

# The Role of Service Activity in Regional Economic Growth

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*The role of services in an economy is reviewed, using a simple model, and empirical evidence of direct service exports is presented for Vancouver, British Columbia. Some suggestions as to how the further development of metropolitan service activities could be simulated are given.*

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We do not yet understand much about the service economy: what does it do? what is its relation to material production? what are its forms of institutional organization? what is its relation to international trade: how is its productivity to be measured? and what, for goodness sake, are all those people doing in those burgeoning metropolitan downtowns? (Alonso 1989: 225)

## INTRODUCTION

Many urban areas in North America were established as manufacturing centers in the nineteenth century and subsequently matured during the high point of mass production toward the middle of the present century. In this period the classic "industrial city" (e.g., Pittsburgh, Chicago, Detroit in the U.S.; Toronto, Montreal, Hamilton in Canada) were clearly in ascendance. This relationship between industrial expansion and urban growth had a naturally powerful influence on models of urban and regional development and, in turn, on development policy and practice.

Over the past quarter century, however, the economies of most North American cities have been fundamentally transformed by processes of structural change that have been characterized by a long term shift of capital and labour from standard production to high technology industry and, in particular, service activities. In a report summarizing a two-year study of the role of tertiary (or service) industries in metropolitan growth and development. Daniels (1990: 5) observed that:

It has always been assumed that the tertiary sector has an essentially

benign status in the evolution of metropolitan economies...[service industries] have been considered as only indirectly contributing to their economic and social well-being. This is now an out-dated and erroneous assessment. During the last decade the tertiary sector has undergone substantial restructuring. This has brought about a fundamental re-evaluation of its contribution to metropolitan development; the tertiary sector has become a catalyst rather than a parasite.

Accordingly, the role of services in regional economic development and in regional development policy is now in a period of reappraisal.

In an effort to contribute to this reappraisal, this article cursorily reviews the role of services in one of the leading models of regional growth and offers an analysis of the potential contributions of services to the metropolitan or regional growth process in terms of a simple model. Empirical evidence for one of the principal contributions, direct exports, is presented from the results of a survey of selected service firms in the metropolitan economy of Vancouver, British Columbia. The discussion is concluded with some suggestions as to how the public sector might promote the further development of metropolitan service activities.

## METROPOLITAN ECONOMIC GROWTH THEORY

At present there is no single, generally accepted theory of regional or metropolitan growth. In his survey of the state of regional growth theory, for example, Richardson (1973) includes export base

models, neoclassical models, cumulative causation models, econometric models and input-output models. Mills and MacDonald (1992) list as "five leading theories" export base theory, neoclassical growth theory, product cycle theory, cumulative causation theory and disequilibrium dynamic adjustment theory. In discussing metropolitan growth and the role of services we will briefly review the role of services in what is perhaps the oldest and most popular of the principal theories, export base.

Export base theory has long been held to be one of the cornerstones of urban and regional economics. In its simplest form, base theory divides the local economy into two sectors: the *basic* sector which is composed of all economic activity whose ultimate market lies outside the local economy and the *non-basic* sector which contains the remaining activities, i.e., those activities serving markets within the local economy. Exports are defined as all sales outside the local economy (the economy of the geographic area under study) and thus include more than sales to foreign nations.

Implicit in this two-fold division of economic activity is a cause and effect relationship. The basic sector is assumed to be the active sector, the non-basic, the passive or dependent sector. External demand for the region's exports is the primary economic engine of the local economy. Basic employment and income expand directly with increases in the demand for the region's exports. In turn, non-basic employment and income are assumed to vary directly with that of the basic sector. As the basic sector expands output to meet an increase in external demand, more money flows into the local economy through the payment of wages and salaries to local employees (and, perhaps, profits to locally owned enterprises). A portion of this expanded income is spent on products and services offered in the local retail market (non-basic sector), thus expanding income and employment in this sector as well. Because of the primary role export activity plays in the economy, it is considered as "basic."

Thousands of economic [export] base studies of varying degrees of sophistication have been completed for regions and localities. Frequently, the economic base study divides the activity in the region into basic and nonbasic activities simply by industry type. For instance, all manufacturing activity is considered basic and all services, retail trade, and local government activities are nonbasic.

Crude as this may appear, the technique has been used to provide economic base studies for hundreds of areas (Emerson and Lamphear 1975: 130).

Because exports are so intimately linked in the minds of many with goods production, the nonbasic sector in a number of export base studies is referred to as the "service" sector. From this perspective, stimulation of regional economic growth originates solely in the goods sector, which consists of primary (agriculture, mining, forestry and fishing) and secondary (manufacturing) activities. Services are then stimulated by the spending from the increased incomes earned in the goods sector.

This view of service activity as passive and as primarily responsive only to changes in the export of goods production has undergone substantial revision in the past decade. To a large degree this reconsideration of the role of service activity has been prompted by the continuing process of economic restructuring which has occurred throughout the developed world on the national and, in particular, the metropolitan levels.

Reexamination of the role of services in regional development has emphasized the heterogeneity of the service activity and has led to the current view that particular service activities make important direct and indirect contributions to export development. Empirical research on regional economies in recent years has strongly supported this view and, moreover, contributed significantly to its formulation.<sup>1</sup>

### SERVICES AS AN ENGINE OF METROPOLITAN ECONOMIC GROWTH

Because of the increasing attention directed to service activities, a number of taxonomies have been proposed by economists (see, e.g., Bailly et al., 1987; Coffey, 1991; Harrington, 1992). For our purposes, the taxonomy established by the Economic Council of Canada is sufficient in that it emphasizes both the diversity of the service sector and distinguishes those services that are the principal contributors to the economic growth process.

Table 1 divides service activities into three major groups, each of which has its own distinctive characteristics, employment pattern, and role in the economic growth process. The principal divisions are the dynamic services, the traditional services, and the nonmarket services.

**TABLE 1**  
**A Typology of Service Activities**

<i>Dynamic services</i>
Finance, Insurance and Real Estate
Business Services
Transport & Storage
Communication and Utilities
Wholesale trade
<i>Traditional services</i>
Retail Trade
Accommodation, Food and Beverage
Amusement and Recreation
Personal Services
<i>Nonmarket services</i>
Education
Health Services
Social Services
Public Administration

Source: Economic Council of Canada, 1991.

The dynamic services are composed of the producer services (finance, insurance and real estate; business services) and the distributive services (transport and storage; communications and utilities; wholesale trade). These services have been labeled "dynamic" by the Economic Council because they are generally the high value-added, high growth industries that are involved in globally competitive markets. They are increasingly exported and shape to a considerable degree the international competitiveness of goods production.

In the Council's view the traditional services are the more "garden variety" commercial services. Compared to the dynamic services, they tend to be lower value-added, less subject to technological change, and less rapidly expanding. While this observation applies to the services as a group, there are exceptions (e.g., the fast-food industry, electronic home shopping, and tourism services in some areas).

The nonmarket services are those service activities that are primarily generated outside the market place under the control and supervision of the public sector. While these services are not directly subject to the competitive pressures of the private sector, increasing attention is being directed to the influence of management practices, technological change and productivity growth in these activities.

In light of this typology of service activities, the potential contributions of service activities to the regional growth process may now be considered in terms of the following simple model:

$$Y = \frac{v}{1 - cs}$$

where Y = regional income  
v = the volume of dollar inflow to the region;  
c = the marginal propensity to consume locally; and  
s = the marginal propensity of local business to generate local income per dollar of sales.

Two basic determinants underlie the generation of income in a regional economy. The first is the amount of money flowing into the region, v. The second is the regional income multiplier,  $1/(1 - cs)$ , i.e. the average number of times each dollar inflow changes hands within the economy before it "leaks" from the local respending process in the form of savings, imports or taxes. Regional income Y varies directly with the volume of monetary inflow (i.e., with v) and with the regional income multiplier (i.e., with c and s).

### The External Demand for Services

Traditionally, public policy has turned to the stimulation of manufacturing and resource extraction as means of expanding exports and thus the inflow of dollars into the local economy. In terms of the equation above, such action is directed toward increasing regional income Y by increasing v. There is a growing body of empirical evidence, however, to support the proposition that services, particularly the dynamic services, are becoming increasingly exportable (Daniels, 1990). The decline in many advanced nations of the ability of manufacturing exports to finance import demand is causing these nations to consider expanding exports via their comparative advantages in services (Marquand, 1983; Riddle, 1986; Petit, 1986; Daniels, 1987). Changes in the composition of international trade has to a large degree paralleled the shift in importance of service activities within developed nations. Trade in services, although relatively small in comparison with merchandise trade, is growing in significance.<sup>2</sup> An estimate of Canadian international trade in producer services is shown in Table 2.

At the provincial level, Stabler and Howe (1988) used detailed provincial input-output data provided by Statistics Canada for the years 1974 and 1979 to analyze service exports for the four western provinces, Manitoba, Saskatchewan, Alberta and

**TABLE 2**  
**Exports of Canadian Producer Services and Dependent Employment, 1988**

	Export Share of Total Output	Export- Dependent Employment
	(Percent)	(In Thousands)
Transportation		
Air	5.0	3
Rail	31.9	24
Truck	21.2	24
Other Trans. & Storage	20.3	42
Communication	2.2	5
Electric Power	11.8	10
Other Utilities	0.9	1
Wholesale Trade	11.8	65
Finance, Ins. & Real Estate	1.1	7
Business Services	8.7	45
<b>TOTAL</b>		<b>228</b>

Source: McRae (1989) as cited in Economic Council of Canada (1990).

British Columbia. The authors found that for the four provinces combined, service exports, which were between 22 and 44 percent of total (direct plus indirect) exports in 1974, rose to a level between 38 and 53 percent in 1979. In terms of absolute gain, the increase in value added generated by service exports exceeded that resulting from goods exports in Manitoba and Saskatchewan and was approximately three-quarters of the increase in value added by goods for the other two provinces.

At the regional and urban level, services have been regarded for many years as constituting the passive economic sector oriented toward meeting local rather than external demand. As previously discussed, the common expression of this view is found in the frequently employed economic base model which has traditionally focussed on extractive and manufacturing activities as the principal generators of economic development. In contrast, service activities have been traditionally thought to constitute the principal portion of the passive sector in the model (frequently referred to as the "service" sector), expanding only in response to increases in the exports of tangible commodities.

In the last ten years, however, empirical evidence of the export of services, particularly the dynamic services from the metropolitan regions, has continued to accumulate (Beyers and Alvine, 1985; Keil and Mack, 1986; Gilmer et al., 1987; Coffey and Polese, 1987; Ley and Hutton, 1987; Austrian and Zlatoper, 1988; Michalak and

Fairbairn, 1988; Gilmer, 1990; Davis and Hutton, 1991; Harrington et al., 1992.) The evidence is now overwhelming that service activities are increasingly exported from urban economies, thus directly contributing to the monetary flows into these economies. While it is the dynamic services and the tourism-linked traditional services that are the primary service activity exports, the contribution to the volume of cash inflows by the services demanded by those on retirement income is likely to become an increasingly important factor as the average age of the Canadian population continues to rise (Bender, 1987; Hodge, 1991).

Recent empirical evidence of service exports from the metropolitan Vancouver economy is presented in a later section.

#### Services and the Regional Income Multiplier

In addition to their contribution to direct exports, service activities generate income in the local economy through the income multiplier, the total regional income generated per dollar inflow to the region. The magnitude of the multiplier is a function of the technical and consumption linkages in the economy.

Technical linkages are the input-output or sales-purchase relationships between producing sectors in the economy. For example, when there is a direct export from the economy of a particular good or service, the exporter purchases a number of inputs from the local economy in order to produce and deliver the product. The local suppliers of these inputs must in turn purchase inputs in order to make their supporting production, which leads to further rounds of purchases. Each successive round is smaller in magnitude than the immediately preceding round because of leakages from the local economy (imports, savings and taxes).

Among the service activities, it is the dynamic services that provide the greater portion of the technical linkages. A comparison of the first round linkages of the dynamic, traditional and nonmarket services in the metropolitan Vancouver economy can be seen from Table 3.

Over the two decades that have passed since the input-output study was completed, the direct linkages provided by the dy-

**TABLE 3**  
**Direct Purchases of Services Inputs by All Sectors of the Metropolitan Vancouver Economy, 1971**

	Intermediate Purchases	Percent
Primary Industries	11,368	1.2
Goods Industries	503,432	52.9
Dynamic Services (less wholesale trade and transport)	146,544	15.4
Traditional Services (less retail trade)	30,908	3.2
Nonmarket Services	50,958	5.4
Trade and Transport	209,128	22.0
<b>TOTAL</b>	<b>952,338</b>	<b>100.1</b>

Source: Davis (1976). Wholesale trade, retail trade, and transport are aggregated in the trade and transport sector.



dynamic services have undoubtedly increased.

The second set of linkages on which the magnitude of the regional income multiplier depends is the consumption linkages. Consumption linkages are the sales of goods and services to local consumers. While the dominant contribution among the services to the technical linkages are the dynamic services, it is the traditional services that are of relatively greater importance in forming the consumption linkages, as can be seen from Table 3.

The magnitude of the regional income multiplier is increased whenever the technical or consumption linkages are increased. An expansion of linkages may result from product innovation (new sets of technical and consumption linkages) or from import substitution (the replacement of linkages to external economies with linkages to the local economy). In either case, the regional income multiplier is expanded by an increase in the magnitude of  $c$ , the marginal propensity to consume locally, in the equation given earlier.

### Services and Productivity

Services constitute a large and critical portion of the inputs both to goods and service activities (*Statistics Canada, 1991*). Complexity in production processes continues to increase, i.e. the linkages between economic activities continue to expand (Cohen and Sysman, 1987). Services, particularly the dynamic services, are vital among these linkages. Increases in the productivity and quality of these services will in turn increase the productivity of the economic activities to which they serve as inputs. In the long run, the competitiveness of a region's production vis-a-vis other regions will depend in large part on the productivity of its expanding employment in the services.

In its study of sectoral interdependencies, the Economic Council of Canada (1991: 39) concludes that:

goods producers are highly dependent on services as large and important sources of intermediate inputs. Consequently, the quality (and cost) of those service inputs will have a critical impact on the competitiveness of the goods sector, and that competitiveness will ultimately determine whether the goods sector grows.

The argument applies as well to the dynamic services themselves. For example, the increases in productivity of these service activities shown in Table 3 are undoubtedly attributable in large part to the infusion of computer and telecommunications

technology into these services. Productivity in the legal, management consulting, accounting, engineering spheres — to name but a few — has been enhanced by the various applications of computer hardware and software. Advances in the quality (i.e., productivity) of these particular goods are the results of improved information services (the services of engineers, programmers, lawyers, accountants, consultants, etc.) that are inputs into the production process. The dynamic services are increasingly a key factor in the determination of economic growth across all sectors.

The growth of producer services in part of the process of capital deepening in society which has been the source of ever-increasing productivity and living standards in Canada. In particular, the accumulation of human capital in the form of education and of knowledge in the form of technical know-how has been accompanied by the growth of specialized firms and professionals. These agents sell their services to others who use them to increase the productivity of their factor inputs. Seen in the broad context of overall development..., the process of capital deepening is typically accompanied by increased specialization, of which service sector growth is an important manifestation (Gruebel and Walker 1989:258)

In terms of the equation above, increases in productivity originating in the service sector can increase regional income  $Y$  in two principal ways. If the beneficiary of the increased labour productivity is serving the local market, an increase in  $s$ , the propensity to generate a dollar of income per dollar of local sales, may result. If increased productivity occurs in a local firm serving the export market,  $Y$  may be expanded by the increase in  $v$ , the volume of cash inflow. The augmented inflow in this case is increased export revenue and perhaps, as well, an increased inflow of investment funds.

### REGIONAL SERVICE EXPORTS: EMPIRICAL EVIDENCE FROM VANCOUVER, B.C.

Metropolitan Vancouver with a current population of 1.8 million is Canada's third largest urban area (behind Toronto and Montreal) and is the largest metropolitan area in the province of British Columbia. The regional economy of Vancouver encompasses a diversity of activities but is distinguished from other regions of the

province by its complex of interdependent producer or 'corporate' services, e.g., engineering, computer services, management consultants, accounting, financial, and legal services (Davis and Hutton, 1989; Ley and Hutton, 1987). In contrast, the metropolitan economy of Victoria, the provincial capital, is based primarily on the public-sector activities of education, health and social services, and government administration. The regions in the remainder of the province are distinguished by a relative dependence on resource-based, primary industries (forestry, mining, agriculture and fishing).

Although there is evidence that economic ties between Vancouver and the rest of the province remain very strong (Davis 1993), there has undoubtedly been a substantial reorientation of the Vancouver economy from its traditional role as a service centre for the rest of the province to its position in the increasingly interdependent urban nodes of the emerging economy of the Pacific Rim. As its service sector has gained in prominence (see Table 4), Vancouver has experienced a steadily expanding share of total provincial employment. By January 1991, 55 percent of the jobs in the province were in the metropolitan Vancouver economy, up from 53 percent a year ago. This trend has been relatively steady since 1984, when Vancouver's share of provincial employment was 48%.

**TABLE 4**  
**Growth of Selected Vancouver**  
**Service Activities, 1981-1991**

	Employment 1991 (1000)	Percent Change 1981-1991
Bus. Serv.	72.5	65.5
Accom./Food	54.0	57.4
Health	78.4	50.2
Education	52.8	36.4
Trade	52.0	19.3
F.I.R.E.	55.7	16.8
TOTAL ECONOMY	812.9	26.4

Source: Adapted from Kunin and Knaut (1992: 16).

In 1990 an effort was made to determine the proportion of output exported from selected sectors of the Vancouver economy, as well as the destinations of the exports. A questionnaire survey by post was jointly undertaken by the City of

Vancouver Economic Development Office and the University of British Columbia School of Community and Regional Planning.<sup>3</sup> The survey was of several hundred firms, principally producer services and technology-intensive manufacturing. The results reported here focus on the 251 responses from the producer services.

A principal focus of the survey was engineering services, a sector of the economy which has not received the attention in studies of restructuring compared with other producer services such as finance, real estate and insurance, legal services, advertising, accounting, and management consulting. Like the other producer service activities, however, engineering services are experiencing economic globalization and are increasingly exported.

### Present Markets

An estimation was requested of the approximate percentages of current sales to clients located in metropolitan Vancouver, Victoria, the remainder of British Columbia, the rest of Canada, U.S., U.K./Western Europe, Asia-Pacific, and elsewhere. The responses of the firms surveyed, shown in Table 5, indicate the extent of the export orientation of the producer service firms in the Vancouver economy. The ratio of exports to total sales ranges from 24 percent for advertising services to 84 percent for computer services.

Engineering and advertising in Table 5 show less of a dependence on the local market and a great proportion of sales internationally. Table 5 also shows the greater importance of Asia as a market for the selected service exports relative to Europe, a result consistent with the ongoing reorientation of the Vancouver economy toward the Pacific Rim (Hutton and Davis 1990).

The results are particularly striking when compared with the geographic distribution of exports for service activities in the metropolitan Vancouver economy two decades ago. In the early 1970s, producer services were predominantly oriented toward the facilitation and administration of natural resource activity in the provincial economy. Exports of producer services were thus overwhelmingly to the rest of the province (Davis 1976). By 1990 a complex of interdependent corporate services was beginning to emerge that weakened, relatively if not absolutely, the traditional tie between the Vancouver economy and that of the remainder of the province. Stronger links with the U.S. and the Asia Pacific had

**TABLE 5**  
**Geographical Distribution of Sales by Vancouver Service Activity**

(Percent)

Service Activity	No. of Firms	Van. CMA	Vic. CMA	Rest of B.C.	Rest of Can.	U.S.	Eur.	Asia	Other
Engineering	148	42.5	5.4	22.4	10.1	10.5	0.8	4.3	4.0
Advertising	49	76.3	6.6	5.2	6.0	4.0	0.3	1.0	0.7
Mgmt. Consult.	35	54.1	2.5	11.8	21.3	5.6	0.8	3.6	0.2
Computer	8	16.3	1.9	25.9	16.9	19.0	5.0	15.0	0.0
<b>TOTAL</b>	<b>240</b>								

Source: Davis and Hutton (1991).

evolved and the direct exports of producer services to these regions have formed a critical part of these new ties.

The evolving links via producer services with the economies of the Pacific Rim are also evident from a comparison of the Vancouver service exports with those of Edmonton. For a sample of 173 producer service firms in the Edmonton metropolitan area, Michalak and Fairbairn (1988) found that slightly over a third of their production was exported from the region. Of total sales, 27.2 percent was to Alberta, 5.9 percent to Canada and only 3.2 percent was destined for markets outside Canada. Similar to the Vancouver study, the Edmonton survey was restricted to the commercially oriented producer services or business services. The significantly greater proportion of exports from the Vancouver service activities, in particular to foreign markets, is undoubtedly attributable to the City's status as a major Pacific port and its expanding role within the system of in-

creasingly interdependent Pacific Rim economies.

### Future markets

Firms surveyed were asked in which of the above regions they expected to register their greatest sales increase over the next five to ten years. Table 6 shows the number of firms that listed each geographical market as a market in which a significant increase in sales is foreseen. Several firms listed more than one region.

What is striking about these figures in the context of service-led urban economic growth is the strong export expectations of each of the four sectors. In the Engineering sector, more firms listed the U.S. than Vancouver as the major growth area. The latter was listed by only one more firm than was Asia. Perhaps reflecting the incipient talks regarding the North American Free Trade Area, six engineering firms indicated Mexico as the prime growth area for sales (included as "Other" in Table 6),

**TABLE 6**  
**Area of Expected Major Increase in Sales over the Next Five to Ten Years by Vancouver Service Activity**

(No. of firms)

Service Activity	No. of Firms	Van. CMA	Vic. CMA	Rest of B.C.	Rest of Can.	U.S.	Eur.	Asia	Other
Engineering	155	33	1	30	25	39	6	32	17
Advertising	50	23	4	12	8	16	0	4	0
Mgmt. Consult.	38	11	1	10	12	13	2	7	1
Computer	8	0	1	0	1	5	2	3	0
<b>TOTAL</b>	<b>251</b>	<b>67</b>	<b>7</b>	<b>52</b>	<b>46</b>	<b>73</b>	<b>10</b>	<b>46</b>	<b>18</b>

Source: Davis and Hutton (1991).

equal to the number which look to Europe. Overall, it is clear from the Table that for the selected producer services the growing importance of the Asian market, particularly in relation to the European market, is expected to continue.

## SERVICES AND PUBLIC POLICY

In view of the growing importance of service activities in the metropolitan economy, greater emphasis needs to be assigned these activities in the formulation of economic development policy. In this regard there are a number of ways in which the public sector might respond.

First, government may facilitate in various ways the export of services. It may do so directly by organizing trade missions abroad and by gathering and disseminating information regarding export opportunities and the steps necessary to exploit these opportunities. In the longer run, government may promote export development in a more indirect manner by working with local educational institutions, including the media.

Second, in its various efforts at promoting the urban area to attract new investment, local government might advertise the service activities, providing significant information on the development, operation and future prospects of these activities. The public sector might also support the targeted service activities by promoting trade shows, articles in trade magazines, and promotional films. Such efforts may facilitate not only financial investment in the sector, but as well the in-migration of skilled personnel.

Third, government might take action to promote the sharing of information and experience within the industry (Satterthwaite, 1992). Government might do this by assisting in the development of local trade and professional associations and the networking of such organizations with their counterparts elsewhere.

Fourth, government may support the development of programs that will impart skills to the work force that firms will increasingly demand as the process of globalization continues and international competition increases. In his assessment of producer services in the U.S., Beyers (1992: 16) concludes that regional development policy should:

support the education and training system needed to provide workers with the skills needed in the more technical, professional, and managerially oriented economy that appears to

be coming in this country. In addition, support for research that continues the evolution and development of information processing and telecommunications technologies, as well as support for the creative application of these technologies in industries in various communities, would appear to be high priorities. This would include assistance in marketing for small "niche" firms, allowing them to engage in the market extension process needed to take advantage of new possibilities for economies of scale in the provision of services.

The current status of regional economic development policy in the province of British Columbia is similar to that of many other regions: policy still largely favours the enhancement of resource-based primary activities and the development of secondary manufacturing. There is, however, a continuously increasing body of theoretical argument and empirical evidence in support of the contribution of service activity to regional development (Swan, 1985; McRae, 1985; Browne, 1986). Service activities are seen to play critical roles in creating local economic linkages that increase the magnitude of the local income and employment multipliers, while simultaneously adding to the diversity and stability of the local economy; in contributing to the productivity, and hence the competitiveness, of primary and secondary activities; and, in an increasing number of instances, in generating revenue through direct exports. Comprehensive and effective regional policy can no longer be formulated without an explicit accounting of the active contributions to regional development rendered by service activities.

## NOTES

<sup>1</sup>Like export base theory, neoclassical agglomeration theory has traditionally focused on goods production activity and has been the basis for the development of industrial complex analysis of industries such as steel and petrochemicals (Isard 1975). Also like export base theory, it has not been until recently that agglomeration theory has been reexamined with a view to reassessing the role of service activities, which has largely been overlooked see, e.g., Henderson 1988; Mills and MacDonald 1992). Service activity has also traditionally played a secondary role in other regional growth theories such as product cycle theory and cumulative causation theory.

<sup>2</sup>World trade in services is now estimated to have reached \$770 billion (U.S.) annually (Economist, 1991: 62).

<sup>3</sup>Since data are not generated with regard to regional exports, a quicker and less expensive method of estimating such exports compared with the survey approach is the calculation of location quotients. For example, in their consideration of services as em-

ployment generators, Polse and Stafford (1982) used location quotients to estimate the principal service exports of Canadian metropolitan areas in 1971. In constructing the elements of a location model with specific reference to producer services, Coffey and Polse (1987) also constructed location quotients as indicators of export activity. The same technique was adopted by Keil and Mack (1986) to identify export potential for service activities in urban economies in the U.S. Midwest. However, the shortcomings of the location quotient approach, in particular its tendency to overestimate export activity, are well known (see, e.g., Davis, 1990).

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