	9.4	5.1
Management Consulting	10.0	2.1	2.9	12.1	12.5	8.6
Personnel Placement	0.0	6.4	0.0	2.2	0.0	2.0
Human Resource Training	8.0	8.5	14.3	16.5	9.4	12.2
Major Loans	14.0	8.5	2.9	1.1	6.3	5.9
Pension Fund Management	0.0	0.0	0.0	0.0	0.0	0.0
Brokerage and Intermediary	0.0	0.0	2.9	0.0	0.0	0.4
Property Insurance	0.0	0.0	0.0	0.0	0.0	0.0
Personal Insurance	0.0	2.1	0.0	0.0	0.0	0.4
Total	100.0	100.0	100.0	100.0	100.0	100.0
No. of Responses	50	47	35	91	32	255

TABLE 8 Correlates of Producer Services Consumption (I), Montreal CMA¹

Service	PART A: Utilization /Non Utilization Correlates ²	PART B: Frequency of Utilization Correlates ²
Professional Computer	WCOLLAR [*] ; SALARY	ORGSTAT; BLDGTYPE
Data Processing	ORGSTAT	GCOLLAR; YEARMTL
Legal Advice	UNIVER; WCOLLAR [*]	OPERCOST; BLDGTYPE; ORGSTAT; ZONE
Adv. and Sales Promotion	BLDGTYPE; FEMALE [*] ; GCOLLAR	SALARY [*] ; ZONE; GCOLLAR; MALE
Accounting and Bookkeeping	UNIVER [*]	ORGSTAT
Engineering	ORGSTAT; FT-EMP; GCOLLAR [*] ; ZONE	FT-EMP; SALARY [*]
Scientific and Technical Advice	OPERCOST; ORGSTATUS; BLDGTYPE; GCOLLAR [*]	FT-EMP
Management Consulting	ORGSTAT	BLDGTYPE
Personnel and Executive Search	ORGSTAT; WCOLLAR [*]	FT-EMP
Human Resource Training	ORGSTAT; FT-EMP	OPERCOST
Major Loans	YEARMTL; ZONE	FLOOR
Pension Fund Management	YEARMTL; WCOLLAR [*]	ORGSTAT
Brokerage and Financial Intermediary	YEARMTL	BLDGTYPE
Property Insurance	--	--
Personal Insurance	WCOLLAR(-); UNIVER	SALARY; OPERCOST

Note:

1. Logistic Regression; all variables significant at 95% level.
2. * indicates an inverse relationship between variable and service use (Part A) and frequency of use (Part B).
3. Variables: BLDGTYPE= building type, FEMALE= % of female employees, FLOOR= total floor space, FT-EMP= no. of full-time employees, GCOLLAR= % of office and sales employees, MALE= % of male employees, OPERCOST= total operating cost, ORGSTAT= organizational status, SALARY= % operating cost devoted to salaries, benefits, etc., UNIVER= % employees with university degree, WCOLLAR= % management/professional employees, YEARMTL= years located in Montreal CMA, ZONE= geographic zone.

TABLE 9 Correlates of Producer Services Consumption (II), Montreal CMA

Service	PART A: % of Externally Acquired Producer Services Consumed Correlates ² (Linear Regression)	PART B: Utilization of In-Person vs. Impersonal Acquisition Methods Correlates 1 (Logistic Regression)
Professional Computer	FT-EMP* ; GCOLLAR*	SECTOR
Data Processing	WCOLLAR* ; GCOLLAR* ; ZONE	GCOLLAR; ORGSTAT; YEARMTL
Legal Advice	SECTOR; FT-EMP* ; GCOLLAR* ; UNIVER*	--
Adv. and Sales Promotion	--	--
Accounting and Bookkeeping	MALE; WCOLLAR; UNIVER* ; ZONE	--
Engineering	FT-EMP* ; GCOLLAR; SALARY	--
Scientific and Technical Advice	SECTOR; FT-EMP* ; ZONE	--
Management Consulting	YEARMTL*	BLDGTYPE; UNIVER*
Personnel and Executive Search	--	ORGSTAT; SECTOR; GCOLLAR
Human Resource Training	SECTOR	--
Major Loans	SECTOR; UNIVER*	ORGSTAT
Pension Fund Management	--	YEARMTL* ; WCOLLAR
Brokerage and Financial Intermediary	--	YEARMTL*
Property Insurance	AGE*	SECTOR; UNIVER* ; FEMALE* ; ZONE
Personal Insurance	GCOLLAR* ; AGE*	FEMALE*

Note:

1. All variables significant at 95% level.

2. * indicates an inverse relationship variable and % of externally acquired services consumed (Part A) and use of in-person methods (Part B).

3. Variables: AGE= age of establishment, BLDGTYPE= building type, FEMALE= % of female employees, FT-EMP= no. of full-time employees, GCOLLAR= % of office and sales employees, MALE= % of male employees, ORGSTAT= organizational status, SALARY= % operating cost devoted to salaries, benefits, etc., SECTOR= sector of activity, UNIVER= % employees with university degree, WCOLLAR= % management/professional employees, YEARMTL= years located in Montreal CMA, ZONE= geographic zone.

