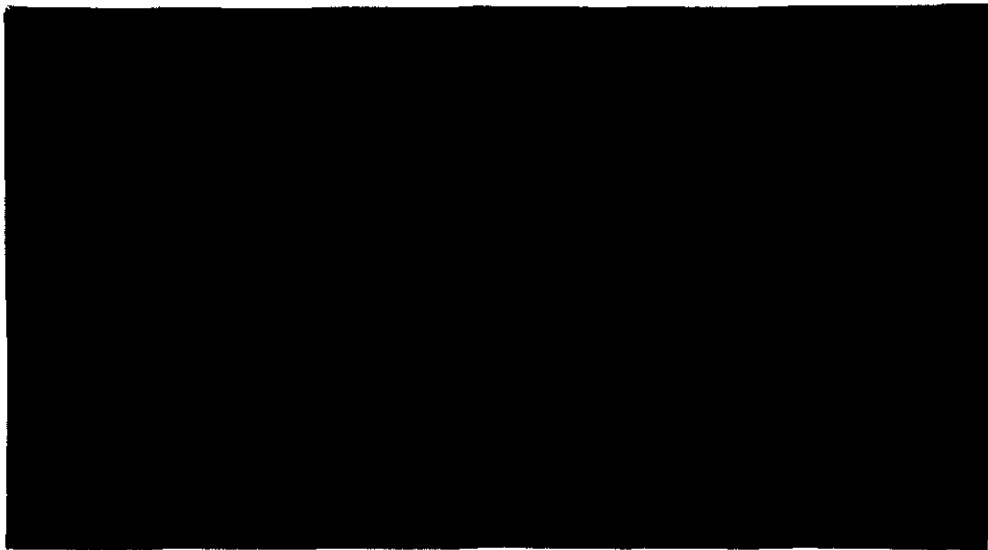




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**THE APPROPRIATENESS OF MONETARY
INSTRUMENTS EMPLOYED BY
CARIBBEAN CENTRAL BANKS –
A PRELIMINARY INVESTIGATION**

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The Appropriateness of Monetary Instruments Employed by Caribbean Central Banks - A Preliminary Investigation

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Abstract

In an effort to manage liquidity, the Central Banks in the Caribbean countries with floating exchange rates have been seeking to make a transition from direct controls, towards the use of indirect instruments. This study investigates the effectiveness of the use of such monetary instruments in influencing operating policy targets in the 1990s. Moreover, the study examines whether there is a conflict between monetary policy employed and the goal of financial stability. As part of the empirical analysis, estimation is done by using panel data conditioned on financial information emanating from commercial banks in Guyana, Jamaica and Trinidad and Tobago, as well as monetary information pertaining to these countries. A fixed effects, generalised least squares model is the preferred estimation technique employed.

1.0 Introduction

From the onset, efforts by central banks in the Caribbean to achieve stabilisation was largely directed at managing liquidity in the banking system, since it was feared that persistently high and excessive levels of liquidity would have adverse macroeconomic and balance of payments consequences. In theory, high liquidity can undermine the sustainability of economic growth since it can fuel inflationary pressures, induce capital outflows and put pressure on the exchange rate to depreciate.¹ The primary challenge to policy makers therefore, has been to find instruments capable of mopping up excess liquidity, while maintaining financial stability.

To undertake the task of liquidity management, instruments were copied largely from the Bank of

¹ In an econometric study by Birchwood (2000), he found that liquidity movements conveyed short-term information on interest rates and commodity prices in Guyana and Jamaica. However, he did not find convincing evidence that it impacted on exchange rate movements in the short-term.

England model for use as tools for liquidity management (Thomas (1972)). However, from since their inception, the effectiveness of these instruments with respect to liquidity management has been challenged by fiscal deficits and the consequent monetising of debt (See for example, Forde (1998) and Ramsaran (1995)). In addition, the ability of the monetary authorities to control liquidity through the monetary base is made more difficult by the openness of the economy to capital flows and external trade (See Ramsaran 1988). Monetisation of external capital surpluses into local currency for example, can potentially undermined the control of central banks over reserves. Bisignano (1996) also observed, that capital mobility and market integration further frustrates the task of monetary management. Worrell (1996) argued that available instruments are virtually impotent in their ability to absorb liquidity in the face of persistent and severe fiscal deficits.

The study investigates whether the instruments used for the conduct of monetary policy have been effective in absorbing liquidity and whether there have been negative implications for the stability of the financial sector, resulting from the use of these instruments. It utilises panel data consisting of 13 banks located in Guyana, Jamaica and Trinidad and Tobago. The sample is drawn for the period 1990 to 1996. The countries on which the study is focussed, are in the process of making a transition to the use of indirect instruments inclusive of open market operations, to mop up excess liquidity within the banking system.

In the following Section, Section 2.0, the transition from the use of direct instruments to indirect instruments through open market operations in these countries is highlighted. This is followed in Section 3.0, by a brief discussion of some of the implications for financial stability that are associated with the use of these instruments. Aspects of the macro-economic environments against which the analysis is conducted, are examined in Section 4. The methodological aspects of the study are highlighted in Section 5 followed by an outline of the empirical findings in Section 6. The study is then concluded in Section 7.

2.0 The Use of Monetary Instruments

The systems of monetary programming employed by the central banks in Guyana, Jamaica and

Trinidad and Tobago, have been outlined by Forde (1998), Ganga (1997) and Robinson (1999). Influenced by the International Financial Institutions, these central banks in the region have been attempting to make a transition from the use of direct to indirect instruments. The use of indirect instruments provides flexibility and allows central banks to target reserve money, as opposed to the balance sheet of commercial banks when direct instruments are used (See Alexander et al (1995)).² Indirectly, however, they may hope to control the supply of credit or influence interest rates by impacting on the liquidity of the commercial banks. Reserve requirements have been used by banks in the region alongside direct instruments, and they have been regarded as the most successful of instruments used prior to the 1990s (Farrell (1995)).³ Despite its success, there are drawbacks associated with its use. The instrument is not practical for fine-tuning purposes and over-time commercial banks may simply liquidate short-term instruments to generate credit. As such, the instrument lacks flexibility. In addition, the imposition of cash reserve ratios often is seen by banks as a tax on their operations, since they do not receive interest on these costly deposits at the central bank. As such, they may seek to engage in regulatory arbitrage, in the sense that they may simply divert funds to or from the other companies that are not stringently regulated within their group (Seerattan (2000)). To this end, the Bank of Jamaica has been taking steps to bring the required liquidity ratios equal between banks and non-bank financial institutions.

To circumvent such weaknesses, many developing countries have attempted to make a transition to the discretionary use of open market operations for the management of liquidity. However, the transition can be reversed if certain conditions are not met (See Alexander et al (1995)). Worrell (1996) suggests that open market operations may not necessarily be effective in addressing liquidity in the long-term, if it simply involves the transfer from excess cash reserves to excess liquidity. In any event, the transmission is limited as capital markets in many developing countries are

² Direct instruments include interest rate controls and bank by bank credit ceilings, directed lending by central banks. Indirect instruments include, reserve requirements, open market operations and central bank lending or discount operations.

³ This is supported by an empirical study conducted by Watson (1999).

rudimentary compared to advanced industrialised countries. The range of instruments tends to be narrow, containing mainly treasury bills, the market may consist of only a few sellers dealing only in primary issues and the interbank market is often not advanced in its development. Furthermore, large fiscal deficits create a challenge to the use of open market operations by central banks, as the market may not be able to absorb large volumes of securities. Moreover, the transition may be hampered by episodes of macroeconomic instability.

3.0 Externalities Associated with the Use of Instruments

An issue which arises from the monetary stability goal, concerns whether monetary policy may be in conflict with the central bank's objective of achieving financial stability. It has been argued that monetary measures taken by central banks to achieve price stability can in themselves threaten the stability of financial institutions. Guitian (1997) argued for example that there is a bidirectional relationship between a sound banking system and successful monetary management. Monetary authorities require a stable banking system in order to achieve their ultimate goal of price stability, but the pursuit of monetary policy goals may in some way hinder the profitability of banks. As such, he argued that successful monetary programming must also take into account the soundness and stability of banks, if monetary authorities are to maintain confidence, efficient intermediation, and influence ultimate targets by smoothening the transmission process.

The association between the micro aspects, such as bank stability, and broader monetary policy was pointed to by Freidman and Schwartz (1963) with respect to the United States, when the depression occurred between 1929 and 1933. They argued that bank failures which occurred late in the depression, in 1931, appeared to be associated with the tight monetary policy pursued by the Federal Authorities. According to them, the tight monetary policy that was pursued, was associated with a decline in deposits, higher interest rates and the subsequent failure of many commercial banks.

Weaknesses in the internal governance of financial institutions in Jamaica which contributed to financial distress were outlined by Bonnick (1998). McFarlane (1997) and later Stennett et al (1999) argued that to some extent, financial distress exhibited by financial institutions in Jamaica, was

partly attributable to the stabilisation policies which included the imposition of measures aimed at achieving tight liquidity. Banks for example, may have raised interest rates to attract deposits, thereby incurring increases in interest expense. If they attempted to maintain interest rate spreads, loan rates would rise, but their credit risk exposure could also have increased. They argued that the higher interest rates contracted the demand for real estate. As such, the heavy exposure of banks to real estate loans, resulted in a deterioration of their loan portfolio, and it eroded the use of collateral as a second line of defence. Zephirin (1996) further argues that higher interest rates resulting from monetary policy can result in the omission of those projects for which returns were marginal before the increase in interest rates.

Ramkisson (1996) pointed out that it is in the interest of banks to engage in arbitrage or pass on costs to the public in order to evade regulations that impose costs or constrain liquidity. This point is particularly important he argues, as local commercial banks are competing with competitors domiciled overseas who are capable of gaining access to cheaper sources of funds, especially if they face lower reserve requirements in their home country or they are already operating in the host country without the burden of branches. He therefore argued, that burdensome excess liquidity beyond what is needed for prudential concerns may erode the competitiveness of banks.

Williams (1996) conducted an econometric study on the impact of monetary and regulatory measures on the profitability, liquidity and solvency of banks in Barbados, Jamaica and Trinidad and Tobago. Using an error correction model, she found that reserves ratios had a negative impact on profitability in all three markets. She further argued that regulation rather than profitability prospects, restricted entry of foreign banks. As such, she argued that the development of the commercial banking industry may be compromised by monetary policy.

Conflict between the two objectives, monetary policy and financial stability, strengthens the case for separation of supervision from central banking as is done in Germany (See Guittan (1997) and McDonald (1998)). In theory, separation allows the supervisory body to concentrate solely on solvency, without having to look after monetary policy, while the central bank can concentrate its

efforts solely on monetary policy. In practice, however, the need for the close collaboration of the two bodies is undeniable as is the case in Germany, where the Federal Banking Supervisory office (FBSSO) and the Central Bank (Bundesbank) work in close collaboration.

4.0 Differences in Monetary and Demand Conditions in the Three Countries

The environment background upon which monetary policy measures was examined, was enriched by the three countries considered in the study. Through the use of panel data, the investigation can be carried out on monetary policy effects under different and yet similar economic environments which occurred simultaneously. These countries struggled at some stage either during or before the period considered for the study and they resorted to structural and stabilisation adjustment policies (SSAP) espoused by the IMF and the World Bank. As such, SSAP preceded the floatation of their currencies.⁴ However, there are contrasting features in their post SSAP performances. Growth in Guyana recovered from negative figures in the 1980s, to exceed that of the other countries during the period, averaging 7.6 percent per annum and ranging between 5.1 percent and 8.5 percent for the period on which the study is focussed. Trinidad and Tobago recorded negative growth between 1992 and 1993, but the economy rebounded thereafter. Growth in that country averaged 1.6 percent, ranging between negative 2.6 percent and positive 5.1 percent. The Jamaican economy seemed to have stagnated over the period, as it reflected annual growth rates ranging between negative 1.4 percent and positive 1.5 percent. The economy grew at an average of 0.7 percent per annum over the period

In terms of inflation, Jamaica exhibited prolonged but declining high inflation rates over the period, varying between 77 percent and 20 percent. Since then, inflation has been in single digits. Guyana, began with inflation reaching as high as 70 percent in 1991, but it declined rapidly thereafter. Trinidad and Tobago in contrast, was able to maintain relatively low inflation rates.

⁴ Of the three countries considered, Jamaica was the first to have their currency market determined when they took this measure in 1990. They were soon followed by Guyana in 1991 and then by Trinidad and Tobago in 1993.

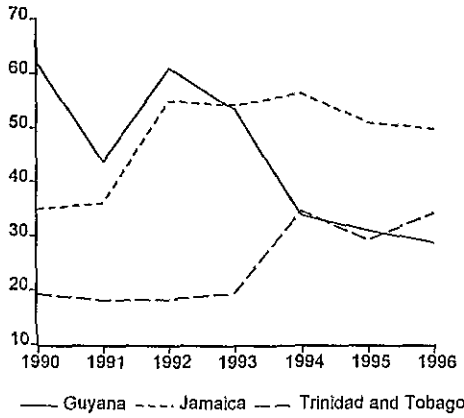
Consistent with the argument advanced by Friedman and Schwartz (1963), the expansion of the banking system amplified economic growth. In terms of domestic currency, the banking systems in Guyana, Jamaica and Trinidad and Tobago expanded by an average of 35 percent, 42 percent and 11 percent per annum respectively, over the period 1990 to 1996. It is surprising, however, that the expansion in bank assets in Jamaica was the highest, since this economy was the most sluggish with respect to growth. Indeed, some association between economic performance and troubled banks seemed to be evident, as nine banks in Jamaica found themselves in financial distress by the end of 1996. Moreover, three of the commercial banks in Trinidad and Tobago had to be restructured in 1993, after two years of consecutive stagnation or negative growth.

In terms of monetary conditions, commercial banks in the three countries exhibited varying degrees of liquidity (See Chart 1). The period is too short to establish a trend, but it appeared that liquidity in all countries rose just after the floatation of the respective currencies, but while it subsequently declined subsequently in Guyana, it lingered in Jamaica and Trinidad and Tobago. Liquidity conditions were much tighter in Trinidad and Tobago as banks in that country held the lowest level of liquid assets with respect to deposits, compared to those in the other two countries. Commercial banks in Guyana held the highest proportion of liquid assets to deposits at the beginning of the 1990s, but the proportion declined, while that of Jamaica rose to take the lead. Ganga (1999) attributed the initial high liquidity in Guyana to low investment demand for credit. This is consistent with the findings of Birchwood and Nicholls (1999) that the proportion of credit in the asset portfolio of banks in these countries tended to reflect investment demand in the long-term. Regulatory liquid asset ratios were used in the case of Guyana and Jamaica. An examination of these ratios suggests that liquidity was much tighter in Jamaica than it was in Guyana, given the higher level of liquidity requirements of the Central Bank in the former country. However, a trend towards tighter liquidity is noticeable in both countries. In terms of reserve ratios, regulated minimum balances were set in Guyana and Trinidad and Tobago, and from the available evidence, excess reserves were tight around the time the currencies were floated.

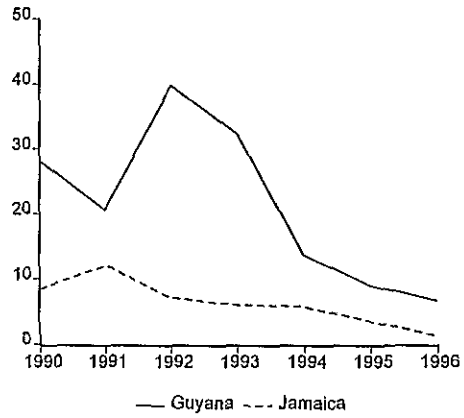
Chart 1

Monetary Indicators in Selected CARICOM Countries: 1990-1996

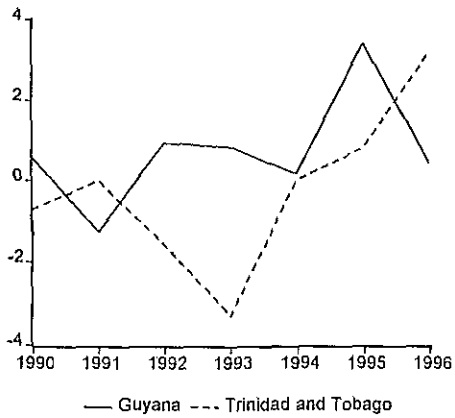
Ratio of Liquid Assets to Broad Deposits



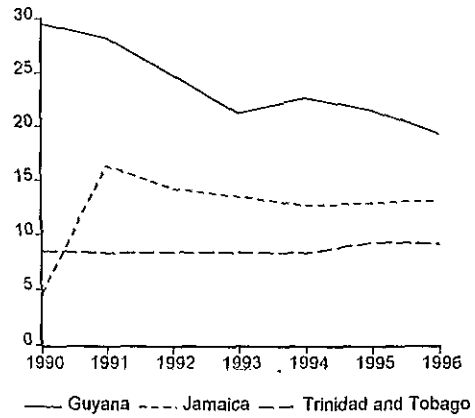
Excess Liquidity as a Percentage of Broad Deposits



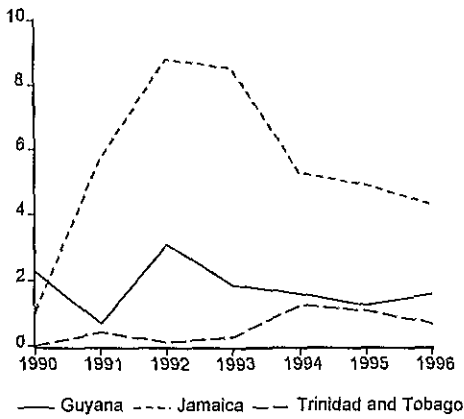
Excess Reserves as a Percentage of Broad Deposits



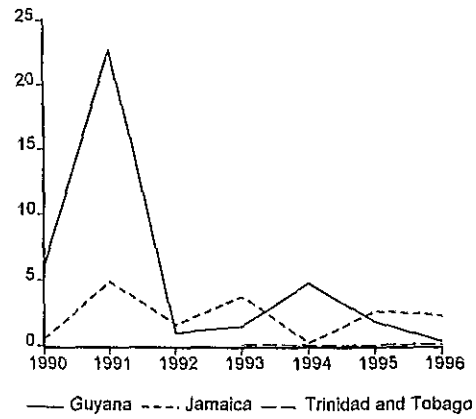
Ratio of Currency to Broad Deposits



Volatility of Treasury Bill Rates



Volatility of Exchange Rates



The highest preference for cash by the public was exhibited by Guyana, perhaps suggesting that there may be fewer substitutes available to the public. Zephirin and Seerattan (1997) observed that financial innovations in Guyana were slow, owing to State domination and restraint in policy actions of the monetary authorities. However, the retreat of the state in the early 1990s and innovative activities on the part of commercial banks and the central bank, resulted in a reduction in the currency to broad deposit ratio. Not surprisingly, the Guyanese banks held the highest level of treasury bills to deposits than the other banks in the region, followed by Jamaica.

Interest rates were highest in Jamaica, perhaps driven up in the main by tight monetary policy and expectations. The Central Bank attempted to restrict net domestic assets in light of increases in the net international reserves and also to counter fiscal injections into troubled financial institutions. Interest rates in Jamaica were the most volatile, over the period.⁵ In contrast, interest rates in Trinidad and Tobago were the lowest and most stable. In Guyana, interest rates were declining during the period, perhaps due to the high level of liquidity prevailing in that country. In terms of exchange rates, rates in Guyana and Jamaica were more volatile than that of Trinidad and Tobago.

5.0 Methodology

The intermediate target of monetary authorities can be thought of in terms of the money supply, credit or the exchange rate. Regardless of the operating target of the monetary authorities, credit remains an important indicator that is used to gauge pressures on the stability of prices in the economy.⁶ Moreover, monetary instruments impact on this variable, which in turn influence the

⁵ Volatility is measured as the monthly standard deviation per annum of the respective variable.

⁶ This is corroborated by Birchwood (2000), where movements in credit was found to convey pro-cyclical information on inflation in Jamaica and Trinidad and Tobago throughout, but counter cyclical information in the case of Guyana. The counter-cyclical relation in Guyana perhaps suggest that increased credit in Guyana would be absorbed by increased output, rather than through price increases.

stability of the financial system. As such, lending by commercial banks is used as a dependent variable in regressions f^1 - f^4 .

For models f^1 - f^4 , the volume of loans in the asset portfolio of commercial banks was postulated to be a function of (1) liquidity absorbed by monetary instruments, interest rates and growth in the demand of the real side of the economy and (2) expectations on the part of commercial banks and investors. Contemporaneous and dynamic relationships were examined for each model. More specifically, hypotheses' f^1 - f^4 were tested using the following relationships:

$$LA_{it} = f^1(RES_{st}, TBD_{st}, TROI_{st}, YG_{st})$$

$$LA_{it} = f^2(RES_{st-1}, TBD_{st-1}, TROI_{st-1}, YG_{st-1})$$

$$LA_{it} = f^3(INF_{st}, TRV_{st}, ERV_{st})$$

$$LA_{it} = f^4(INF_{st-1}, TRV_{st-1}, ERV_{st-1})$$

where,

LA_{it} denotes the volume of gross loans as a ratio of assets of commercial bank i at time t , RES_{st} denotes total cash reserves as a ratio of broad deposits held by banking system in country s in which bank i is operating at time t ; $TROI$ denotes the treasury bill rate, YG denotes growth of nominal GDP at factor prices, INF denotes inflation, TRV denotes the volatility of interest rates, calculated as the standard deviation of monthly interest rates for each year, ERV denotes the volatility of exchange rates calculated as the standard deviation of monthly exchange rates for each year.

The reserves held by banks were hypothesised as impacting upon the proportion of loans in their asset portfolio. Also, the treasury bill rate is included as one of the regressors, as upward movements

in this rate may be indicative of upward pressure on interest rates, thereby potentially dampening the demand for loans. Moreover, higher treasury bill rates may render treasury bills more attractive, thus encouraging banks to substitute treasury bills in place of loans. Economic growth is included as one of the regressors, to control for the buoyancy of the economy. Model f^2 tests the significance of the same variables in relation to loan demand, but this time the exogenous variables in the model are dynamised by the employment of one period lags.

In the models f^3 and f^4 , the demand and supply of bank loans was seen as a function of macro economic stability and confidence in the economy on the part of economic agents. A necessary ingredient for this is the predictability of prices.⁷ Since the economies underwent structural adjustment, lending could have been constrained by instability in the macroeconomy and uncertainty concerning the predictability of prices. As such, inflation, and the volatility of interest rates and the exchange rate are used as explanatory variables.

5.1 Externalities

The externalities arising from the management of liquidity by the Central Banks were investigated, by examining the impact of liquidity and intermediation on the profitability of the commercial banks. The model was formulated as follows:

$$ROE_{it} = f^5(LAS_{it}, LIQ_{st}, OCAS_{it})$$

where,

ROE_{it} denotes profitability measured as net income divided by shareholders equity of bank i at time t , LAS denotes gross loans to assets, LIQ_{st} denotes liquid assets as a percentage of broad deposits held by the banking system in country s in which bank i is operating at time t , and $OCAS$ is used as a crude proxy for operating efficiency of bank i , calculated as operating cost divided by

⁷ This is consistent with the official views of the Jamaican Central Bank (See Stennett et al (1999)).

assets of the bank.

Profitability is used as an indicator of bank stability with respect to their competitiveness.⁸ Profitability helps to buffer banks from short term negative shocks and it allows these institutions to generate higher levels of capital through retain earnings (See Greuning and Bratanovic (1999)). Empirically, the use of profitability as an indicator of stability of the banking system is supported by the findings emanating from Craigwell and Polius (1998) that profitability is one of the important indicators of fragility of the banking system. The intermediation function of banks is proxied by the proportion of loans in the asset portfolio of banks. Given that loans are the highest earning asset of commercial banks in theory, the impact of monetary measures aimed at restricting this variable for monetary purposes, may adversely affect profitability of these institutions. However, bad loans on the part of banks can also erode the profitability associated with the use of this instrument.

It is assumed that central banks would attempt to directly or indirectly manipulate liquidity of commercial banks in pursuit of macroeconomic objectives. Such measures may impact on the stability of the banking sector, however. Hence, liquid assets are used in the model to capture the externalities that may arise from measures taken to absorb liquidity. Finally, owing to the fact that the results of the study may reflect differences in the efficiency of banks, the operating efficiency of individual banks was controlled for.

Data were constructed for the period 1990 to 1996. Country data were obtained from publications of the three Central Banks. Individual commercial bank data were collated from the published annual reports of the respective commercial banks. The sample consisted of thirteen banks, three operating in Guyana, four in Jamaica and six in Trinidad and Tobago. These banks cover a high percentage of assets of the commercial banking industry in the various countries. In the case of Guyana, with the exception of 1991 where coverage amounted to only about 17 percent of total assets, coverage varied between 49 percent and just under 95 percent over the period. For Jamaica, coverage varied

⁸

The measure does not directly capture solvency, however.

between 35 percent and 44 percent, while in Trinidad and Tobago it ranged between 59 percent and 100 percent. However, these estimates are intended only as a guide, as the end of the financial year for the commercial banks does not coincide with the calendar year and the coverage was calculated as a percentage of annual industry assets published by the central bank.

6.0 Estimation Results

The method of estimation employed were generalised least squares with cross sectional weights. This method was chosen as the various central banks are operating in different environments and as a consequence, the variances of the parameters were expected to be heteroskedastic, given the heterogeneous conditions which exist in the three countries used. The White heteroskedastic-consistent standard errors and covariance was used to correct for heteroskedasticity.

Table 1: Results from Fixed Effects Panel Data Estimation using Generalised Least Squares with Cross-sectional Weights

	LAS _t	LAS _t	LAS _t	LAS _t	ROEt
	f ¹	f ²	f ³	f ⁴	f ⁵
RES _t	-0.007***				
TBD _t	-0.001*				
TROI _t	-0.004**				
YG _t	-0.002**				
RES _{t-1}		-0.005***			
TBD _{t-1}		0.004**			
TROI _{t-1}		-0.002			
YG _{t-1}		0.001			
INF _t			-0.001***		
TRV _t			-0.005**		
ERV _t			-0.002		
INF _{t-1}				9.3x10 ⁻⁵	
TRV _{t-1}				0.002	
ERV _{t-1}				-0.006***	
LAS _t					-0.35***
LIQ _t					0.003***
OCAS _t					-3.172
Adj. R ²	0.86	0.81	0.73	0.75	0.87
F-Statistic	1859.5***	3.65x10 ³¹ ***	1200***	7113.3***	243.1***

Notes: *** denote significance at 1 percent, ** denote significance at 5 percent level and * denotes significance at 10 percent level.

All the variables turned out to be significant to the model, f¹. The signs of the cash reserves held at the central bank, the percentage of treasury bills to deposits of the banking system and the treasury bill rate turned out to be negative in its association with credit as expected. The results suggest that the use of reserve ratio, and the auction of treasury bills by the central banks managed to restrict the

volume of bank lending in the short-run. Based on the magnitude of the coefficients, the volume of reserves appeared to have a stronger effect on loans compared to treasury bills. Treasury bills had a dual impact on bank lending in terms of volume and treasury bill rate. Thus, higher volumes of treasury bills bought by banks or increases in the treasury bill rate, appeared to dampen the supply of loans. The negative coefficient obtained with respect to economic growth was surprising. However, the turnaround in Guyana and Trinidad and Tobago to increased growth, may have occurred with banks reacting cautiously in terms of credit expansion, while credit expansion took place in Jamaica despite its economic stagnation, as firms may have become further dependent on bank financing.

In the second regression, f^2 , increases in reserves of commercial banks carried over into the following year in its impact on bank lending. However, increased treasury bill holdings by banks did not appear to lead to increases in bank lending in the following year, no doubt because banks can redeem these instruments in the short term in order to increase their lending. Thus, the results suggest that reserves have a longer term effect on bank lending than treasury bills. The other variables were not significant in the regression.

In terms of stability of the macro economy, the results suggest that macroeconomic instability in terms of inflation and volatility of interest rates, impacted negatively on bank lending. Moreover, exchange rate volatility was found to have a negative and a longer term effect on bank lending than did the impact of other prices. Bank lending may therefore be constrained by uncertainty about prices in the economy.

6.1 Associated Externalities

For this part of the study, the impact of operating targets on the competitiveness of banks was examined. The model (f^3) was a good fit, as evidenced by the adjusted R^2 and F statistic. All the explanatory variables were significant in the model. The control variable, the ratio of operating cost to assets, turned out to be negatively associated with profitability as expected. The results also

showed a negative relationship between lending and profitability. The negative association may not be as surprising as it might first appear. Some of the banks in all three countries used in the sample underwent restructuring owing to the threat of bad loans to their solvency (See for example, Nelson (1995), Polius (1998), Stennett et al (1999) and Bonnic (1998)). On the other hand, the blend of liquid assets held by banks, seemed to have contribute marginally to their increased profitability. The results therefore suggest that banks have an incentive to cut back on their intermediation function of lending, and instead hedge on securities offered by the Central Bank.

7.0 Conclusion

Based on the empirical findings obtained in the study, it appeared to be the case that the instruments used in the exercise of monetary policy had a negative effect on lending on the part of commercial banks in Guyana, Jamaica and Trinidad and Tobago over the period 1990 to 1996. Moreover, cash reserves held in reserves seemed to have had a stronger and longer term effect on reducing idle funds available for lending than did the auctioning of treasury bills. High liquidity levels, accompanied by underdeveloped capital markets, may have weakened the effectiveness of the sale of treasury bills, relative to the imposition of reserves requirements. The results also suggest that uncertainty with respect to prices had the effect of dampening bank lending.

Another issue which arises from such an analysis, concerns the relation between monetary policy and the stability of the banking system. While central banks need a stable banking system for the successful execution of monetary policy, it has been argued that the pursuit of tight monetary policies can threaten the stability of the banking system by impairing the ability of borrowers to repay loans at high interest rates. In addition, it has been argued that tight monetary policy puts banks at a competitive disadvantage relative to their overseas competitors and it acts as a barrier for the entrance of foreign banks.

The empirical evidence emanating from the study suggests that the net effect of the blend of indirect instruments adopted by the central banks in the three countries, were complementary to the profitability of commercial banks, but detrimental to their intermediation function with respect to

the provisioning of funds. However, lending seemed to have had an adverse relationship with profitability of these commercial banks. Perhaps, increased lending accompanied by higher interest rates induced by liquidity tightening, could have increased exposure to default risk, and could have also caused credit rationing. Moreover, the negative relationship between lending and profitability obtained, suggests that banks could have had an incentive to cut back on lending, and instead hedge with investments on securities, as well as seek other forms of business. Thus the evidence is supports those arguments which suggest that monetary tightening can threaten the stability of the banking sector, via the quality of their the loan portfolio.

The possible conflict between monetary policy objectives and the stability of the banking system, does strengthen the argument for an independent but closely aligned supervisory authority out side the structure of the Central Banks. Moreover, given the trend for commercial banks to be part of holding companies that are involved in other business activities, the need for consolidated supervision that cuts across other sectors of the economy becomes evident. As such, Central Banks would one way or the other need to reexamine the configuration of the regulatory infrastructure.

Bibliography

Alexander, Tomas, E., J. T. Balino and Charles Enoch (1995). The Adoption of Indirect Instruments of Monetary Policy, Occasional Paper 126, Washington: International Monetary Fund.

Birchwood, Anthony (2000). *Asset Prices and the Information Content of Monetary Variables Under Floating Exchange Rates: A case Study of Three Small Open Economies*, Social and Economic Studies, forthcoming.

Birchwood, Anthony and Shelton Nicholls (1999). *Credit, Investment and Economic Cycles in the Caribbean* Social and Economic Studies, 48(1&2):91-125.

Bisignano, Joseph (1996). Varieties of Monetary Policy Operating Procedures: Balancing Monetary Objectives with Market Efficiency, Switzerland: Bank for International Settlements.

Bonnic, Gladstone (1998). Storm in a Teacup or Crises in Jamaica's Financial Sector, Caribbean Centre for Monetary Studies, XIV Adlith Brown Memorial Lecture, St. Augustine, Caribbean Centre for Monetary Studies.

Craigwell, Michael and Tracy Polius (1998). *Bank Fragility in the Caribbean* Social and Economic Studies 47(2&3):37-58.

Farrell, Terrence W. (1995). *Issues in Caribbean Central Banking*, in The Experience of Central Banking with Special Reference to the Caribbean, in The Experience of Central Banking with Special Reference to the Caribbean, edited by Ramesh Ramsaran, St. Augustine: Regional Programme of Monetary Studies. 8-24

Forde, Penelope (1998). *Banking in Practice: Some Experiences from Trinidad and Tobago*, Paper presented at the XXX Annual Conference on Monetary Studies, Nassau, October.

Friedman, M, and Schwartz, A. (1963). A Monetary History of the United States, Princeton University Press.

Ganga, Gobin (1999). *Credit, Excess Liquidity and Monetary Policy Issues in Guyana*. Paper presented at the XXXI Annual Conference on Monetary Studies, Paramaribo, October.

Ganga, Gobind (1997). *Stabilisation and Financial Adjustment in Guyana*, Money Affairs 11(2): 147-165.

Greunig, Hennie, Van and Sonja Brajovic Bratanovic (1999). Analyzing Banking Risk: A Framework for Assessing Corporate Governance and Financial Risk Management, Washington, D.C. The World Bank.

Guitian, Manuel (1997). *Banking Soundness: The Other Dimension of Monetary Policy*, in Banking Soundness and Monetary Policy: Issues and Experiences in the Global Economy, edited by Charles Enoch and John H. Green. Washington: International Monetary Fund. 41-62

McDonald, Oonagh (1998). *Financial Regulation in Germany and the UK: A Comparison*, in The Emerging Framework of Financial Regulation, edited by C.A.E. Goodhart, London, Central Banking Publications Ltd.

McFarlane, Dunbar (1997). *Financial Sector Mergers and Acquisitions: Implications for the Economy and Society - A Jamaican Perspective* in Mergers and Acquisitions in the Caribbean Financial Sector edited by Glenn A. Khan, St. Augustine: Caribbean Centre for Monetary Studies.

Nelson, Augustine (1995). *Failed, Restructured and Problem Banks: The Performance of Government-Sponsored Indigenous Commercial Banks with Special Reference to Trinidad and Tobago*, Insights into an Emerging Financial Structure: The Experience of Trinidad and Tobago, edited by Ramesh Ramsaran. 145-188.

Polius, Tracy, Dora (1998). The Fragility of Commercial Banks in the English Speaking Caribbean, M.Sc. Thesis, St. Augustine, The University of the West Indies.

Ramkisson, Ronald (1996). *Monetary and Liquidity Management: Public and Private Sector Nexus: Implications for the Banking System in Liquidity Management in Liberalising Economies: Some Experiences from the Caribbean*, edited by Laurence Clarke and Hyginus Leon. St. Augustine: The Caribbean Centre for Monetary Studies. 31-34

Ramsaran, Ramesh (1995). *Changing Perspectives on Central Banking*, in The Experience of Central Banking with Special Reference to the Caribbean, edited by Ramesh Ramsaran, St. Augustine: Regional Programme of Monetary Studies. 1-7

Ramsaran, Ramesh (1988). *Determinants of the Money Stock in Trinidad and Tobago (1969-1984) and the Problem of Control*, in Money and Finance in Trinidad and Tobago, edited by Compton Bourne and Ramesh Ramsaran, Mona:Regional Programme of Monetary Studies.

Robinson, John (1999). *Independent Monetary Policy in a Very Open Economy: Challenges, Costs and Benefits* Social and Economic Studies, 48(1&2): 5-41.

Seerattan, Dave (2000). *Financial Development, Regulatory Arbitrage and Appropriate Policy Responses*, Paper Presented n 23rd February at Workshop on Financial Sector Reform and Risk Management. Port of Spain. Mimeo.

Stennett, Robert R., Pauline M. Batchelor & Camille S. Foga (1999). *Stabilisation and the Jamaican Commercial Banking Sector (1991-1997)* Social and Economic Studies, 48(1&2): 345-377.

Thomas, Clive Y. (1972). The Structure, Performance and Prospects of Central Banking in the Caribbean. Jamaica: Institute of Social and Economic Research.

Watson, Patrick, Kent (1999). *Evaluating Monetary Policy Measures in a Small Primary-Exporting Economy: The Case of Trinidad and Tobago*. Paper presented at the XXXI Annual Conference on Monetary Studies, Paramaribo, October.

Williams, Marion V (1996). Liberalising a Regulated Banking System: The Caribbean Case, England: Avebury Publishing Limited.

Worrell, Delisle (1996). *Liquidity Management: Some Policy Issues, in Liquidity Management in Liberalising Economies: Some Experiences from the Caribbean*, edited by Laurence Clarke and Hyginus Leon. St. Augustine: The Caribbean Centre for Monetary Studies. 16-20

Zepherin, M.G and Dave Seerattan (1997). Financial Innovations in the Caribbean, St. Augustine: Caribbean Centre for Monetary Studies.

Zepherin, Mary (1996). *Implications for Capital Markets, In Liberalising Economies: Some Experiences from the Caribbean*, edited by Laurence Clarke and Hyginus Leon. St. Augustine: The Caribbean Centre for Monetary Studies. 34-35