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# THE CASE OF GUYANA AND JAMAICA

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*Abstract*

# Exchange Rate Regimes And Inflation in The Caribbean:
## The Case of Guyana and Jamaica*

by

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High rates of inflation have been a feature of some Caribbean countries, namely Guyana and Jamaica, over the past two decades. Several factors account for these high rates - monetary expansion, exchange rate depreciations/devaluations, increases in world prices and supply shortages. This paper investigates the impact of exchange rate changes on the inflation rates in Guyana and Jamaica. These two countries have implemented structural adjustment programs which have included non-fixed exchange rate regimes with the US dollar. Since these countries have highly open economies, it is expected that changes in the exchange rate would affect domestic prices, wages (via the pass-through effect), domestic liquidity (if there is no sterilisation) and create additional uncertainty in the economic environment. Since exchange rate changes have liquidity effects, the monetary authorities have to be mindful of the inflationary impact of further monetary expansion occasioned by an increase in the fiscal deficit.

The paper begins by examining the theoretical relationships between exchange rate changes and domestic price inflation with special reference to the Caribbean. It then reviews the exchange rate experience of Guyana and Jamaica. Finally, an econometric time series analysis of the inflationary process in these two countries is undertaken.

## INTRODUCTION

Two decades of first generation macroeconomic reforms in English-speaking Caribbean countries have yielded moderate success as varying degrees of stability have been achieved in the region. This stability is reflected, on the whole, in single-digit inflation rates, low interest rates, reasonable external balances and some economic growth. This paper will attempt to extend our understanding by undertaking time-series analyses of Guyana and Jamaica, concentrating on the relationships of the key variables, monetary changes, exchange rates and inflation. While there are other important variables in the analysis of short-term macroeconomic management, these have a central role in the context of small open economies. Among other things, we are interested in the causal interaction among these variables. It is widely accepted that exchange rate change affects inflation, but there is an interesting question of whether the reverse causation occurs and to what extent if it does. One analysis, focusing on the Singapore economy, observes that "changes in domestic prices can lead to exchange rate movements through changes in trade balances and expected inflation" (Heng, 1999, p. 100). Depending on the strength of this feedback from prices to exchange rates, we may have a problem of a vicious circle of succeeding rounds of inflation and depreciation feeding on each other, and this could have important implications for inflation management.

The analysis that we are pursuing in this paper is justified on two further grounds. Firstly, despite some success of stabilization programs in the Caribbean, stability continues to be fragile especially against the background of continuing efforts to stimulate increased economic growth and manifest turbulence in the international economy. Secondly, the empirical evidence has been based mainly on cross-section analysis of large numbers of countries. Although the stabilization experience of Caribbean countries has been subjected to considerable study and scrutiny, relatively few attempts have been made to apply time-series techniques. By carrying out time-series analysis, we hope to take more fully into account the specific circumstances of Caribbean countries and thereby quantify the roles of the relevant variables. It should also be noted that the need for constant vigilance with respect to maintaining stability in the small countries of the Caribbean makes it advisable to keep revisiting empirically the issues, relationships and mechanisms.

The organization of the paper will be as follows. Section I looks at some pertinent aspects of the theoretical and empirical work on stabilization that has been carried out in the Caribbean and elsewhere. Section II presents a brief outline of the main landmarks in the stabilization experience of Guyana and Jamaica since the 1960s. Section III describes the econometric methodology that will be employed, explaining the use of a VAR analysis. Section IV indicates the data that will be used. It should be pointed out here that the period of the empirical analysis is 1960-98 which provides 39 annual data points. Section V presents a summary of the main empirical results. Finally some remarks are made in Section VI on the conclusions of the study and the directions for further work in this area.

## I THEORY AND EVIDENCE

### Caribbean Studies

The evolution of Caribbean studies of macroeconomic management issues since the 1960s has followed a parallel path to the experiences of these countries. In the 1960s, low inflation prevailed and exchange rates were pegged (first to the Pound Sterling and, in the early 1970s, to the US Dollar). Consequently, the focus then was on issues of economic growth and the establishment of indigenous institutional arrangements for managing the systems. When attention was paid to questions of inflation, money supplies or exchange rates, it was usually incidental to other major concerns like wages and productivity, for example (see Brewster 1968, Hall (1968), Bourne 1974, Thomas 1963).

The 1970s ushered in a period of intractable instabilities in some countries, indicated by rising inflation, low economic growth and sizable fiscal and balance-of-payments deficits, and consequently, a lot more attention has been paid to the central issues of macroeconomic stabilization since then (see for example, Bourne 1977, Downes 1985, 1992, Downes et al. 1988, 1991, Syfox 1992, Thomas 1989, 1996, 1999).

These papers have consistently found exchange rates and import prices to be important in determining inflation in Caribbean countries. Wage factors have also been found to play a role

but their impact has been weaker and their significance has varied from place to place. Expected inflation was viewed as having a positive impact on the determination of actual inflation insofar as higher expected inflation would stimulate current expenditure. This approach is somewhat distinct from the current hypothesis, which sees output as a positive function of the difference between actual and expected inflation.

These studies contributed a substantial body of empirical work that informed the understanding of the factors at work. It may be argued that while the role of financial considerations (including monetary and fiscal policies) was acknowledged, this aspect was not focussed upon in terms of trying to quantify its impact and interactions. Consequently, the scope exists for an advancement of our understanding of the causal interactions between the financial variables, the exchange rate and inflation within a quantitative framework. It may also be observed that while a strong role for import prices was observed, the treatment of the foreign impact remains underdeveloped. For example, a number of studies still take the view that Caribbean countries are price-takers in the markets for their imports but not in their export markets (see, for example, Bourne and Persaud 1977). It may be argued that, given the smallness of Caribbean economies, the structure of analysis should incorporate the element of openness and externally induced influences more centrally. This is attempted by Thomas 1989 and 1996 where openness is emphasised by appealing to the law of one price and assuming a direct mechanism for terms of trade and exchange rate impact on inflation.

**Other Studies**

The appropriate theoretical framework for analysis of Caribbean Countries is one of discretionary policy and where monetary surprises can have sustained real effects. Following Kydland and Prescott (1977), this implies that inflation management will remain a significant challenge as a practical matter in Caribbean countries, raising important questions about monetary management and exchange rates. Kydland and Prescott demonstrate that inflation tends to be higher under discretionary monetary policy than under a fixed rule approach. However, in the context of small developing countries such as the ones under study, a fixed rule framework is of purely academic interest since no Caribbean country has been able to implement

it. A further underlying element is the presumption, which is supported by a considerable empirical literature, that exchange rate shocks impact strongly on inflation in open economies (and even in large ones, see Callen and Chang 1999). Consequently, there are some interesting insights on this subject provided by the literature that has emerged on the relationship between openness and inflation.

The typical theoretical mechanisms by which exchange rate shocks impact on inflation may be summarized as follows:

- Directly through the prices of imported consumer goods.
- Indirectly through the prices of imported raw materials and other inputs into production.
- Through changes in the relative prices of foreign and domestic goods which raise (in the case of devaluation) the demand for domestic goods. The ultimate impact of this effect depends on the output response in the domestic sector.
- A cost-push impact via wages: exchange rate changes causing increases in expected inflation which is fed into wage bargains.
- A monetary impact: this depends on whether the monetary authorities engage in sterilization.

A framework within which the three variables, money supply, exchange rate and inflation are considered together deals with the relationship between openness and inflation and attributes the emerging relationship to monetary discipline. A useful point of departure in this regard is Romer (1993) which assumes a framework of discretionary policy where monetary surprises can impact on real output and employment because of non-competitive market features. This analysis incorporates policy-makers incentives to inflate or not inflate in arriving at a relationship between openness and inflation. It argues that, in an open economy, surprise monetary expansion causes the real exchange rate to depreciate and, paradoxically, it is the disincentive of this real depreciation that causes monetary authorities to pursue fiscal and monetary restraint. Consequently, it finds that this disincentive effect is the basis for an inverse relationship between openness and inflation, attributing the relationship to higher monetary discipline the more open the country because of the more inflationary impact of monetary surprises in more open countries.

Greater openness is associated with a higher disincentive to inflate because 1) domestic output expansion caused by monetary expansion causes domestic goods prices to fall and the implied real depreciation is greater, the smaller the size of domestic output relative to the tradable goods sector and, 2) the higher the openness, the greater the inflation caused by monetary expansion: real depreciation implies higher prices for traded goods, so that the higher the openness, the higher the inflationary pressure. Moreover, real depreciation is associated with cost-push factors which aggravate inflationary pressures. These adverse effects of monetary surprises in open economies cause strong disincentives for monetary expansion and consequently an inverse relationship between openness and inflation.

This analysis is tested empirically using a sample of 114 countries (all non-centrally planned) over the period of 1973-1988. Average import shares are used as the measure of openness and average GDP deflators to measure inflation. The empirical analysis finds a significant negative relationship between inflation and openness.

One criticism that can be leveled at this work is that its assumptions seem more suited to large than to typical small, open economies - in particular, the implication of significant market power in international markets[1]. This issue is addressed by Lane (1997) (and Thomas (1989) who assume a model in which tradable and foreign goods are perfect substitutes. Consequently, the prices of tradable output are exogenously determined in foreign markets. The non-tradable goods sector is assumed to face a market-clearing condition with a monopolistic market structure and sticky prices. This analysis yields the prediction of an inverse relationship between openness and inflation in the case of small countries. This prediction is supported by the empirical estimation carried out, with the interesting qualification that the relationship is strengthened when the model is controlled for size. This qualification implies that the relationship is not working just through a term of trade effect.

One drawback to this analysis is that it does not allow for balance-of-payments effects in the form of a changing current account, even though the real and nominal exchange rates change in

[1] Heng, 1999, also implies significant market power which is not consistent with small country status.

the short-term. This is a serious drawback for two reasons: Firstly, it rules out of consideration an important element with respect to the stability condition of a country, especially a small, open economy. Given the vulnerabilities of small states in the international arena, it is reasonable to expect that some attention will be paid to reserve levels as a goal of macroeconomic policy. Besides being a source of concern in its own right, balance of payments changes may transmit inflationary effects. Secondly, to the extent that the inflationary experience of small countries is based on current account effects rather than monetary discipline as the models discussed above suggest, the case for managed exchange-rate regimes, for example, is weakened accordingly (see Fielding and Bleaney 2000).

In contrast to the works cited above, Bleaney (1999) finds that the strong inverse relationship observed in studies of the 1973-88 period has disappeared in a later period, 1989-98. That is, the estimated coefficient of openness is highly reduced and insignificant in the later period. However, per capita GDP emerges as a much more significant factor, with a negative coefficient, in the later period and the strong relationship between inflation and exchange rate regimes is maintained. One explanation advanced for this is the successful disinflation that was achieved by the large industrialized economies during the later period. Bleaney (1999) also found a strong positive correlation between land area and inflation but although he was not able to give a clear explanation, he argued that this factor should not be dismissed. Bleaney makes the judgment that the future can be expected to resemble the 1989-98 period more than the 1973-88 period because of the impact of large commodity price shifts characterizing the earlier period. Moreover, he argues that countries with pegged exchange-rate regime face increased vulnerability to speculative attacks in capital markets as a consequence of globalization.

## II EXPERIENCE

### Jamaica

Prior to the early 1970s, the Jamaican economy enjoyed financial stability with consistently moderate growth and low inflation, within the framework of the *1960 Bank of Jamaica Act*,

which had established the central bank and provided the framework for an independent monetary policy for Jamaica. During this period, Jamaica maintained a fixed parity with the pound sterling, adjusting interest rates as required in order to maintain reserve levels which fluctuated in response to instabilities and policy changes affecting the U.K. currency. In 1973, the Jamaica switched to the alignment of its currency with the US Dollar.

The 1970s witnessed the onset of economic instability in Jamaica, prompted by international instability as the Bretton Woods System crumbled, and by major policy shifts at home. Output growth plummeted, the balance of payments went into sustained deficit and inflation shot up to an average of 22 percent per annum in 1975-80. By 1976, net international reserves were depleted and remained negative until the early 1990s. Given the openness of the economy, shocks invariably impact on its external performance. Without the cushion of net international reserves, this inevitably set up a chain of events culminating in exchange rate and inflationary volatility. Among the shocks, which occurred at the time, could be included international commodity price shocks, capital flight and fiscal deficits fuelled by money creation. The Government's response included the tightening of exchange controls and import restrictions and, from 1977, Jamaica experimented with a variety of exchange rate systems including multiple rate, fixed and crawling peg systems. In addition, the GOJ introduced further monetary control measures but their impact was frustrated by the large fiscal deficits that were being experienced. In these conditions, the exchange rate depreciated steadily and inflation increased (as observed above).

In the 1980s, policy shifted toward import liberalisation, unification of the exchange rate and adoption of an auction mechanism for determining the exchange rate. Economic recovery was stifled by low bauxite/alumina export prices and capital inflows remained weak, resulting in further balance of payments weakness and the accumulation of external debt. In the second half of the 1980s, the exchange rate system was flexible but the exchange rate was maintained at around J$5.50 to US$1 by the management of the central bank and inflation subsided somewhat while output growth improved. In the 1990s, the pace of liberalisation was increased. The exchange rate was floated in 1990, allowing foreign exchange purchases and sales by authorised dealers to determine the rate. Exchange controls were eliminated in 1991 and the Financial

Institutions Act was introduced in 1992 (replacing the Protection of Depositors Act) to strengthen the regulation of near-banks and bring about greater uniformity with the commercial banks. These steps were accompanied by exchange rate depreciation and increased price inflation, which reached a peak of 80 percent in 1991. Monetary policy was tightened in order to combat inflation and has remained tight since then. Some fiscal restraint was exercised and fiscal surpluses were achieved in the early 1990s.

Within this general policy framework, inflation declined steadily reaching single-digit rates by 1997, interest rates rose substantially in both nominal and real terms and reserves built up steadily. However, economic growth was sluggish in the early 1990s and became negative after 1995. Exchange rates have depreciated steadily since 1990, by an average of 42 percent per year up to 1995 and then by 6 percent average between 1996 and 1999. The financial crisis which emerged in 1996 brought a return to high fiscal deficits, and aggravated the problems of high debt service and interest rates.

**Guyana**

Monetary management in Guyana was governed by the Bank of Guyana Act, 1965 and involved a conventional approach and fixed parity with the pound sterling until the mid 1970s. In the early 1970s, the GOG announced a socialist programme and this was to be the main factor driving monetary policy over the ensuing decade and a half. The implementation of this programme involved a massive expansion in the public sector mainly through nationalisation's and the government adopting an expanded presence in education and other activities. Consequently, public sector borrowing from the banking sector expanded from 40 percent in 1970 to nearly 90 percent of total claims in 1986 (see Khan 1997). Production and export performance weakened in the 1970s, following a brief export bonanza due to very favourable sugar prices in 1974-75. The GOG responded to the deteriorating economic performance by expanding its import restrictions, banning a range of imported items, and introducing further exchange control measures.

Against this background, it was clear by the beginning of the 1980s that the economy was facing a severe crisis. This crisis was reflected partly in a foreign exchange crisis in which put pressure on the Guyana Dollar but the parity of G$2.55 to US$1, which had been adopted in 1975, was maintained. With respect to monetary policy, the government absorbed the major part of bank credit and the emphasis was on channelling what was left to productive enterprises by direct measures. Consequently, a black market in foreign currency emerged, posing major problems for monetary and exchange rate management. Piece-meal stabilisation measures were introduced throughout the 1980s but it was not until 1989 that a full *Economic Recovery Programme* was adopted. The main thrust of this programme was to reduce the role of the government by privatisation and thereby curb the fiscal deficit and government borrowing, achieve a unified exchange rate system and improve liquidity management. Between 1981 and 1987, the official exchange rate depreciated from G$3.00 to G$10.00 for US$1 but these rates still represented an overvalued Guyana Dollar relative to the black market values. In 1987, a dual exchange rate system was formalised with the free foreign exchange market rate being set initially at G$20 for US$1. The rate was finally unified and a floating exchange rate regime formally introduced in 1990, and it depreciated to G$140 for US$1 by 1995.

The liberalisation of the exchange rate system has been supported by tighter monetary policy aimed at improved liquidity management. After an initial period of high interest rates which accompanied the introduction of the new policy framework, interest rates have been reduced. Consequently, by 1991, the economy was beginning to experience significant output growth and inflation was relatively stable throughout the 1990s.

## III ECONOMETRIC METHODOLOGY

The basic purpose of this study is to examine the relationship among inflation, exchange rate change and money supply, using the vector auto-regressive methodology. The econometric procedure used is as follows:

1. Pretest the variables for the order of integration (i.e. the stationarity of the variables):

2. Determine if the variables are cointegrated;

3. Undertake the causality testing of the variables, assuming the stationarity of the variables;

4. If the variables are non-stationary in levels and there is cointegration, then use a Vector Error Correction Model (VECM) which is a Vector Autoregression (VAR) in first differences together with a vector cointegrating residnals which is stationary or integrated of order zero (I(0);

5. Undertake innovation accounting:

    (i) impulse response analysis – to trace the effects of a shock to an endogenous variable on the variables in the VAR.

    (ii) Variance decomposition – to decompose the variation in an endogenous variable into the component shocks to the endogenous variables in the VAR.

## IV DATA: ANNUAL 1960 – 1998

1. **Consumer Price Index (CPI)**:

   (i) Jamaica's overall consumer price index, average for the year;

   (ii) Guyana's consumer price index covering Georgetown, average for the year.

2. **Exchange Rate (ER)**:

   (i) Jamaica's market exchange rate (J$ per US$) – average for the year.

   (ii) Guyana's market exchange rate index – average for the year.

3. **Money Supply (MS)**

   (i) Jamaican's end of the period money plus quasi-money.

   (ii) Guyana's end of the period money plus quasi-money.

*Source Of Data*: IMF: International Financial Statistics – Yearbook (1986, 1988, 1994, 1999).

Quarterly data to be used in further analysis.

## V EMPIRICAL RESULTS: EVIEWS PROGRAM

1. Unit Root Tests For Stationarity – Logs of Variables.

(a) Augmented Dickey-Fuller Test (ADF)

(b) Phillips – Perron test (PP).

**JAMAICA:**

CPI ~ I(2) ADF, PP.

ER ~ I(1) ADF, PP

MS ~ I(2) ADF
I(1) PP

**GUYANA:**

CPI ~ I(1) ADF, PP

ER ~ I(2) ADF
I (1) PP

MS ~ I(2) ADF
I(1) PP

2. Test For Cointegration:

**JAMAICA:** Assuming a linear deterministic trend in the data and using lag intervals 1 to 1 and 1 to 2; there is no cointegration in the levels of the variables (CPI, ER and MS). There is one cointegrating equation using the first difference with a trend at the 5 percent significant level.

**GUYANA:** Assuming a linear deterministic trend in the data and using lag intervals 1 to 2; the likelihood Ratio (LR) test indicates ONE (1) cointegrating equation at the 5% significance level (CPI, ER, MS).

3. Causality Testing: Granger

**JAMAICA:** Levels:

CPI → ER *

CPI → MS *

MS → ER **

MS → CPI **

ER → MS **

**FIRST DIFFERENCE:** $\Delta$ ER → $\Delta$ MS ***

**GUYANA:** LEVELS:

CPI → ER *

CPI → MS *

ER → MS *

MS → ER **

**FIRST DIFFERENCE:** $\Delta$ER → $\Delta$MS *

* 5% significance level

** 7% significance level

*** 8% significance level

## 4. VECTOR AUTOREGRESSION AND VECTOR ERROR CORRECTION MODELS. PRELIMINARY RESULTS:

**JAMAICA:**

**VECM:** Inflation affected by changes in market exchanges rate

**NOTE:** Since there is no cointegration in the levels equation then a VAR in first Differences should be used.

Possible sterilization to curb the liquidity effect of the change in the exchange rate (weak $\Delta$ER MS) $\longrightarrow$

## GUYANA:

**VECM:** Inflation affected by:

(i) Change in the exchange rate (t-2) (+)

(ii) Change in the money supply (t-1) (+)

(iii) Past inflation rates: (t-1), (t-2) (+); (-)

Changes in Money Supply affected by:

(i) Exchange rate changes. (confirms Granger causality test).

## VI CONCLUDING REMARKS

Our preliminary results reinfoece the view that changes in the exchange rate have a positive impact on inflation in Jamaica and Guyana. In the case of Guyana, exchange rate changes lead to money supply which in turn had a positive impact on the inflation rate whereas in the Jamaican case, the use of annual data does not show a positive impact of changes in the money supply on inflation, although there is some causal relationship leading from changes in the exchange rate to changes in the money supply.

The results of this paper require further investigation along the following lines.

1. The use of quarterly data,
2. The use of alternative money supply aggregates,
3. The analysis of specific episodes of exchange rate systems
4. Refinement of econometric methods, e.g., the use of intervention analysis to capture the introduction, elimination of dual exchange systems and introduction of cambios.

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