MONETARY POLICY AND EXCHANGE RATE LIBERALISATION IN THE CARRIBEAN: PRELIMINARY ANALYSIS (Draft)

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Abstract

This study undertakes an examination of the information content of monetary variables in relation to asset prices, in the post exchange rate liberalisation period for three Caribbean Countries, Guyana, Jamaica and Trinidad and Tobago. As such, the paper analysis the nexus between monetary variables and exchange rates, interest rates and commodity prices under floating exchange rates. Hence, the stabilisation role of monetary policy is evaluated, in the aftermath of exchange rate liberalisation.

1.0 Introduction

The idea that monetary policy should target economic growth no longer seems fashionable. There is now growing consensus that monetary policy is more appropriate as a stabilisation measure, than as a device for achieving economic growth.[1] Expansionary monetary policy aimed at inducing growth has proven inflationary in many countries. Moreover, in the case of small open economies with floating exchange rates, such policies can exert pressure on the exchange to depreciate rate. For these reasons, a larger number of countries have directed the focus of their monetary policy actions at maintaining internal and external price stability.

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[1] See for example Kamin et al (1998), and Caprio and Honohan (1991).

The nature and effect of monetary policy on prices and aggregate economic activity, however, is still to be settled by economists. Leeper (1995) points out that while most economists agree on the qualitative effects of monetary policy, there is widespread disagreement on its quantitative effects. The theories outlining the qualitative effects, seem appropriate where there are controlled experiments, so that only one variable at a time is allowed to change in the theoretical construct. In reality, shifts in policy are clouded by many other changes taking place simultaneously, or with varying lags. Thus, there is a great deal of uncertainty concerning the impact of monetary policy, and its impact may be differ across different economies.

This study examines the importance and timing patterns of various monetary aggregates and prices with respect to their influence on price stability. It is premised on the idea that the usefulness of these monetary aggregates as intermediate targets or as information variables, is dependent on their ability to provide timely information on internal and external price movements. This is particularly useful to policy makers in these countries, since they require a tool kit that is practical and one that applies to their own environment. The analysis is applied to three countries with liberalised exchange rate regimes, to see to what extent, the qualitative effects predicted by various schools in economics, would hold. To this end the study focuses on three Caribbean countries, Guyana, Jamaica and Trinidad and Tobago in the aftermath of exchange rate liberalisation.

Previous related empirical studies in the region have focussed on the transmission mechanism between money and prices, and causal relations between money and prices. This study focuses on the information content of a wide array of monetary variables, using data for only the liberalised

period. Two different methodologies, a traditional and a modern one, are used to examine the timing patterns. The study begins by first providing some historical background. Following this, Section 3 provides a brief discussion on the empirical approaches to be used in the study. In Section 4, the results are reported. The study ends with a brief summary of some of the important findings, and concluding statements.

2.0 Historical Backdrop

The three countries, Guyana, Jamaica and Trinidad and Tobago floated their currencies as part of an overall strategy of liberalisation. Guyana and Jamaica initiated the move towards market determined exchange rates in 1990, while Trinidad and Tobago did the same in 1993. Further steps to towards capital liberalisation occurred later, but to a large extent it can be argue that the flotation of the exchange rates have been managed and not fully market determined.

Under the floating exchange rate regime, the Central Banks of Guyana and Jamaica directed their monetary policy instruments at attaining internal and external price stability. As such, inflation management became a primary objective in these countries. In Trinidad and Tobago, monetary policy was less restrictive in goals, though to a large extent liquidity management formed an intermediate target

To initiate discussion on monetary trends since liberalisation, the mean of price and non-price monetary variables was examined with respect to the post liberalisation era, (see Table 1). Comparisons were done in four-year intervals for Guyana and Jamaica to obtain an idea of the co-

movement of the quantity variables and prices. In Trinidad and Tobago only the four-year interval proceeding the floatation could be reported.

It is most noticeable that in Guyana and Jamaica, the mean price variables declined from their initial level, following currency liberalisation.2 At the same time, broad money exhibited lower growth levels in the second period, in both countries. Thus lower growth in prices were accompanied by a decline in money growth. In Trinidad and Tobago, where the price variables are lowest, monetary variables exhibited the lowest percentage of growth, and liquidity levels were tighter.

Table 1: Monetary Aggregates and Prices

Year	Country	Roi	Inf	ER	gln %	Gm2 %	Totliq
91-94	Guy	22.82	1.90	126.31	2.43	3.04	77.94
95-98	Guy	11.51	0.44	143.61	2.73	1.20	34.86
91-94	JAM	30.99	3.04	23.65	2.75	2.32	49.98
95-98	JAM	24.51	1.13	36.22	0.75	1.42	51.18
94-98	TT	10.05	0.37	6.01	0.61	1.07	28.94

Notes: Data are reported in terms of mean per period. Calculations based on respective central bank reports.

Notwithstanding, mere associations of this type are not useful as a policy guide, as the data may contain trends, and as such, comparisons may be spurious. Moreover, the annualised data does not capture the short-term volatility of various monetary variables and their short-term relationships. A more formalised econometric procedure is necessary therefore.

2 Price variables are defined as interest rates, consumer prices and the exchange rate.

3.0 Overview of Econometric Procedure

The qualitative relationships between monetary variables have been well worked out in the economic literature, and are often summarised by reference to the IS/LM framework. However, its applicability to the economy hinges to a large extent on the stability of the relationship between quantity variables and prices. Several factors may affect the relationship between these two. These factors include the degree of price flexibility, interest elasticity of aggregate demand, public money demand behaviour and banks money behaviour, (Friedman and Kutter (1992)). In the case of small open economies such as those of the Caribbean, external variables can be expected to critically affect such stability. Smallness is a constraint which may confine these countries to been passively integrated into the world economy, so that in a floating exchange rate regime these countries are susceptible to external shocks in international demand, prices and capital movements. As such, the qualitative and quantitative relationships between monetary variables may be disrupted by these external shocks.

The study directs its attention to examining the information content of monetary variables, which the Central Banks can influence. Given the focus of the study, external factors are not included in the model. Instead, the following relationships are hypothesised:

(roi, inf, ER)=f(cred, M2, liq, roi, inf, ER)

where, roi denotes interest rates, inf denotes inflation, ER denotes exchange rate, cred denote credit, M2 denotes broad money supply, liq denotes liquidity. Unanticipated movements in the right hand side variables are hypothesised to co-move with transitory movements in the left-hand side terms.

Two methods are used to establish the timing patterns between these variables. The first method has been traditionally used to study the timing patterns. In this method, cross correlation analysis is used to examine leads and lags associated with the variable of interest. Leads and lags are estimated for periods +/- 6 months. This procedure in itself does not establish causality, rather, it captures the timing patterns and quality of association between the variables of interest. The second method is more modern in its approach. It employs the use of Choleski decomposition to identify the effects of shocks in monetary variables on price variables using impulse response functions.

The series are detrended, to avoid spurious relationships, which may arise due to stochastic trends. The detrending is also important, as it is assumed that unanticipated movements in a series may induce transitory movements in another. In this study, a series is considered to consist of a stochastic trend, if it contains at least one unit root. For this reason, unit root tests are conducted using principally the Dickey and Fuller tests.

If a series is found to contain a unit root, then two popular filters are employed to extract the trend, Hodrick-Prescott filter(HP filter) 14400 and differencing. The two approaches are used, since according to Canoval (1998) and Maravall (1999), different methods of detrending yield different results, so that timing patterns are sensitive to the choice of filter employed. However, Canova (1998) and Burnside (19998) argue, that those techniques emphasise different aspects of a business cycle, so that the results obtained must be qualified by the different assumptions made in the use of the filter. In this regard, the HP filter is an economic based approach that allows the researcher to exercise judgement in selecting the trend from the observed data. The trend is assumed to be smooth,

stochastic and uncorrelated to the transitory component of the time series. The cyclical component is extracted from the deseasonalised series by subtracting the trend component.

The procedure of differencing as a method of detrending stems from the assumption that short-term changes in the series are stochastic, and the trend may be a random walk. The trend is independent of the researchers judgement of the economic facts. Thus, this method is completely data driven, and applies strictly to the short-run data properties.

Since the timing patterns are sensitive to the method of detrending employed, care must be taken with respect to the matching of variables. As far as possible, transitory components formulated under similar assumptions are matched with each other. As such, those transitory components identified by the HP model are matched with each other, so as to judge timing patterns associated with cyclical movements around a long-term trend. Furthermore, those cyclical movements identified by differencing, are matched together, to compare the short run properties of the various series.

The monthly data employed are obtained from the publications of the various Central Banks. The year in which the initial move to market based exchange rates took place, was omitted from the study. The implications of the currency floatation are assumed to be realised a few months later. All variables used in the study are logged. Inflation is calculated as the log of the consumer price index. The 91-day treasury bill rate, is used to represent interest rates.

4.0 Findings

Most of the data were found to be integrated of order one I(1) roots and were therefore detrended. Only the treasury bill rate in Jamaica, and inflation rates of the various countries were found to be I(0). Outside of this variable, two approaches to detrend the series were executed, the HP Filter 14400 and the method of first differencing. The third approach is the conduct of impulse analysis. The results emanating from the three approaches are summarised in Table 2.

Table 2: Summary of Short-term Relations and Timing Patterns

Coun.	Dep. Var.	Credit		Ms		Liq		Roi		Inf		ER	
		Sign	Months	Sign	Months	Sign	Months	Sign	Months	Sign	Months	Sign	Months
Guy	Roi	- STI	2-4	- STI	2-5	- STI	2-4	**	**	-/+ SI	0-2	.+ STI	0-2
	Inf	-/+ STI	1-2	-/+ TI	0-2	- STI	2-5	.+ STI	0-6	**	**	-/+ STI	1-3
	ER	.+ I	2	-/+ TI	2	- I	2	-/+ STI	0-2	.+ I	0	**	**
Jam	Roi	-/+ TI	0-2	-/+ STI	0+	- STI	2+	**	**	.+ SI	4+	.+ STI	2+
	Inf	.+ SI	2-6	-/+ TI	2-10	-/+ TI	0-2	NO	**	**	**	.+ SI	2
	ER	.+ SI	0-2	- I	2	- I	2	NO	**	.+ TI	2-4	**	**
T&T	Roi	.+ SI	0-3	- STI	0	- STI	2-3	**	**	-/+ I	3	-/+ TI	1-6
	Inf	.+ TI	1-2	-/+ SI	0-4	- I	2	-/+ SI	3	**	**	-/+ STI	2-6
	ER	- STI	0-3	.+ I	0	.+ TI	2	- I	3	-/+ I	2	**	**

Notes: Independent Variables are in columns, and the dependent variables are placed in rows. S denotes stochastic changes, T denotes transitory movements in relation to trend. Both S and T reveal results from the cross-correlations. I denotes results derived from the use of impulse analysis. Timing patterns refer to the time it takes for the row variables to lead column variables in the case of cross correlation analysis, and the maximum impact of the row variable on the column variable in the case of impulse analysis. Both timing patterns are combined. The quality of the relationship is represented by positive and negative signs. The results are briefly discussed below.

4.1 Guyana

Interest Rates

The relation between prices and interest rates appear to be short term. Cross correlations show an instantaneous and positive relation between each price variable with interest rates. However, impulse analysis show that the impact of shocks in inflation initially have a positive effect on interest rates, but the effect becomes counter-cyclical, impacting heaviest on interest rates after two months. The results are much clearer with respect to exchange rate movements, where a depreciation in the exchange rate lead increased growth in interest rates in the very short term.

Movements in credit, the money supply and liquidity, each exhibit an inverse relationship with interest rates, after a minimum of 2 months. The direction of the relationship satisfies a priori expectations and is well supported by economic theory. However, the results show that information gained from the non-price monetary variables tends to be more long-term than that gained from other prices on interest rates.. This is due to the results emanating from the cross correlations, where the monetary aggregates lead interest rates by four months.

Inflation

The correlation between stochastic changes in the exchange rate and inflation turns out to be very strong after one month, suggesting that depreciation of the exchange rate lead higher levels of inflation, only after one month. Despite this, a negative relationship is found when transitory changes

in the exchange rate were considered. However, impulse response functions reinforce the finding that depreciation in the exchange rate creates inflationary pressures.

The results are unambiguous with respect to the relation between inflation and liquidity, and inflation and interest rates. The pattern of these relationships remained invariant to the method of detrending or technique used. The results suggest that the tighter liquidity in Guyana can be indicative of higher growth of prices in two to five months. This result is a bit surprising however, since increased liquidity is normally expected to have inflationary consequences. The result therefore requires further study.

Exchange Rates

Hardly any of the monetary aggregates or balances appears to lead exchange rate movements in Guyana, when cross correlations are used as the analytical tool. Impulse response functions are more revealing. Shocks in inflation and broad money supply, are found to immediately put pressure on the exchange rate to depreciate, with the shocks dying off after two periods in the case of inflation, and four months in the case of broad money. A shock in credit growth, has its maximum lead on exchange rates after two months, creating pressure on the rate to depreciate. Positive shocks in interest rates surprisingly turn out to be associated with depreciation in the exchange rate in the short-term (up to two months).

However, despite the results obtained, it must be remarked that the cross correlations between the

various variables reported with exchange rates are weak. Thus it would appear that none of the variables can provide decisive information on movements in exchange rates.

4.2 Jamaica

Interest Rates

For Jamaica, the relation between liquidity and exchange rate movements with interest rates remains invariant to the method used. Cross correlation results show that tight liquidity conditions lead higher interest rates by two months. Use of the impulse reaction functions shows that a negative liquidity shock has a long-term, positive effect on interest rates. Similarly, the evidence from the cross correlations reveal that a depreciation in the exchange rate lead higher interest rates with a maximum effect of at least two months. The cross correlations between these variables are quite high. The impulse reaction functions show that a positive shock in the exchange rate (depreciation) causes the interest rate to explode.

The qualitative relationships between credit and money supply with interest rates seem dependent on the methodology used. While cross-correlation results show a positive and contemporaneous relationship between these monetary aggregates and interest rates, impulse analysis indicate that shocks in each of these monetary variables causes interest rates to behave in a counter-cyclical manner.

Inflation

The cross correlation results for Jamaica suggest that the following factors lead inflation: stochastic movements in the exchange rate, credit growth and transitory changes in broad money relative to its trend. However, of the three, stochastic changes in the exchange rate seems to provide the most useful association for policy makers, since its correlation with inflation is strong. It was found that this variable lead inflation by one month. The impact of exchange rates is corroborated by the impulse reaction functions where a shock in the exchange rate is shown to create inflationary pressures up to two months.

Among the other variables, credit growth turned out to lead higher levels of inflation over a longer period of time, four to six months, but the association was weak, both in terms of cross correlations and in terms of the impulse reaction results. Transitory changes in broad money revealed itself to be counter-cyclical to inflation, a rather surprising result, given that in economic theory, the relation between money supply and prices should be positive. Transitory movement in total liquidity relative to its trend, exhibited a strong, instantaneous negative relation with inflation.

Exchange Rates

The monetary variables used in the study appear to be very poor indicators of exchange rate movements. Indeed, only credit growth and transitory movements in inflation are found to lead movements in exchange rates. The correlation coefficient of the former is weak. On the other hand,

the correlation coefficient with respect to the nexus between transitory inflation and exchange rates are found to by very high and positive, with higher levels of inflation leading depreciation in the exchange rate by four months. This finding is supported by the impulse response functions, where shocks in inflation result in a positive movement in exchange rates (depreciation).

A high degree of correlation is also found between transitory movements in exchange rates in relation to its trend and transitory movements in the liquidity away from its trend. The association is negative, and therefore surprising, since it suggests that increases in total liquidity are associated with appreciation of the currency. The impulse functions support this result by revealing that a positive shock in total liquidity lead to a counter-cyclical movement in the exchange rate (depreciation). The impulse functions also show that a positive shock to broad money growth has the same effect on the exchange rate. The result may suggest that the transmission mechanism is taking place through the real sector, so that relaxation of monetary conditions may stimulate investment and growth and lead to an appreciation in the exchange rate.

4.3 Trinidad and Tobago

Interest Rates

The combined results of the impulse reaction functions and cross correlation patterns suggest that movements in total liquidity, credit growth, inflation and exchange rates convey useful information concerning movements in interest rates. Though there is also support as to the relevance of the

money supply as an information variable, the results clearly indicated that money supply behaves counter cyclical to interest rates, instantaneously. In contrast, the relationship between movements in credit and interest rates appears positive, implying that an increased demand for credit lead to higher interest rates within three months.

All three methods show a negative relationship between movements in liquidity and interest rates. In fact, inspection of the impulse functions shows instability in interest rates following shocks in liquidity.. Nevertheless, the impact remains largely negative and as such the results show that tight liquidity is likely to be followed by an increase in interest rates two or three months later.

Stochastic movements in the exchange rate lead movements in interest rates by at least one month. The cross correlation result show a positive relationship, but the impulse functions show that though the relationship is positive up to three months, it eventually becomes slightly negative. The positive relation suggests that depreciation in the currency lead to higher interest rates.

Inflation

The results emanating from the impulse response functions did not corroborate the findings of the cross correlations, for most of the variables matched with inflation. Only the positive relationship between credit and inflation was corroborated by two independent method. Even then the cross correlation results show a very weak association between these two variables. The variables used in the study do not appear to exert a decisive influence on inflation. Nevertheless, the results suggest

at transitory movements in credit, tend to be inflationary.

xchange Rates

Only two variables were found to lead movements in exchange rates, credit and total liquidity. However, the relation between credit and exchange rate movement is surprising. Credit growth and transitory increases in credit in relation to its trend were found to lead to an appreciation of the exchange rate. The findings were corroborated when impulse response functions were applied. Indeed one would expect credit expansion to create deflationary pressures on the exchange rate to depreciate. The result may suggest a spurious relationship between these two variables. Perhaps confidence in the economy may first lead to increased lending and eventually appreciation of the exchange rate.

The second relation, total liquidity and exchange rates, are more predictable in theory. The cross correlation results show that transitory increases in total liquidity in relation to its trend, lead transitory depreciation in the exchange rate after two months. Impulse analysis also shows that shocks in total liquidity can create pressures for the exchange rate to depreciate after two months.

5.0 Summary and Conclusion

Three approaches to examining the information content of monetary variables with respect to prices were used in the study: transitory movements in the series in relation to its trend, stochastic changes in the series, and the impact of innovations in one variable (shocks) on the other. Based on the three

approaches used in the study, some generalisations can be made. Liquidity in Guyana was found by all three approaches to provide unambiguous information on interest rates and inflation. Movements in liquidity was found to be counter-cyclical to interest rate movements and inflation, providing information with a lead between two to five months. As such tighter liquidity appears to lead higher interest rates and higher levels of inflation. Movements in credit and the money supply were found by all three approaches to lead movements in interest rates between 2-5 months. Among the other variables, movements in interest rates were found to provide information on inflation. The timing pattern between these two was uncertain, however, as some cross correlation results show an instantaneous relationship, and impulse analysis show a slower relationship lasting at least six months. Positive movements in the exchange rate (depreciation) were found to provide unambiguous information on upward movements in interest rates in the very short-term, 0-2 months.

In Jamaica, both inflation and the exchange rate are found to provide information on each other and on interest rates. All three approaches show that higher levels of inflation yield more immediate information on exchange rate depreciation compared to interest rates. Movements in exchange rates also carry information on upward movements in interest rates after a minimum of two months and on inflation after two months. Interestingly, interest rates do not appear to have much information content on the other prices. With respect to the non-price variables, all three methodologies suggest that changes in liquidity lead movements in interest rates in a counter-cyclical manner. The lead is by a minimum of two months. Also, two methods indicate that movements in credit provide information on inflation and movements in exchange rates. The information on the latter is more immediate.

For Trinidad and Tobago, all the approaches indicate that changes in liquidity carry unambiguous information on interest rates and exchange rates, where increases in liquidity lead lower interest rates and exchange rate depreciation, both after two months. Two of the approaches show that positive movements in credit lead positive movements in interest rates and inflation in the very short term.

Based on the methodologies, it can be argued that what Guyana and Jamaica have in common, is that prices carry information on each other. In Trinidad and Tobago the evidence is a bit ambiguous with respect to prices. Instead, it is the non-price variables that provide clearer information on price stability for that country.

A major success of this study lies in the fact that it has been able to use a cross section of methodologies to arrive at a practical typology of the effects of monetary policy and its timing pattern with respect to prices. However, nothing remains static, so that continuous estimations with rolling data windows are essential to further refining the typology.

Selected References

Canova, Fabio (1998). *Detrending and Business Cycle Facts*, Journal of Monetary EconomicsVol. 41, pp475-512

Leeper, Eric M (1995). *Reducing our Ignorance about Monetary Policy Effects*. Economic Review, Federal Reserve Bank of Atlanta, July/August pp1-37.

Maravall, Augustin (1999). Unobserved *Components in Economic Time Series*, in HandBook of Econometrics. Pp12 to 71.

Appendix

Table A. List of Abbreviations used in the Study

G	Guyana
J	Jamaica
T	Trinidad and Tobago
d	Series after differencing
c	Detrended series using HP Filter
l	Log
Ln, cred	Credit
M2	Broad Money
liq	Total Liquidity
Roi	Treasury Bill rate
Inf	Inflation
er	Exchange rate

Table B: Lags and Leads with Respect to Inflation

Inf_{t+s}

	-6	-5		-3	-2	-1	0	1	2	3	4	5	6
Gcln	0.11	0.14	0.14	0.10	0.05	-0.08	-0.16	-0.25	-0.24	-0.21	-0.11	-0.10	-0.07
Gdln	-0.02	0.04	0.07	0.07	0.13	0.03	0.10	-0.10	0.02	-0.11	0.01	-0.03	0.09
Gclm2	-0.03	-0.08	-0.15	-0.22	-0.28	-0.29	-0.32	-0.30	-0.29	-0.19	-0.12	-0.07	-0.08
Gdlm2	0.28	0.29	0.30	0.34	0.23	0.28	0.27	0.13	0.09	0.05	0.00	0.16	0.03
Gcliq	-0.33	-0.36	-0.25	-0.25	-0.10	0.00	0.13	0.18	0.12	0.08	0.06	0.03	0.02
Gdliq	0.10	-0.10	0.05	-0.27	-0.18	-0.24	-0.06	0.07	-0.02	-0.01	0.01	0.06	-0.07
Gcler	0.15	0.16	0.19	0.20	0.24	0.25	0.11	-0.04	-0.46	-0.33	-0.17	-0.03	-0.13
Gdler	-0.03	-0.03	-0.02	-0.01	-0.01	0.15	0.34	0.66	0.46	0.27	0.07	0.23	0.08
Jcln	-0.23	-0.19	-0.14	-0.11	-0.05	0.02	0.04	0.05	0.04	0.03	0.04	-0.00	-0.06
Jdln	0.04	0.07	0.06	0.05	0.04	0.11	0.09	0.11	0.09	0.06	0.15	0.17	0.17
Jclm2	0.13	0.04	-0.03	-0.07	-0.10	-0.15	-0.25	-0.32	-0.39	-0.47	-0.48	-0.50	-0.45
Jdlm2	0.31	0.31	0.24	0.22	0.24	0.32	0.27	0.07	0.15	0.18	0.22	0.26	0.26
Jcliq	-0.03	-0.15	-0.21	-0.29	-0.40	-0.49	-0.53	-0.51	-0.50	-0.47	-0.38	-0.31	-0.17
Jdliq	0.31	0.22	0.23	0.31	0.21	0.13	0.03	0.03	-0.20	-0.13	-0.12	-0.20	-0.16
Jcler	0.59	0.71	0.72	0.69	0.59	0.54	0.46	0.39	0.17	-0.04	-0.15	-0.22	-0.27
Jdler	-0.14	0.13	0.23	0.39	0.29	0.35	0.32	0.41	0.43	0.38	0.50	0.62	0.67
Tcln	0.09	0.17	0.16	0.13	0.15	0.51	0.10	0.00	-0.04	-0.00	0.04	0.02	-0.03
Tdln	-0.06	-0.03	0.10	0.05	-0.17	0.12	0.15	0.20	-0.03	-0.10	0.04	-0.04	0.16
Tclm2	0.21	0.08	-0.07	0.01	-0.03	-0.31	-0.14	0.12	0.04	0.06	0.025	-0.05	0.19
Tdlm2	0.12	0.12	-0.07	0.05	0.23	-0.17	0.22	0.07	-0.01	-0.17	0.26	-0.22	0.05
Tcltiq	0.05	-0.08	0.00	-0.05	0.07	-0.05	-0.05	-0.08	0.07	0.03	0.08	-0.00	-0.00
Tdltiq													
Tcler	-0.13	-0.10	-0.05	-0.06	-0.10	0.03	0.15	0.07	0.06	0.04	0.07	0.12	0.16
Tdler	-0.11	0.07	0.14	-0.02	-0.10	-0.24	0.09	0.15	-0.04	-0.15	-0.04	-0.10	0.03

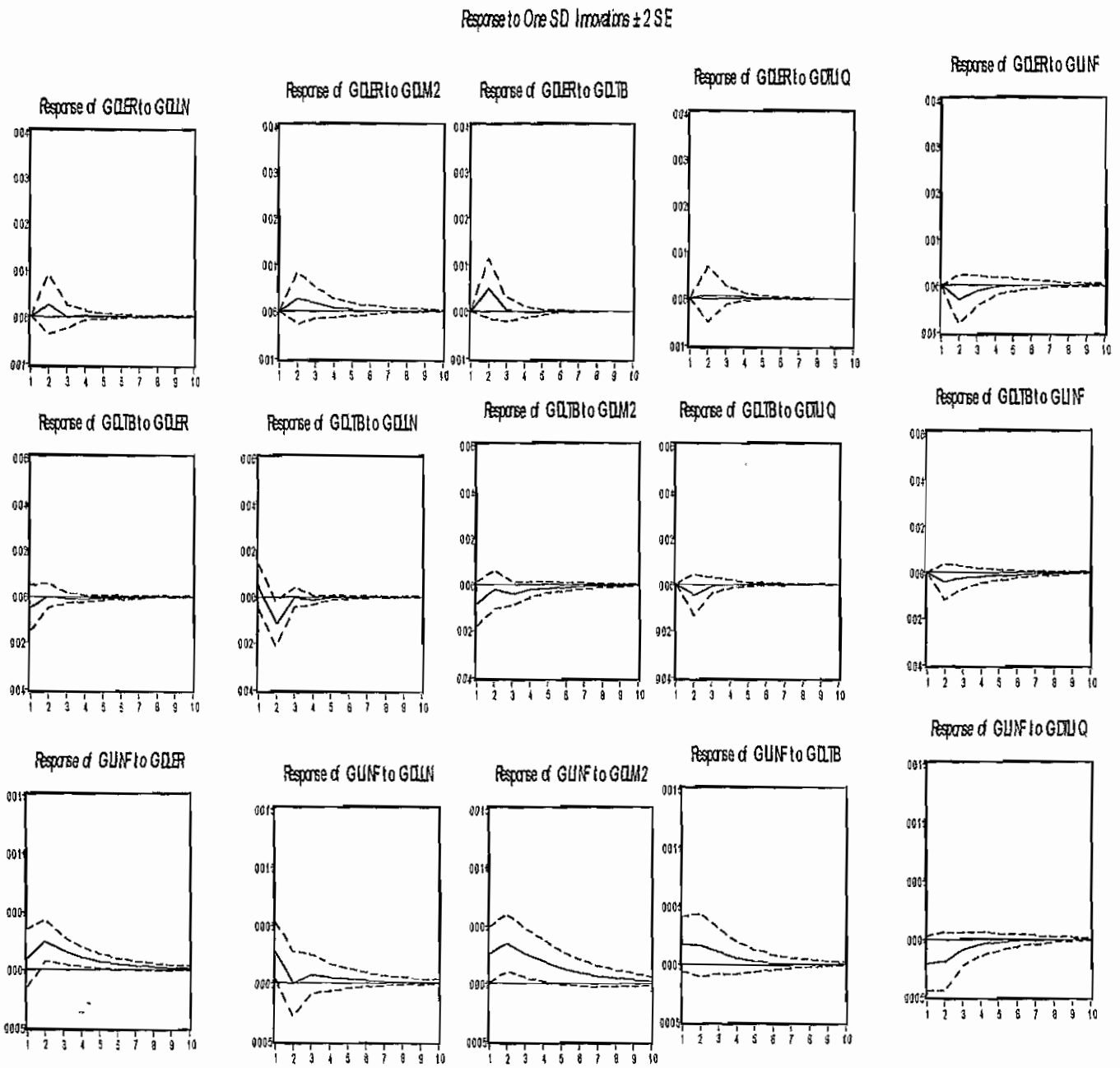
Table C: Lags and Leads with Respect to Interest Rates

Roi_{t+s}

	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6
Gcln	0.09	0.07	0.03	0.01	-0.01	-0.08	-0.11	-0.21	-0.24	-0.31	-0.33	-0.32	-0.32
Gdln	-0.04	0.08	-0.00	0.02	0.22	-0.09	0.13	-0.18	0.13	-0.25	-0.14	0.02	0.02
Gclm2	-0.02	-0.08	-0.16	-0.25	-0.33	-0.39	-0.46	-0.53	-0.60	-0.65	-0.68	-0.70	-0.70
Gdlm2	-0.12	0.18	0.05	0.02	-0.07	-0.04	-0.12	-0.19	-0.11	-0.13	-0.16	-0.06	0.03
Gctliq	-0.29	-0.30	-0.35	-0.38	-0.42	-0.47	-0.47	-0.45	-0.42	-0.33	-0.28	-0.20	-0.12
Gdtliq	-0.12	0.02	-0.14	-0.07	0.17	-0.08	-0.11	-0.08	-0.21	0.13	-0.19	-0.03	0.10
Gcler	0.04	0.07	0.09	0.11	0.13	0.19	0.37	0.27	0.23	0.20	0.17	0.15	0.15
Gdler	-0.01	-0.00	0.05	-0.04	0.01	0.08	0.17	0.07	0.08	0.01	0.05	0.03	-0.00
Jcln	-0.25	-0.29	-0.28	-0.24	-0.21	-0.17	-0.10	-0.05	-0.00	0.03	0.06	0.08	0.07
Jdln	0.20	0.10	0.08	0.10	0.10	0.09	0.05	0.05	0.11	0.11	0.11	0.16	0.17
Jclm2	0.05	0.06	0.08	0.11	0.11	0.12	0.13	0.12	0.13	0.13	0.11	0.07	0.00
Jdlm2	0.05	0.04	0.03	0.09	0.12	0.13	0.17	0.16	0.15	0.15	0.15	0.17	0.15
Jcliq	0.42	0.36	0.26	0.14	0.02	-0.11	-0.26	-0.41	-0.48	-0.05	-0.51	-0.47	-0.38
Jdliq	0.11	0.21	0.24	0.29	0.33	0.36	0.32	0.20	0.11	0.02	-0.09	-0.18	-0.22
Jcler	-0.10	0.01	0.12	0.25	0.38	0.49	0.56	0.59	0.61	0.58	0.51	0.39	0.22
Jdler	-0.18	-0.22	-0.25	-0.27	-0.23	-0.12	-0.00	0.03	0.17	0.27	0.32	0.40	0.42
Tcln	-0.50	-0.54	-0.48	-0.36	-0.16	0.06	0.27	0.39	0.46	0.47	0.44	0.36	0.31
Tdln	-0.12	-0.16	-0.20	-0.22	0.06	0.03	0.26	0.11	0.19	0.18	0.16	-0.06	-0.08
Tclm2	-0.14	-0.22	-0.35	-0.40	-0.45	-0.51	-0.60	-0.55	-0.44	-0.25	-0.11	0.01	0.12
Tdlm2	-0.09	0.20	0.00	-0.16	0.07	0.08	-0.30	-0.00	-0.08	-0.08	-0.15	0.05	-0.03
Tcliq	0.50	0.51	0.45	0.42	0.33	0.14	-0.13	-0.36	-0.47	-0.56	-0.56	-0.49	-0.41
Tdliq	0.10	0.23	-0.03	0.04	0.19	0.13	-0.15	-0.14	-0.08	0.22	-0.03	-0.08	-0.05
Tcler	0.21	0.14	0.05	-0.05	-0.11	-0.12	-0.10	-0.10	-0.18	-0.25	-0.29	-0.30	-0.31
Tdler	0.07	0.13	0.09	-0.19	-0.18	-0.14	-0.03	0.30	-0.10	-0.16	-0.03	0.04	0.03

Figure 1 Impulse Functions

Guyana



Response to One SD Innovations ± 2 SE