ESTIMATING QUARTERLY REAL OUTPUT FOR CARICOM COUNTRIES USING THE LISMAN-SANDEE TEMPORAL DISAGGREGATION METHOD

By

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ABSTRACT

The unavailability of short term economic data for CARICOM countries have often made it difficult to determine exogenous shocks and forecast their impact. Consequently, this paper develops quarterly real Gross Domestic Product (GDP) estimates using the temporal disaggregration method of Lisman and Sandee (1964). The plausibility of these quarterly estimates is checked by considering two simple regression models related to money supply and real income. The results indicate that these models give parameters estimates that are in line with economic theory.

1. Introduction

Caribbean countries often find themselves in very precarious economic situations, influenced by their limited size, vulnerability to natural disasters and heavy dependence on the developed economies like the United States and Europe for trade and finance. As Craigwell and Maurin (2007) have argued, one way to control some of the effects from these constraints is for Governments in the region to determine and anticipate the business cycles of these economies, which comprise alternating periods of economic upturns and declines, and which is primarily measured by gross domestic product (GDP) fluctuations. As a result, economic surveys of the region should concentrate on providing information to follow closely short-term economic fluctuations. Unfortunately, and disturbingly, particularly since, a *prior*i reasoning would suggest, that economic fluctuations are likely to be more substantial and persistent in developing countries than in industrialized economies, most of the countries in the Caribbean seemed to have overlooked these short-term concerns as their economic surveys often focus on typical problems pertaining to long-term tendencies and repercussions of national output. This is exemplified by the fact most of the information in these economic surveys utilised annual national accounts, which is totally inadequate to identify business cycles and to anticipate their impact.

Given the above, Caribbean territories must follow the lead of the developed countries and the more advanced developing economies and create statistical methodologies to enable them to provide indicators to build quarterly national accounts aimed at estimating and forecasting economic fluctuations in the short-term. Some islands such as Barbados and Trinidad and Tobago have already started this process of creating quarterly data, but the others are still in the preliminary phase of putting together the necessary resources. Bringing all the countries on a level playground cannot be overemphasised, especially with the advent of the Caribbean Single Market and Economy where the link between the islands is envisaged to get much closer with coordinated macroeconomic policies.

In light of the budgetary constraints faced by Caribbean governments in this globalised world, it is very unlikely that they will be able to generate quarterly national accounts from first principles such as surveys in the near future. A least costly and practical alternative approach that has been

used extensively worldwide (see Eurostat (1999) for a survey) is to develop quarterly data from the already existing annual data using various statistical methods. It is this procedure that is adopted in this paper to develop quarterly output data for 14 Caribbean countries over the period 1971 to 2004. The method employed in this paper is based on the work of Lisman and Sandee (1964). More approaches will be undertaken in due course.

After the introduction the paper reviews the methodologies usually used to develop quarterly high frequency data from annual low frequency data. Then, a discussion of the Caribbean literature that utilised the above approaches is presented. In the third section, the Lisman and Sandee (1964) method is applied to real output data from 14 Caribbean countries. In the next section, simple models are estimated with the quarterly estimates to evaluate their plausibility in explaining economic phenomena. Finally, conclusions are made.

2. A Short Review of Temporal Disaggregation Methods

Temporal disaggregation methods are mathematical and statistical procedures that allow low frequency (annual) data to be decomposed into high frequency (quarterly) data. Eurostat (1999, pp.148) distinguished between three types of temporal disaggregation methods: (i) methods that do not involve the utilisation of related indicators; (ii) methods that make use of related series and (iii) extrapolation methods. Given this paper multi-country approach and the need to keep it focussed, only the first set of methods are analysed here; the readers are referred to the Eurostat article mentioned above, Di Fonzo (2003a,b) and Proietti (2004) for a review of the other two approaches. These latter procedures will be undertaken in another paper planned by this author.

Quarterly estimates are obtained from the methods that do not involve the use of indicators by either providing a sufficiently smoothing quarterly path coherent with the temporal aggregate constraints or by using time series models. They are particularly suited to cases where there are serious gaps in the data and only annual series are available.

2.1 Smoothing Methods

These methods typically assume that the unknown quarterly trend can be written as a function of time, either given a priori or to be chosen within a larger class, such that the necessary condition of satisfying aggregate constraints and the desirable condition of smoothness are both met. In this category there are several methods: "Dividing by 4"(see Eurostat (1999)), Lisman and Sandee (1964), Boot, Feibes and Lisman (1967) and Jacob (1994). These are discussed briefly for the case of a flow variable distribution to coincide with the distribution of real gross domestic output (GDP).

2.1.1 Method of "Dividing by 4" and Linear Interpolation

In the case of a flow, the disaggregation matrix should be written as: $H = \frac{1}{4}.C$, where C is an $(n \times 4n)$ aggregated matrix defined as

$$\mathbf{C} = \begin{pmatrix} 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & . & . & . & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & . & . & . & 0 & 0 & 0 & 0 \\ . & . & . & . & . & . & . & . & . & & & . & .. & . & . \\ . & . & . & . & . & . & . & . & & . & & . & . & . & . \\ . & . & . & . & . & . & . & . & & & . & . & . & . & . \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & . & . & . & 1 & 1 & 1 & 1 \end{pmatrix}$$

However, with this approach, after disaggregation, 4(T-1) observations remain, and the disaggregation matrix is expressed as follows: $H = A + \frac{1}{4}.$ BD where $A = [C'_{T-1} \quad O_{4(T-1)}]$ with $O_{4(T-1)}$ being a $4(T-1)\times 1$ null vector,

$$B = \begin{bmatrix} \overline{B} & 0 & \cdots & 0 \\ 0 & & & \\ \vdots & & \ddots & \vdots \\ & & & 0 \\ 0 & & \cdots\ 0 & \overline{B} \end{bmatrix}$$ is a $4(T-1)\times 4(T-1)$ matrix with

$$\overline{B} = \begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 2 & 0 \\ 0 & 0 & 0 & 3 \end{bmatrix} \text{ and } D = \begin{bmatrix} \hat{D} & 0 & \cdots & 0 \\ 0 & & & \\ \vdots & & \ddots & \vdots \\ & & & 0 \\ 0 & & \cdots\ 0 & \hat{D} \end{bmatrix} \text{ is a } 4(T-1)\times T \text{ matrix with}$$

$$\hat{D} = \begin{bmatrix} -1 & 1 \\ -1 & 1 \\ -1 & 1 \\ -1 & 1 \end{bmatrix}.$$

2.1.2 The Lisman and Sandee Procedure

In the case of the "Dividing by 4" method there is a discontinuity in the disaggregated times series at the beginning of every year. To avoid this problem, Lisman and Sandee (1964) used a weighted mean of the quarterly values of the years α-1, α, α+1. This procedure includes two steps. Firstly, four quarterly values from the known annual value A_α is built. Hence,

$$\Psi_{1\alpha} = \Psi_{2\alpha} = \Psi_{3\alpha} = \Psi_{4\alpha} = \frac{1}{4} A_\alpha = \Psi_\alpha$$

Secondly, a system of weighted means from values $\Psi_{i,\alpha-1}$, $\Psi_{i,\alpha}$ and $\Psi_{i,\alpha+1}$ is derived in order to estimate the quarterly time series $X_{i,\alpha}$ in quarter i of current year α . This system is expressed as:

$$X_{1,\alpha} = 0.291.\Psi_{\alpha-1} + 0.793.\Psi_\alpha - 0.084.\Psi_{\alpha+1}$$

$$X_{2,\alpha} = -0.041.\Psi_{\alpha-1} + 1.207.\Psi_\alpha - 0.166.\Psi_{\alpha+1}$$

$$X_{3,\alpha} = -0.166.\Psi_{\alpha-1} + 1.207.\Psi_\alpha - 0.041.\Psi_{\alpha+1}$$

$$X_{4,\alpha} = -0.084.\Psi_{\alpha-1} + 0.793.\Psi_\alpha - 0.291.\Psi_{\alpha+1}$$

The inconvenient of this method is that values for years α and α+1 must be forecast.

2.1.3 Method of Boot, Feibes and Lisman (1967)

Boot, Feibes and Lisman resolved the inconvenience in the previous procedure by treating the problem of estimating quarterly series consistent with a given annual series as a solution of a constrained minimization problem. They used several objective functions but the two versions currently in use are the first difference and the second difference. In mathematical terms, the method can be expressed as:

$$\min_{(X_1,\ldots,X_{4\alpha})} \sum_{j=2}^{4y} \left[X_j - X_{j-1}\right]^2$$

subject to the constraint that: $\sum_{j=4y-3}^{4y} X_j = A_y$ $y \in \{1,\ldots,\alpha\}$ where X is the quarterly time series to be estimated. The Boot, Feibes and Lisman first difference estimates are the solution in X of the following linear system

$$\begin{bmatrix} B & C' \\ C & O \end{bmatrix} \cdot \begin{bmatrix} X \\ \lambda \end{bmatrix} = \begin{bmatrix} O \\ A_\alpha \end{bmatrix}$$

where λ is a nx1 vector of Lagrange multipliers, C is as defined above, $B = 2M' \times M$

$$= \begin{bmatrix} 2 & -2 & 0 & 0 & 0 & \cdots & 0 & 0 & 0 \\ -2 & 4 & -2 & 0 & 0 & \cdots & 0 & 0 & 0 \\ 0 & -2 & 4 & -2 & 0 & \cdots & 0 & 0 & 0 \\ \cdots & \cdots & \cdots & \cdots & \cdots & \cdots & \cdots & \cdots & \cdots \\ 0 & 0 & 0 & 0 & 0 & \cdots & -2 & 4 & -2 \\ 0 & 0 & 0 & 0 & 0 & \cdots & 0 & -2 & 2 \end{bmatrix}$$

and $M = \begin{bmatrix} -1 & 1 & 0 & \cdots & \cdots & 0 & 0 \\ 0 & -1 & 1 & \cdots & \cdots & 0 & 0 \\ \cdots & \cdots & \cdots & \cdots & \cdots & \cdots & \cdots \\ 0 & 0 & 0 & \cdots & \cdots & -1 & 1 \end{bmatrix}$ is $(4\alpha\text{-}1) \times 4\alpha$ matrix which transforms the X into their differences.

2.1.4 The Procedure of Jacobs (1994)

This method elaborates on Boot, Feibes and Lisman (1967) by providing an explicit expression for the matrix that converts annual totals into quarterly data. An algorithm, based on the matrix, is developed and it computes the quarterly series in linear time and memory. Jacobs (1964) also found a close connection between the Boot, Feibes and Lisman approach and Generalised Least Squares.

2.2 Time Series Models

The time series procedures are the most recent of the temporal disaggregation methods. They seek to incorporate all the information on the dynamics contained in the historical time series in the temporal disaggregation models. These models follow closely the Autoregressive Integrated Moving Average (ARIMA) processes. Given the time series nature of these ARIMA processes, the time series models of temporal disaggregation have the advantage that they can be applied in cases where there is a lack of information on related indicators. The models discussed below falls into this category, that is, the methods of Al-Osh (1989) and Wei and Stram (1990). However, note that quarterly series can also be estimated by including information from quarterly related indicators into the ARIMA process, which guides the infra-annual path.

2.2.1 Method of Wei and Stram

Taking into account the close relationship between the ARIMA model and its autocovariance structure, Wei and Stram (1990) used the available autocovariances of the aggregate model to estimate the autocovariance structure of the unknown series. Formally, let $Y_{4\ (\alpha\ -1)+\varphi}$ be the unknown value of the aggregate Y* for the quarter φ of year α and Y_α, α =1,…,n, the corresponding known annual value. Then the relation between Y^* and Y_α is given by:

$$Y_\alpha = \sum_{\varphi=1}^{4} Y_{4(\alpha\ -1)+\varphi} \qquad \alpha = 1,\ldots,n$$

or

$$Y_\alpha = \frac{1}{4} \sum_{\varphi=1}^{4} Y_{4(\alpha\ -1)+\varphi} \quad \alpha = 1,\ldots,n$$

Now, consider the stationary series: $W_\alpha = (1\text{-}L)^d Y^*_\alpha$ and $U_\alpha = (1\text{-}L)^d Y_\alpha$ obtained by differentiating the basic and the aggregated series, respectively. A result by Barcellan and Di Fonzo (1993) states that the relationship between the covariances of W_α and Y_α permits the use of a generalized least squares procedure that is able to supply estimates which fulfil the aggregation constraint:

$$Y^* = \begin{bmatrix} \Delta_n^d \\ 0 \quad I_d \otimes c' \end{bmatrix}^{-1} \begin{bmatrix} V_w (C_d)' V_u^{-1} \Delta_n^d \\ 0 \quad I_d \end{bmatrix} Y$$

where V_u and V_w are the variance-covariance matrix obtained from the relation between the autocovariances of the stationary aggregated and disaggregated models, C_d is the matrix which contains the information provided by the aggregate model, $\otimes$ is the Kronecker product and c = (1,1…1)' represents the flow variable distribution. In practice, V_u and V_w are usually not known and have to be estimated from available data. Although the estimation of V_u can be easily computed from the aggregated model parameter estimates, the process for V_w is not as straightforward. Moreover, the Wei and Stram (1990) procedure assumes a one to one relationship between the autocovariances of the aggregated and disaggregated models, which only holds under special conditions (see Eurostats, 1999).

2.2.2 The Method of Al-Osh

This method uses a state space representation of the ARIMA model to describe the unknown series under the temporal aggregation constraint. The estimated state vectors and the corresponding covariance matrices are obtained from the Kalman filter with reference to the state space representation.

3. A Brief Review of Temporal Disaggregation Studies in The Caribbean

As discussed in the previous section, there are several methods that convert an aggregated low frequency series into a disaggregated high frequency series. This section looks at the studies that have used these procedures on the GDP data of Caribbean countries.

Table 1: A Tabular Survey of Temporal Disaggregation GDP Studies in the Caribbean

Authors	Countries	Variables	Samples	Methods
Prescod (1986)	Barbados	Real GDP by sector	1974-1985	Lisman-Sandee (1964)
Forde, Singh and Coker (1987)	Trinidad and Tobago	Real GDP by sector	1982-1997	Extrapolation
Nicholls, Forde and Coker (1995)	Trinidad and Tobago	Real GDP	1983-1993	Lisman-Sandee (1964)
Lewis (1997)	Barbados	Real GDP by sector	1974-1995	Extrapolation
Nicholls (2002)	Belize	Real GDP	1990-2001	Chow-Lin (1971)
Allen (2002)	Jamaica	Real GDP	1981-1998	Lisman-Sandee (1964)
Serju (2004)	Jamaica	Real GDP based expenditure	1991-2002	State Space
Perry (2006)	Tobago	Nominal GDP	1997-2004	Chow-Lin (1971)

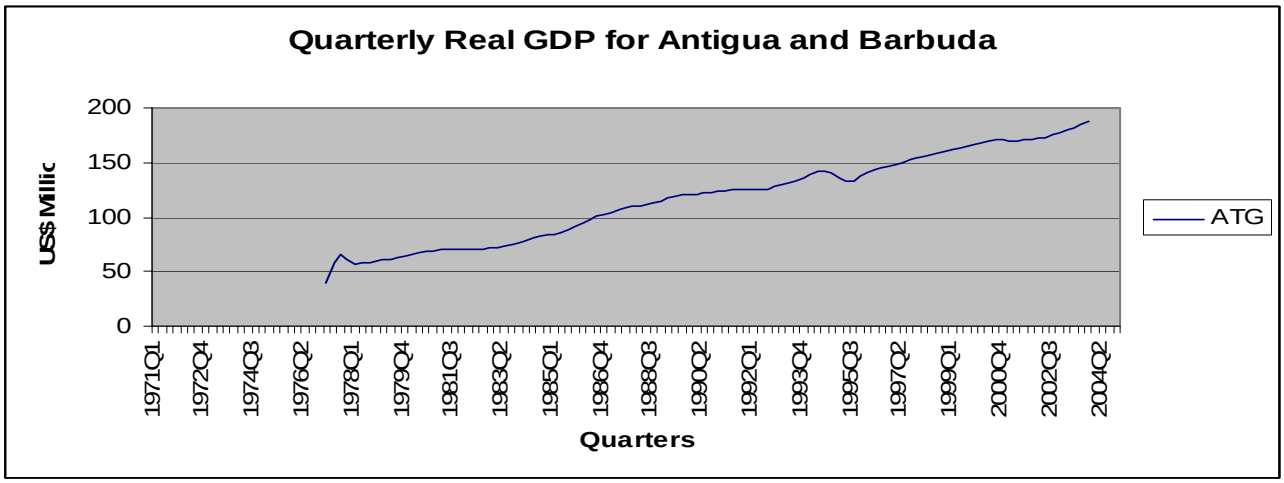
From Table 1 it is observed that these methods have mainly been conducted on the GDP data of the more developed Caribbean countries. Indeed, with the exception of Nicholls (2002) on Belize and Perry (2006) on Tobago all the other studies utilized GDP data from Barbados, Trinidad and Tobago or Jamaica. Furthermore, the table revealed that the most common procedures employed have been the Lisman-Sandee and Extrapolation, presumably because these are relatively easy to compute. Finally, most of the research has been done on GDP by sector as apposed to overall GDP.

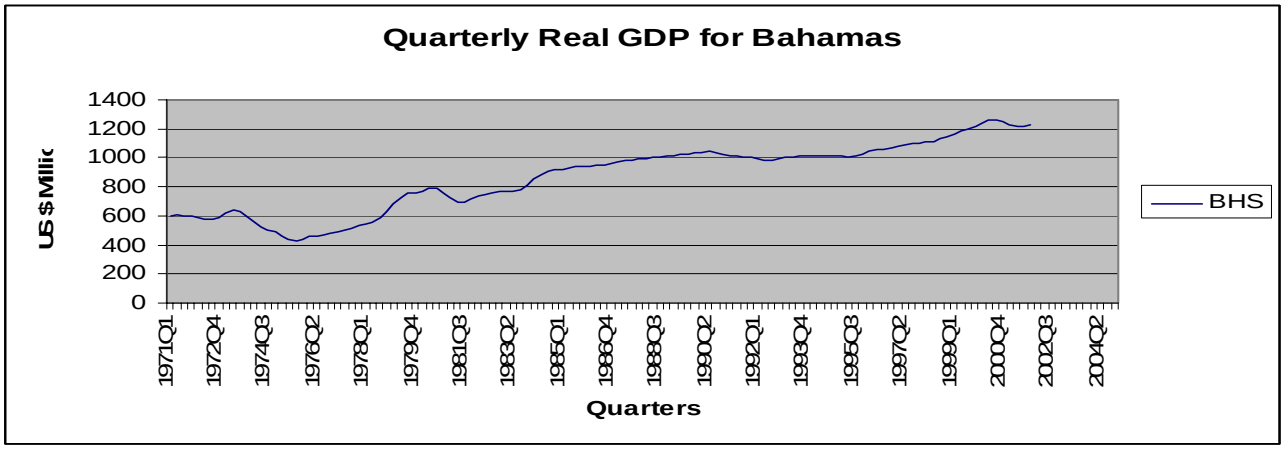
4. Estimates Of Quarterly Real GDP Using the Lisman and Sandee Method

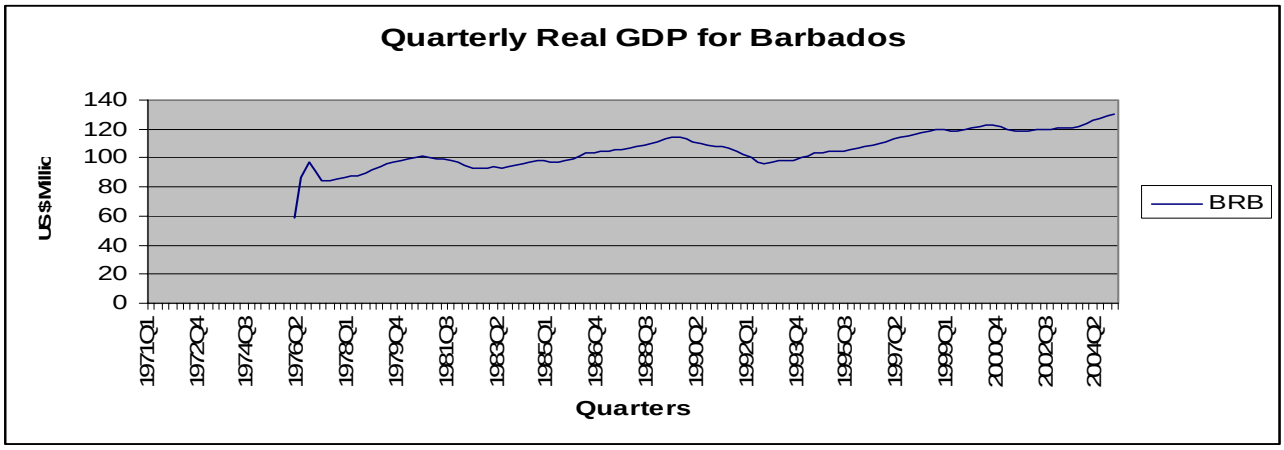
Taking into account the data constraint of the majority of the CARICOM countries, this section estimates the quarterly real GDP from annual data for these countries using the Lisman-Sandee (1964) approach. The results obtained (see Figure 1 and the Appendix) show that the quarterly estimates of real GDP has an increasing trend for all the CARICOM countries, except Suriname and Haiti whose fluctuations are less persistent and Guyana whose estimated quarterly real GDP recorded a downward trend from the second quarter of 1981 to the third quarter of 1990. All the

data in this paper was taken from the Annual Statistical Digest of the Central Bank of Barbados, International Financial Statistics of the International Monetary Fund and the World Bank'sWorld Development Indicators Online. Computations were done using the RATS software programme.

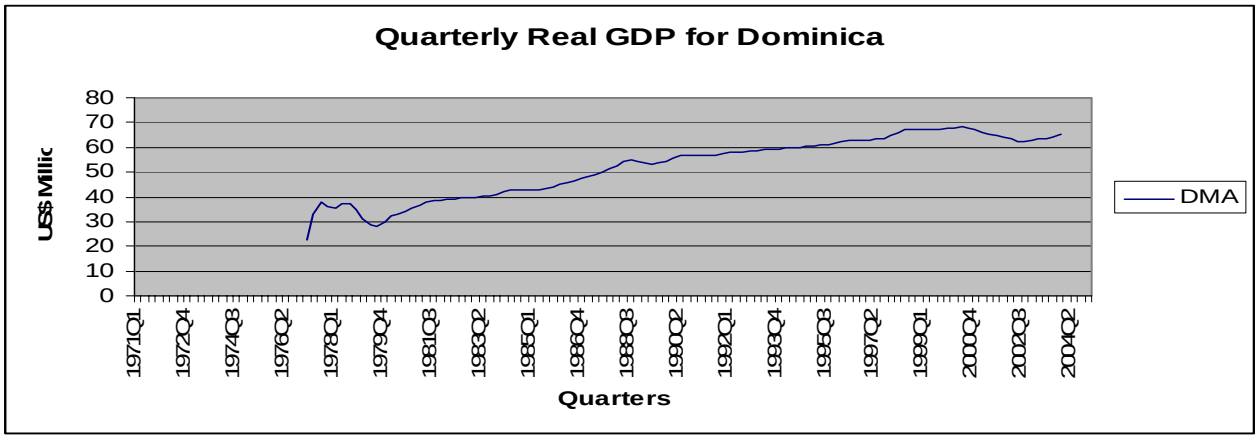
Figure 1: Estimates of Quarterly Real GDP for Caribbean Countries

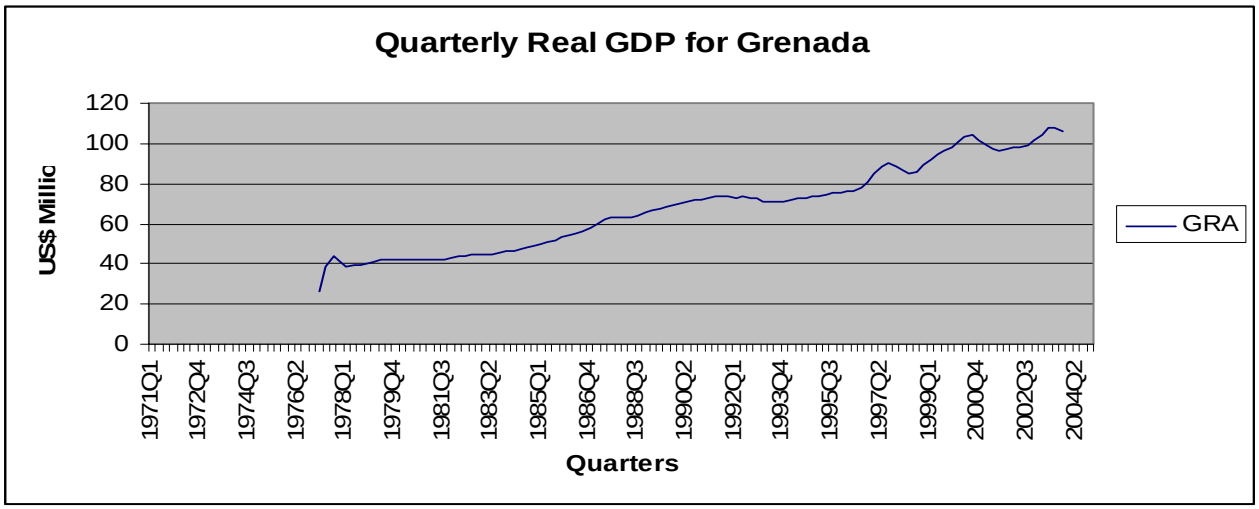




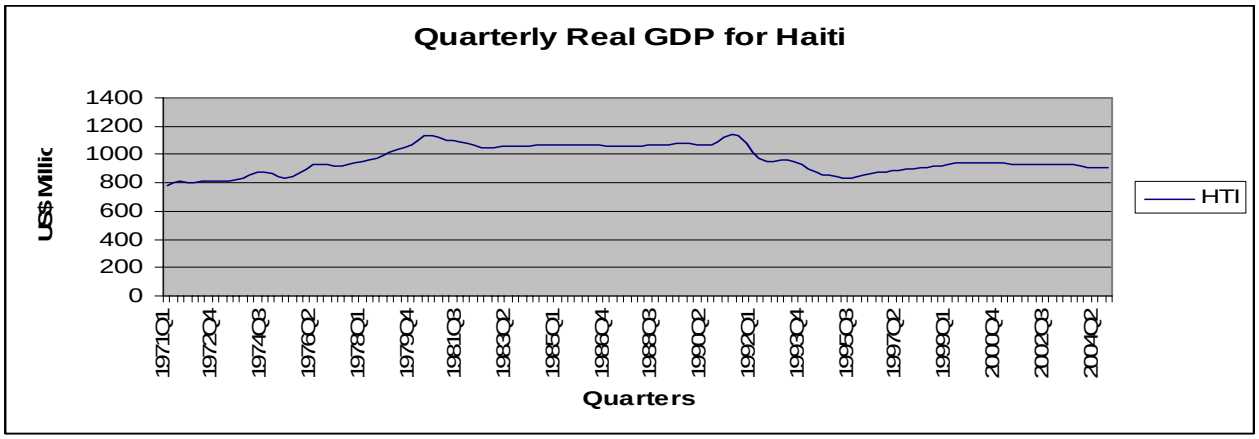

Quarterly Real GDP for Barbados
US$Millic
140
120
100
80
60
40
20
0
1971Q1
1972Q4
1974Q3
1976Q2
1978Q1
1979Q4
1981Q3
1983Q2
1985Q1
1986Q4
1988Q3
1990Q2
1992Q1
1993Q4
1995Q3
1997Q2
1999Q1
2000Q4
2002Q3
2004Q2
Quarters
BRB

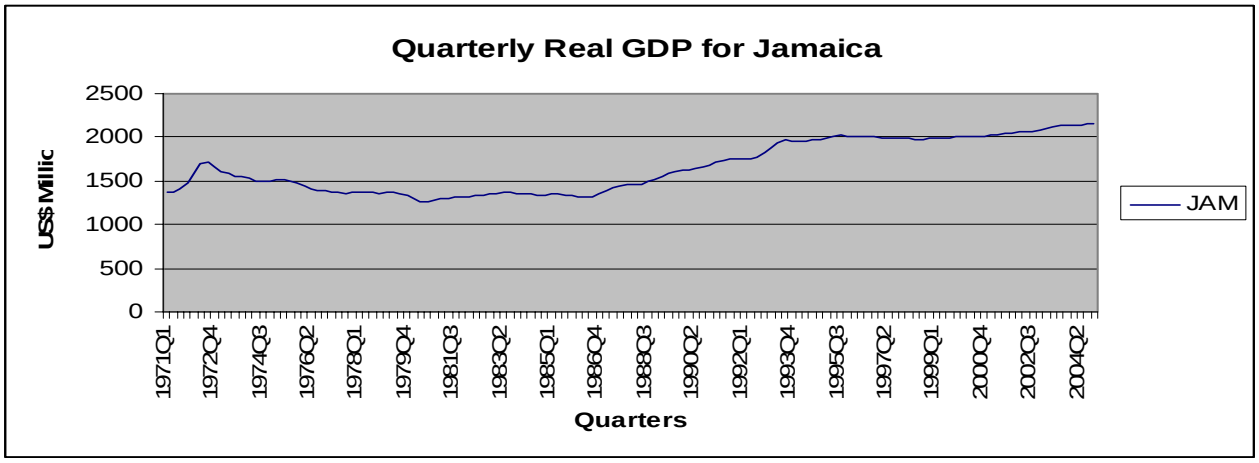
Quarterly Real GDP for Belize
US$ Millic
300
250
200
150
100
50
0
1971Q1
1972Q4
1974Q3
1976Q2
1978Q1
1979Q4
1981Q3
1983Q2
1985Q1
1986Q4
1988Q3
1990Q2
1992Q1
1993Q4
1995Q3
1997Q2
1999Q1
2000Q4
2002Q3
2004Q2
Quarters
BLZ

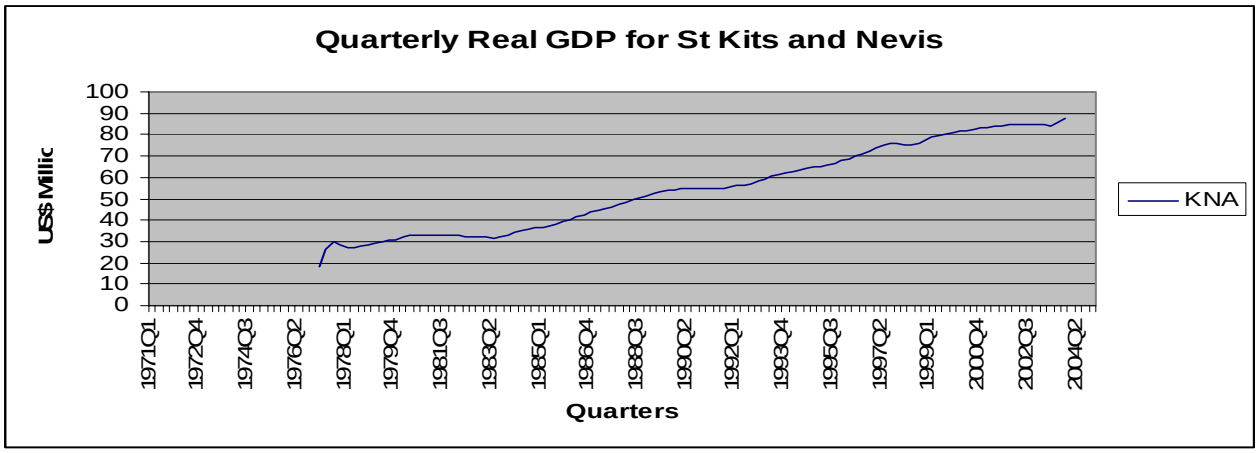

Quarterly Real GDP for Dominica
US$ Millic
80
70
60
50
40
30
20
10
0
1971Q1
1972Q4
1974Q3
1976Q2
1978Q1
1979Q4
1981Q3
1983Q2
1985Q1
1986Q4
1988Q3
1990Q2
1992Q1
1993Q4
1995Q3
1997Q2
1999Q1
2000Q4
2002Q3
2004Q2
Quarters
DMA

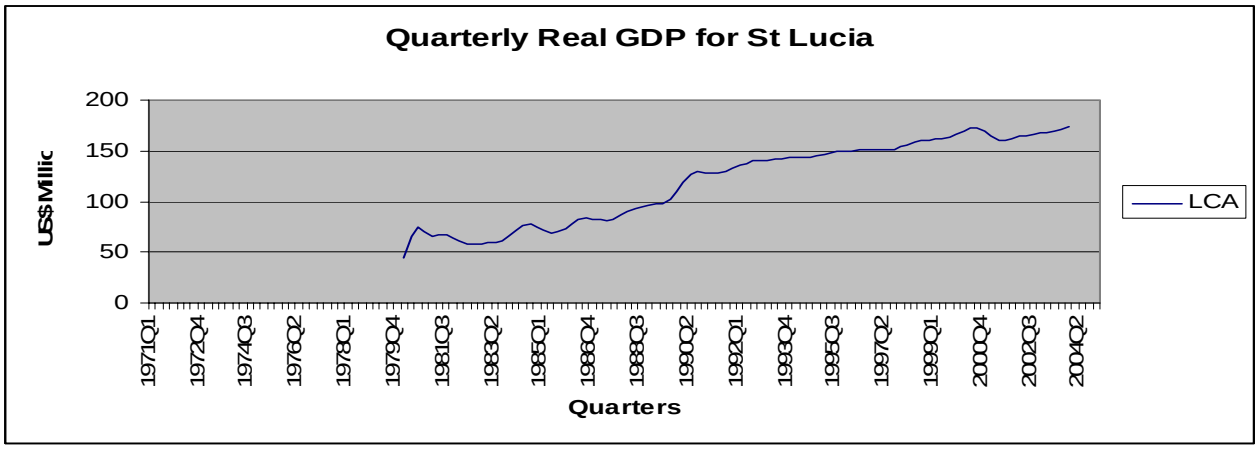

Quarterly Real GDP for Grenada
US$ Millic
120
100
80
60
40
20
0
1971Q1
1972Q4
1974Q3
1976Q2
1978Q1
1979Q4
1981Q3
1983Q2
1985Q1
1986Q4
1988Q3
1990Q2
1992Q1
1993Q4
1995Q3
1997Q2
1999Q1
2000Q4
2002Q3
2004Q2
Quarters
GRA

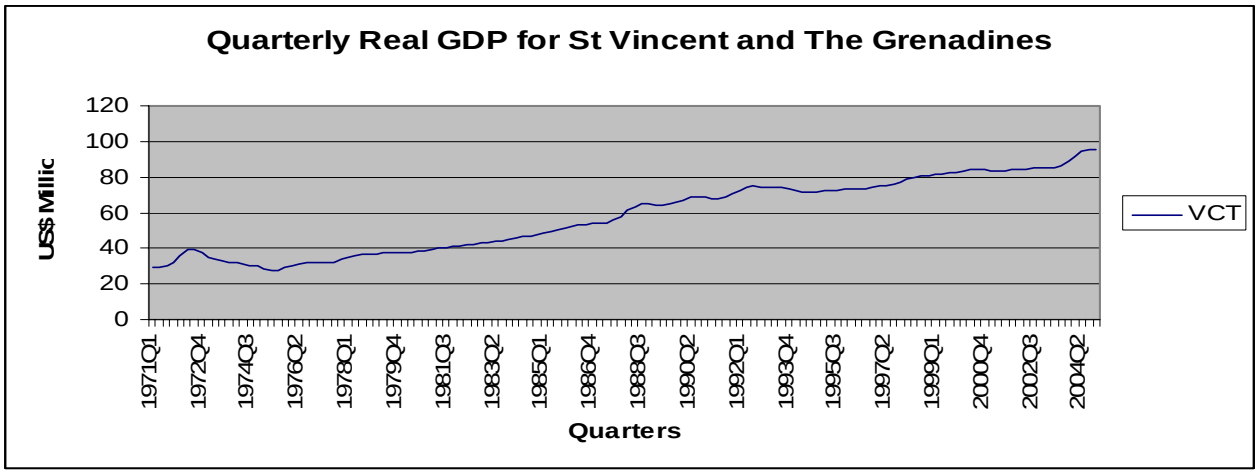
Quarterly Real GDP for Guyana
US$ Millic
200
150
100
50
0
1971Q1
1972Q4
1974Q3
1976Q2
1978Q1
1979Q4
1981Q3
1983Q2
1985Q1
1986Q4
1988Q3
1990Q2
1992Q1
1993Q4
1995Q3
1997Q2
1999Q1
2000Q4
2002Q3
2004Q2
Quarters
GUY


Quarterly Real GDP for Haiti
US$ Millic
1400
1200
1000
800
600
400
200
0
1971Q1
1972Q4
1974Q3
1976Q2
1978Q1
1979Q4
1981Q3
1983Q2
1985Q1
1986Q4
1988Q3
1990Q2
1992Q1
1993Q4
1995Q3
1997Q2
1999Q1
2000Q4
2002Q3
2004Q2
Quarters
HTI


Quarterly Real GDP for Jamaica
US$ Millic
2500
2000
1500
1000
500
0
1971Q1
1972Q4
1974Q3
1976Q2
1978Q1
1979Q4
1981Q3
1983Q2
1985Q1
1986Q4
1988Q3
1990Q2
1992Q1
1993Q4
1995Q3
1997Q2
1999Q1
2000Q4
2002Q3
2004Q2
Quarters
JAM


Quarterly Real GDP for St Kits and Nevis
US$ Millic
100
90
80
70
60
50
40
30
20
10
0
1971Q1
1972Q4
1974Q3
1976Q2
1978Q1
1979Q4
1981Q3
1983Q2
1985Q1
1986Q4
1988Q3
1990Q2
1992Q1
1993Q4
1995Q3
1997Q2
1999Q1
2000Q4
2002Q3
2004Q2
Quarters
KNA


Quarterly Real GDP for St Lucia
US$ Millic
200
150
100
50
0
1971Q1
1972Q4
1974Q3
1976Q2
1978Q1
1979Q4
1981Q3
1983Q2
1985Q1
1986Q4
1988Q3
1990Q2
1992Q1
1993Q4
1995Q3
1997Q2
1999Q1
2000Q4
2002Q3
2004Q2
Quarters
LCA


Quarterly Real GDP for St Vincent and The Grenadines
US$ Millic
120
100
80
60
40
20
0
1971Q1
1972Q4
1974Q3
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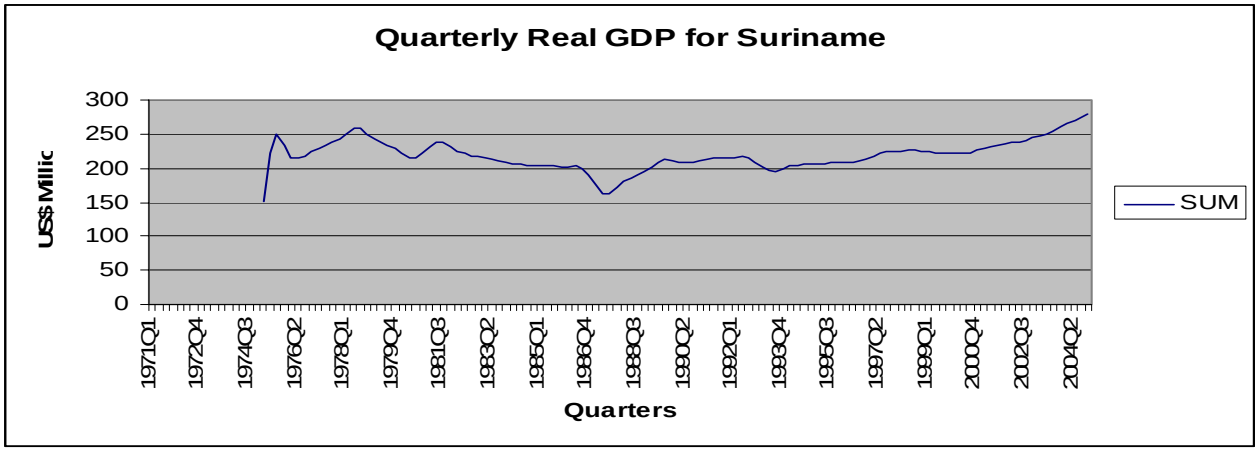
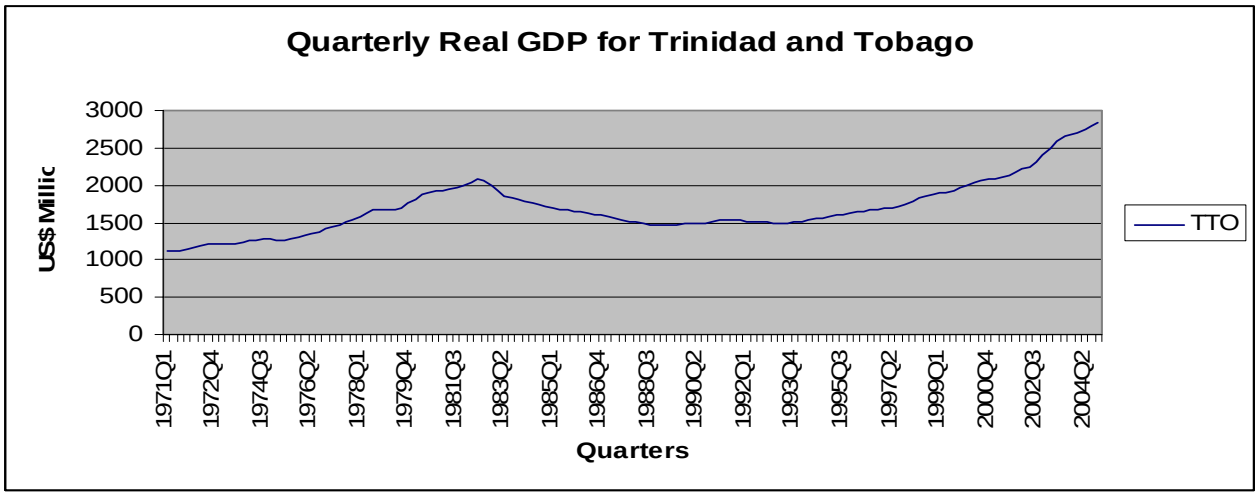
1978Q1
1979Q4
1981Q3
1983Q2
1985Q1
1986Q4
1988Q3
1990Q2
1992Q1
1993Q4
1995Q3
1997Q2
1999Q1
2000Q4
2002Q3
2004Q2
Quarters
VCT


Quarterly Real GDP for Suriname
US$ Millic
300
250
200
150
100
50
0
1971Q1
1972Q4
1974Q3
1976Q2
1978Q1
1979Q4
1981Q3
1983Q2
1985Q1
1986Q4
1988Q3
1990Q2
1992Q1
1993Q4
1995Q3
1997Q2
1999Q1
2000Q4
2002Q3
2004Q2
Quarters
SUM


Quarterly Real GDP for Trinidad and Tobago
US$ Millic
3000
2500
2000
1500
1000
500
0
1971Q1
1972Q4
1974Q3
1976Q2
1978Q1
1979Q4
1981Q3
1983Q2
1985Q1
1986Q4
1988Q3
1990Q2
1992Q1
1993Q4
1995Q3
1997Q2
1999Q1
2000Q4
2002Q3
2004Q2
Quarters
TTO

5. Robustness of the Quarterly Real GDP Estimates

As mentioned in the introduction of this paper, the real GDP estimates derived above are intended to serve as a proxy for quarterly real GDP until steps can be put in place to calculate the official series. It is therefore necessary that these estimates do not distort underlying economic relationship. This can be checked by estimating standard economic relationships. As such, two simple regressions are run. The first is an income determination equation:

$$CARINCOM_t = \alpha + \beta * USINCOM_t + \varepsilon_t \quad (1)$$

where ***t*** represents the number of quarters; ***CARINCOM*** is real income for the respective CARICOM countries; ***USINCOM*** is the income of the United States and ε is the error term which is assumed to have normal properties. The second equation to be estimated is a money demand function where income is one of the explanatory factors, that is,

$$MON_t = \gamma + \delta * CARINCOMt_t + \zeta * IR_t + \eta * CPI_t + \mu_t \quad (2)$$

where ***t*** and **CARICOM** are defined as above; ***MON*** represents money demand; ***IR*** is the interest rate; ***CPI*** is the consumers price index and μ is an error term with classical properties assumed .

According to the results of Tables 2 the quarterly real income for the United States positively and significantly influences quarterly real GDP of all CARICOM countries, except Suriname, which has the correct sign but is statistically insignificant. This model explains reasonably well the amount of variability in the data, that is, excluding the low R^2 for Guyana, Haiti and Suriname, the other countries show an R^2 of about 50% with a high of 98% for Antigua and Barbuda. Likewise for the money demand equation (Table 3), the model explains a significant amount of variation in the data (R^2 ranging from 83% to 99%); the income variable is positive and significant for all countries except Guyana. In addition, the price and interest rate variables are also as expected for the majority of the countries. These results suggest that the quarterly income estimates may be a reasonable proxy for the actual series.

Table 2: Results of Real Income Equation

Countries (Sample=N)	**USINCOM**	R^2
Antigua and Barbuda (N=108)	0.752 (69.804)	0.979
The Bahamas (N=124)	0.424 (28.371)	0.868
Barbados (N=116)	0.193 (18.656)	0.753
Belize (N=132)	0.794 (49.541)	0.950
Dominica (N=108)	0.498 (33.333)	0.913
Grenada (N=108)	0.655 (52.080)	0.962
Guyana (N=136)	0.067 (3.571)	0.087
Haiti (N=136)	0.026 (2.141)	0.033
Jamaica (N=136)	0.190 (12.711)	0.545
St Kits and Nevis (N=108)	0.786 (62.012)	0.974
St Lucia (N=96)	0.897 (33.838)	0.924
St Vincent and The Grenadines (N=136)	0.528 (45.577)	0.939
Suriname (N=120)	0.022 (1.342)	0.015
Trinidad and Tobago (N=136)	0.211 (11.676)	0.504

Table 3: Results of Money Demand Equation

Countries (Sample=N)	**CARINCOM**	**IR**	**CPI**	R^2
Antigua and Barbuda (N=14)	2.138 (2.013)	0.000 (0.000)	-0.130 (-3.915)	0.898
The Bahamas (N=123)	0.885 (8.841)	-0.180 (-7.495)	0.939 (14.341)	0.972
Barbados (N=111)	1.278 (7.139)	-0.234 (11.838)	1.270 (24.874)	0.973
Belize (N=78)	1.399 (13.783)	0.386 (7.596)	1.402 (3.781)	0.974
Dominica (N=96)	2.429 (5.775)	-9.046 (-2.459)	0.061 (0.128)	0.938
Grenada (N=90)	1.597 (8.480)	2.392 (2.709)	0.325 (1.242)	0.990
Guyana (N=55)	-0.432 (-1.002)	-0.138 (-2.634)	1.789 (7.514)	0.945
Haiti (N=32)	1.547 (2.172)	-0.014 (-0.488)	0.982 (28.052)	0.966
Jamaica (N=136)	1.249 (10.878)	-0.032 (-1.070)	1.012 (64.469)	0.997
St Kits and Nevis (N=81)	2.155 (6.395)	0.000 (0.000)	-0.226 (-0.371)	0.832
St Lucia (N=96)	1.031 (8.808)	1.135 (2.844)	1.231 (6.605)	0.975
St Vincent and The Grenadines (N=100)	0.853 (2.487)	-0.709 (-2.455)	2.254 (5.207)	0.913
Suriname (N=55)	4.591 (7.950)	-0.009 (-0.121)	0.783 (27.279)	0.992
Trinidad and Tobago (N=136)	0.812 (7.063)	-0.381 (-7.736)	1.149 (34.203)	0.984

6. Conclusion

Given that it is important for Caribbean countries to control output fluctuations in the short term and forecast business cycles, this paper employs a temporal disaggregration method to compute quarterly real output data. Based on the Lisman and Sandee (1964) approach, the results obtained for the most of CARICOM countries revealed that there is an increasing trend throughout the period 1971-2004. In addition, to check the plausibility of the quarterly real GDP estimates two simple regression models related to money demand and real income are run. These results show that the coefficients of both models have the expected sign and significance suggested by economic theory. As this study covers 14 CARICOM countries, with different data constraints, the temporal disaggregation method chosen does not involve the use of related series. Future work will involve estimating quarterly real GDP using methodologies that involve related series.

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Appendix

Table 1: Quarterly Real GDP series for Antigua & Barbuda
(In millions of US dollars)

Years	QGDP1	QGDP2	QGDP3	QGDP4	GDP
1977	39,24	57,54	64,97	61,06	222,82
1978	57,00	57,41	58,26	59,48	232,14
1979	60,60	61,57	62,80	64,22	249,19
1980	65,86	67,40	68,44	68,91	270,61
1981	69,60	70,50	70,87	70,68	281,66
1982	70,22	69,98	70,42	71,51	282,13
1983	72,26	72,75	74,10	76,21	295,33
1984	78,39	80,23	81,98	83,53	324,13
1985	84,68	85,90	88,15	91,30	350,03
1986	94,70	97,71	100,20	102,00	394,55
1987	103,90	106,10	107,90	109,20	427,16
1988	110,30	111,70	113,30	115,00	450,32
1989	116,90	118,80	120,00	120,50	476,31
1990	121,00	121,80	122,50	123,10	488,43
1991	123,80	124,50	125,00	125,10	498,38
1992	124,80	124,60	125,60	127,70	502,61
1993	129,70	131,30	133,20	135,40	529,70
1994	138,90	142,10	142,40	139,80	563,22
1995	135,90	133,20	133,60	137,10	539,69
1996	140,80	143,20	145,30	146,80	576,06
1997	148,40	150,20	152,00	153,60	604,21
1998	155,20	156,90	158,60	160,20	630,84
1999	161,90	163,60	165,10	166,30	656,84
2000	168,00	169,70	170,50	170,30	678,52
2001	169,80	169,60	170,30	171,60	681,33
2002	172,60	173,30	175,00	177,70	698,52
2003	180,00	181,90	184,80	188,40	735,11

Table 2: Quarterly Real GDP series for Bahamas
(In millions of US dollars)

Years	QGDP1	QGDP2	QGDP3	QGDP4	GDP
1971	600,02	604,98	603,53	595,74	2404,27
1972	582,50	571,83	574,76	591,10	2320,19
1973	619,91	643,26	635,50	597,10	2495,77
1974	556,39	528,14	504,92	488,17	2077,62
1975	463,04	435,59	428,68	442,76	1770,07
1976	455,18	459,22	467,61	479,83	1861,85
1977	489,58	497,68	512,35	532,69	2032,30
1978	546,34	557,52	586,16	630,45	2320,47
1979	683,49	729,84	755,33	758,37	2927,03
1980	771,45	793,27	790,15	762,28	3117,15
1981	724,40	696,55	693,41	715,18	2829,55
1982	738,66	752,11	761,65	766,68	3019,09
1983	764,69	764,39	782,05	816,56	3127,69
1984	856,75	889,92	909,62	914,63	3570,92
1985	921,84	934,74	942,41	944,37	3743,37
1986	945,36	948,56	954,35	962,37	3810,64
1987	970,89	978,42	984,96	990,10	3924,37
1988	995,20	1000,80	1006,60	1012,40	4015,01
1989	1019,10	1025,90	1030,30	1032,10	4107,36
1990	1037,20	1043,30	1041,20	1030,90	4152,68
1991	1020,00	1012,40	1006,20	1001,80	4040,38
1992	994,24	985,96	985,79	993,73	3959,71
1993	1003,00	1009,00	1011,80	1011,20	4034,96
1994	1010,60	1011,30	1012,10	1012,90	4046,93
1995	1010,30	1007,70	1013,60	1027,50	4059,07
1996	1042,00	1053,20	1063,20	1071,20	4229,55
1997	1079,30	1088,20	1096,80	1104,80	4369,13
1998	1109,90	1115,20	1127,90	1147,20	4500,20
1999	1167,00	1184,10	1200,20	1214,40	4765,71
2000	1235,70	1257,60	1262,00	1248,70	5004,00
2001	1232,60	1223,50	1221,40	1226,40	4903,92
2002	172,61	173,27	174,99	177,66	698,52
2003	180,00	181,92	184,79	188,41	735,11

Table 3: Quarterly Real GDP series for Barbados
(In millions of US dollars)

Years	QGDP1	QGDP2	GDP3	QGDP4	GDP
1976	58,74	86,21	97,08	90,67	332,70
1977	84,06	84,29	85,04	86,27	339,65
1978	87,25	88,03	89,46	91,45	356,20
1979	93,68	95,66	97,10	97,91	384,35
1980	99,22	100,80	101,10	100,10	401,15
1981	99,33	99,10	98,23	96,78	393,43
1982	94,88	93,23	92,66	93,23	374,00
1983	93,56	93,43	93,92	94,99	375,90
1984	96,25	97,27	97,83	97,90	389,25
1985	97,63	97,56	98,34	99,91	393,45
1986	101,70	103,10	104,10	104,60	413,50
1987	104,90	105,50	106,30	107,30	424,10
1988	108,30	109,20	110,10	111,10	438,75
1989	112,80	114,40	114,50	112,90	454,55
1990	111,30	110,50	109,40	108,30	439,55
1991	107,50	106,70	105,20	103,00	422,35
1992	100,20	97,58	96,71	97,61	392,05
1993	98,20	98,08	98,77	100,20	395,25
1994	101,80	103,20	104,00	104,30	413,35
1995	104,50	104,80	105,60	106,80	421,80
1996	108,00	108,90	110,10	111,50	438,50
1997	112,90	114,30	115,50	116,50	459,25
1998	117,70	119,10	119,70	119,50	476,00
1999	119,10	119,00	119,40	120,30	477,75
2000	121,60	122,80	122,70	121,40	488,55
2001	119,80	118,70	118,40	119,00	475,95
2002	119,40	119,50	119,90	120,60	479,30
2003	121,00	121,20	122,30	124,10	488,60
2004	125,90	127,50	128,90	130,10	512,45

Table 4: Quarterly Real GDP series for Belize
(In millions of US dollars)

Years	QGDP1	QGDP2	QGDP3	QGDP4	GDP
1971	36,47	36,62	37,29	38,43	148,80
1972	39,71	40,78	41,55	41,96	164,00
1973	42,06	42,30	43,33	45,09	172,78
1974	47,19	48,99	49,97	50,06	196,21
1975	50,30	50,89	51,11	50,96	203,26
1976	50,52	50,24	50,66	51,76	203,19
1977	52,77	53,51	54,48	55,63	216,39
1978	56,76	57,82	58,93	60,02	233,53
1979	60,69	61,35	63,13	65,92	251,08
1980	69,43	72,51	73,85	73,36	289,16
1981	72,97	73,30	73,39	73,24	292,89
1982	73,21	73,27	73,04	72,55	292,07
1983	71,81	71,18	71,16	71,76	285,91
1984	72,40	72,80	73,08	73,22	291,51
1985	73,15	73,12	73,65	74,70	294,62
1986	75,32	75,71	77,25	79,83	308,10
1987	82,48	84,68	86,80	88,70	342,66
1988	90,24	91,84	94,42	97,82	374,31
1989	101,30	104,40	107,40	110,10	423,31
1990	112,60	115,20	118,40	122,00	468,30
1991	125,40	128,60	132,40	136,40	522,85
1992	141,00	145,40	148,50	150,20	585,15
1993	152,70	155,60	156,80	156,20	621,35
1994	155,60	155,70	155,90	156,00	623,20
1995	155,90	155,90	156,30	157,10	625,20
1996	157,70	158,20	159,20	160,90	636,05
1997	162,50	163,90	165,40	167,00	658,85
1998	167,80	168,60	171,30	175,50	683,30
1999	179,10	182,00	186,80	193,10	740,95
2000	200,50	207,10	211,40	212,90	831,80
2001	214,30	216,80	219,50	222,30	872,85
2002	224,30	226,20	230,30	236,50	917,25
2003	243,50	249,60	253,90	255,90	1002,90

Table 5: Quarterly Real GDP Series for Dominica
(In millions of US dollars)

Years	QGDP1	QGDP2	QGDP3	QGDP4	GDP
1977	22,60	33,03	37,66	36,21	129,50
1978	35,63	37,46	37,09	34,56	144,74
1979	31,11	28,54	28,22	30,18	118,05
1980	32,15	33,20	34,26	35,26	134,88
1981	36,47	37,70	38,42	38,59	151,18
1982	38,81	39,24	39,58	39,80	157,43
1983	39,92	40,09	40,51	41,15	161,67
1984	41,92	42,61	42,96	42,95	170,44
1985	42,74	42,67	43,13	44,10	172,63
1986	45,03	45,75	46,59	47,48	184,85
1987	48,32	49,11	50,10	51,22	198,75
1988	52,71	54,13	54,66	54,26	215,76
1989	53,61	53,33	53,67	54,62	215,23
1990	55,78	56,69	57,10	56,97	226,54
1991	56,78	56,80	56,99	57,35	227,92
1992	57,72	58,03	58,30	58,53	232,59
1993	58,77	59,02	59,25	59,45	236,50
1994	59,62	59,81	60,07	60,39	239,88
1995	60,67	60,93	61,29	61,73	244,62
1996	62,22	62,68	63,00	63,18	251,08
1997	63,17	63,21	63,74	64,71	254,83
1998	65,91	66,93	67,39	67,28	267,51
1999	67,16	67,28	67,39	67,51	269,34
2000	67,87	68,24	67,97	67,09	271,17
2001	66,21	65,58	64,92	64,27	260,98
2002	63,28	62,30	62,14	62,81	250,52
2003	63,25	63,36	64,06	65,31	255,99

Table 6: Quarterly Real GDP series for Grenada
(In millions of US dollars)

Years	QGDP1	QGDP2	QGDP3	QGDP4	GDP
1977	26,37	38,64	43,70	41,22	149,93
1978	38,72	39,19	39,76	40,38	158,04
1979	41,21	42,01	42,29	42,03	167,55
1980	41,72	41,63	41,65	41,79	166,80
1981	41,78	41,72	42,03	42,69	168,22
1982	43,41	43,99	44,42	44,68	176,51
1983	44,86	45,10	45,55	46,16	181,67
1984	46,63	47,03	47,80	48,90	190,36
1985	49,96	50,88	51,91	53,00	205,75
1986	53,92	54,81	56,14	57,85	222,72
1987	59,90	61,78	62,85	63,03	247,55
1988	63,06	63,44	64,21	65,32	256,04
1989	66,47	67,46	68,41	69,25	271,59
1990	70,26	71,29	71,95	72,20	285,71
1991	72,61	73,17	73,35	73,14	292,27
1992	73,08	73,17	72,89	72,27	291,40
1993	71,33	70,52	70,53	71,34	283,71
1994	72,16	72,65	73,14	73,58	291,52
1995	73,92	74,27	74,89	75,74	298,82
1996	75,98	76,12	77,83	81,01	310,95
1997	85,17	88,72	89,86	88,52	352,28
1998	86,32	85,12	86,05	89,07	346,56
1999	92,21	94,50	96,54	98,21	381,46
2000	100,90	103,70	104,00	101,70	410,41
2001	98,90	97,10	96,64	97,55	390,19
2002	97,96	97,83	98,96	101,30	396,03
2003	104,60	107,40	107,80	105,80	425,59

Table 7: Quarterly Real GDP series for Guyana
(In millions of US dollars)

Years	QGDP1	QGDP2	QGDP3	QGDP4	GDP
1971	139,74	141,55	141,49	139,59	562,37
1972	137,15	135,46	135,08	136,03	543,71
1973	136,24	135,91	137,48	140,86	550,48
1974	144,07	146,53	149,50	152,78	592,88
1975	156,92	160,88	162,81	162,57	643,18
1976	162,91	164,09	163,85	162,22	653,06
1977	160,46	159,27	158,35	157,76	635,83
1978	157,17	156,45	155,72	155,01	624,35
1979	153,83	152,66	152,63	153,76	612,88
1980	154,91	155,59	156,23	156,78	623,51
1981	159,28	161,81	159,44	152,31	632,84
1982	144,22	138,07	134,21	132,86	549,37
1983	131,28	128,72	126,70	125,35	512,05
1984	123,21	120,83	120,38	121,89	486,30
1985	123,74	124,80	125,03	124,41	497,97
1986	123,61	123,14	123,14	123,60	493,49
1987	124,54	125,30	124,85	123,23	497,93
1988	121,72	120,70	119,35	117,77	479,53
1989	115,98	114,30	113,10	112,45	455,82
1990	110,95	109,24	109,65	112,13	441,98
1991	114,41	115,83	117,85	120,34	468,43
1992	122,73	124,90	127,40	130,08	505,11
1993	132,64	135,11	137,93	140,92	546,60
1994	144,28	147,52	149,96	151,43	593,19
1995	152,50	153,93	156,44	159,90	622,77
1996	163,50	166,70	169,61	172,05	671,86
1997	175,63	179,36	180,30	178,41	713,70
1998	175,83	174,38	174,66	176,64	701,51
1999	179,27	181,21	181,56	180,30	722,34
2000	178,49	177,33	177,52	179,06	712,39
2001	180,77	181,94	182,70	183,00	728,42
2002	183,62	184,41	184,42	183,64	736,08
2003	182,21	181,09	181,62	183,77	728,68
2004	186,77	189,12	189,35	187,44	752,68

Table 8: Quarterly Real GDP series for Haiti
(In millions of US dollars)

Years	QGDP1	QGDP2	QGDP3	QGDP4	GDP
1971	778,52	798,22	807,58	806,02	3190,35
1972	804,58	807,43	810,07	812,34	3234,42
1973	811,08	809,94	817,79	834,15	3272,96
1974	856,55	875,41	879,45	868,41	3479,83
1975	849,57	836,77	843,49	869,32	3399,15
1976	900,88	924,64	934,51	929,86	3689,89
1977	921,85	919,58	925,84	940,24	3707,52
1978	952,43	961,24	976,02	995,82	3885,51
1979	1015,00	1031,90	1051,10	1071,30	4169,20
1980	1100,80	1129,50	1135,70	1118,90	4484,96
1981	1102,70	1095,60	1086,90	1077,10	4362,29
1982	1063,50	1050,40	1046,60	1052,40	4212,85
1983	1058,60	1061,00	1062,40	1062,80	4244,84
1984	1063,30	1064,10	1064,80	1065,20	4257,43
1985	1066,00	1066,80	1066,90	1066,30	4265,83
1986	1066,20	1066,50	1065,30	1062,80	4260,79
1987	1058,90	1055,50	1055,60	1058,90	4228,89
1988	1062,10	1063,80	1066,30	1069,40	4261,63
1989	1073,50	1077,40	1078,70	1077,40	4306,97
1990	1072,20	1068,00	1073,70	1088,90	4302,77
1991	1120,40	1148,00	1134,90	1082,00	4485,24
1992	1018,60	971,53	949,57	954,12	3893,85
1993	963,29	962,03	948,92	924,78	3799,03
1994	896,92	873,68	859,20	854,39	3484,19
1995	843,79	829,47	829,47	843,81	3346,54
1996	859,06	868,53	875,95	880,87	3484,41
1997	886,10	892,26	897,79	902,35	3578,49
1998	906,48	910,95	916,62	923,17	3657,22
1999	931,47	939,36	942,99	942,14	3755,97
2000	942,26	944,14	943,59	940,64	3770,63
2001	937,11	934,55	933,41	933,75	3738,83
2002	934,49	934,64	933,78	931,96	3734,87
2003	931,41	931,24	927,86	921,48	3711,99
2004	911,84	903,47	903,12	910,83	3629,27

Table 9: Quarterly Real GDP series for Jamaica
(In millions of US dollars)

Years	QGDP1	QGDP2	QGDP3	QGDP4	GDP
1971	1377,64	1367,55	1404,35	1485,74	5635,29
1972	1596,11	1688,00	1708,80	1657,21	6650,13
1973	1603,55	1578,85	1558,67	1544,27	6285,33
1974	1524,61	1502,87	1493,87	1498,17	6019,51
1975	1510,59	1517,75	1504,40	1471,36	6004,09
1976	1432,94	1402,63	1385,12	1381,48	5602,16
1977	1374,85	1362,83	1358,08	1360,89	5456,65
1978	1364,86	1365,83	1363,88	1359,15	5453,72
1979	1359,67	1361,35	1349,63	1325,25	5395,90
1980	1291,58	1263,17	1257,60	1275,22	5087,57
1981	1293,39	1302,27	1310,02	1316,17	5221,86
1982	1322,45	1329,28	1336,00	1342,17	5329,91
1983	1352,25	1362,45	1363,03	1353,94	5431,66
1984	1346,39	1342,75	1335,03	1323,72	5347,89
1985	1307,06	1291,94	1290,03	1301,44	5190,46
1986	1306,19	1305,59	1322,00	1354,40	5288,18
1987	1390,76	1420,46	1441,00	1451,09	5703,32
1988	1457,02	1466,90	1487,76	1518,31	5929,99
1989	1552,18	1581,88	1604,04	1617,26	6355,36
1990	1629,36	1644,79	1663,59	1684,58	6622,32
1991	1709,44	1733,18	1747,78	1752,32	6942,73
1992	1745,71	1742,98	1768,66	1821,14	7078,49
1993	1885,36	1938,44	1963,20	1958,09	7745,08
1994	1951,36	1956,38	1965,71	1978,78	7852,23
1995	1995,91	2011,42	2017,03	2012,40	8036,75
1996	2009,49	2010,66	2007,43	2000,03	8027,61
1997	1991,00	1983,70	1980,31	1981,05	7936,06
1998	1980,30	1977,93	1979,29	1984,29	7921,81
1999	1989,46	1993,14	1996,51	1999,37	7978,48
2000	2000,87	2002,53	2007,73	2016,15	8027,26
2001	2024,25	2030,99	2038,75	2047,03	8141,02
2002	2053,36	2059,37	2070,59	2086,32	8269,63
2003	2104,82	2121,36	2131,34	2134,14	8491,64
2004	2135,58	2139,80	2147,61	2158,55	8581,54

Table 10: Quarterly Real GDP series for St. Kitts & Nevis
(In millions of US dollars)

Years	QGDP1	QGDP2	QGDP3	QGDP4	GDP
1977	17,99	26,35	29,87	28,34	102,55
1978	26,77	27,18	27,75	28,43	110,13
1979	29,11	29,75	30,39	30,99	120,24
1980	31,78	32,57	32,93	32,84	130,13
1981	32,83	32,99	32,97	32,77	131,57
1982	32,55	32,41	32,30	32,24	129,50
1983	31,87	31,49	31,87	33,00	128,24
1984	34,22	35,14	35,85	36,32	141,53
1985	36,62	37,00	37,85	39,12	150,59
1986	40,46	41,61	42,64	43,49	168,19
1987	44,29	45,16	46,16	47,23	182,84
1988	48,33	49,38	50,40	51,31	199,42
1989	52,44	53,60	54,24	54,33	214,61
1990	54,50	54,88	55,07	55,04	219,48
1991	54,87	54,79	55,05	55,64	220,34
1992	56,06	56,35	57,06	58,17	227,64
1993	59,33	60,33	61,21	61,92	242,79
1994	62,69	63,53	64,22	64,74	255,18
1995	65,09	65,50	66,36	67,60	264,54
1996	68,80	69,84	71,00	72,22	281,85
1997	73,77	75,28	76,00	75,89	300,94
1998	75,51	75,46	76,08	77,32	304,38
1999	78,71	79,84	80,64	81,05	320,24
2000	81,51	82,11	82,61	82,97	329,20
2001	83,40	83,88	84,19	84,31	335,78
2002	84,44	84,65	84,83	84,99	338,91
2003	84,56	84,15	85,20	87,64	341,55

Table 11: Quarterly Real GDP series for St Lucia
(In millions of US dollars)

Years	QGDP1	QGDP2	QGDP3	QGDP4	GDP
1980	44,79	65,70	74,11	69,52	254,12
1981	65,71	67,04	66,42	63,87	263,04
1982	60,51	57,94	57,35	58,77	234,57
1983	59,20	58,82	60,98	65,54	244,54
1984	71,68	76,82	78,09	75,43	302,02
1985	71,51	69,17	69,96	73,84	284,48
1986	78,48	81,86	83,41	83,05	326,80
1987	81,97	81,64	83,14	86,37	333,12
1988	89,74	92,40	94,78	96,74	373,66
1989	97,39	98,19	102,30	109,60	407,52
1990	118,6	126,30	129,80	128,90	503,47
1991	127,50	127,80	129,40	132,20	516,96
1992	135,40	138,10	139,70	140,10	553,25
1993	140,70	141,70	142,40	142,80	567,49
1994	142,90	143,20	144,00	145,40	575,55
1995	147,10	148,50	149,30	149,60	594,48
1996	150,00	150,60	151,00	151,10	602,80
1997	150,70	150,50	151,50	153,70	606,42
1998	156,20	158,20	159,70	160,60	634,62
1999	161,20	162,10	163,70	166,00	652,94
2000	169,80	173,20	173,10	169,30	685,37
2001	164,40	160,90	160,20	162,30	647,78
2002	164,30	165,20	166,30	167,60	663,36
2003	168,50	169,30	171,20	174,00	682,98

Table 12: Quarterly Real GDP series for St Vincent & the Grenadines
(In millions of US dollars)

Years	QGDP1	QGDP2	QGDP3	QGDP4	GDP
1971	29,24	28,87	29,98	32,49	120,59
1972	36,01	38,95	39,41	37,36	151,74
1973	35,20	34,05	33,13	32,50	134,89
1974	31,81	31,02	30,34	29,82	122,99
1975	28,84	27,82	27,90	29,07	113,64
1976	30,42	31,33	31,82	31,86	125,43
1977	31,66	31,64	32,24	33,44	128,99
1978	34,86	36,04	36,68	36,76	144,34
1979	36,88	37,22	37,47	37,62	149,18
1980	37,63	37,69	38,08	38,79	152,20
1981	39,54	40,15	40,70	41,14	161,53
1982	41,60	42,08	42,57	43,03	169,28
1983	43,42	43,82	44,39	45,10	176,72
1984	45,78	46,41	47,11	47,84	187,14
1985	48,53	49,20	49,99	50,85	198,58
1986	51,79	52,68	53,41	53,93	211,82
1987	53,98	54,10	55,44	57,92	221,43
1988	60,95	63,50	64,74	64,59	253,78
1989	64,29	64,54	65,16	66,12	260,11
1990	67,31	68,37	68,84	68,71	273,23
1991	68,17	67,88	68,59	70,27	274,91
1992	72,38	74,09	74,76	74,37	295,60
1993	74,17	74,39	74,12	73,38	296,06
1994	72,38	71,58	71,39	71,82	287,17
1995	72,22	72,38	72,59	72,86	290,05
1996	73,00	73,13	73,55	74,25	293,94
1997	74,80	75,24	76,04	77,17	303,24
1998	78,43	79,55	80,36	80,81	319,15
1999	81,32	81,97	82,48	82,83	328,61
2000	83,32	83,88	84,08	83,91	335,19
2001	83,64	83,51	83,65	84,05	334,85
2002	84,44	84,72	85,03	85,35	339,54
2003	85,12	84,88	86,05	88,54	344,59
2004	91,52	93,95	95,21	95,24	375,92

Table 13: Quarterly Real GDP series for Suriname
(In millions of US dollars)

Years	QGDP1	QGDP2	QGDP3	QGDP4	GDP
1975	150,77	221,27	249,17	232,74	853,96
1976	215,20	215,21	218,06	223,58	872,04
1977	229,04	233,39	238,02	242,65	943,10
1978	250,45	258,19	258,09	250,17	1016,9
1979	242,09	237,17	232,50	228,38	940,14
1980	221,40	214,27	214,18	221,15	871,00
1981	230,68	237,36	237,71	231,71	937,45
1982	225,29	221,44	218,52	216,70	881,95
1983	214,66	212,21	210,25	208,90	846,01
1984	207,17	205,22	204,17	204,09	820,65
1985	204,26	204,06	203,20	201,73	813,25
1986	202,43	203,39	198,84	189,08	793,75
1987	175,08	163,24	161,86	171,02	671,19
1988	180,11	184,95	190,15	195,37	750,58
1989	202,32	209,19	211,86	210,15	833,52
1990	207,97	207,52	208,28	210,19	833,96
1991	212,63	214,59	215,28	214,65	857,16
1992	215,29	216,45	214,41	209,29	855,44
1993	202,33	196,64	195,48	198,92	793,37
1994	202,71	204,66	205,78	205,99	819,14
1995	206,16	206,69	207,31	208,00	828,16
1996	207,89	207,76	209,63	213,40	838,69
1997	217,90	221,60	223,58	223,71	886,80
1998	224,30	225,60	225,79	224,85	900,54
1999	223,76	223,13	222,86	222,98	892,72
2000	222,23	221,33	222,61	225,99	892,16
2001	229,63	232,40	234,61	236,11	932,76
2002	237,14	238,42	240,97	244,63	961,15
2003	247,72	250,32	254,48	259,94	1012,50
2004	265,88	271,24	275,55	278,55	1091,20

Table 14: Quarterly Real GDP series for Trinidad & Tobago
(In millions of US dollars)

Years	QGDP1	QGDP2	QGDP3	QGDP4	GDP
1971	1123,91	1122,28	1132,16	1152,92	4531,27
1972	1177,51	1197,58	1208,50	1209,59	4793,19
1973	1208,45	1211,15	1219,63	1233,36	4872,58
1974	1249,41	1263,24	1271,57	1273,88	5058,11
1975	1270,86	1270,16	1283,07	1308,79	5132,87
1976	1330,95	1347,77	1374,24	1408,68	5461,64
1977	1441,05	1469,87	1504,91	1544,00	5959,84
1978	1590,67	1635,26	1661,91	1668,97	6556,80
1979	1666,15	1670,92	1701,06	1754,68	6792,81
1980	1815,93	1867,30	1900,87	1914,54	7498,63
1981	1928,76	1950,61	1971,72	1990,78	7841,86
1982	2032,25	2074,29	2060,39	1991,42	8158,35
1983	1915,64	1862,27	1824,60	1805,00	7407,51
1984	1782,49	1753,16	1730,32	1715,40	6981,38
1985	1699,05	1679,79	1663,57	1651,39	6693,80
1986	1640,80	1628,79	1612,31	1592,39	6474,29
1987	1571,36	1551,92	1534,71	1520,82	6178,81
1988	1502,88	1483,82	1474,50	1475,51	5936,71
1989	1473,63	1467,70	1468,97	1477,37	5887,67
1990	1484,27	1488,27	1496,24	1507,68	5976,46
1991	1524,61	1540,03	1541,93	1530,17	6136,73
1992	1518,13	1511,57	1505,54	1500,41	6035,65
1993	1488,98	1477,27	1481,26	1500,68	5948,19
1994	1519,43	1531,90	1546,48	1562,25	6160,07
1995	1577,83	1592,74	1608,63	1624,49	6403,69
1996	1641,88	1659,07	1672,92	1682,55	6656,42
1997	1684,82	1688,60	1711,36	1751,66	6836,44
1998	1796,33	1833,63	1860,97	1876,65	7367,58
1999	1889,39	1906,50	1931,67	1963,35	7690,91
2000	1997,56	2028,82	2054,62	2073,32	8154,32
2001	2085,12	2099,46	2131,90	2180,42	8496,90
2002	2217,12	2246,92	2307,87	2396,18	9168,08
2003	2496,10	2584,20	2645,46	2676,04	10401,80
2004	2704,68	2744,94	2791,46	2841,33	11082,40