

AN ANALYSIS OF THE SERVICE SECTOR IN BARBADOS

by

**Blair Clarkson
and
Roland Craigwell
Central Bank of Barbados
P.O. Box 1016
Bridgetown
Barbados**

July 1997

An Analysis of the Service Sector in Barbados

Introduction

The study of the service sector in the Barbadian economy is critical to an understanding of the economic health and development of the country. It is the largest and most diversified sector, and its productive success and failure affects the entire economy more directly than any other. This study provides a definition of what the service sector is, which industries it encompasses, and how it contributes to national levels of output and employment. It then analyzes data from past and present statistical publications to illustrate certain trends in output for each industry group within the sector in both real and nominal terms. After assessing the importance of the services to the economy, the study looks at the methods used by these statistical institutions to estimate the real and nominal GDP figures, what problems they face in measuring output, and some possible solutions to these difficulties, including a discussion of the off-shore sector.

1. Defining Services

Defining the service sector of an economy can be a very daunting task because the term encompasses a very heterogeneous set of industries. Different economies and different economists have created their own definitions of what is included in service sectors. Some state that an industry is a service if it does not produce a tangible commodity. Another definition

claims that the user or the user's goods must be altered in some way by the provider of the service. As Mohr (1992) points out, this definition includes the aspects of being worked on, as in a haircut or a doctors visit, or by being moved, as in transportation. In most statistical journals, services are classified as those which produce non-tangible, non-commodity goods. In other words "everything except agriculture, mining, construction, and manufacturing" (Griliches (1992)). However, this definition leads to certain obvious discrepancies, as Griliches takes notice of, such as the fact that electricity is a service and is also tangible. Other problems arise because the various service industries, such as, transportation, communication, tourism, public utilities, wholesale and retail trade, repair, personal services, health services, legal services, and government activity, are vastly different in nature and function. As Riddle (1986) discusses, the key to defining services is to discover what it is that the various industries have in common. This can be achieved, she says, by identifying the nature of the output, the unique inputs used, and the purpose served by the process. Accounting for these factors, her proposed definition, and the one I will use in this paper, claims that services are economic activities that provide time, place, and form utility, by which she means intermediate rather than ultimate utility, while bringing about a change in or for the recipient of the service. These services are produced by:

- (1) the producer acting for the recipient,
- (2) the recipient providing part of the labor,
- (3) the recipient and the producer creating the service in interaction.

2. Trends in Services

An understanding of the service sectors in Caribbean economies is important because the

majority of the countries are economically dependent on the production of these sectors. Barbados is no exception. In the Barbadian economy, for purposes of measurement, the service sector industries are separated into seven broad categories: (1) electricity and water, (2) wholesale and retail trade, (3) tourism, (4) transport, storage and communication, (5) finance, insurance, real estate, and business services, (6) general services, and (7) government services. When we examine various statistics concerning these industries we find certain trends which point to continued growth in each sector and in the services in general. This growth, for example, in GDP and employment, functions to increase the islands reliance on its service sector for its economic well-being. When we look at the contribution of service sector output to GDP, we see a steady increase not only in specific industries, but in the entire sector as a whole. Because the real and nominal estimates indicate similar trends, the following figures are all in nominal terms. Please refer to the attached tables (Tables 1-4) for a comparison of real and nominal figures. In Barbados in 1977, service sectors contributed over \$631 million to GDP, which is approximately 71% of the total. In 1981, that level had risen to \$1.2 billion, or 72.5% of total GDP. Five years later, in 1986, the contribution to GDP was \$1.77 billion, almost 77%. In another five years, in 1991, service sector output was over 80% of Barbadian GDP, \$2.32 billion. Then in 1995, that level had risen to \$2.59 billion, which was 82% of the total economic output. To say that Barbados is a service dependant economy would be quite an understatement. In fact, the growth rate in the service sector exceeded that of the economy as a whole.

If we look at individual service sector industries, we see that each sub-sector is following a similar trend of growth. In 1977, wholesale and retail trade, the largest contributor to service output, accounted for about \$182 million, almost 30% of service output. Throughout the period

to 1995, it remained the sector's greatest contributor with production levels of \$368 million in 1981, \$486 million in 1986, \$575 million in 1991, and \$543 million in 1995. One of the more rapidly growing sectors is that of government services, which, in 1977, supplied \$142 million to GDP, approximately 20% of service output. By 1981, the government had increased to \$230 million, and ten years later, in 1991, had increased further to \$530 million, which was then around 22% of total service output. By 1995, the government contributed 21% of service GDP, with \$539 million. Another group of large industries on the rise includes financial, insurance, real estate, and business services. These services, which compromised 16% of total output in 1977, grew four percentage points by 1995. The 1977 estimate of \$110 million rose to \$210 million in 1981, \$310 million in 1986, then to \$435 million in 1991, and then to \$505 million in 1995. Although day to day services, such as electricity and water, do not compromise a large proportion of total service GDP (2.5% in 1977, and 4.2% in 1995), they are however two of the fastest growing industries. Total output by these two industries rose from \$14 million in 1977 to \$68 million in 1984 and then to \$109 million in 1995. Tourism, which has contributed between 15% and 18% of service sector GDP from 1977 to 1995 has had substantial increases in output from its 1977 level of \$88 million to its 1995 level of \$466 million.

In assessing the importance of the service sectors in the Barbadian economy, another important trend to focus on is the employment levels of the services related to each other and to the rest of the economy. In 1981, the service sector employed 70% of the total work force, about 70,400 persons. The government and related services accounted for the majority of this percentage, with 37,100 employees, and distributive trade and tourism accounted for another 23,400 workers. Ten years later, services employed 75% of the total work force with 80,800

workers. In 1995, service sector employment reached 84,000 persons, 76% of the total level. Government services rose to a 42,100 person work force, and the distributive trades and tourism to almost 29,000. Table (5) provides employment data for the industries.

As is evident from the preceding figures and trends, the Barbadian service sector is by far the most important in the economy.

3. Estimating Service Output

Now that we have an understanding of what the Barbadian service sector is, which industries it comprises, and what trends it followed in the past, the next step is to analyze how various establishments go about measuring service sector output. In other words, where the numbers are coming from. We must look both at nominal and real estimates for annual GDP calculations and calculations by quarters.

3.1 Estimating Nominal Service Output

The figures for annual nominal GDP are collected and constructed by the Barbados Statistical Service. The office collects data for a two year period before publishing results of sectoral outputs. For the private sector, surveys are conducted on specific industries within each sector to gain necessary information on various financial data, income, expenses, inventories, etc. An example of such a survey, which was sent to firms in the manufacturing sector, has been included (see figure 1). The figures obtained from these sample industries over the period are then used as a basis for the entire industry group by appropriate scaling. The industries used in the sample are usually the largest in their respective fields, thus their financial figures would be the

least likely to report fluctuations, and would provide a good data set to represent their economic activity group. For information on the output of the government sector, the Accountant General's office supplies the data to the Statistical Service. It should be noted that all the nominal estimation is done on an annual basis. Measurement of nominal service output on a quarterly basis has so far not been undertaken.

3.2 Estimating Real Service Output

The estimation of real service output, which is conducted by the Central Bank of Barbados, utilizes a much different process. The method used studies each industry in the service sector separately by considering all the available indicators of economic activity. Often different methodologies are utilized on a particular industry to ensure the most accurate estimates as possible, since inaccurate data can lead to erroneous policy decisions. Let us now look at the estimation of real GDP in the service sectors.

It is important to note here that published information on the real service sector output is available from 1974 on an annual basis. Quarterly series are also provided by the Central Bank from 1986 onward. Recently, this has been backdated to 1974 by Lewis (1997). The annual estimating process matched the quarterly process between 1986-1996, but prior to this, the quarterly data provided by Lewis (1997) deviates from the annual data because of the unavailability of several of the indicators. This study focuses on the official estimates but from time to time may refer to Lewis' work.

The contribution of tourism to GDP is calculated by combining the economic activities of

both cruise and long-stay visitors. Output for cruise tourism is equal to the number of cruise tourists multiplied by the average monthly expenditure per tourist. For long-stay visitors, the contribution is estimated as the average monthly expenditure per long-stay visitor multiplied by the number of long-stay arrivals multiplied by the length of stay. By summing these monthly totals, the quarterly and annual GDP figures are obtained.

$$TourGDP = (\# \text{ of cruise tourists} * \text{ave.mon}\$) + (\# \text{ of long stay arrivals} * \text{ave.mon}\$ * \text{length of stay})$$

The information for the numbers of cruise and long-stay visitors, as well as their lengths of stay, are provided by the statistical service.

For the calculation of real GDP in the electricity, gas, and water industries, the technique used applies the percentage change in the electricity and gas component of the Index of Industrial Production to the previous year's estimate. For example, the estimate for the first quarter of 1997 (Q1(1997)) would be generated by multiplying the figures from the first quarter of 1996 (Q1(1996)) by the percentage change in the electricity index (x), as is seen in the equation:

$$Q1(1997) = Q1(1996) * (1+x)$$

After obtaining the quarterly estimates, the annual figures can be calculated. The source of the industrial production data is the Barbados Statistical Service.

The method utilized to measure the real GDP estimates for the Wholesale and Retail sector depends on estimates from a regression equation that consists of three variables: tourism, construction, and lagged wholesale and retail activity.

$$W+R = f(\text{tourism, construction, } W+R \text{ lagged})$$

The sum of these three factors yields consistent data for quarterly estimates, which can be used to estimate annual figures.

A method based on employment is used in the estimation of real GDP for the Transport, Storage, and Communication sector in the absence of adequate quarterly data. The regression equation states that transport, storage and communication for 1997 (TSC(1997)) would equal transport, storage and communication for 1996 (TSC(1996)) multiplied by a percentage change in employment (x) in the sector:

$$TSC(1997) = TSC(1996) * (1+x)$$

The contribution to real GDP by business and other services (financial, legal, health) is estimated employing a regression equation which contains several variables:

$$GDP_{bus} = f(\text{wholesale and retail, the traded sector, business and other services lagged})$$

The quarterly estimates provided by this equation are transformed into annual figures by simple summation of results

For the government sector, the technique used is similar to the transport, storage and communication sector, that is, it is based on the number of persons employed by the government. The use of the employment figures for GDP measurement reflects the difficulty in quantifying the value of governmental services.

4. Problems in the Estimation Process

This section examines the problems the various statistical institutions have had in collecting and estimating the service sector contributions to output.

4.1 Nominal GDP

The Statistical Service faces many problems in the collection of data for nominal GDP estimation. One problem is that some industries have their numbers calculated on a calendar year basis, while others use their financial year figures. Additionally, many of the latter group have financial years that end at different times. Since the nominal estimates can not be made until all the industries have submitted their figures, the publishing of the data is often delayed. Further delays result from the fact that the industries are often not returning the surveys on a timely basis, and the Service is even troubled by establishments which do not reply at all. Yet another obstacle in the survey collection comes from the fact that many of the industries have reported that they do not have staff available to dedicate time to completing the surveys. To remedy this problem the Service has tried to get the surveys out to the industries earlier, but this has been difficult because the distribution process is accomplished through field work, and they are unfortunately endowed with rather limited resources with which to deliver and collect the surveys.

4.2 Real GDP

There are several problems with the real GDP estimates of service output. The equation used in the estimation of real GDP in the tourist industries overestimates expenditures prior to 1980 because of a lack of available data concerning earlier tourist expenses. This means that

comparisons over this period require some caution.

The equation employed to estimate output in the electricity, gas and water industries relies on changes in the Industrial Production Index, and it does not allow for changes in personal consumption due to the tastes and demands of the using population.

Those industries, such as government and business services, which use employment regression to create real GDP estimates would be better off using actual service production figures. However, in some cases (e.g. government), data collection would be difficult because the nature of output and activity is so varied. Quantifying the value of such social services as roads, law and order, national defense, and schools is quite difficult.

5. Possible Solutions to Estimation Problems

This section explores some possible alternatives to the methodologies currently being used by statistical offices.

5.1 Nominal GDP

The problems faced by the Statistical Service stem from the inability of the various industries to complete and return the simple estimation surveys on time, or at all. They claim that they don't have personnel with the time to devote to the surveys, although after reading over the sample, it is obvious that anyone in the accounts department of the industry should not have any difficulty in filling it out. The Service has already attempted to solve the problem by getting the surveys to the firms earlier, before their financial years end. However, this has been met with limited success. The surveys are straightforward and direct and do not require any simplification.

Thus, the Service's continuing efforts to get the surveys to the industries as early as possible, giving them adequate time to return them, remain its primary solution.

5.2 Real GDP

The problem faced by the Central Bank, in its efforts to accumulate data for the construction of real GDP figures, is one of accuracy. Several sectors, such as tourism, wholesale, and business, are subject to estimating equations which include several factors connected to the sectoral inputs or outputs. For the time period prior to 1986, when such equations are not viable, output is measured using percentage changes in employment to gauge changes in production. However, although the results often agree with published data, the estimates made using these techniques can sacrifice accuracy. However, several of the industries could use alternative indicators of output and income.

For example, the electricity and gas and water companies could supply the total electricity and gas consumption figures which are collected by the Barbados Light and Power Company. In the transportation, communication, and storage sector, there are multiple indicators that could be utilized for improved estimation, such as gas and diesel revenue, BARTEL and BET revenue, Post Office revenue, and the cost of stamps. The estimation of output in the business services sector could also be improved through the use of other indicators than employment. These indicators include profits and wages of commercial banks, insurance revenue, legal fees, hospital revenue, property tax revenue, and advertising.

The problems faced by the Central Bank and the Statistical Service in their efforts to provide estimates of real and nominal GDP result in data which often can suffer from inaccuracy. The consequence of this, no matter how small the discrepancies, can lead to a misrepresentation of national output and income. Thus, any and every effort should be made to report findings as accurately as possible. Although requiring additional expenditures of both time and money, when weighed against the importance of accurate national production estimates, the collection and use of alternative indicators appear to be necessary procedures.

6. Including the Offshore into GDP

What we have looked at are the service sector industries which are accounted for in national GDP reports. These reports fail to include the contribution to output and income provided by the various sub-sectors of the off-shore services, including, off-shore banking, corporate registries, informatics, and data processing. The contribution to GDP made by the off-shore sector is generally excluded from national estimates due to the lack of official data on the sector's production. However, this omission from GDP estimates should be corrected because these sub-sectors represent significant growth areas in the economies of Caribbean countries. In Barbados, which is among the world leaders in off-shore financial and business services, the number of International Business Corporations (IBC's) and insurance companies has more than doubled in the last five years. In 1988, the sector accounted for 439 IBC's, 153 exempt insurance companies, and 5 offshore banks. By 1996, those figures had risen to 2,126 IBC's, 193 EIC's, and 40 banks (Central Bank 1996 Annual Report). Additionally, the informatics and data processing sub-sectors are continuing to grow and diversify. These activities, as well as software

development, provide services such as keyboarding of codes, consultancy, and professional services. These sectors, however, face several problems. One, which has implications for employment in the sector, is that as the sector develops, there will be a shift in demand from a high level of low skilled, low wage earners to higher skilled, higher paid professionals. However, the combination of business knowledge, computer programming, and consultancy required with professional services may be difficult to obtain in sufficient numbers in Barbados (Lewis (1997)). Other concerns in the industry are the rate of technological change, which moves so quickly that present advances can become obsolete after short periods of time, as well as the high cost of electronic transfer. However, the employment possibilities are great in the expanding industries, and the levels of foreign exchange earnings are expected to continue rising. To understand the importance of GDP contribution made by the off-shore sectors, let us look at the figures from Table (6), which give us the breakdown of output per sector. In 1995, unofficial estimates measured the contribution of the Barbadian off-shore sector to be \$122 million (BDS), which is greater than the output of the electricity, gas, and water companies (1996 Annual Report). If factored into current estimates, the off-shore sector would account for approximately 4.5% of total service sector output and would increase the level of output to \$2.7 billion (BDS). Total service GDP would account for 83% of total economic output which is raised to \$3.3 billion with the inclusion of the offshore sectors. As is evident, the inclusion of off-shore GDP in national estimates is important for the purposes of accuracy and a more complete understanding of the economic health of the country.

Conclusion

A complete understanding of the operation of the service sector in an economy like that of Barbados, which is primarily dependent on its services, is essential to a proper analysis of the economy as a whole. This study has given a basic definition of what the service sector is - the set of economic activities which provide time, place, and form utility while bringing about a change in or for the recipient of the service - and has identified the various industries included in the service sector. The study then took information from statistical journals to show recent trends in the service sectors, and their contribution to national output and employment. Once it had assessed the importance of the sector to the economy, the study examined the estimation processes undertaken by the Statistical Service and the Central Bank for annual and quarterly reports in real and nominal terms. The study highlights several problems faced by these institutions in measuring contributions to GDP, and suggests some possible remedies. The concern with accurate data is essential to national estimates and this study has identified several areas of improvement, such as the inclusion of offshore figures and the switch from behavioral equations to more performance oriented ones, that should be included in future work on the sector. Changes in these estimating methods will facilitate a more accurate understanding of the economic position and trends of the country.

References

- Charles, Sylvia. The Services Sector in the Caribbean Economies. Institute of Social and Economic Research, University of the West Indies. Barbados; 1994.
- Griliches, Zvi. Output Measurement in the Service Sectors. The University of Chicago Press. Chicago; 1992.
- Lewis, Denny. "A Quarterly Real GDP Series for Barbados, 1974-1995: A Sectoral Approach." Central Bank of Barbados. 1997.
- Lewis, Denny. "Report on Meeting of Persons Involved in the Informatics/Data Processing Subsector." Central Bank of Barbados. 1997.
- Riddle, Dorothy I. Service-Led Growth. Praeger Publishers; New York, 1986.
- 1996 Annual Statistical Digest - Central Bank of Barbados.
- 1996 Annual Report - Central Bank of Barbados.

The Contribution of Service Sector Industries To GDP

Table (1) **Nominal Estimates (BDSS MILLIONS)**

Sector	1977	1981	1986	1991	1995
Wholesale and Retail Trade	\$182	\$368	\$486	\$575	\$543
Gov't Services	\$142	\$230	\$379	\$530	\$539
Finance, Insurance, Real Estate, and Business Services	\$110	\$210	\$310	\$435	\$505
General Services	\$35	\$69	\$94	\$110	\$132
Electricity and Water	\$14	\$39	\$72	\$100	\$109
Tourism	\$88	\$206	\$233	\$315	\$466
Transport, Storage, and Communication	\$60	\$113	\$197	\$254	\$291
Total (% of total GDP)	\$631 (71%)	\$1,200 (73%)	\$1,770 (77%)	\$2,320 (80%)	\$2,589 (82%)

Source: 1996 Central Bank of Barbados Annual Statistical Digest

Table (2) **Real Estimates (BDSS MILLIONS)**

Sector	1977	1981	1986	1991	1995
Wholesale and Retail Trade	\$125	\$158	\$163	\$161	\$165
Gov't Services	\$97	\$104	\$112	\$118	\$113
Business (Finance, Insurance, Real Estate) + General Services	\$121	\$130	\$145	\$148	\$147
Electricity and Water	\$12.3	\$16.5	\$23	\$27	\$30
Tourism	\$77	\$104	\$97	\$116	\$130
Transportation, Storage, and Communication	\$46	\$52	\$61	\$68	\$70
Total (% of total real GDP)	\$478 (70%)	\$565 (72%)	\$601 (73%)	\$638 (76%)	\$655 (76%)

Source: 1996 Central Bank of Barbados Annual Statistical Digest

Specific Industries Share of Total Service Sector Output

Table (3) **Nominal Estimates**

Sector	1977	1981	1986	1991	1995
Wholesale and Retail Trade	30%	29%	27%	26%	21%
Gov't Services	21%	20%	21%	22%	21%
Finance, Insurance, Real Estate, and Business Services	16%	17%	18%	18%	20%
General Services	5.5%	5.6%	5.2%	4.4%	5%
Electricity and Water	2.5%	3%	4%	4%	4.2%
Tourism	16%	15%	14%	15%	18%
Transportation, Storage, and Communication	9%	10%	11%	11%	11.2%
Total	100%	100%	100%	100%	100%

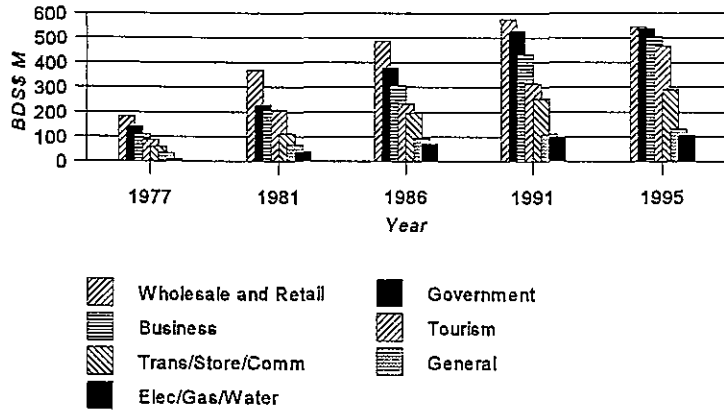
Source: Charles, Sylvia. *The Services Sector In The Caribbean Economies* (1994), and ASD.

Table (4) **Real Estimates**

Sector	1977	1981	1986	1991	1995
Wholesale and Retail Trade	26%	28%	27%	25%	25%
Gov't Services	20%	18%	19%	18%	17%
Business (Finance, Insurance, Real Estate) + General Services	25%	23%	24%	23%	22.4%
Electricity and Water	2.5%	3%	4%	4.2%	4.5%
Tourism	16%	18%	16%	18%	20%
Transportation, Storage, and Communication	10%	9%	10%	11%	11%
Total	100%	100%	100%	100%	100%

Source: Charles, Sylvia. *The Services Sector In The Caribbean Economies* (1994), and ASD

Nominal GDP Estimates



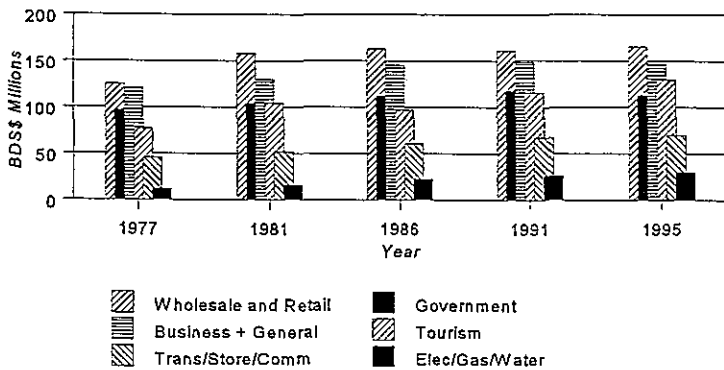
Employed Labor Force by Service Industry Group

Table (5)

Sector	1981	1986	1991	1995
Distributive Trade + Tourism	23,400	20,700	26,100	28,500
Finance + Business Services	3,900	3,500	4,200	7,600
Elec/Gas/Water	1,200	2,100	1,700	1,000
Government + Other Services	37,100	36,000	43,700	42,100
Trans/Store/Comm	4,800	5,400	5,100	5,100
Total Service Employment	70,400	67,700	80,800	84,000
Total Employment	100,200	96,200	107,100	109,900
Service as % of Total	70%	70%	75%	76%

Source: 1996 Central Bank of Barbados Statistical Digest

Real GDP Estimates



The Contribution of Service Sector Industries To GDP - Offshore Included - 1995

Nominal Estimates (BDSS MILLIONS)

Table (6)

Sector	Contribution	Percent of Total
Wholesale and Retail Trade	\$543	20%
Gov't Services	\$539	20%
Finance, Insurance, Real Estate, and Business Services	\$505	19%
General Services	\$132	5%
Electricity and Water	\$109	4%
Tourism	\$466	17%
Transport, Storage, and Communication	\$291	11%
Offshore	\$122	4.5%
Total (% of total GDP)	\$2,711 (83%)	100%

Source: 1996 Central Bank of Barbados Annual Statistical Digest

