Research Department

Fixed Exchange Rates and Exchange Controls in The Small, Undiversified Open Economy

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Overview

Aside from having to defend a policy of fixed exchange rates that may be considered counter intuitive by external bodies like the IMF, regional policy makers are also constantly called upon to address the objections raised by the users of the fixed rate mechanisms. User objections are usually expressed vis-a-vis displeasure at exchange controls, sometimes in oblivion to links between the controls and the exchange rate. Having regard to this, we solidify the policy makers' defense of exchange controls and by extension the fixed rate regime.

The defense lies in the advancement of a welfare maximizing argument, in which risk averse individuals agree to endure the inconveniences of fixed rate regimes --viewing them as insurance measures against volatile swings in exchange rates-- in order to enjoy stable patterns of real consumption. We examine the common assumptions underlying arguments for flexible exchange rates, which generally presuppose among other factors certain production states, degree of economic diversification and the existence of tradable goods, and show that when elements of these assumptions disappear a flexible exchange rate is not plausible--hence reinforcing the need for a fixed arrangement and the accompanying regulations. We also consider the circumstances under which a system of controls for fixed exchange rates breaks down, necessitating currency devaluations and the adoption of flexible mechanisms; notwithstanding that the latter may otherwise be an inferior policy for some LDCs.

Thus, the suitability of exchange control measures in a small open economy is essentially a weighted discussion on the merits of fixed as opposed to flexible exchange rates. Fixed rates constitute obligations by governments or monetary authorities to convert local currency into foreign currency at set rates. The implicit understanding is that should such currencies not be obtainable through normal banking channels the respective

authorities will source them. In this way external reserves have become necessary as a buffer stock to supplement the flow of foreign exchange, and reserves management a necessary facet to the maintenance of fixed rate regimes. This has lent itself to the introduction of regulatory measures to control currency conversions, which occasionally differ depending on whether the foreign exchange is used for current or capital consumption.

The plan of the paper is as follows. Section I, gives a brief survey of the literature on exchange rate systems, and Section II follows on with a review of the popular regional experiences with exchange rate management. Section III incorporates these experiences into an extended model of welfare maximization under risk and uncertainty solidifying the case for fixed rates in Caribbean economies. In reconciling the model's results with the experiences of Jamaica and other countries, which have resorted to the market mechanism, we note that the route taken by these economies stemmed principally from structural imbalances which are not going to disappear simply because of flexible rates. Rather, improved balance of payments and growth prospects will depend upon long run restraint in monetary and fiscal policies.

Section I -- A Survey of the Literature.

Whether fixed or flexible exchange rates are out rightly suited for any economy depends upon a number of considerations, which encompass the objectives of policy makers, the nature of the shocks frequenting the economy and the economy's structure. In the normative sense, the main objectives of policy should be to maximize the welfare of economic agents by promoting growth in real incomes and stability with respect to output growth and prices.

In view of this, the chosen regime should assist by insulating the economy against destabilizing forces. Along this vein fixed rates are better for dealing with shocks arising from domestic demand and monetary policy (Lipschitz 1978), as domestic absorption may be sustained or increased relative to pre-shock levels vis-a-vis trade deficits financed out of

external reserves or capital inflows. Flexible rates offer better protection against external price shocks and domestic supply disturbances. However, when an economy encounters varied disturbances in both the domestic and external sectors the polar regimes become sub-optimal, yielding to a policy of active intervention through adjustable pegs or managed floating.

Notwithstanding, the theoretical prescriptions must be tempered by the structural assumptions about the underlying economies in question. The degree of openness, capital mobility, labor market rigidities and the level of development in financial markets all govern the insular properties of the exchange rate. For example, under fixed exchange rates, an economy faced with wage and price rigidities in the non-tradable sectors may contract and experience increased unemployment from external price shocks (Flanders & Helpman, 1978; cited in Wickham 1985).

As regard the stability of the exchange rate itself, the existence of efficient and well developed capital markets is vital (Wickham 1985). Given perfect capital mobility, as in the assets market approach, capital markets source the speculative forces necessary to obtain equilibrium rates. Ideally these forces should help to minimize the negative effects of currency movements on the terms of trade, and by extension the uncertainty costs related to exchange rate changes. An important implication of the approach is that whenever financial market development is hindered by regulatory measures, then the removal of such measures are necessary forerunners to the adoption of market determined rates. An added corollary is that exchange rate liberalization in an underdeveloped financial setting exposes an economy to undue instability.

In an open economy the exchange rate should function as an equilibrating force, providing the link between domestic and foreign prices and more so, domestic and foreign policies. Hence the choice between flexible and fixed rates also imply trade-offs in the modes of adjustment between the domestic and international economies. At one extreme, floating rates constantly adjust to account for policy and price differentials, while on the

other hand, fixed rates constrain domestic polices in line with their foreign counterparts. In essence, polices become imported under fixed rates. In spite of this, fixed exchange rates are still common among most developing countries. As will be explored shortly, the choice has been governed partly by issues of uncertainty, in addition to structural features which nullify the insular properties of flexible rates. In instances where countries have decided to float or to devalue their currencies, it has been due primarily to excessive expansionary policies and mounting balance of payments difficulties (as in Wickham, 1985; Connolly and Taylor, 1984; Obstfeld, 1984; Krugman, 1987; and Savastano, 1992).

The prevalence of parallel foreign currency markets and capital flight underscores two channels through which balance of payments crises can escalate. As the crises deepen more of an economy's foreign exchange resources may be diverted to the informal sector; a factor which becomes critical when an economy is faced with heavy debt servicing obligations. Thus, one positive result of the flexible mechanism is the ability to reduce or eliminate parallel market flows (Quirk, et al, 1987). Success in stemming capital flight however rests in fostering confidence in the market mechanism; that is, by pursuing polices conducive to improving the balance of payments outlook.

However, one concern with the market mechanism --particularly that arising from inefficient capital markets -- is how the associated price inflationary uncertainties affect output and employment decisions among firms. Cabellero and Corbo (1989) argue that irrespective of firms' adjustment costs structures[1], the presence of risk averse producers in itself is sufficient to generate retarded rates of investments, employment and output growth. This behavior was found to be significant for a number of developing countries (Chile, Colombia, Peru, Philippines, Thailand, and Turkey). Similar conclusions have also been

[1]In a generalized framework Pyndick (1982) showed that if firms have decreasing marginal costs of adjustments with respect to uncertainty, investment and hence output rates will be retarded. However, Abel (1983) argues that in a Cobb-Douglas framework the rate of investment is increasing in uncertainty, since growth in the capital stock is independent of the shape of adjustment cost functions. Instead, Abel links the rate of capital accumulation to the expected future marginal revenue product of capital, where the latter varies positively with uncertainty.

reached for developed countries, although the effects are considered negligible in terms of the total volume and flow of trade.

As stated earlier, the inconsistencies between excessively expansionary monetary and fiscal policies and the exchange rate has been the main reason why LDCs, when they have done so, have been forced to abandon fixed exchange rates. The abandonment of the fixed rate is most often preceded by persistent balance of payments deficits and depleting external reserves, a pattern which also holds out in the regional cases. Theoretical examination of regime change attributes the abandonment to a collapse of the fixed rate precipitated by the threat of a speculative run on external reserves, as private agents attempt a reordering of their domestic and foreign assets portfolios in anticipation of an impending currency devaluation (Krugman, 1979; Connolly & Taylor, 1984; Obstfeld, 1984). The central bank is forced protect reserves by suspending the official exchange rate in favour of a market determined mechanism.

Under this scenario the monetary authority is said to announce periodic depreciations in the fixed rate, which private agents factor into their demand for domestic monetary assets.[2] Agents then monitor money and credit trends, placing upper limits on their rates of growth in line with the announced rate of depreciation in the currency. Expansionary policies beyond these prescribed levels are therefore viewed as threats to the exchange rate. In Svastano's (1992) model, the explicit link is drawn between regime collapse and fiscal deficits, where agents monitor the deficit financing practices of the government as to credit trends in general. Stability of reserve balance and the exchange rate expectations in the new equilibrium is only attained by increasing either the rate of currency depreciation or through fiscal savings.

In each case the models predict a collapse of the regime, the exact timing of which is accelerated depending on the size of the expected devaluation, the magnitude of the

[2]A constant nominal exchange rate implies that the periodic rate of depreciation in the currency is zero. This zero rate therefore becomes the basis of expectations vis-a-vis the consistency of monetary and fiscal policy.

discrepancy between domestic credit growth and the rate of currency depreciation, and sensitivity on domestic money demand with respect to inflation. Increasing the initial stock of reserves or the length of the expected period of float before a return to the fixed rate both act to delay the timing of the regime's collapse. The results are not altered by imposing constraints on capital movements, rather such constraints would only eliminate or minimize the threat of speculative attacks. Progression to the new equilibrium would be slower, where the financing of persistent trade deficits gradually exhausts reserve balances. Concurrently, one would expect a depreciation in parallel market rates and increased diversion of foreign exchange flows to the parallel sector.

Section II. Caribbean Experience.

Guyana was the first of the regional economies to completely liberalize its foreign exchange market, resorting to a free float of its dollar in February of 1991. In September of the same year, Jamaican markets were liberalized, and more recently in April 1993, Trinidad and Tobago followed suit. Each change over was designed to facilitate critically needed external adjustments, and was carried out under IMF supervision. In all three cases the market realigned currencies have been considerably depreciated relative to pre-liberalized levels.[3]

The IMF would support the liberalization measures, since liberalization is viewed as a stimulus to improved flow and availability of foreign exchange (vital to the growth process) and devaluations as a way to promote export competitiveness. However, devaluations and free floating are at best temporary solutions for Caribbean countries, as the structural imbalances present in these economies extend beyond the concept of mono-export cultures to encompass the challenges posed by the predominance of a single trading partner, the United States. Such factors are foremost in determining the practicality of flexible

[3]Between the end of January 1991 and July 1993 the Guyanese dollar depreciated by 181%; the Jamaican currency by 58% over September 1991 - mid October 1993; and the Trinidad & Tobago currency by 32% over March 1993 - July 1993.

exchange rates. Devaluation and market mechanisms may be optimal in the short-run, but only to the extend that they buy policy makers the extra time need --minus a few distractions-- to address the true causes of external imbalances, credit expansion and inflated domestic demand. As regard the longer term prospects, improved performance will be linked mainly to boosted labour productivity and higher rates of savings.

Thomas (1989) models the devaluation scenario in the context of small Caribbean economies, assuming the absence of non-tradable goods and an economy subject to external terms of trade shocks.[4] The main conclusion reached is that devaluations serve mainly to inflate prices, and may result in declining real wages. The findings are closely linked to the non-tradables assumption, a major departure from traditional IMF models, which allow for the full transmission of external price shocks. The assumption is plausible, given that most non-tradables are viewed as services, which are generally insignificant in relation to total production (see also Witter 1983). Furthermore, despite the importance of construction as a non-tradable, the sector too has traditionally been driven by trade related investments, and by household demand sourced from incomes earned in the export sector.

Concerning competitive gains from devaluation, these are most likely to be tied to adjustments in real wages. However, one setback in this regard, is the fact that declining real wages may also reduce the demand for domestic goods, in turn stagnating production of domestic goods. Obviously, this runs counter to any policy which seeks to improve the trade balance through import substitution. Aside from this, when they occur, real wage effects may be negligible; especially when most wage contracts are indexed for inflationary expectations. As Bennet (1992) observes, in both Jamaica and Guyana real wages have consistently and gradually adjusted to erase the real exchange rate gains which followed from the periodic nominal realignment of the respective currencies.

Blackman (1989) also highlighted the failure of devaluation to correct external

[4]Cozier (1986) also models a small open economy in which exports finance a composite of imported consumption goods. Cyclical variations in output are liked external terms of trade shocks.

payments problems in the region. His observations even raised doubts about polices advocated to remedy overvalued exchange rates, noting that even though some regional currencies may be overvalued the affected countries have still fared better than those opting for the devaluation route. Citing excessive credit polices as the root cause of most difficulties, Blackman underscored the importance of monetary and fiscal restraint. As regard the problem of capital flight, he also emphasized the critical importance of nurturing investor confidence in the economies of the region.[5]

Lumsden (1989) believes that we should distinguish between the long and short run effects of devaluation, implicitly suggesting that regional experiences have been mostly short run. This therefore raises a question of how to reconcile the popularly cited experience of Jamaica which now spans more than two decades. The author hints at this in her reference to gradual versus abrupt changes in the exchange rate parities. To successfully accomplish the former, a country would need to have adequate external resources at its disposal. Otherwise, Lumsden notes that the latter option is the only available course of action; the longer the adjustments are postponed the greater will be the need for deflationary policies later on.

Although trade was a consideration, the early devaluations of the Jamaica dollar in 1967 and 1973 were respectively linked to the devaluation of sterling, and subsequent alignment of the currency with the US dollar (Witter 1983). Thereafter, exchange rate policy became an integral part of IMF/World Bank sponsored structural adjustment programs. The first trial with market determined rates spanned the period 1983 - 1989, when the auction mechanism functioned. The suspension of the mechanism in the 1989-1990 interval stemmed from the authorities desire to temper ongoing devaluations in the dollar. However, amid costly difficulties the market mechanism was reintroduced in mid

[5]Witter (1983) cites Girvan et. al's (1980) study of the early experiences which estimates decline in investments in Jamaica at 20% in 1971 and 62% in 1972. On the issue of public sector credit, McBain (1990) details how central bank polices to manage bank liquidity have served merely to increased flows to the government at the expense of the private sector. In 1998, 29% of all bank loans consisted of Bank of Jamaica and Government Securities; 34% in 1989.

1990, and was followed in 1991 by the lifting of all restrictions on capital movements and a complete float. Despite some volatility during the initial stages of the float, the evidence now suggests that the currency has obtained some measure of stability.

Notwithstanding, exchange rate policies in Jamaica have generally failed to stimulate exports, contain imports or cheapen real wages --particularly during the early stages. As Witter points out, the only visible effects were higher prices and eroded fixed incomes. Exports were primarily influenced by external forces (see Brown, 1981; and Robinson, 1992). During the mid 70's sales of bauxite and alumina products contracted under the combined effects of oil price shocks which inflated processing costs, and rising transportation costs. Significant processing facilities were shifted overseas. In addition there was extreme weakness in the tourism sector.

As regard Guyana, the extensive socialist policies pursued during the 1970's and early '80s fueled foreign divestiture and aggravated balance of payments imbalances. Although declining for the most part, economic activity was generally underpinned by public sector deficit spending, sourced in turn from considerable external borrowing. In the period 1976-1985 government deficits accounted for almost 74% of GDP (Ganja, 1990). Evidence of the decline was seen in the falloff in export earnings, with trade in 1991 some 42% below 1976 levels. The drop in exports was due partly to declining investments, which were affected by import restraints that constrained the supply of investment goods (Ibid.). Furthermore, much of the available foreign exchange was used to service the country's mounting foreign debt. As a fraction of total exports, the debt service ratio rose from 5.3% in 1974 to an average of 21.1% in 1976-1985, and yet higher to an average 28.9% between 1986-1989. The government initiated various structural adjustment initiatives to arrest deteriorating conditions, including periodic devaluation of the exchange rate. However, until 1989 the measures were not considered broad base enough to produce any noticeable turnaround (Danns, 1992). The difference in 1989 was the adoption of an IMF sponsored economic recovery program. In this vein, Guyana completely liberalized its foreign

exchange markets and implemented a market determined exchange rate. Positive results have already been observed, and these are expected to increase over the medium term.

Thomas and Rampersaud (1992) however, question the suitability of the market mechanism for Guyana. In particular, like other regional economies, the country lacks the efficient and developed financial base theorized in the literature of flexible exchange rates. The system has been very unstable, introducing greater risk and uncertainty in the economy and is expect to fuel more speculation, higher inflation, capital flight and currency devaluations. As a result, the researchers foreshadow added servicing costs for the country's massive foreign debt, given the considerable mismatch between the currency composition of the debt and export earnings, whose values are now subject to greater uncertainty vis-a-vis the instability of the local currency.

For a while Trinidad and Tobago--a petroleum based economy--was spared balance of payment difficulties.[6] The upsurge in oil prices in the 1970s and 1980s, which caused significant strain in Guyana and Jamaica, fueled considerable growth in Trinidad. However, with the drastic reduction in oil prices in the mid and latter half of the 1980s fortunes were reversed. The fiscal position and the overall balance of payments deteriorated substantially and net foreign reserves fell rapidly, from over US$2.0 billion in 1983 to a negative US$5.6 million at the end of 1988. Attention was directed at the balance of payments from as early as 1982, when exchange controls on visible exports were tightened and import quotas imposed on non-essential consumer imports. In 1986, under mounting external pressures, the currency was devalued by 33%, followed by a further drop of 15% in 1988. The exchange rate was maintained at this level until the market mechanism came on stream in April 1993.

Thus, it would appear that the sequence of developments in the economies having pursued some form of active exchange rate management has been expansionary monetary and fiscal policies, leading to devaluation vis-a-vis external disequilibrium, and then higher

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[6]For a complete discussion see Theodore (1992) and Victor (1992).

prices following on the devaluations. To put these into perspective, comparative trends are now introduced for the economies surveyed along with those for the more subdued cases of Barbados and The Bahamas. In terms of the susceptibility to external price shocks, all five economies have a high degree of openness. Except for oil producing Trinidad and Tobago, imports have generally averaged 54% or more of GDP over the period 1982-1991, and were increasing on average during the last five years (see Table 1).

An immediate contrast however, is evident from the domestic credit trends plotted in Figures 1A and 1B. Between 1974-1991, the private sectors in Barbados and The Bahamas (not shown), have consistently attracted more than three quarters of the domestic credit resources; albeit the shares have fallen modestly in recent years. At the other end of the scale, the public sector in Guyana has attracted over three quarters of the domestic resources on average; average flows to the private have fallen. In the more moderate case of Trinidad and Tobago; the government was a net provider of credit from 1974-1982. Net borrowings emerged in 1983 and continued thereafter. Compared to the pre-1982 phase, net domestic credit to the public sector has averaged in excess of 30% of the total local resources (1986-1989). In Jamaica, the enlarged fraction of public sector net holdings became particularly significant over 1977-1986, averaging above 50%. Afterwards the share contracted; by 1990 the sector's balances were negative as the government endeavored to effect positive net domestic savings.

The price and inflationary experiences summarized in Table 2, underscore the significant and almost singular influence of external forces. Both foreign prices and exchange rate movements have impacted upon the domestic price levels in the economies represented, with exchange rate responsiveness greatest in Jamaica. On the inflation front the exchange rate effects mattered only for Jamaica and Guyana, underscoring the more active nature of currency management relative to the other economies. The lack of a significant relationship for Trinidad and Tobago is perhaps more indicative of the shortened period of crises management compared to Jamaica and Guyana.

Section II

Clearly the failure of most fixed and adjustable peg regimes stem from a lack of "financial discipline" (Agheveli et al, 1991). Free floating however, is accompanied by uncertainty, credibility problems and the potential for instability because of excessive speculations. The implicit conclusion therefore, is that Caribbean states are in general better off by maintaining fixed exchange rates. We develop a model in further support of this view, based upon assumptions of risk averse welfare maximizing agents operating in an uncertain environment.

By starting in a world of flexible exchange rates and introducing uncertainty along with the possibility of insurance through a risk free asset, it can be shown that with the attainment of complete insurance over all future states, the economy attains an equilibrium similar to that of the fixed regime. In the fixed rate system external reserves insure against uncertainty. Risk aversion implies that economic agents will always be willing to forego some level of income in order to avoid the uncertainty surrounding exchange rates and prices. This can be modeled in one of two ways: flexible rates with an insurance contract, or fixed rates with foregone consumption or saving vis-a-vis external reserves equivalent to the insurance premium under the former case.

Assume a small open economy operating under flexible exchange rates. The economy produces a single export good, taking the world price as given, and uses the proceeds to finance imports of a consumption good as in Thomas (1989) and Cozier (1986). The absence of non-tradables is used to simplify the pass through effects of foreign prices. Non-tradables in the Caribbean sense however do not alter the results because of their high import content. There are three sectors: workers, producers and the government, where both workers and producers are risk averse. Furthermore, the supply of labor inputs to the productive sector is limited. Thus even if export demand is not fully elastic (as in tourism) the feasible benefits derivable from real exchange rate and terms of trade movements are limited; that is, at some point along the short run supply curve output becomes completely

inelastic.

Risk aversion implies that the worker maximizes a discounted stream of expected utility from consumption. The value of consumption in each period must equate with income earned in the current period plus last period's savings, less savings in the current period. Savings in each period comprises domestic money balances. Formally the decision problem reduces to

$$\text{(1)} \qquad \text{Max } E_0 \int \beta^t U_t(C_t^f)$$

subject to the budget constraint

$$\text{(2)} \qquad P_t C_t^f = (1-s)\left[(1-\tau)W_{t-1}L_t + M_{t-1}\right]$$

$$P_t = e_t P_t^f$$

where the subscript t denotes the relevant period, C_t^f is consumption of the imported good, W_{t-1} the wage rate negotiated one period in advance, L units of labour worked and M_{t-1} last period savings in domestic money. P_t, which represents the domestic price of the imported good is the foreign price P_t^f, multiplied by the exchange rate e, and τ is the rate of taxation.

The producer also maximizes a discounted stream of expected utility, subject to a budget constraint consisting of profits net of investments. That is

$$\text{(3)} \qquad P_t C_t^f = \Pi_t = (1-\tau)\left[P_t^x X_t - W_{t-1}L_t - I_t\right]$$

$$X_t = X(K_t, L_t)$$

where X is production of the exported good or service, I is producer savings or investment, and P^X the price of exportables given as the world price multiplied by the exchange rate, and K the existing capital stock.

At the start of each period the worker and producer negotiate the contract wage. At this point the firm also commits to employment and output decisions. However, neither producer nor worker knows how much of the foreign good they will be able to consume since their relevant budget constraint is the value of their real resources, which depends upon both the exchange rate and foreign prices. Hence all decisions are made in

anticipation of what the next period's prices will be. Expectations are governed by past experiences and the existing state of monetary and fiscal policy. To simplify, assume that both the producer and agent form similar expectations about the path of the exchange rate. The contract wage will be chosen in such a way as to prevent a deterioration in real resources, that is to offset exchange rate and terms of trade effects.

The government consumes G amount of the imported good by imposing a tax on income and through printing money. The government also acts as an intermediary in the foreign exchange market, buying export proceeds and making them available to finance imports of consumer and investment goods. In this way domestic money fulfills a transaction purpose and is also a store of value for savers. The budget constraint therefore becomes

$$G_t - T_t = M_t - M_{t-1} \tag{4}$$

External reserves factor into the model through the money supply identity: the change in the money supply must be equal to the changes in money demand and international reserves. That is

$$dM_t^s - dM_t^d = dIR_t. \tag{5}$$

In the absence of a balance budget the deficit must be financed from workers savings, otherwise the excess money creation results in domestic inflation vis-a-vis the impact upon the nominal exchange rate.

The only effect of money in this economy is prices. All consumption is externally sourced, and is determined by foreign exchange earnings and exports. The setting of the wage rate is also linked to external factors, notably the foreign price of imports. Hence an increase in the money supply beyond the rate of change in export earnings has no real effects; it only causes a bidding up of the price of foreign exchange or alternatively a depreciation in the exchange rate.

In this model the uncertainty with respect to real spending resources of agents stems from three sources: monetary/fiscal policy (and the exchange rate), export prices and

import prices. While the policy component of uncertainty may be eliminated as in the Canzoneri (1985) model, the uncertainty in external prices will persist as they are beyond domestic influence.

Under these conditions the risk averse agent's utility from real resources may be depicted graphically like in Figure 2. Given fluctuations in domestic prices which arise from the exchange rate and foreign prices, real income may fall anywhere between Y_L and Y_H, inclusive, where the probability that resources will be realized at any level depends upon the probabilities governing the distribution of the future exchange rate and external prices. The simplest case to analyze is when Y assumes either Y_L or Y_H with relevant probabilities summing to one. Then the expected utility will lie somewhere on the locus of the line AB at point like C corresponding to an expected real resource constraint of EY.[7]

With expected utility maximized at C, it is also obvious that point E to the left of C obtains the same level of utility, but under risk free conditions. E corresponds to utility maximization from a certain stream of real resources Y*. At this point the agent is therefore indifferent between having resources Y* with certainty, and average resources of EY under risky conditions. Alternatively, the agent is willing to forego F amount of resources equal to EY-Y* if it means being able to avoid the price uncertainties. F is commonly known as the risk premium.

Another feature of the risk averse behavior is that the risk premium is increasing in the level of uncertainty. Greater (less) uncertainty shifts the line AB below(above) its present position, which holding expected income constant, increases the spread between EY and Y*.

If agents are now allowed to obtain insurance against the erratic shifts in real resources (which may be externally sourced if need be), they would buy the coverage provided that the cost of such does not exceed the risk premium.[8] An alternative view of the insurance is

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[7]That C lies below the utility curve U(Y) is a result of risk aversion (or the concavity of the utility function), requiring that the expected utility, EU(Y), be less than or equal to the utility from the expected value, U(EY) at D.

[8]This is equivalent to the condition that $F \leq EY-Y^*$. Once this inequality is violated that agent can always do

as a tax on resources which funds a pool of reserves denominated in foreign currency. If real resources fall below some guaranteed level (like Y* in Figure 2) then consumption would be supplemented from the pool of insured funds; otherwise, the fund carries over to the next period, and the agents pay for continued coverage. The size of the insurance pool and hence premiums will vary positively with the level of uncertainty.

In this economy, there is essentially no difference between the fixed and flexible exchange rate regime. Assuming that there are administrative and distortionary costs linked to maintaining the fixed regime, one of which could possibly be a overvalued exchange rate and in turn the need for foreign exchange rationing, these would represent disutilities the maximizing agent equate with the risk premium. Once they exceed the risk premium, the fixed system becomes sub-optimal, and collapses to the flexible regime. Alternatively a depreciation becomes necessary to restore the equilibrium. The excessive cost of the insurance scheme is inferred from the conditions already cited in the literature, along with others such as the excessively burdensome nature of exchange control administration.

Today's investor can choose from numerous foreign currency instruments; portfolio diversification, options and forward contract are just a few of these. However, these are costly and generally beyond the reach of the small investor or individual consumer. Thus firms and investors in the small Caribbean type open economies are precluded from using these markets. Their optimal arrangement is likely to involve some form of risk pooling. Even still, it is inconceivable that exchange rate risks will be completely diversifiable. An added impediment is the oilgopolistic nature of financial markets which in themselves are prone to produce less than efficient outcomes for flexible exchange rates.

For these reasons the fixed exchange rate regime provides a better form of insurance, and at reduced cost for the small island state. The mechanism acknowledges the structural realities of Caribbean economies, and the skewed trading relationship with the United

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better by canceling the insurance, since now U(Y*) becomes strictly less than EU(Y).

States. It is also conceivable that the mechanism acts as a better check against destabilizing domestic polices. The lack of efficient market forces is sufficient reason to impose controls on capital movements under the fixed regime. Added to this is the importance of foreign resources vital to the development process vis-a-vis investments in the productive infrastructure.

There is still some work to be done on the model however; particularly a formal derivation of the equilibrium conditions. In addition one would wish to be in a position to characterize and compare employment and output conditions relative to risky conditions with no insurance. It is expected that the inability to insure against risks will impact negatively upon private rates of savings and investments, in turn reducing equilibrium growth and employment rates.

IV Conclusions

In the absence of significant long run changes in the structures of our economies, fixed exchange rates supported by appropriate monetary and fiscal policies will always be more conducive to welfare maximization. Added to the structural impediments already present, are the elements of increased risks and price uncertainties which emerge when flexible exchange rates are introduced. This is not to say that such uncertainties completely disappear under fixed rates, albeit, they are significantly reduced. Arguably, an interventionist exchange rate policy can foster an equivalent measure of stability in a flexible environment as can be obtained under fixed exchange rates. However, the practice would be extremely costly, and quite beyond the reach regional central banks --as the daily experiences of central banks in the G7 industrial countries clearly illustrate.

Appendix

Modeling Prices and Inflation

In the econometric exercise the domestic price level has been specified as a function of the foreign price level and the exchange rate:

(A1) $$P_t = f(P_t^f, e_t) \quad f_1, f_2 > 0$$

where P_t is the domestic price level at time t, P_t^f the foreign price level, and e_t the exchange rate. The model was estimated in log-linear form incorporating a lagged adjustment structure for short run price changes. That is

(A2) $$p_t = \alpha + \alpha_1 p_t^f + \alpha_2 e_t + \alpha_3 p_{t-1} + u_t$$

where all the variables are expressed in logs form and u_t is the error term.

Inflation was estimated based upon the following relationship

(A3) $$\pi_t = \dot{p}_t = \alpha + \alpha_1 \dot{p}_t^f + \alpha_2 \dot{e}_t + \alpha_3 \dot{p}_{t-1} + \varepsilon_t.$$

The dot over the variables indicates changes in the log of the relevant variables, π_t the inflation rate and ε_t the error term.

All data was sourced from the IMF International Financial Statistics Year Book. Foreign prices are proxied by US consumer prices, and the exchange rate by the value of the domestic currency in per unit of Special Drawing Rights (SDR). Use of US prices is justified from the predominance of Caricom trading with the US. Aside from incorporating domestic policies, use of the SDR rate for the exchange rate helps to capture price effects originating in other external economies. These are significant to the extent that fluctuations in the US$/SDR rate reflects divergent policy stances between the US and the major international economies. This variable is therefore meaningful for fixed regime economies like The Bahamas and Barbados to the degree that trade is not conducted exclusively with the US.

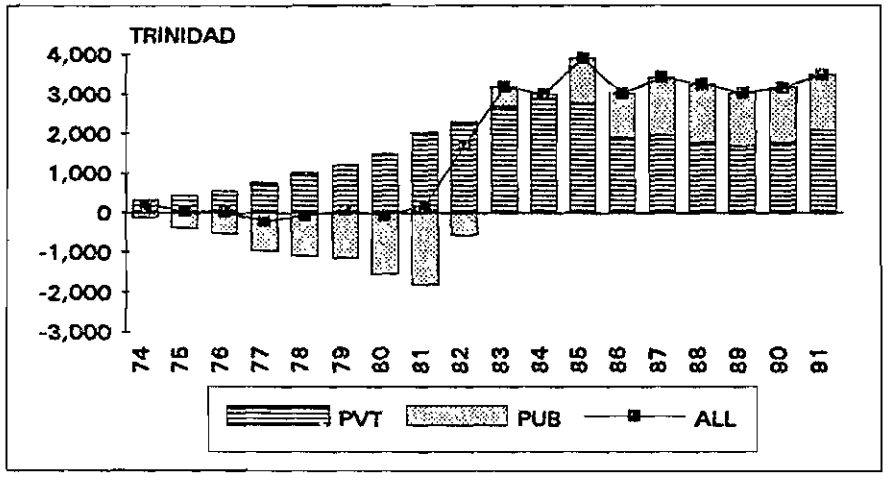
Table 1
Average Imports to GDP Ratios
(Percent)

		82-86	86-91	82-91
Jamaica	All Items	55.5	57.0	56.3
	Non-oil	41.9	48.4	45.1
Trinidad	All Items	36.7	32.7	34.7
	Non-oil	33.8	30.0	31.9
Barbados	All Items	63.8	51.9	57.8
	Non-oil	56.6	47.1	51.9
Guyana	All Items	60.2	72.6	66.4
	Non-oil	48.7	57.4	53.0
Bahamas*	All Items	52.1	56.3	54.2
	Non-oil	41.5	51.0	46.3

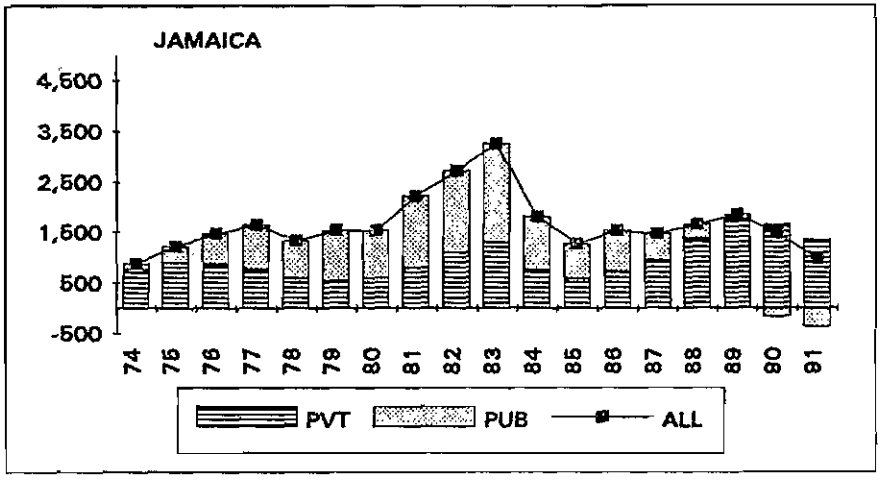
Source:
IMF International Fin. Statistics Year Book
*Bahamas Department of Statistics

Figure 1A

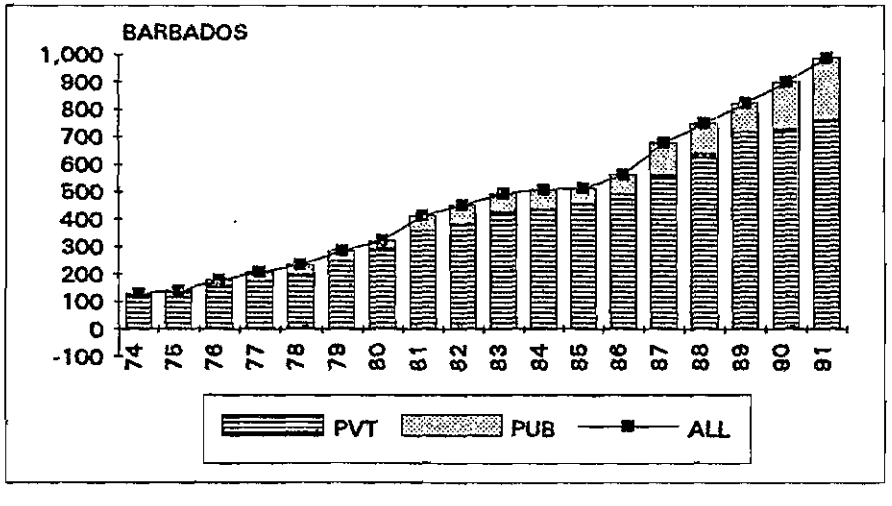
DOMESTIC CREDIT TRENDS (NOMINAL VALUES IN US$ MILLION)



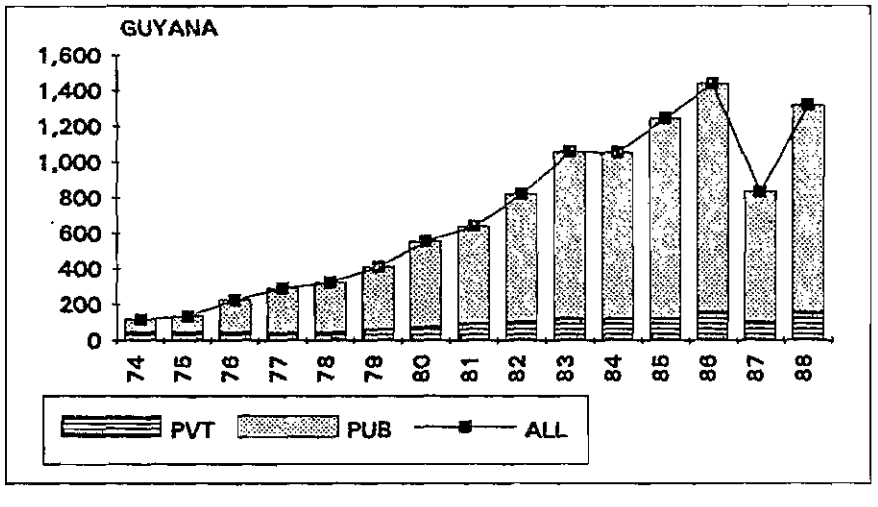
Excludes Non Bank Fin. Intermediaries



Banking Survey



Banking Survey

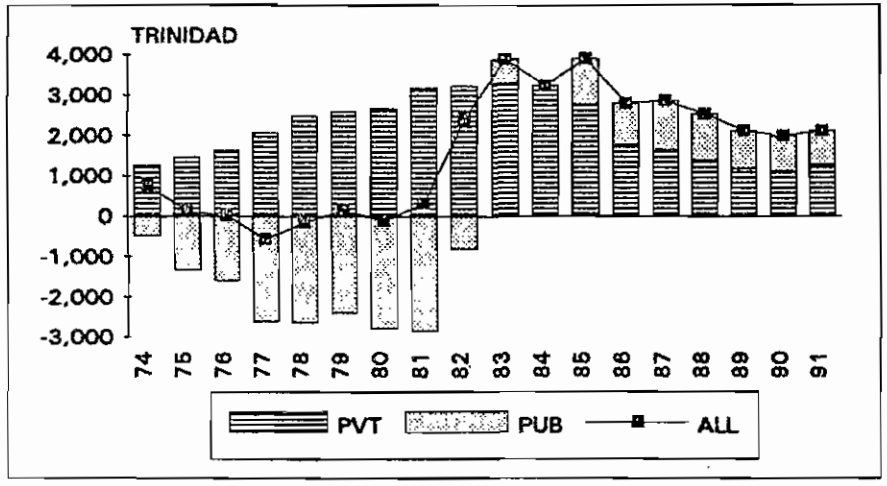


Monetary Survey

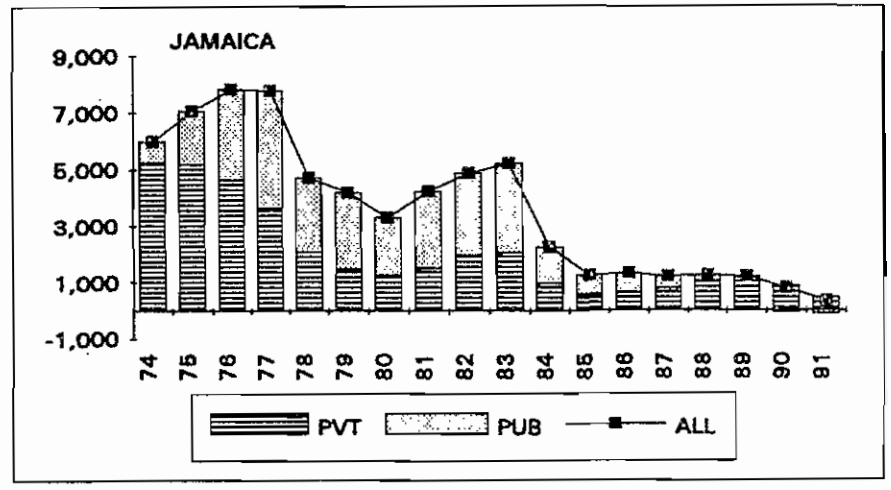
Source: IMF IFS Year Book

Figure 1B

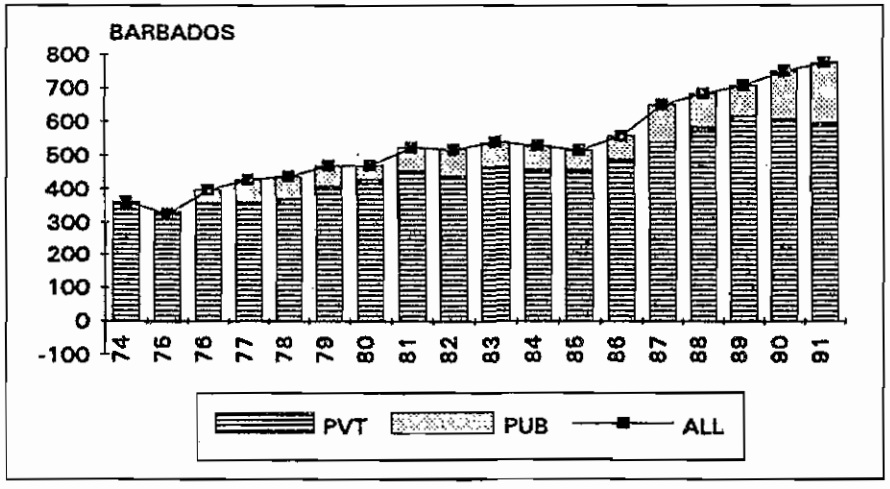
DOMESTIC CREDIT TRENDS (REAL VALUES IN US$ MILLION: 1985=100)



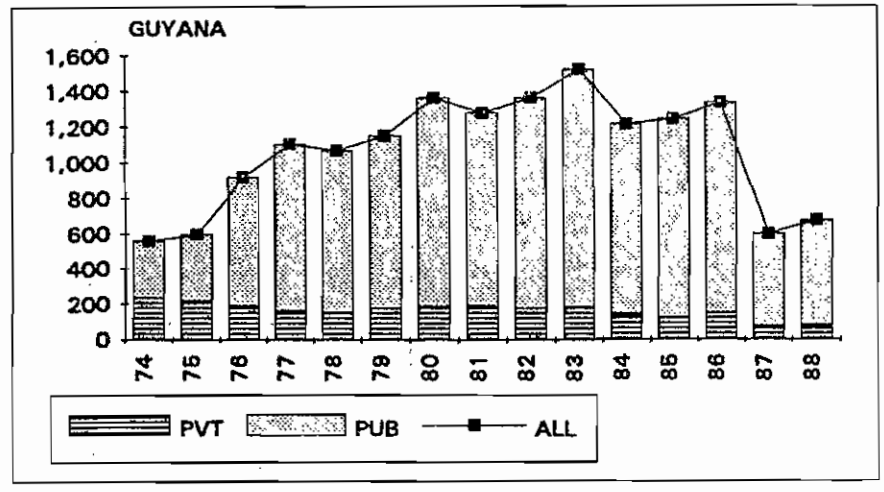
Excludes Non Bank Fin. Intermediaries



Banking Survey



Banking Survey



Monetary Survey

Source: IMF IFS Year Book

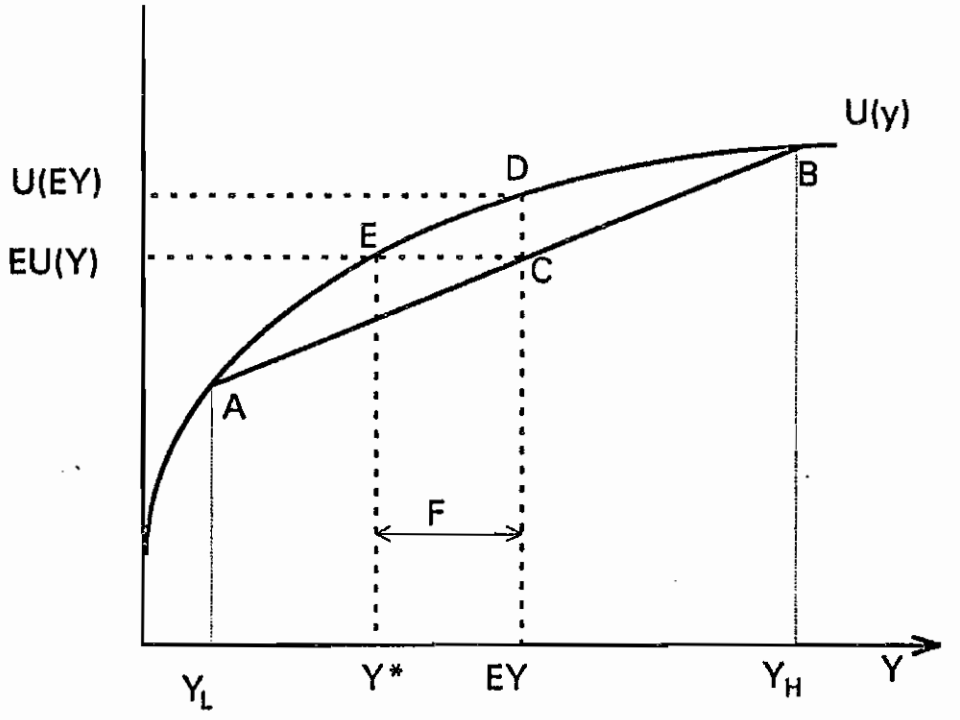
Table 2
Domestic Prices and Inflation
(Econometric Estimates)

Price Level:	Const.	Lagged Prices	Ext. Prices	Exchange Rate	Rho	Adj-Rsq	F-Score	Durbin h-Test	Durbin m-Test	Chow Test
										2.25
Bahamas (69-92)	0.127	0.591	0.386	0.152		0.999	6669.5	1.530	---	
	(3.60)	*(7.76)*	*(4.97)*	*(4.17)*						
Trinidad (64-92))	-1.263	0.590	0.676	0.076	0.475	0.999	3151.1	---	0.16	2.26
	(4.11)	*(6.26)*	*(4.40)*	*(1.77)**					*(0.79)*	
Jamaica (64-91)	-2.364	0.280	1.123	0.359	0.578	0.999	1808.6	0.890	---	1.49
	(4.11)	*(2.51)*	*(5.14)*	*(8.25)*						
Barbados (68-92)	-1.051	0.357	0.855	0.104	0.821	0.996	55.1	---	0.26	1.50
	(1.54)	*(1.39)*	*(2.74)*	*(0.70)*					*(1.09)*	
Guyana (63-88)	-0.380	0.930	0.148	0.117		0.998	3753.7	0.762	---	1.52
	(3.18)	*(21.07)*	*(2.60)*	*(3.40)*						

Inflation	Const.	Lagged Infl.	US Infl.	Exch Rate Change						
Bahamas (70-92)	0.010	0.174	0.689	0.077		0.634	13.7	0.358	---	0.54
	(0.94)	*(1.13)*	*(5.32)*	*(1.21)*						
Trinidad (65-92))	0.045	-0.151	1.137	0.039	0.681	0.632	3.8	1.012	---	1.93
	(1.52)	*(0.64)*	*(3.18)*	*(0.78)*						
Jamaica (65-91)	-0.006	0.285	1.243	0.359	-0.276	0.810	53.2	1.213	---	0.98
	(0.40)	*(2.45)*	*(3.83)*	*(8.75)*						
Barbados (69-92)	-0.016	-0.026	1.856	0.000	0.581	0.610	5.8	---	0.44	1.81
	(0.44)	*(0.11)*	*(3.82)*	*(0.002)*					*(1.32)*	
Guyana (64-88)	-0.011	0.823	0.452	0.192		0.690	18.8	0.404	---	0.97
	(0.47)	*(5.96)*	*(1.33)*	*(3.57)*						

Absolute T-Score bracketed ()
*Significance at the 10% level

Figure 2:
Individual Utility and Risk Aversion



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