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EXCHANGE RATE CONVERGENCE IN CARICOM

By

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ABSTRACT

The paper investigates the issue of exchange rate convergence in CARICOM during the period 1967 to 1996 as part of the general discussion on CARICOM's single currency initiative. It begins with a review of the optimum currency area literature which is the theoretical genesis of the exchange rate convergence issue, followed by a review of the empirical literature on economic convergence and of CARICOM's attempts at monetary union. Using an empirical test of convergence developed by Hall, Robertson and Wickens (1992), the study concludes that there is little evidence of exchange rate convergence in CARICOM, and that CARICOM's approach to the single currency needs to be reviewed.

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INTRODUCTION

In 1992, the CARICOM Heads of Government decided that the region should move towards monetary integration.[1] They argued that monetary integration would provide much needed exchange rate and price stability, reduced transactions costs in regional trade and economies in the use of foreign reserves. The new regime would thereby stimulate intra-regional trade, capital flows and investment, increase growth and employment and improve balance of payments performance. Monetary integration, they argued, would enhance economic efficiency and strengthen the capacity of the region to compete internationally.

However, the attainment of these objectives depends critically on effective management of the implementation process which must be credible and non-reversible. At the very heart of the management process is the issue of economic convergence. Without economic convergence, policy coordination which is the corner stone of monetary integration, becomes extremely difficult. Lack of convergence would threaten stability of the union.

The purpose of the study is to investigate one facet of the convergence issue, i.e., exchange rate convergence. Given the openness of Caribbean economies, their vulnerability to exchange rate fluctuations and the variety of exchange rate regimes in the region, the exchange rate issue is

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[1] Although monetary integration may take many forms, it consists essentially either of the establishment of a single currency in a region or the fixing of exchange rates among members backed by currency convertibility. For further discussion, see Hilaire et al ,"Options for Monetary Integration in the Caribbean" and D. Worrell, " The Harmonisation of Exchange rates in the Commonwealth Caribbean" in Caribbean Monetary Integration (eds.) T. Farrell and D. Worrell (1994).

arguably the most critical and the most difficult facing the region in the approach to monetary integration.

The paper is divided into five sections. A review of the literature is presented in the first section. In the second section, the CARICOM approach to monetary integration is discussed. The third section discusses the empirical tests of convergence. The model is presented in the fourth section and estimation and results in the fifth section of the paper.

A. LITERATURE REVIEW

The theoretical genesis of the discussion on monetary integration is the optimum currency area literature to which a seminal contribution was that of Mundell (1961). Mundell argued that factor mobility and particularly labour mobility within a region is critical to success in the establishment of a currency area. Factor mobility would result in reduced dependence on exchange rate variations for external balance, thus making the area a good candidate for a fixed exchange rate. An important contribution by Mundell was his conclusion that the optimum currency area may not be the nation state but the region.

Mundell's contribution was followed by several others which focussed similarly on a specific attribute for determining the desirability of establishing a currency area. Notable contributions among these were McKinnon (1963) who emphasised the openness and size of the economy as important determining features and Kenen (1969) who presented the degree of commodity diversification as the most important factor. Haberler (1970) and Fleming (1971) argued for the

similarity of inflation rates as the decisive factor. Other criteria presented in the literature included the degree of goods and market integration (Mundell (1961)); fiscal integration (Kenen (1969)); the desire for political union (Cohen 1993); the degree of financial integration (Ingram (1969)); and the degree of policy integration (Haberler (1970)).

Increasingly, however, it was recognised that the desirability or non-desirability of a currency union depended on the existence of no single factor but rather the coexistence of several factors impacting on the benefits and costs of the union. Efforts therefore subsequently concentrated on the definition of those benefits and costs. Often mentioned costs include the loss of the exchange rate as a policy tool; the loss of monetary policy independence; increased inflation and unemployment; the loss of fiscal independence, given the need to maintain external regional payments equilibrium and the possible deterioration of the national economy as a result of the acceleration of polarised growth and development in the region.

Benefits mentioned include the increased mobility of both labour and capital; an increase in the liquidity value of money; the reduction of exchange rate speculation within the region; the reduced foreign reserves requirement given the fact that intraregional trade no longer would require foreign exchange. Advocates of the cost-benefit approach include Ishiyama (1975) and Tavlas (1993). However, significant difficulties in quantifying the benefits and costs of monetary integration were recognised. Despite this shortcoming, proponents of the cost-benefit approach argued that an explicit evaluation of costs and benefits is superior to the single characteristic approach that dominated the earlier literature.

More recent attempts to develop the literature have incorporated new considerations such as the size and correlation of underlying disturbances, the cost of labour mobility, the time consistency of policy and the impact of expectations on exchange rates. In addition, attempts have been made to incorporate the model into an empirical framework, analysing the impact of some of the characteristics which have been detailed in the literature. Examples of these include the work by Bayoumi (1994) and of Bayoumi and Prasad (1996). Bayoumi and Prasad (1996) reviewed the level of industrial diversification, the sources of shocks and the response of labour mobility in an empirical framework in the USA and eight countries of the European Union. They concluded that labour is less mobile in the EU than in the US and that, as a result, significant wage differentials in the EU are likely to persist for some time after the formation of the European Monetary Union.

B. CARICOM'S APPROACH TO MONETARY INTEGRATION

The criteria for entry into the monetary union were presented in the 1992 report of the Central Bank Governors. The 3-12-36-15 criteria required that: (i) countries maintain foreign reserves equivalent to three months of import cover for a period of 12 months; (ii) that the exchange rate be maintained at a fixed rate to the US dollar for 36 consecutive months without external debt payment arrears; and that (iii) the debt service ratio be maintained within 15% of the export of goods and services.[3] In 1996, it was proposed that the import cover criterion be amended to include three months of import cover or 80% of central bank current liabilities, whichever is

[3] Council of CARICOM Central Bank Governors, Final Report of the Task Force on Currency Convertibility and Economic Convergence, November 1996, p.4-7.

greater. Additionally, it was proposed that the fixed parity rule be amended to include bands of 1.5% on either side of parity for floaters. Fixers must, however, maintain their parity for a period of 36 months.[3]

The community envisaged the implementation of a monetary union in three stages on the basis of two groupings, A and B. Category A countries are the OECS, Bahamas and Belize. Since these countries had already met the criteria for entry in 1992, their task was simply the maintenance of macroeconomic stability. Category B countries included all other CARICOM members whose task it was to make the appropriate adjustments to satisfy the entry criteria.

The first phase of the monetary integration process was to have been concluded in 1996 and was to have included the OECS, Belize, The Bahamas, Barbados and Trinidad and Tobago. There was to have been a common currency with the exception of Belize and the Bahamas. The second stage was to have covered the period 1997 to 2000 and was to include the following initiatives: (i) the formation of a Caribbean Monetary Authority; (ii) the issuance and circulation of a common currency in the first tier countries excluding the Bahamas; (iii) use of the new currency in the remaining countries as a unit of account in the settling of regional transactions; and (iv) continued adjustment by Jamaica and Guyana to meet the criteria for entry into the union. The third phase, which was to have begun in the year 2000, had the objective of entering all CARICOM countries into membership of the Caribbean Monetary Authority.[4] However, with

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[3] Ibid., p.39.

[4] The Caribbean Monetary Authority would issue the Caribbean currency, be responsible for regional monetary policy, the regional foreign reserves pool and exchange rate management, regional coordination of economic policy and banking supervision. For a fuller discussion of the phases, see Caribbean Monetary Integration (eds.) Farrell and Worrell (1992), p. 236-41.

the floating of the Trinidadian dollar in 1993, the implementation of Stage I was suspended. It was subsequently proposed that Barbados, Belize and the OECS form a union by the end of 1997. This also was not achieved. CARICOM therefore must reformulate the monetary integration schedule. More importantly, however, it may have to reformulate its approach to the process of monetary integration.[5]

C. EMPIRICAL TESTS OF CONVERGENCE

Given the centrality of the convergence issue in the monetary integration debate, attempts have been made to operationalise the concept empirically. Three notable attempts are those by Honohan (1992); Haldane and Hall (1991); and Hall, Robertson and Wickens (1992). Using an error correction mechanism, (Honohan (1992)) investigated the convergence of inflation and interest rates in the rand and franc zones in Africa, and found empirical evidence to support his convergence theory with respect to the two core countries, i.e., France and South Africa.

Haldane and Hall (1991) investigated the relationship between the US dollar, the Deutsche Mark and pound sterling between 1976 and 1989. They found that the pound had converged on the Deutsche Mark during the period. They concluded that as a result of this convergence with the

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[5] The EU required that members satisfy four criteria for entry: (i) that the rate of inflation of the prospective member country be within 1.5 percentage points of the average of the lowest three rates in the community; (ii) that the interest rates on long term securities be within 2 percentage points of that within the foregoing three members; (iii) that the exchange rate of the prospective member be kept within the band of the exchange rate mechanism without realignment for two years; and (iv) that the overall fiscal deficit be not greater than 3% of GDP and that the ratio of public debt to GDP be not greater than 60%. The satisfaction of these criteria was to be achieved in three phases over approximately eight years. The purpose of the criteria, as in the CARICOM case, was to enforce economic convergence. By May 1998 when the selection was made of countries for entry into the European Monetary Union, the aforementioned economic indicators had converged in the majority of EU member countries.

Deutsche Mark, it would be easier for the pound sterling to be a part of the European Monetary System than would have been the case if the pound sterling were convergent with the US dollar.

Hall, Robertson and Wickens (1992) broadened the study to include nine European Union currencies and once again investigated convergence with the Deutsche Mark and the US dollar. They defined economic convergence between two series as the approximation to a constant of the difference between the series. In other words, in the limit as time goes to infinity, the difference between two variables X and Y would equal some constant, α. In stochastic terms this is expressed as $E[\lim (a(t))_{t\to\infty}]=\alpha$. They then went on to describe two types of convergence: (i) strong system convergence and (ii) weak system convergence. In the case of strong system convergence, all pairs of variables in the system have converged. In the case of weak system convergence, some pairs have converged while others have not.

To operationalise their concept, Hall et al.(1992) used a simple three variable model, including the Deutsche Mark, the pound sterling and the US dollar. In an attempt to determine whether the Deutsche Mark and the pound sterling had converged during 1976 to 1989, they used the model presented below:

$$(X_{DM} - X_{UK})(t) = a(t) + b(t)(X_{DM} - X_{US})(t) + e(t) \qquad (1)$$

where X_{DM}, X_{UK} and X_{US} are the logs of the exchange rates of the Deutsche Mark, the pound sterling and the US dollar respectively. The parameters in the model are time- varying. This emphasises their assertion that convergence is a process rather than a state. The critical

parameter in the model is b(t). The expectation is that this parameter would tend to zero in the limit if the Deutsche Mark and the pound sterling have converged. Alternatively, if the Pound Sterling and the US dollar have converged, this parameter would tend towards one. However, the convergence of b(t) to zero is considered a necessary but not sufficient condition for convergence between the Deutsche Mark and the pound sterling. They insisted that for convergence, both a(t) must tend to a constant and b(t) must tend towards zero. They also added that cointegration among the variables under consideration (in this case the Deutsche Mark and the pound sterling) is a necessary but not sufficient condition for convergence. Consequently, co-integration among the variables must be investigated prior to model estimation. Hall et al.(1992) intimated that this model could be used to investigate the convergence of any two variables.

D. THE MODEL

Following the Hall et al.(1992) model, the study begins by investigating the convergence of nominal exchange rates in the CARICOM region during the period 1967 to 1996. The model used is presented below:

$$(X_{TT} - X_{CARICOM}) = a(t) + b(t)\,(X_{TT} - X_{US}) + e_t \qquad (2)$$

where X_{TT}, X_{US} and $X_{CARICOM}$ represent the logs of the nominal exchange rates of the Trinidadian dollar, the US dollar and individual CARICOM (Barbados, Guyana, Jamaica, Eastern Caribbean,

Bahamas, Belize, Suriname) currencies vis-a-vis the SDR[6]. The period used was 1967 to 1996. All exchange rates are taken from the IMF Financial Statistics. The US dollar is used since the region is generally considered as belonging to the US dollar currency area. The Trinidadian dollar is used as the core CARICOM currency. The Trinidadian economy is one of the two largest economies in the region, and its inclusion in the initial stage of the monetary union is generally seen by the regional authorities as critical for ensuring success. Until 1993, Trinidad and Tobago had a fixed exchange rate which it began to float thereafter.

E. ESTIMATION AND EMPIRICAL RESULTS

Firstly, the variables of the model were tested for stationarity. The results are presented in Table 1. With the exception of the Guyanese exchange rate, the logs of all other exchange rates are I (1). This result in itself suggests a problem for the region with respect to the convergence of exchange rates in the move towards monetary integration, and supports the decision that at least the Guyanese currency be not part of the initial phase of the union. The fact that the remaining currencies are all I(1) suggests that they are more readily candidates for monetary union. Additionally, co-integration analysis using the Johansen model suggests the existence of at least one co-integrating vector among the I(1) CARICOM currencies. The cointegration analysis was done using RATS. The results are presented in Table 2.

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[6]The SDR is a currency basket composed of the currencies of the five IMF members with the largest portions of world exports of goods and services. The weight of each currency in the basket reflects both trade performance and the amounts of the currencies held as reserves by IMF members. The basket is reviewed every five years. The exchange rate of national currencies with the SDR is determined by the daily market rates of the basket of currencies translated into US dollar amounts(US dollar:SDR exchange rate) and subsequently converted into the national currency at the exchange rate of the US dollar to the national currency. Since 1981, the SDR has comprised the US dollar; Deutsche mark; Japanese yen; French franc and the Pound sterling. The current weights of these currencies in the SDR basket which have not significantly since 1981 when they replaced the sixteen currencies that previously comprised the basket are US dollar(39%); Deutsche mark(21%); Japanese yen(18%) French franc (11%) and Pound sterling (11%).

Table 1: Stationarity Tests		
Logs of the Exchange Rates	**Computed ADF Test Statistic**	**Computed Perron Statistic[7]**
US Dollar*	-3.56	-3.42
Trinidadian Dollar*	-2.70	-1.83
Barbadian Dollar*	-4.03	-3.25
Bahamian Dollar*	-3.56	-3.43
Belizean Dollar*	-3.24	-2.62
Guyanese Dollar**	-5.23	-3.32
Jamaican Dollar*	-4.55	-0.89
Eastern Caribbean Dollar*	-2.90	-2.57
Surinamese Guilder*	-3.59	-4.24

The ADF statistic (1% level of significance) is -2.65 *Variables are I(1) ** Variable is I(2)

[7] Given the substantial exchange rate changes during the period, it was necessary to supplement the ADF tests with tests suggested by Perron (1989,1990) for determining stationarity in the presence of a structural break. In this study, his Additive-Outlier (AO) model was used. The AO model is a two stage model for determining whether a variable is stationary or non-stationary. The null hypothesis is that the variable is non-stationary subject to a single shock/intervention at a given time. The alternative hypothesis is that the variable is stationary subject to a shift in the mean after the intervention. (For a more detailed discussion, see Charemza and Deadman (1997)). The intervention dates used were 1984 (US,Bahamas, Belize, Eastern Caribbean, Guyana and Trinidad); 1983 (Jamaica) and 1994 (Suriname). In the case of the US, 1984 represented the culmination of a period of tight monetary policy in response to high inflation induced by the oil shocks of 1979 and 1983. High interest rates resulted in substantial appreciation of the US dollar. This was in turn reflected in a substantial appreciation of the Bahamas, Barbados, Belize, Eastern Caribbean and Trinidad dollars vis-a-vis the SDR. In the case of Guyana, 1984 also represented the beginning of the process of exchange rate liberalisation culminating in the unification of the official and parallel exchange rates in 1991. For Jamaica, 1993 was the beginning of a similar process with the establishment of the parallel market in January of that year. In Suriname, the major shock to the exchange rate took place in 1994 with the floating of the exchange rate. The critical values for the Perron (1989) test for 1983 and 1984 (λ=0.6) interventions are -3.62 (lower limit) and -3.55 (upper limit) at the 5% level of significance. The corresponding limits for the 1994 intervention (λ=0.93) are -3.25(lower limit) and -3.12(upper limit). The last column of Table 1 gives the results of the Perron test. Critical values were taken from Table 6 of Charemza and Deadman (1997). To a large extent, the Perron tests corroborate the results of the ADF tests that all the variables are non-stationary. The exception is the Surinamese guilder which, according to the Perron test, is stationary.

Table 2: Test of the Number of Cointegrating Vectors				
λ Max(Computed)	Trace(Computed)	Ho: r	λ Max*	Trace*
152.31	213.09	0	36.36	82.49
27.49	60.79	1	30.04	59.46
18.72	33.29	2	23.80	39.89
7.86	14.58	3	17.89	24.31
5.37	6.71	4	11.44	12.53
1.34	1.34	5	3.84	3.84

*5% critical values

To obtain estimates of a(t) and b(t) in equation (2), the Kalman filter was used[8]. The Kalman filter is a recursive algorithm used for the estimation of time-varying parameters. In this case, the specific model estimated was the following:

$$Y_t = a(t) + b(t)\, X_t + e_t \qquad (3a)$$

$$a(t) = a(t)_{-1} + v_{1t} \qquad (3b)$$

$$b(t) = b(t)_{-1} + v_{2t} \qquad (3c)$$

where $Y_t = \log X_{TT} - \log X_{CARICOM}$; $X_t = \log X_{TT} - \log X_{US}$

in equation (2) and e_t, v_{1t} and v_{2t} are normally distributed error terms with zero mean and constant variance. The error terms are also both serially uncorrelated and independent of each other.

[8] In the literature on the Kalman filter, equation (3a) is referred to as the measurement equation and equations (3b) and (3c) as state or transition equations with the coefficients of the latter referred to as state variables. For a discussion of the Kalman filter, see Haldane and Hall (1991); Cuthbertson, Hall and Taylor (1992); Doran and Ramballi (1997).

Unlike the case of Hall, Robertson and Wickens (1992), the estimates of a(t) with the exception of the Bahamian currency, were all non-stationary. Thus, one of the conditions for convergence with the Trinidadian dollar was not satisfied. Figures 1, 2 and 3 below present graphically the results with respect to b(t). Estimates of the coefficients a(t) and b(t) are presented in Table 1 of the Appendix. Figure 1 presents the results for the region as a whole while Figures 2 and 3 present the results for sub-groups within the region, specifically the floaters (Guyana, Jamaica and Suriname) and fixers (Barbados, Belize, Bahamas, Eastern Caribbean)[9].

Figure 1: State Variable Coefficients (b(t)) for the Fixers

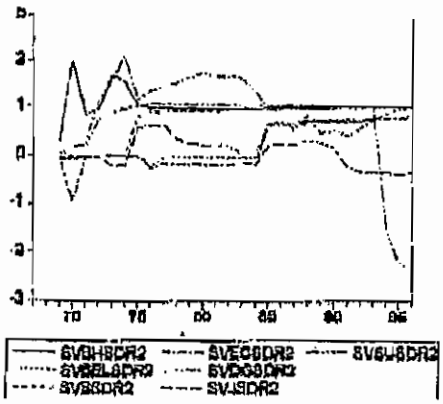


Figure 2: State Variable Coefficients (b(t)) for the Floaters

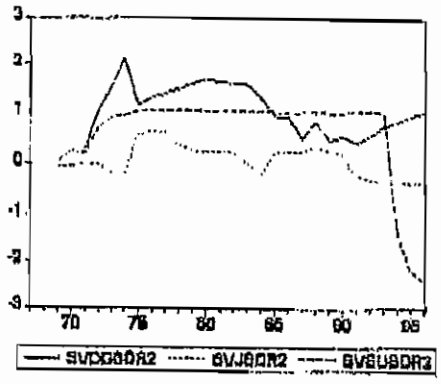
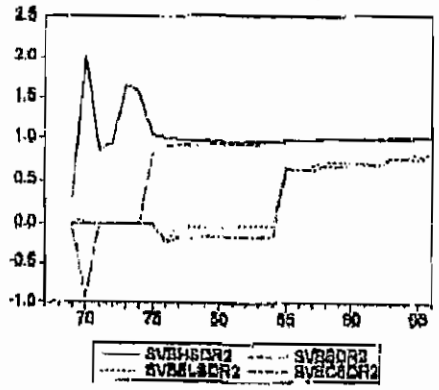


Figure 3: State Variable Coefficients (b(t)) for Fixers



[9] In the case of Guyana, the model was applied to the first difference of the log of the exchange rate since according to the ADF test, the latter is an I(2) variable. The residuals of equation (3a) for all countries with the exception of Guyana and Suriname are stationary. In the case of Guyana, the non-stationarity of the residuals was due to the substantial changes in the exchange rate in the post-1984 period when the process of exchange rate liberalisation was initiated. The substantial variation of the exchange rate towards the end of the period may also explain the non-stationarity of the residuals in the Surinamese case.

The empirical results are very instructive. First of all, they show a clear difference between the fixers and the floaters in the region.[10] Over the period, the relationship between the exchange rates of the fixers and the US dollar seems to have strengthened while the floaters have gone their individual ways. Particularly noticeable in Figure 3 is the intensification of the relationship of the fixers with the US dollar especially since 1985 (Figure 2) as a result of the significant devaluation of the TT dollar. The strengthening of the relationship with the US dollar continued thereafter with the devaluation of the TT dollar by 15.2% in 1988 and subsequent floating in 1993.[11] Given the desire of the regional authorities to include the Trinidadian dollar in the first phase of the monetary integration process, the foregoing results seem problematic.

An analysis based on real exchange rates provides somewhat different conclusions with respect to the convergence issue. The analysis uses real exchange rates for the Bahamas, Barbados, Guyana, Jamaica, Trinidad, Suriname, Dominica, St. Lucia and the US in equation (2).[12] Tests of stationarity indicate that all of the real exchange rates are I(1) variables with the exception of the real exchange rate of the Guyana dollar which is an I(2) variable (See Table 3). Additionally,

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[10] With respect to the legend for the graphs, the prefix "SV" stands for "state variable."After this follow the letters designating the various currencies: B(Barbados); BH(Bahamas);BBL(Belize);EC(Eastern Caribbean); G(Guyana); J(Jamaica); SU(Suriname). The suffix SDR2 is common to all currencies, and indicates that the estimation is done using the exchange rate of the currencies vis-a-vis the SDR.

[11] Of course, the change in b(t) is much more substantial in the case of the Belize and EC dollars than in the case of the Bahamas and Barbados dollars which were already closely aligned with the US dollar after the realignments in 1976.

[12] Real exchange rates were estimated as the product of the nominal SDR exchange rates and the ratio of the index of the export unit values of the industrialized countries to the consumer price index of the individual CARICOM countries. In the case of the US, the index of import unit values replaced the index of export unit values. Because of the lack of data for the entire period, it was necessary to eliminate Belize from this part of the analysis. Additionally, in the case of the OECS countries, a full data set was available only for St. Lucia and Dominica. All data were taken from the IMF Financial Statistics.

as indicated in Table 4, co-integration tests using the Johansen model indicate at least three co-integration vectors.

In all cases, with the exception of the Surinamese exchange rate, a(t) is no-stationary.

Table 3: Stationarity Tests for Real Exchange Rates		
Currencies	**Computed ADF Statistic**	**Computed Perron Statistic[13]**
US Dollar*	-3.51	-2.96
Trinidad Dollar*	-2.89	-3.42
Barbadian Dollar*	-3.85	-2.18
Bahamian Dollar*	-3.54	-3.35
Guyanese Dollar**	-4.64	-2.94
Jamaican Dollar*	-4.38	-3.13
Surinamese Guilder*	-4.02	-9.81
EC Dollar (Dominica)*	-4.04	-3.23
EC Dollar (St. Lucia)*	-3.35	-3.49

The ADF statistic (1%) is -2.65 * Variables are I(1) ** Variable is I(2)

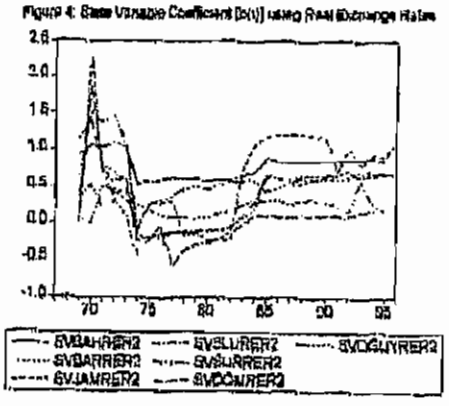
[13] The Perron tests using the same intervention periods as before, largely support the ADF conclusion that the variables are non-stationary, the exception being, as before, the Surinamese guilder. As in the case of the nominal exchange rates, the residuals for the Suriname equation are non-stationary. The residuals in equation (3a) for all the other currencies are stationary. In the case of the Guyana equation, non-stationary residuals were obtained using the first order autoregressive rather than the random walk model for the state equation. The autoregression coefficients for both state equations were statistically significant. For the Guyana equation, the first difference of the log of the exchange rate was used.

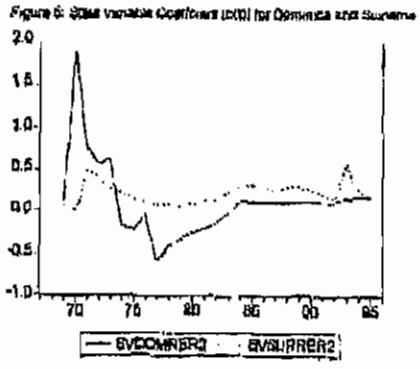
Table 4: Test of the Number of Cointegrating Vectors				
λ Max (Computed)	Trace (Computed)	Ho: r	λ Max*	Trace *
96.73	232.4	0	41.51	117.3
58.85	135.68	1	36.36	89.37
33.43	76.83	2	30.04	64.74
29.98	43.40	3	23.80	43.84
9.13	13.42	4	17.89	26.70
4.10	4.28	5	11.44	13.31

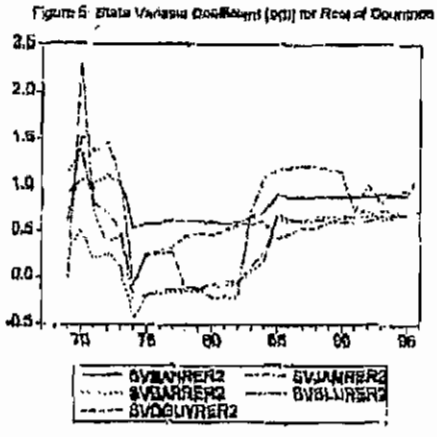
* 5% critical values

The estimates of b(t) are presented graphically in Figure 4. The statistical results are presented in Table 2 in the Appendix. While no clear pattern of convergence is evident, Figure 4 suggests three distinct phases in the relationship of CARICOM currencies with the Trinidad and US dollars: (i) the pre oil-boom period (prior to 1973); (ii) the oil-boom period (1973 to 1984); and (iii) the post oil-boom period (1985 onwards). While in the first period , the estimates of b(t) seem centered around one, indicating a relatively stronger relationship with the US dollar, the second period begins with a sharp general decline in the estimates of b(t) in 1973/74, ushering in a period when the estimates of b(t) are closer to zero, suggesting a temporary strengthening of the relationship with the Trinidad dollar. The Trinidad economy in this period was performing very well and the currency was relatively stable as compared with the US dollar which had devalued with the collapse of Bretton Woods and had entered a period of further decline with the first oil shock. Trade between Trinidad and the rest of CARICOM had risen substantially as compared with the subsequent period which saw a considerable decline in trade between Trinidad and the rest of the region. The third period is marked by a weakening of the

relationship with the Trinidad dollar and a return to a closer relationship with the US dollar. Apart from the end of the oil-boom and the devaluation of the Trinidad dollar, another contributory factor was the process of exchange rate liberalisation initiated notably in Jamaica and Guyana.







The division of the 1967-96 period into three sub-periods is instructive in that it demonstrates the vulnerability of the CARICOM exchange rate regimes to external influences, and underscores the difficulties of the task of monetary convergence. It also shows that perhaps an opportunity for monetary integration was lost during the oil-boom years. In the current international

economic environment with the dismantling of trade preferences, exchange rate liberalisation, increasing international competition and pressure on major export commodities in a number of Caribbean countries, the instability in the performance of the external sector will make monetary integration much more difficult. Additionally, recent experience suggests that hinging the monetary integration process on a single country, and in this case, the price of a single commodity (oil) is short-sighted.

CARICOM has also decided to establish a tier system. However, the question arises as to how many groupings there should be and which countries should be members of those groups. The analysis of nominal exchange rates suggests that an appropriate approach would be to treat the floaters and the fixers separately. Figure 2 also suggests that Jamaica and Trinidad may possibly be in one group, given the fact that b(t) is closest to zero in the Jamaican case. This would join together the two largest economies in the region followed by the fixers (Bahamas, Barbados, Belize and the OECS). The third group would include Guyana and Suriname which, however, may also be treated separately.[14]

The real exchange rate analysis suggests a somewhat different grouping. It suggests that Suriname and possibly the OECS (as suggested by the results for Dominica) may be grouped (See Figure 5) together with Trinidad. However, given the non-stationarity of the residuals once again in the case of Suriname, too much credence cannot be given to that proposition as regards Suriname. More importantly, the analysis refutes the simple categorisation of fixers and floaters

[14]Given the non-stationarity of the residuals in the case of both Suriname and Guyana, it would be incorrect to conclude with any degree of certainty what the appropriate groupings should be, based on the nominal exchange rate analysis.

suggested by the nominal exchange rate analysis. The estimates of b(t) for Guyana, St. Lucia and Bahamas cluster together in the post 1984 period, and the estimates for Jamaica and Barbados seem more closely aligned in the nineties at least until 1995.[15]

The foregoing analysis is interesting in that, depending on whether one uses the nominal or real exchange rate analysis, the groupings can be different, and it does raise the important issue of which approach to the application of the exchange rate criterion should be used. Clearly, in the case of a monetary union it is real rather than nominal exchange rates that are paramount.

Of course, the choice of membership for the various groups would be further complicated by the inclusion of the other criteria (debt service ratio, import cover), begging the question as to whether the sequestering of countries into groups is the best approach. Given the difficulties in the past with the use of country groups, the better approach may be the abolition of categories and the use of the entry criteria as the sole determinant of membership as occurred in the European Monetary Union. In fact, the analysis based on real exchange rates seems to suggest this. This approach would avoid prejudging the membership issue. Some may argue that this approach may lead to the exclusion of some of the largest economies of the region in the initial stage. However, the issue of critical mass is itself controversial, especially given the success of the OECS, the smallest states in the region. In any case, in the context of a monetary union, stability may be much more important than size, especially in the initial stages of implementation.

[15] The analysis using real exchange rates suggests, rather interestingly, that individual OECS countries may be best placed in separate groups.

Clearly the time has come for an intensive rethink of the implementation process in terms of the criteria, overall management, strategy and timing.

F. CONCLUSION

The process towards monetary integration in the Caribbean is in difficulty. Given the openness of Caribbean economies, the root cause, to some extent, lies in the substantial changes that have taken place in the world economy (increasing international competition, loss of preferences, decline in aid flows etc.) in the nineties. The difficulties also reflect the failure to adjust in a timely manner in the face of fundamental disequilibria, a reflection of weak economic management. In such an environment, monetary integration will be difficult, but not impossible, if the process is more effectively managed. This will likely require much more than economic monitoring of individual country performance.

APPENDIX

Table 1: Results for Full Sample Using Nominal Exchange Rates

Country/Region	a(t)	b(t)	R^2	D.W.
Bahamas	0.01(0.2)	0.99(2.0)	0.99	2.06
Barbados	-0.69(1.2)	0.99(2.0)	0.99	2.03
Belize	-0.31(2.4)	0.79(8.1)	0.85	2.00
Eastern Caribbean	-0.56(4.6)	0.76(8.4)	0.89	2.09
Guyana	0.02(0.1)	1.02(6.05)	0.60	2.03
Jamaica*	1.15(0.2)	-0.32(0.1)	0.99	1.89
Suriname	-0.47(0.2)	-2.41(1.7)	0.91	2.11

t statistics are presented in brackets

Table 2: Results for Full Sample Using Real Exchange Rates

Country	a(t)	b(t)	R^2	D.W.
Bahamas	0.21(2.2)	0.87(16.0)	0.99	2.35
Barbados*	-0.22(0.03)	0.68(0.2)	0.99	2.19
Dominica	0.2(1.0)	0.18(1.3)	0.07	2.01
Guyana	-0.06(0.2)	1.10(3.1)	0.28	2.03
Jamaica	-2.08(4.1)	1.12(3.2)	0.32	2.12
St. Lucia*[16]	0.45(0.1)	0.67(0.2)	0.96	2.41
Suriname	0.08(0.08)	0.16(0.24)	0.002	1.59

t statistics are presented in brackets

[16] In the abovementioned cases, the R^2 is high but the t statistics are low, evidence of the presence of multicollinearity. Nevertheless, the estimates of the coefficients are used since they are still BLUE.(See Gujarati(1995), p.325-26).

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