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Implications of Excess Liquidity in Fiji's Banking System: An Empirical Study

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Abstract

The reasons behind the frequent occurrences of excess liquidity, especially in the recent months since 2007, are well known and documented. They include low investor confidence following the military coups and related political uncertainties with their lingering effects for a while. What are unknown and not studied in detail are the long term effects of excess liquidity on various key economic variables. Utilizing the VAR methodology, this paper examines the effects of excess liquidity on loans, lending rate, exchange rate and price level. The findings are that excess liquidity is a major component of forecast variation in loans, exchange rate and lending rate.

Keywords: Excess liquidity, loans, monetary policy, cointegration test, variance decomposition

Implications of Excess Liquidity in Fiji's Banking System

1. Introduction

Fiji's economic growth since the beginning of the new millennium has been uneven. After growing at an average rate of 2.75 percent during the first five years, the economy began to slide down at an average rate of 0.25 percent during the next five years. In 2011, the economy bounced back with a growth rate of 2.1 percent (UN ESCAP 2012). Describing the 2011 growth performance as the best result in years, IMF struck a note of caution and observed that growth in the future years including 2012, was not likely to be more than 1.5 percent to 2.0 percent, given the political uncertainties and structural weaknesses (IMF 2012).

One of the outcomes of political uncertainties is the excess liquidity in banking system. An accommodative monetary policy adopted by Reserve Bank of Fiji (RBF) with the historically lowest ever bench market rate[1] at 0.5 percent since October 2011and downward adjustments in lending rates[2] by commercial banks consequent to moral persuasion by Reserve Bank of Fiji (RBF) did not result in any notable rise in credit flows (RBF 2011a). The banking sector has been arguing that it is not the cost of borrowing which mattered most; and a prolonged period of weak investment climate, was responsible for inadequate number of bankable projects (IMF 2012).

The argument is not an unfamiliar one. The current sluggish global recovery is also blamed on poor investor confidence in Europe, Japan and the United States. While the causes of frequent bouts of persistent excess liquidity for are fairly well known, which are traced to lingering effects of uncertainties generated by the 1987 and 1988 coups (Prasad 2010, Prasad and Narayan 2008), its impact on different key economic variables in Fiji are uncertain. The general view is that excess liquidity unless controlled by monetary authorities in time, the impact would be in terms of worsening balance of payments, resultant pressures on international reserves, which are held by monetary authorities to defend the fixed exchange rate and eventual rise in the price level. As there has been no study on the implications of excess liquidity, this paper seeks to fill the gap by undertaking an empirical examination of these aspects in Fiji with a view to forging a more appropriate monetary policy.

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[1] The policy rate is known as overnight policy rate (OPR) is announced in advance by monetary authorities as per the new procedure effective May 17, 2010 (RBF 2010). This new procedure discontinued the previous practice of adopting the rate on 91-day open marker sale of RBF Notes as policy indicator rate. The open market sale operation for mopping up surplus liquidity was suspended in June 2007.Though reactivated with the new monetary policy framework in May 2010,it was again suspended from December 2010 and there are no more open market sale operations by RBF

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[2] A high spread between lending and deposit rate was believed to responsible by investors for poor credit growth. On the other hand, banks were arguing that high interest margin was due to rising loan defaults and consequent high provision for bad loans had to be made (Jayaraman and Sharma, 2003).

The paper is organized on the following lines. The second section reviews the theoretical background of liquidity and factors influencing excess liquidity; the third section examines trends in excess liquidity in Fiji in recent years and undertakes an empirical investigation of impact of excess liquidity; and the fourth and final section presents conclusions with a discussion on their policy implications.

II A Brief Note on Theoretical Background

Money supply under a fixed exchange rate regime is influenced by changes in the stock of net foreign assets and domestic credit. The linkage is best understood by looking at the consolidated balance sheet of the banking system and the central bank. The balance sheet of the commercial banks is given by assets on left-hand side and liabilities on the right hand side:

$$LP + GB + RCB = DD + DST + CB \quad (1)$$

where,
LP = loans to the non-bank public;
GB = loans to the government;
RCB = reserves with the central bank;
DD = demand deposits with commercial banks;
DST = savings and time deposits with commercial banks; and
CB = credit by central bank to commercial banks

The central bank's balance sheet is given as assets on left hand side and liabilities on right hand side.

$$NFA + CG + CB = CP + RCB \quad (2)$$

where, in addition to the terms already defined,
NFA = net foreign assets;
CG = credit by central bank to government;
CP = currency held by non-bank public; and
RCB = reserves of commercial banks with central bank.

The consolidated balance sheet of the banking system is obtained by combining equations (1) and (2) as

$$NFA + CG + LP + GB = CP + DD + DST \quad (3)$$

The right hand side of (3) is money supply (MS), which comprises currency held by the public and the demand deposits and savings deposits and time deposits held by public with the commercial banks. The left hand side is the sum of net foreign assets held by

central bank and commercial banks, and domestic credit (DC) by the banking system, which comprises credit to government and credit to the public both by commercial banks and credit to the government by the central bank.

The money supply equation is derived thus:

$$NFA + DC = MS \quad (4)$$

If net foreign assets rise/decline, they result in increase / decrease in money supply[3]. Similarly, increase/decrease in domestic credit would result in rise/fall in money supply.

Measurement of surplus liquidity

Commercial banks are required to keep with RBF a certain proportion of their total deposit liabilities (D). In addition to the reserve requirements, banks keep certain additional reserves to meet the clearance obligations and unexpected withdrawals especially during the holiday seasons. These extra reserves are known as excess reserves. Thus, we have two components of reserves (R): required reserves (RR) and excess reserves (ER). Excess liquidity (ELQ) is then defined as the ratio of excess reserves to total deposits held by banks

In symbols,

$$ER = DRBF - RR \quad (5)$$
$$ELQ = ER / D \quad (6)$$

where, besides symbols already defined,

DBRF = deposits by commercial banks held with RBF

When the market rate of interest is high, banks tend to keep a minimum level of excess reserves since opportunity cost of holding excess reserves in terms of foregone interest income from loans given out would be relatively high. Thus, during expansion phase of the economy, banks tend to keep minimum excess reserves and vice versa. The rise in ELQ denotes the rise in the magnitude of excess liquidity; the higher the ratio, the greater the liquidity and lower the ratio, the lower the liquidity. What would be the optimum or desirable level is entirely up to the central bank. If the central bank considers surplus liquidity is not warranted on the grounds it may have adverse impact on balance of

[3] In February 2009, when the banks' lending rates of interest in Fiji rose and flows of credit to private sector decreased, there were concerns regarding the tightened liquidity in the banking system whether it was due to any measures taken by RBF to reduce money supply. In a press statement, RBF clarified the position stating that the market liquidity had been "a direct result of outflows of foreign reserves and not from any deliberate policy actions of the Reserve Bank" (RBF 2009a). As foreign reserves were declining, money supply decreased in March 2009. Consequent to devaluation of the currency by 20 percent on April 10, 2009, foreign reserves were revalued, which led to improving liquidity (RBF 2009b).

payments equilibrium, exchange rate and price level, it would resort to mopping up liquidity.

Central bank tools

The central bank has effective tools to control liquidity. In market economies, where financial sectors are well developed, not only with effective primary markets with large number of players, but also active secondary markets where financial securities could be traded with ease, monetary authorities rely upon open market operations in securities, either government issued or their own papers of different maturities[4] to mop up the surplus funds.

In those countries, where primary markets have only a few players and where there is no secondary market or where the secondary market is not active or not at a nascent stage, central banks have to rely on direct instruments. These include statutory reserve requirements for reducing the reserves available to commercial banks, quantitative restrictions, credit ceilings and moral suasion measures bordering on stern warnings or interventions. Decision to resort to any or a combination of these measures depends on a careful assessment of the situation by monetary authorities.

Recent experiences in industrialized countries including USA, UK and European nations USA indicate central banks have continued to keep bench mark rates very low (for example, the US Fed Funds rate at 0.5 percent) since the conditions prevailing in those countries continue to be recessionary and did not warrant any change in monetary policy stance[5]. The RBF monetary policy stance, as prevailed in the last two quarters of 2011 and in the first quarter of 2012 quarter is similar. The bench mark rate, OPR which was lowered to 0.5 percent in October 2011 has remained unchanged in the first quarter of 2012 (RBF 2012b) as RBF is confident of non-inflationary growth.

Literature Survey

The banks, as noted earlier keep certain proportion of reserves as insurance against unexpected withdrawals, which are also described as precautionary reserves. Khemraj (2007) in his study on Guyana has given a succinct summary of the findings of studies conducted in the second half of last century. These studies as well a recent study by Agenor *et al* (2004) attempted to test the hypotheses that banks choose a quantity of reserves, which maximize profits or minimizes losses. The findings are: (i) banks increase their demand for reserves when the adjustment costs (the cost of borrowing reserves from central bank's discount window plus transaction costs involved in cashing

[4] In Fiji, the operating costs and interest cost obligations were fully borne by RBF, which reduced the profitability of RBF. In Solomon Islands and Tonga, central banks discontinued OMO in their own papers once they incurred losses (Jayaraman 2011).

[5] The only exception is Australia, which was the first industrialized country to increase its bench market rate, known as official cash rate after fighting the global recession, in 2009. The reason behind the monetary policy action of Reserve Bank of Australia was to put out the incipient inflationary pressures, as the country's booming mining sector was flourishing with growing mineral exports to China.

securities in secondary market); (ii) required bank reserves increase/decrease when the statutory required reserve ration increases/falls; and (iii) reserve levels rise when uncertainties (proxies for uncertainties being cash and output volatility) increase.

Saxegaard (2006), who studied excess liquidity in Central African countries, Nigeria and Uganda, divides demand for excess liquidity on the part of banks into two categories: precautionary and involuntary. Precautionary liquidity is predictable, whereas involuntary liquidity is conditioned by demand factors. If demand conditions are not favourable for various reasons including political and economic uncertainties as well as global conditions, involuntary liquidity would be on the rise. While precautionary excess reserves do not engender changes in bank portfolio composition and hence less inflationary, the involuntary liquidity is more likely to be inflationary once demand conditions improve. Utilizing the model by Agenor *et al.,* (2004), Saxegaard (2006) determined the following factors responsible for the buildup of involuntary liquidity: (i) foreign aid inflows; (ii) new found oil revenues; (iii) rise in government deposits in the banks; (iv) weak loan demand by private sector. Khemraj (2006) identified a few more factors influencing excess liquidity. They are (i) large underground economy which generates bank deposits; (ii) inward remittances; (iii) unsterilized foreign exchange market interventions by governments.

Aside from the determinants of excess liquidity, the likely effects of excess liquidity on key macroeconomic variables assume greater importance from the point of view of monetary policy formulation. Holding other things constant, excess liquidity in the banking system would lead to fall in interest rate, resulting in rise in domestic credit flows to private sector. The consequent increase in aggregate demand would in all likelihood be spilling over into imports as well. If exports do not rise to offset increases in imports, trade deficits and current account imbalances would develop, beginning to exercise considerable pressure on exchange rate and also raise the price level.

The next section takes up an empirical study of effects of excess liquidity in Fiji on macroeconomic variables.

III. Empirical Study: Data, Modeling, Methodology and Results

Table 1 presents Fiji's trends in excess liquidity and other related variables, including loans to private sector and interest rate during Jan 2000-2012 March. The choice of the period is influenced by two factors. Fiji witnessed two coups in the first decade of the new millennium: a civilian coup in May 2000 and the other, a military coup in December 2006, affecting investment climate. Consequently, following the coup of 2000, excess liquidity in Fiji's banking system recorded a dramatic high increase in 2001 and the domestic credit declined. Return to democracy and an elected government in office improved the situation and during the next four years, the economy witnessed high growth rate in loans and low ratio of excess liquidity to deposits (Jayaraman 2011).

Table 1: Excess Liquidity

Year	Excess Liquidity F$ (mill)	Excess Liquidity Growth Rate (%)	Excess Liquidity as ratio of deposits	Average Lending Rate (%)	Loans F$ (mill)	Rate in Loans (%)	Exch Rate F$/US$	CPI (index)	Inflation (%)
2000	51.9		3.4	8.37	1173.7	-	2.19	122.2	-
2001	124.6	140.1	8.4	8.19	1114.4	-5.1	2.31	125.0	2.3
2002	126.7	1.7	7.9	7.89	1154.5	3.6	2.06	127.0	1.6
2003	236.2	86.4	12.9	7.39	1359.9	17.8	1.72	132.3	4.2
2004	101.0	-57.2	5.1	7.03	1623.2	19.4	1.65	136.7	3.3
2005	71.5	-29.2	3.0	6.63	1994.7	22.9	1.74	102.2	-25.2
2006	107.3	50.1	3.8	7.90	2422.6	21.5	1.66	105.2	2.9
2007	331.1	208.7	10.3	8.46	2474.2	2.1	1.55	109.7	4.3
2008	55.1	-83.4	1.8	7.72	2761.1	11.6	1.76	116.9	6.6
2009	296.6	438.3	9.1	7.52	2786.1	0.9	1.93	124.9	6.8
2010	348.4	17.5	10.4	7.42	2882.6	3.5	1.82	131.1	5.0
2011 Jan	370.8	6.4	10.9	7.42	2876.2	-0.2	1.83	133.9	2.1
Feb	384.9	3.8	11.3	7.49	2900.3	0.8	1.83	134.9	0.7
Mar	358.9	-6.8	10.5	7.44	2937.5	1.3	1.81	135.1	0.1
Apr	457.7	27.5	13.3	7.44	2862.1	-2.6	1.74	136.7	1.2
May	520.7	13.8	14.9	7.50	2943.2	2.8	1.75	137.6	0.7
June	580.4	11.5	16.3	7.48	2963.2	0.7	1.75	138.5	0.7
July	660.2	13.7	18.2	7.51	2983.4	0.7	1.71	138.9	0.3
Aug	678.8	2.8	18.2	7.49	2992.4	0.3	1.73	138.5	-0.3
Sep	661.7	-2.5	17.3	7.49	3025.0	1.1	1.84	138.3	-0.1
Oct	571.2	-13.7	14.8	7.45	3044.5	0.6	1.75	137.9	-0.3
Nov	497.0	-13.0	12.8	7.46	3092.4	1.6	1.83	140.4	1.8
Dec	510.1	2.6	13.2	7.42	3118.1	0.8	1.82	141.2	0.6
2012 Jan	521.7	2.3	13.1	7.43	3077.0	-1.3	1.76	141.8	0.4
Feb	537.8	3.1	13.8	7.36	3098.9	0.7	1.75	143.3	1.1
Mar	537.4	-0.1	13.7	7.17	3153.9	1.8	1.78	142.7	-0.4

Source:RBF(2011a,b),RBF(2012a,b).

The situation was reversed with the military coup of December 2006. The ratio of excess liquidity to deposits rose from a low 3.8 percent in 2006 to a high 10.3 percent in 2007; and growth rate in loans declined from a high 21.5 percent in 2006 to a low 2.1 percent in 2007. Imposition of sanctions by Australia and New Zealand against the government and suspension of Fiji by the Commonwealth worsened the investment climate and the economic growth became poorer in the next three years. Excess liquidity as ratio of deposits rose steadily in 2010 and climbed in the next six months in 2011. The ratio was above at 18 percent in July and August, 2011. Thereafter, the ratio declined because of moral suasion by government.

Model and Methodology

For exploring how shocks or innovations to excess liquidity, which refer to impulses in the language of vector autoregression (VAR) methodology, affect other key macroeconomic variables, namely lending rate, loans, exchange rate and price level, we adopt the VAR model. The chief advantage of using standard VAR, which has been increasingly adopted in recent years (Dabla-Norris and Florekemier 2006, Khemraj 2007) is that only minimal restrictions need to be imposed. A VAR with *k* endogenous variables and *n* lags can be expressed as

$$\prod_0 y_t = \prod_1 y_{t-1} + \prod_2 y_{t-2} + \ldots \ldots + \prod_n y_{t-n} + \varepsilon_t$$

where,

y_t is a *k* x 1 vector of endogenous variables, $\prod$ is *k* x *k* matrix of standard parameters of endogenous variables and ε is a *k* x *k* matrix of structural disturbances. The model uses a recursive, contemporaneous system, where it is assumed that structural shocks ε are orthogonal and that each $\prod$ is lower triangular. The estimation of a VAR is sensitive to the choice of particular strategy such as the ordering of the variables and lag length. We assume that in the first round a positive shock to excess liquidity affects lending rate, loans, exchange rate and price level; a shock to loans affects exchange rate and price level; a shock to exchange rate affects the price level; and a shock to price level affects none. If the correlation matrix of the reduced-form VAR residuals shows the coefficients are low in magnitude, it would suggest that contemporaneous feedback is not a problem. Accordingly, we enter the variables in that order: excess liquidity, lending rate, loans, exchange rate and price level.

Two procedures are employed: the first approach is to determine how each endogenous variable responds over time to a shock in that variable itself and in every other endogenous variable. The second approach traces the response of the endogenous variable to such shocks. Accordingly we have two measures: One measure is to determine how much of the variance in each of the variable, lending rate, loans, exchange rate and price level is explained by excess liquidity. Known as variance decomposition analysis, it enables us to conclude about proportion of changes in a variable resulting from its own shocks as well as shocks to other variables in the system (Enders 1995:311)

The second measure is impulse response function analysis (IRF). It is an effective way to visualize movements over time in response to different shocks in the system (Enders: 1995: 306). When employed it would measure the response of one variable to one standard deviation shock to other variables.

Data

Our objective is to undertake an empirical investigation of impact of excess reserves on macroeconomic variables[6], namely lending rate, loans, exchange rate and price level. Excess liquidity and loans are in current prices and in million Fiji dollars, while exchange rate is nominal rate (units of Fiji dollar per unit of one US dollar) and lending rate is the weighted average nominal rate in percent and unadjusted for inflation and price index. All data series, which are monthly and drawn from the officially published data by RBF, cover January 2000-March 2012. The variables are transformed into their logs and then entered into regression analysis. After testing unit root tests we proceed to conduct VAR in first differences towards variance decomposition and impulse response analyses.

Unit Root tests

There are two types of unit root tests used in this study, namely Phillips and Perron (1988) unit root procedure and Ng and Perron (2001) modified the Phillips-Perron's (PP) Z tests. The results of the tests are shown in Table 2, which indicate that all series are non-stationary at level. These variables are found stationary after first differencing, that is, they are integrated of order one. Having found that all series are integrated of order one, we use the Johansen-Juselius (JJ) multivariate cointegration test to examine the long-run relationship among the series.

Table 2: Results of Unit Root Tests

Variables in logs	**PP Test**		**Ng and Perron Test, MZa**	
	Level (Constant with Trend)	First Difference (Constant without Trend)	Level (Constant with Trend)	First Difference (Constant without Trend)
Sample period: 1970-2002				
LOANS	-1.534	-9.604**	-5.238	-13.625**
ELQ	-3.412	-14.038**	-16.484	-71.932**
ER	-1.639	-13.141**	-5.319	-18.787**
LR	-1.887	-8.186**	-7.618	-62.393**
CPI	-0.849	-9.547**	-5.302	-68.296**

Note: The PP critical value at 5% level is –2.96 and –3.56 for constant without trend and constant with trend regressions, respectively. These critical values are based on Mckinnon. The optimal lag is selected on the basis of Akaike Information Criterion (AIC). The Ng and Perron critical value is based on Ng and Perron (2001) critical value and the optimal lag is selected based on Spectral GLS-detrended AR based on SIC. The null hypothesis of the test is: a series has a unit root. The asterisk ** denotes the rejection of the null hypothesis at the 5% level of significance. The figures in brackets denote number of lags.

[6] Khemraj (2007) did not employ the interest rate whereas our study uses the average lending rate as an additional endogenous variable along with four other endogenous variables.

The results of cointegration test are reported in Table 3. The test statistics do not reject the null p≤1 against its alternative p=2, which indicates the presence of one cointegrating vector between logs of all variables namely loans, excess liquidity (ELQ), exchange rate (ER), lending rate (LR) and CPI.

Table 3: Results of Johansen and Juselius Multivariate Procedure

Hypothesis	Maximum Eigenvalue		Trace	
	Test Statistic	95%	Test Statistic	95%
P=0	56.757**	33.877	98.031**	69.819
P≤1	21.393	27.584	41.274	47.856
P≤2	11.338	21.132	19.881	29.797
P≤3	7.405	14.265	8.543	15.495
P≤4	1.138	3.841	1.138	3.841

Notes: ** indicates significant at 5 per cent level.

Variance Decomposition

Table 4 presents the results of the variance decomposition (VD), which is based on Cholesky factorization with the following ordering: excess liquidity, lending rate, loans, exchange rate and price level. The analysis is done up to a 12-month horizon and we used different orderings. The findings are robust as the correlation matrix of the reduced-form VAR residuals shows the coefficients are low in magnitude suggesting that contemporaneous feedback is not a problem (Table 5).

Table 4: The Results of Variance Decomposition

Period	S.E.	LOANS	ELQ	ER	LR	CPI	Period	S.E.	LOANS	ELQ	ER	LR	CPI
Variance Decomposition of LOANS:							Variance Decomposition of ER:						
1	0.008	89.574	10.197	0	0.228	0	1	0.027	0.155	10.031	87.867	0.398	1.55
2	0.012	88.812	10.8	0.004	0.125	0.26	2	0.036	2.383	10.383	82.348	0.454	4.431
3	0.014	87.525	11.101	0.383	0.776	0.215	3	0.043	4.028	12.314	74.244	0.376	9.038
4	0.017	85.56	11.093	0.584	2.16	0.603	4	0.052	6.007	12.548	73.94	0.259	7.246
5	0.02	82.032	12.084	1.152	3.919	0.812	5	0.059	7.767	13.079	72.426	0.24	6.488
6	0.023	77.24	13.32	1.945	6.616	0.879	6	0.064	8.554	13.555	71.743	0.208	5.939
7	0.026	72.165	14.53	2.959	9.427	0.919	7	0.069	9.496	14.03	71.008	0.189	5.277
8	0.03	66.439	15.867	4.33	12.448	0.916	8	0.073	10.278	14.567	70.088	0.183	4.884
9	0.033	60.809	17.018	5.801	15.43	0.943	9	0.077	10.851	15.056	69.384	0.182	4.527
10	0.037	55.535	18.004	7.387	18.069	1.005	10	0.08	11.367	15.445	68.754	0.2	4.235
11	0.041	50.64	18.844	9.055	20.369	1.093	11	0.083	11.756	15.766	68.256	0.212	4.01
12	0.045	46.268	19.517	10.73	22.268	1.215	12	0.086	12.061	16.013	67.888	0.224	3.814
Variance Decomposition of LR:							Variance Decomposition of CPI:						
1	0.016	0	11.316	0	88.684	0	1	0.008	0.542	3.752	0	0.146	95.56
2	0.026	1.166	13.388	0.066	84.375	1.005	2	0.013	0.469	5.238	0.812	0.171	93.31
3	0.034	1.367	15.23	0.043	81.721	1.639	3	0.016	0.321	7.575	0.543	0.607	90.95
4	0.039	1.033	16.486	0.034	80.333	2.114	4	0.019	0.254	7.841	0.61	0.459	90.84
5	0.043	1.018	16.767	0.147	79.599	2.469	5	0.021	0.246	8.444	0.693	0.389	90.23
6	0.047	1.137	17.022	0.403	78.412	3.026	6	0.022	0.268	8.847	0.624	0.353	89.91
7	0.05	1.339	17.378	0.794	76.605	3.884	7	0.023	0.253	9.526	0.585	0.326	89.31
8	0.052	1.455	17.677	1.415	74.54	4.912	8	0.024	0.23	10.242	0.533	0.295	88.7
9	0.055	1.553	17.937	2.161	72.241	6.108	9	0.026	0.211	10.857	0.489	0.272	88.17
10	0.057	1.654	18.154	2.993	69.788	7.411	10	0.027	0.197	11.339	0.458	0.258	87.75
11	0.059	1.736	18.334	3.861	67.294	8.775	11	0.027	0.185	11.677	0.451	0.247	87.44
12	0.06	1.812	18.507	4.708	64.805	10.168	12	0.028	0.175	11.916	0.47	0.237	87.2

Cholesky Ordering: ELQ LR LOANS CPI ER

Table 5: Correlation Matrix of the Reduced Form VAR residuals

	LOANS	**ELQ**	**ER**	**LR**	**CPI**
LOANS	1	0.044	0.036	-0.053	0.063
ELQ	0.044	1	-0.018	-0.115	-0.194
ER	0.036	-0.018	1	0.065	-0.113
LR	-0.053	-0.115	0.065	1	0.060
CPI	0.063	-0.194	-0.113	0.060	1

Lending rate and excess liquidity

The variance decomposition analysis shows lending rate is very sensitive to its own shock throughout the 12 months period. About 89 percent of its variability in the first

month is explained by its own shock, which decreases slowly over next five months, still well above 75 percent. On the other hand, lending rate is far less responsive to shock to excess liquidity as only 11 percent of its variability is explained by excess liquidity in the first month and 17 percent in the sixth month; and not more than 18 percent in the 12th month.

Loans and excess liquidity

The variance decomposition analysis of loans indicates a similar picture. Excess liquidity impacts variability in loans only to the extent of 10 percent in the first month and its influence increases only to the extent of 15 percent in the sixth month and not more than 20 percent by 12th month. Lending rate explains the variability in loans to a much less extent: It is not more than one percent until the third month. Influence of lending rate in the 12th month is about 22 percent.

Exchange rate and excess liquidity

The variability in exchange rate is explained by excess liqiuidity to the extent of 10 percent in the first month and 14 percent in the sixth month and 16 percent in the 12th month. On the other hand lending rate accounts for less than one percent of variability in exchange rate throughout the 12 months horizon. The own shock of exchange rate accounts for 88 percent of variability in exchange rate in the first month; 72 percent in the sixth month and 68 percent in the 12th month.

Price Level and excess liquidity

About 96 percent of variability in price level is explained by its own shock in the first month; 90 percent in the sixth month and 88 percent in the 12th month. Shock to excess liquidity explains the variability in price level only to the extent of 4 percent in the first month, 9 percent in the sixth month and 11 percent in the 12th month. On the other hand, shocks to exchange rate account for less than one percent of variability in price level.

Thus, the analysis shows excess liquidity plays a large role in the variability in loans, exchange rate and lending rate only next to the shocks in respective variables. The contribution of excess liquidity to loans, exchange rate and lending rate ranges between 10% to 19.5% through-out most of the forecast horizon.

Impulse Response Function

Impulse response function indicates how the variables in the VAR system respond to a standard exogenous change with another variable under investigation. This analysis has

an advantage that it shows whether the effects are positive or negative, and whether a shock is a temporary fluctuation or a long-run persistence. The obtained impulse response functions are displayed in Figure 1.

Response of lending rate to excess liquidity

The reaction of the excess liquidity to lending rate is strictly negative, which supports the hypothesis of liquidity effect dominance. For example, in response to a positive liquidity shock, the lending rate declines, reaches a trough one to four months after the shock, and rises eventually to a new steady state for the remaining horizons. However, for most of the 12-month period the reaction is not statistically significant, as the upper dotted line is above the zero line.

Response of loans to excess liquidity

As the figure indicates, the shock of excess liquidity causes loan increasing steadily for the first four months. However, the lower dotted line is below the zero line for the first five months, indicating absence of statistical significance. Only after the fifth month, the response of the liquidity shock becomes significant and it increases for the remaining horizons.

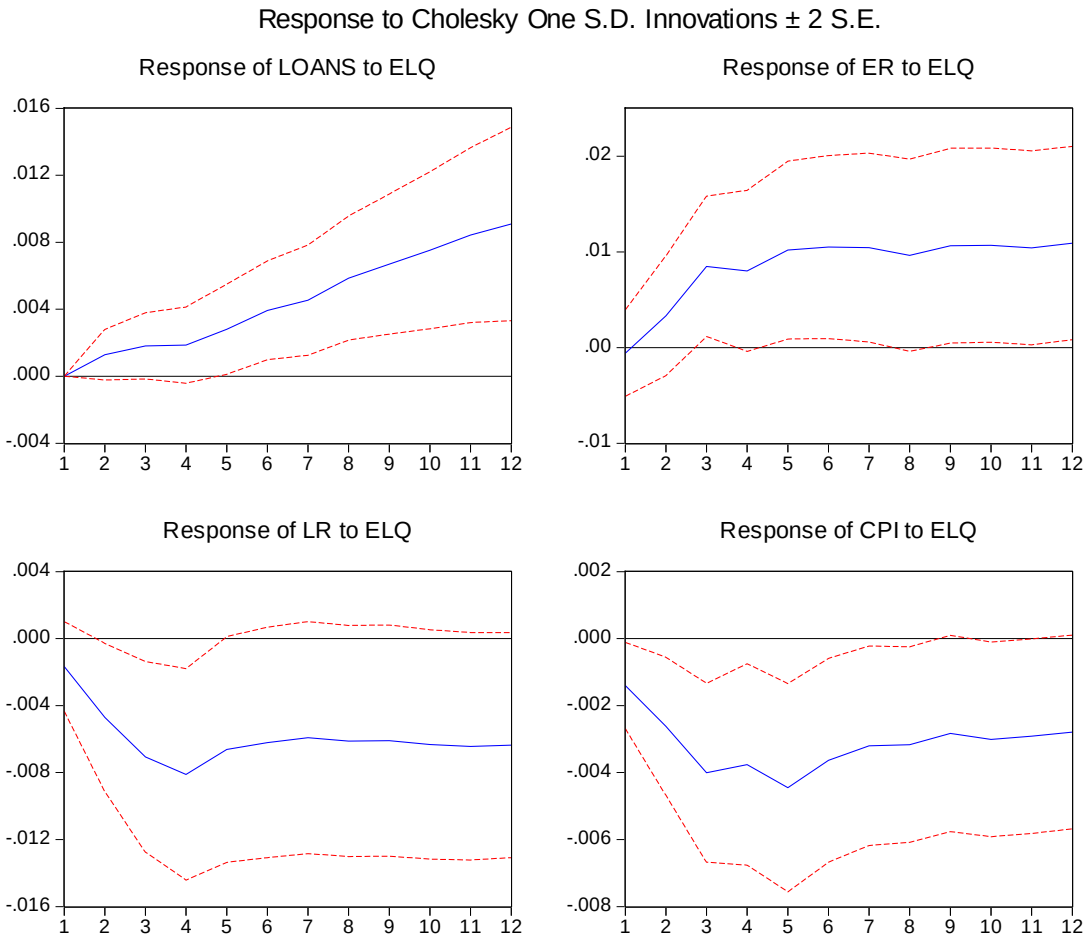
Response of exchange rate to excess liquidity

A shock to excess liquidity has a positive effect on the exchange rate (units of Fiji dollars to one US dollar) up to the third month, indicating depreciation of domestic currency. However, it is not statistically significant. The response significantly increases between fifth and sixth month and has little effect thereafter on the exchange rate.

Response of price level to excess liquidity

It is interesting to note that a positive shock to excess liquidity has a “perverse” effect on inflation. The point estimates show between the first month and the fifth month, an initial rise in excess liquidity decreases inflation. The response of price level is also significant during this period. After that the shock leads to a positive and significant rise between sixth month and eighth month and the response is moving towards its stable long-run equilibrium but becomes statistically not significant thereafter as the upper dotted line cuts the zero line.

Figure 1: Results of Impulse Response Function Analysis



IV. Summary and Conclusions

Using the VAR methodology, this paper examines the effects of excess liquidity on loans, lending rate, exchange rate and price level. After conducting the usual unit root tests, cointegration procedure indicated the existence of a long run relationship between all the variables. We then proceeded to estimate the VAR model in the first differences of all variables for undertaking VD and IRF analyses, for examining how much of the future variation in lending rates, loans, exchange rate and price level would be explained by shocks to excess liquidity.

The results of VD and IRF analyses suggest that excess liquidity is a major component of forecast variation for loans, exchange rate, and lending rate, both in the short- and long-run. In contrast, excess liquidity does not explain significantly the level of inflation in the economy, especially in the short- and medium terms. This particular result reinforces the

view of the IMF Article IV Consultation Mission to Fiji in late last year that the inflation outlook was still benign.

The study indicates that measures undertaken so far by the monetary authorities are appropriate and the accommodative monetary policy of keeping the policy rate suits the present state of affairs. However, any improvement in political atmosphere and resultant rise in economic activities would alter circumstances necessitating a different monetary policy stance.

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