STATISTICAL BULLETIN

Continuous Household Labour Force Survey

July to September 2004

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1   Introduction

The *Continuous Labour Force Sample Survey* (CLFSS) is conducted on a quarterly basis by the Statistical Service Department, under the provisions of the Statistics Act CAP 192 of the laws of Barbados. The Survey seeks to obtain, current socio-economic data from persons in randomly selected households across Barbados. This data is used to generate estimates of the island's adult population, 15 years and over, who may be in the Labour Force (i.e. employed and unemployed) or classified as Inactive (i.e. not in the Labour Force).

1.1 Brief Background

The CLFSS started in October 1975, with technical assistance provided through the United Nations Development Programme (UNDP). This facilitated the establishment of a survey programme for the collection, compilation, analysis and publication of labour force statistics, on a quarterly basis. It continued each quarter, with short breaks in 1980, 1990 and 2000, during the conduct of the population censuses.

Over this period the Survey has passed through four (4) phases. *Phase 1* started from the fourth quarter 1975, with a sample of households that represented 1% of the total resident, non-institutional population. This sample was selected out of 26 areas, called Enumeration Districts (EDs). *Phase 2* commenced in 1980, with an increase in the sample size to cover 2% of the total resident, non-institutional population. The number of EDs chosen in the sample was correspondingly increased to 45. From *Phase 3,* which started after the 1990 Population and Housing Census, the sample design was modified to include stratification of the eleven (11) parishes. The island was divided into four (4) strata, mainly along geographical lines. Areas within each stratum were thought to have similar socio-economic peculiarities.

The current phase, *Phase 4,* started after the 2000 Population and Housing Census and continued using the same sample design, with a sample of approximately 2% of the total private households in the island.

1.2 Survey Objectives

The basic objectives of the Survey are to measure the labour force and its characteristics on a quarterly basis, as well as to provide a framework on which topics, such as household income and expenditure, poverty and housing conditions, among others, may be measured on a periodic basis.

1.3 Survey Scope and Coverage

Geographical Area Covered
The Survey covers the whole country of Barbados. No attempt was made to produce sub-national estimates since the sample was not designed to produce estimates below the national level.

Population Covered
The survey covers the adult population, defined as persons aged 15 years old and over, living in private households.

Excluded from the Survey are visitors to the island and persons who are resident in institutions (such as senior citizens homes, children homes, psychiatric and correctional establishments). However, persons who are temporarily absent from the household (e.g. due to short-term hospitalization; or work, such as fishermen at sea) are still treated as part of that household.

<u>Topics Covered</u>
The following items or topics are covered in the Survey:

1. Household characteristics:- e.g. house occupancy/tenancy, land tenure, household size, house type - requested of the head of household only;

2. Individual details, such as:-
    - Relationship to head of household
    - Date of birth
    - Nationality
    - Marital Status
    - Education
    - Training
    - Status in employment
    - Occupation
    - Industry
    - Major activity last week (for unemployed and inactive population)
    - Type of work (employee, self-employed etc.)
    - Hours of work
    - Main sources of livelihood (for unemployed and inactive population)
    - Wages/earnings (for employed population)
    - Time-related under-employment.

<u>Periodicity</u>
A moving week is used to determine employment. Consequently, estimates of wages/earnings and hours worked relate to the week preceding the date of interview. On the other hand, estimates of industrial attachment, occupation, education, marital status and training, relate to the date of the interview.

For the unemployed (i.e. those persons who did not have a job in the week preceding the interview but who had been engaged in job-seeking activities for up to three months prior to that date), industry and occupation estimates relate to their last job. Other variables such as education, training and marital status refer to the date of interview.

2.   Concepts and Definitions

Some basic concepts and definitions used in this Survey are stated below.

Reference Period.   This is taken as one (1) week preceding the date of enumeration.

Dwelling Unit.   This is defined as the living quarters of a single household. However, grouped dwellings (or institutions) such as jails, hospitals, nursing homes, etc., are not

covered in the Survey. An exception is where separate, self contained quarters exist within such institutions for residential staff and their families, etc.; these units are included.

Household (Private).   This comprises all occupants of a dwelling unit, including related persons, lodgers and servants, who share food from a common kitchen.

Labour Force.   This is defined as all persons, age 15 years and over, who live in the island and were engaged in (or willing and able to be engaged in) the production of economic goods and services.

Employed Labour Force.   According to the 1982 international definition of employment (ILO, 1983) the Employed Labour Force is comprised of all persons above the age specified for measuring the economically active population, who during a brief period, performed a minimum of *one (1) hour's work* for pay or profit.

Included are persons: (a) who were temporarily absent from a job or business, for such reasons as illness, vacation, strike, study, training or maternity leave; and (b) who worked in family businesses (for a minimum of one hour during the reference period) with no direct payment from the owners, but for family gain or profit.

Thus, Employed persons can be:
(a) government or private employees, who receive monthly or weekly wages/salaries;
(b) employers or self employed persons who realize profit;
(c) unpaid family workers or apprentices.

Under-Employment (time related/visible).   This concept refers to those persons whose actual hours worked were less than the normal (40) hours per week during the reference period. Additionally, such persons were seeking and were available for more work.

Unemployed Labour Force.   The International standard of unemployment (also adopted by Barbados) is based on three (3) criteria to be satisfied simultaneously:-

a)   Without work - i.e. not in any paid employment or self employment;
b)   Currently available for work - for paid employment or self employment during the reference period;
c)   Seeking work - i.e. have taken specific steps to seek paid employment or self employment.

Thus in Barbados, to be classified as unemployed an individual must not have worked at all during the reference period, but must have taken some steps during the preceding 3-months period to find a job. Examples of such steps are writing applications, asking friends or relatives or people in authority, going from one company to the other, or preparing to start own business. Persons on lay-offs or waiting to begin a new job are also classified as unemployed.

Inactive Persons.   These include persons who may be at school, retired, incapacitated, keeping house, and do not want work, although they can work. The persons should have been fully in that status throughout the survey period.

Hours of Work.   Two approaches to this topic are taken. The first refers to the normal hours of work – i.e. the usual hours of work of the business entity.

The second refers to the actual hours worked by the respondent during the reference period. It includes overtime hours and hours worked in additional jobs, where applicable, but excludes vacation leave, sick leave, public holidays and other forms of paid or unpaid leave. Where the respondent is self-employed, the actual number of hours spent working is required.

Employment-Related Income.   In the case of paid employees income refers to gross earnings, including wages, salaries and other compensation in cash and kind. For self-employed persons, the income recorded refers to the labour input of the self-employed plus a return on invested capital. The gross income before the deduction of taxes and social security contributions should be reported. The income covers the reference week.

Standard Error (or Sampling Error).   This denotes the extent to which an estimate derived from a sample might be expected to differ from a corresponding measure obtained from a complete census.

Relative Standard Error   This refers to the sampling error expressed as a percentage of the estimate. It is also referred to as the *Coefficient of Variation* (CV).

3.   Brief Description of the Sample Design

The survey has employed a multi-stage design from its inception, with a set of enumeration districts (EDs) being selected at the first stage with probability proportionate to population size, as revealed by the population census. At the second stage, a set of households is selected with inverse probability from each of the selected EDs. This yields a sample which is self-weighting.

Following the census of 1990 some geographical stratification was introduced. The 11 parishes of the island were grouped into 4 strata. Each stratum was relatively homogeneous in terms of social and economic development. Using the 2000 census data, a total sample of 45 EDs was selected from all strata with probability proportionate to population.

Enhancements to Sample Design
A review of the Survey was undertaken during 2003, under the Caribbean Labour Market Information System project (CLMIS), sponsored by the International Labour Office. (ILO). Some recommendations made for its enhancement, were implemented from the beginning of the year 2004. The system of sample rotation used was modified and the sampling frame of EDs was revised.

Sample Rotation
Previously, a new sample of households was selected each quarter (i.e. 100% sample rotation). From January 2004, half of the households in each quarter's sample were being retained in the following quarter's sample (i.e. 50% sample rotation). The same sample of overlapping households will also be revisited in the same quarters of the year immediately following. This revised system of sample rotation is designed to impart some greater reliability to a comparison of the statistics generated from quarter to quarter and from year to year. That is, to reduce the variation between the quarterly estimates.

<u>Amendment to the Area Sample Frame</u>
To facilitate the 50% sample rotation, EDs with small population sizes were amalgamated with adjacent ones to form larger area units, in order to achieve a sampling interval of at least four. This guaranteed that households, having been interviewed in 2 consecutive quarters/rounds and in 2 consecutive years, would not re-enter the survey in under 2 years. The resulting units formed the modified sampling frame, from which a new sample of 45 EDs (the Primary Sampling Units) was selected.

4. Estimation (Main Aggregates and Standard Errors)

The Statistical Services' mandate was to produce aggregate levels of the key labour force variables rather than changes in these variables from round to round. In this regard, ratio estimation techniques were used.

To estimate a total, X", the following formula was employed:

$$X'' = \frac{x'}{y'} \cdot Y$$

where   x' and y' are the sample totals and Y is an independent estimate of the adult population.

The Y values are derived quarterly using standard demographic estimation techniques. Each quarter a different Y value is put into the program that generates the labour force statistics. The program distributes this value according to a fixed set of age/sex/stratum weights, calculated from the 2000 population census, and gives each record the appropriate weight.

Variance estimation of the derived ratio estimates of key labour force aggregates from the multi-stage design is complicated and time-consuming, since there are two components of the variance to be calculated. The first is the within-cluster variance, which measures the variability among sample households within each cluster; and the second is the between-cluster variance, which measures the variability between cluster means.

In this regard, the CENVAR software produced by the United States Bureau of the Census, was used for calculating the standard errors and the coefficients of variation of key variables.

5. Data Collection Procedures

The data from households were collected through personal interview. The Statistical Service has a very experienced group of field officers who have been conducting interviews in the current labour force survey for several years. At present, this field staff numbered 17, comprised of three Senior Field Investigators (Supervisors) and 14 Field Investigators (Interviewers).

A work schedule is usually drawn up for each quarter, spreading the samples from the 45 EDs as evenly as possible over the 3-month period.

Quality Control of Field Work
Each supervisor is responsible for the work of 4/5 interviewers. They take their group to their assigned EDs and ensure that each officer is familiar with the boundaries. They oversee that the work is done as evenly as possible throughout the period and carry out spot checks on each enumerator in the field.

Supervisors are required to follow-up difficult and non-responding households or individuals.

Manual Edits
The manual edits, carried out by the supervisors and the office staff, include the following:
- checking the record identification number on the individual questionnaire against the household schedule;
- checking that there are no missing data on the individual questionnaires;
- inserting the codes in boxes for those questions which require such action.

Computer Edits
The computer edit program carries out a number of edits on the data files. These include range checks, consistency checks and the insertion of the code for the unemployed based on the set of rules established for determining the activity status of an individual.

Data Review and Quality Evaluation
Before the release of the labour force information, it is checked for reasonableness by comparing it with other economic indicators, such as production and price indices, GDP growth information, selected employment data from other sources as well as the number of claims for unemployment benefits.

6.   Table of Standard Errors for Main Aggregates

Given its random design and the effective achievement of the target sample size, the sample results for major variables and attributes have probabilities of 95 in 100 that the sample estimate will not differ from a similar measure obtained from a complete census by more than about twice the standard error. This allows a lower and upper limit to be calculated for each estimate. These limits are referred to as a *95% Confidence Interval* for the given sample estimate.

The tables in this bulletin present estimates that are rounded to the nearest thousand persons. These estimates are all liable to sampling error. Their absolute sampling error increases with their magnitude, while the relative error decreases the greater the size of the estimate. Generally, the smaller the *Relative Standard Error* (or *Coefficient of Variation*) the more reliable is the estimate. Because of this, comparisons of the larger estimates may be used with confidence but small estimates must be regarded with caution. In particular, small differences from one period to another may be due solely to sampling error. This is an unavoidable limitation of data obtained by the sampling technique, and consequently, restricts the detailed cross-classification that can be presented.

Standard Errors for the key estimates of the Continuous Labour Force Sample Survey were calculated using software developed by the United States' Bureau of the Census, viz. *CENVAR.* This is a software package for the calculation of reliability (precision) measures for

sample designs ranging from simple random samples of elements to more complex stratified, multistage cluster designs.

The algorithms (formulae) used by the *CENVAR* programme are obtained from the *ultimate cluster* estimate. An *ultimate cluster* consists of the entire sample from the primary sampling unit (PSU), whether obtained by one, two, or more stages of sampling. The *ultimate cluster variance estimate* is based on the deviations among the PSU totals.

Standard Errors and *Coefficients of Variation* (C.V.) of the estimations for key variables of the Survey, for the 2nd quarter 2004, are shown in the Table below.

Table of Standard Errors for Main Aggregates

Table of Standard Errors for Main Aggregates (Cont'd)

Note. **C.V.** = *Coefficient of Variation*. The smaller this figure is the more precise or reliable is the estimate.

7. Simple Analysis describing Main Features of the Data presented.

All of the tables, as well as the standard errors calculated, presented in this bulletin were introduced as a result of the recommendations made for the enhancement of the Labour Force Survey, under the Caribbean Labour Market Information System project (CLMIS). These tables will be produced each quarter.

The analysis presented below compares the absolute values of the estimates for the key aggregates, in the current quarter, with those of the same quarter last year, as was done in the past.

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A comparison of the Labour Force figures for July to September 2004 with the corresponding period in 2003, revealed the results as stated below. However, it should be recognised that the results for the two periods are based on different samples of Enumeration Districts (the Primary Sampling Units) and consequently will have sampling errors in the estimates.

The Unemployment Rate for the 3rd quarter of 2004 stood at 9.9%. This figure represented a decrease of 0.8 percentage points from the rate of 10.7 % recorded during the 3rd quarter of 2003.

The rate for males was 9.5%, 0.6 percentage point more than the figure of 8.9% recorded during the 3rd quarter of 2003. The rate for females decreased, the figure being 10.4%, 2.2 percentage points less than the figure of 12.6% recorded at the same period in 2003.

The actual number of Unemployed persons totaled 14.7 thousand, 0.8 thousand persons less than the figure of 15.5 thousand recorded during the corresponding period of 2003.

The total number of Employed persons was estimated at 133.6 thousand, some 4.3 thousand persons more than at the same time last year, when the figure of 129.3 thousand persons was recorded.

On the other hand, the total number of Inactive persons fell by 3.3 thousand from 65.2 thousand persons in 2003, to the present total of 61.9 thousand persons. This was due mainly to reductions in the following categories of persons: *Kept House, At School* and *Retired.*

As a result of the changes mentioned, the total Labour Force is now estimated to be 148.3 thousand persons, 3.5 thousand more than the 2003 figure of 144.8 thousand persons.

The Labour Force participation rate for July to September 2004 was estimated at 70.5%, 1.5 percentage point more than the figure of 69.0% recorded for the same period in 2003.

A comparison of the figures for the 3rd quarter of 2004 with those of the 2nd quarter of 2004 (reference Table 8.14), should take into consideration the effect of the overlap of 50% of the households in each quarter's sample. For example:
- the difference between the Unemployment Rate estimated from the set of households in the overlap and the Unemployment Rate estimated from the set of new households in the current quarter's sample, was 1.1%;
- the difference in the Labour Force participation rates, estimated from the same set of households in the overlap and the set of new households in the current quarter's sample, was 1.1%.
- Both the Unemployment Rate and the Labour Force participation rate estimated from the overlapping households, were higher than the corresponding Rates obtained from the estimates based on the full sample for the 3rd quarter 2004.

The Unemployment Rate for the 3rd quarter of 2004 was 0.3 percentage points more than the figure of 9.6% recorded for the 2nd quarter of 2004; while the Labour Force participation rate was 0.1 percentage points less than the figure of 70.6% stated for the 2nd quarter of 2004.

8. Tabulations (presented quarterly):