THE CONDUCT OF MONETARY POLICY IN FIJI:

POLICY FORMULATION, IMPLEMENTATION AND THE TRANSMISSION MECHANISM

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Abstract

This paper examines the formulation, implementation and transmission of monetary policy in Fiji.

Monetary policy is formulated by the Reserve Bank of Fiji Board on recommendations from an internal Monetary Policy Committee. Monetary Policy is implemented using open market like operations in Reserve Bank securities to influence liquidity levels and to influence short-term money market interest rates.

Monetary policy is transmitted to the Bank's final objective – inflation – through commercial bank interest rates and through the real economy. The pass through of changes in policy interest rates to other short-term money market rates is quick. The pass through to commercial bank interest rates is slow but complete. This partly reflects the large proportion of long-maturing time deposits in commercial banks' funding base which delays the impact of monetary policy changes on banks' cost of funds and on lending rates.

The transmission to the real sector is relatively strong and broadly in line with other countries. On average, a one percentage point rise in real short-term policy interest rates reduces the growth rate of the economy in the short-run on average by around one-third of one percentage point. The transmission lag is around one year.

The transmission from the real sector to inflation is broadly in line with other countries. On average, a one percentage point rise in the output gap is associated with a 0.2 percentage point rise in inflation. However, the

effect is roughly doubled when the indirect transmission through labour costs is included. The transmission lag is around one year.

These estimates, while imprecise, show that the transmission of monetary policy in Fiji can be effective, but substantial changes in interest rates are required to influence inflation if it rises too far above acceptable norms. This underscores the need, as has been highlighted in many other countries, for the Reserve Bank to be preemptive in its policy stance, tightening policy at the first sign of inflationary pressures to ensure that inflation stays within acceptable norms. If inflation is allowed to become entrenched, the output costs of bringing inflation back under control are potentially very large.

1.0 Introduction

Under the Reserve Bank Act, the Reserve Bank of Fiji is charged with maintaining price stability, or more generally low inflation.

To achieve and maintain low inflation the Reserve Bank conducts monetary policy. The general term monetary policy refers to policies used by a central bank to influence the money supply and/or interest rates.

In the past, monetary policy in Fiji was implemented using direct controls on commercial bank lending. The financial system was heavily regulated and the Reserve Bank exercised controls on the quantity of commercial bank lending and on the interest rates at which loans were provided. Interest rates on deposits were also regulated.

Central to this approach was control over the quantity of money. Within this framework, the Reserve Bank used changes in reserve requirements of commercial banks to influence the liabilities of the central bank – the money base (currency and deposits with the central bank). By changing the money base the central bank was able to influence the broader money and credit aggregates, and its final objective inflation.

Today the financial system is deregulated and the Reserve Bank conducts monetary policy using a market-based approach. The Bank conducts open market like operations in its own securities to influence interest rates. Changes in interest rates affect spending and production and eventually inflation.

This paper outlines the conduct of monetary policy in Fiji. Section two describes the formulation of monetary policy and Section three describes how monetary policy is implemented. Section four describes and

assesses the transmission mechanism. Section five summarises the paper and gives concluding comments.

2.0 Formulation of Monetary Policy

Monetary policy in Fiji is conducted to achieve the Reserve Bank's objective of low inflation. The Reserve Bank does not have a formal inflation target, but is generally comfortable with inflation rates of around 2-3 percent.

Monetary policy in Fiji is determined by the Reserve Bank of Fiji Board. The Board comprises seven directors. The Directors are the Governor of the Reserve Bank who is also Chairman of the Board, the Permanent Secretary for Finance, and five community representatives. The Board meets monthly.

Recommendations are taken to the Board following discussions by the Monetary Policy Committee (MPC), an internal group comprising the Governor, the Deputy Governor and Executive Management. The MPC reviews regular assessments of economic conditions and the outlook for inflation prepared by members of the Policy Coordinating Committee (PCC). The PCC also meets on a monthly basis and comprises senior members from the Economics Department and the Financial Markets Department.

To assess the outlook for inflation the Bank continually monitors and analyses current and expected future economic and financial conditions, paying particular attention to any signs of emerging price pressures. This assessment involves comprehensive analysis of external conditions,

domestic economic activity, financial conditions and price and wage developments. Since inflationary outcomes in Fiji are linked to the amount of slack in the economy, changes in import prices and domestic wage movements, these factors are monitored particularly closely.

The assessment of economic and financial conditions provides the Bank with a view of the extent of inflationary pressures and the likely evolution of inflation over the next year. The information is conveyed to the Board, via the MPC, on a monthly basis.

At each meeting the Board determines the appropriate stance of monetary policy. If the outlook for inflation suggests that, without any policy change, inflation in the medium term will be above the Bank's comfort range the Board may decide to tighten monetary policy – that is, to reduce liquidity in the economy and increase interest rates. If the outlook is for low inflation the Board may decide to ease monetary policy. Often the Board will assess that monetary conditions are appropriate and no policy change will be made.

There are no formal announcements following Board meetings. However, monetary policy changes are announced publicly. The Bank's policy stance is regularly communicated in the Bank's monthly Economic Commentary, and the conditions underpinning the Bank's policy settings are regularly reviewed in the Bank's Quarterly Reviews of the economy and six-monthly Monetary Policy Statements.

3.0 The Implementation of Monetary Policy

Once the Board takes a decision on the appropriate stance of monetary policy the information is conveyed to the Financial Markets Department of the Bank. The Financial Markets Department is responsible for the implementation of monetary policy.

3.1 The Market

The Reserve Bank of Fiji implements monetary policy by operating in a very specialised market, the market for base money. There are very few participants in this market. Participation is limited to the Reserve Bank, the Government, and institutions that hold accounts at the Reserve Bank. At the centre of the system is the Reserve Bank. Each of the commercial banks (apart from other institutions including the Fiji Development Bank, Fiji Sugar Corporation and the Fiji National Provident Fund) are required to keep an account with the Reserve Bank. Funds held by the banks in these accounts can be used to settle daily inter-bank transactions - that is, transactions between banks - and to settle daily transactions with the Reserve Bank. Monetary policy is conducted by the Reserve Bank using its central position in this market to influence the price of funds used to settle these accounts.

To understand how monetary policy is conducted we need to look more closely at the market for base money. On a daily basis, funds flow into and out of banks' accounts with the Reserve Bank through a variety of transactions. Every transaction between the public sector (the Reserve Bank and the Government) and the private sector affects the balances in these accounts. Government payments to the private sector and Reserve Bank purchases of foreign exchange or debt securities increase the money in these accounts; government receipts and Reserve Bank sales of foreign exchange or debt securities decreases the money in the accounts (Table 1).

Table 1. *Transactions Affecting the Money Base*

Inflows	Outflows
Government payments	Government receipts
Purchases of foreign exchange by the RBF	Sales of foreign exchange by the RBF
Other RBF transactions:	Other RBF transactions:
redemptions of RBF Notes	issue of RBF Notes
purchases of government securities	sales of government securities
purchases of repurchase agreements	sales of repurchase agreements
overnight lending	repayment of overnight lending
rediscount of securities	

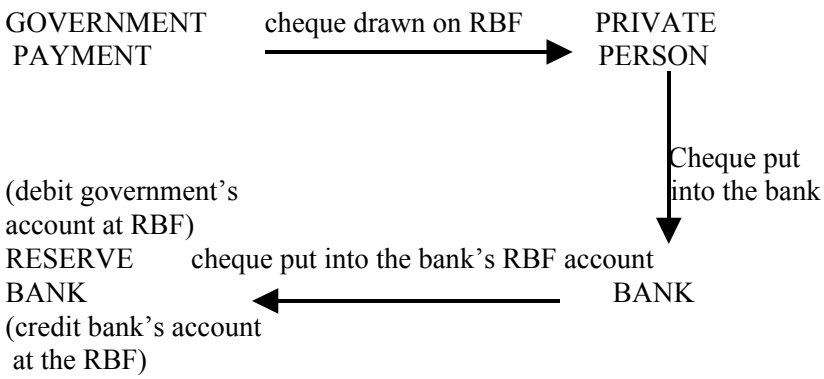
Two examples of how this works in practice are shown in Diagram 1. In the first example, the government makes a payment to a private individual. The person deposits the cheque with a bank and the bank clears the cheque with the Reserve Bank. The Reserve Bank credits the bank's account at the Reserve Bank. There is now more money in the system.

In the second example, the government collects tax from a private person. The person draws a cheque from a bank to pay the government and the government deposits the cheque with the Reserve Bank. The Reserve Bank debits the bank's account at the Reserve Bank. There is now less money in the system.

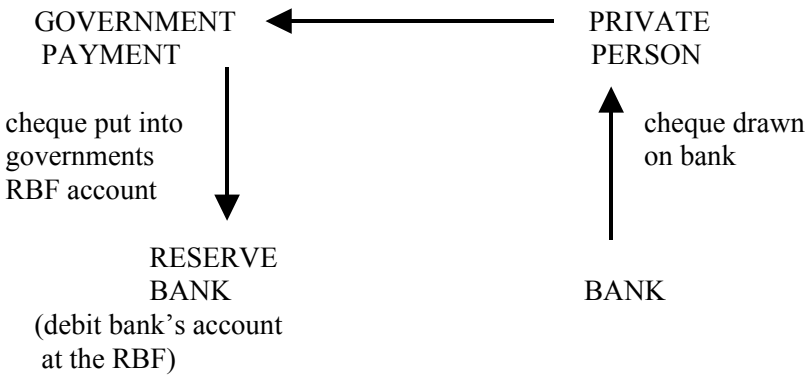
In both of these examples, as with all other transactions between the public and private sectors, there is an effect on bank's balances held with the Reserve Bank. Some transactions cause the balances of individual banks to rise while others cause the balances of individual banks to fall. The net effect of these transactions will be that some banks may owe the Reserve Bank money and the Reserve Bank may owe some other banks money.

Diagram 1. *The Money Base*

Addition to the Money Base



Withdrawal from the Money Base



In the case where a bank owes the Reserve Bank money it will have to find some cash to make the payment. It may be able to borrow from some other bank who has a surplus in their account with the Reserve Bank. If, on the other hand, a bank has a surplus with the Reserve Bank it will try to reduce it. The Reserve Bank does not pay any interest on the money in banks' accounts with it so there is an incentive for banks to do something else with the money. A bank may be able to lend the surplus to another bank who does not have enough money in its RBF account.

Note that there is very little continuing demand for free deposits with the Reserve Bank. The Reserve Bank does not pay interest on these funds, so if the Reserve Bank credits a bank's account, the bank will immediately look for a way to spend the money. A small amount is held for transactions and precautionary reasons because other markets are not yet fully developed, but generally the amount that banks wish to hold in these accounts on a permanent basis is low. In this market, the demand for funds and the supply of funds are transitory phenomena which exist for only a short period each day.

3.2 Market Conditions

To gauge conditions in this market the Reserve Bank maintains a daily liquidity forecast which details expected inflows and outflows to and from the system. There are two main groups of flows: (i) government-related transactions, and (ii) Reserve Bank foreign exchange and domestic transactions.

The forecasting spreadsheet maintained by the Reserve Bank looks similar to the abbreviated version shown in Table 2. Not surprisingly, the spreadsheet looks much like a balance sheet, with forecasts of assets and liabilities in coming days and months. This is because the liquidity forecasts reflect the net effect of flows into or out of the accounts held with the Reserve Bank. The spreadsheet is simply detailing the expected changes in the Reserve Bank's balance sheet resulting from inflows and outflows to and from the system under current policy arrangements.

Table 2 *Liquidity Forecast*

	Mon	Tue	Wed	Thu	Fri
1. Supply of Monetary Base [2.1. + 3]	622.3	619.2	608.8	591.3	591.3
2. Gross Foreign Assets	813.4	811.5	802.1	803.9	803.9
Less SDR All./IMF Credit	17.9	17.9	17.9	17.9	17.9
Less Revaluation Reserves	149.2	149.2	149.2	119.7	119.7
2.1. Net Foreign Assets	646.3	644.4	635.0	666.3	666.3
3. Net Domestic Assets	-24.0	-25.2	-26.2	-75.0	-75.0
3.1. Claims on Government (Net)	-24.0	-25.2	-26.2	-90.0	-90.0
Claims on Government	4.7	3.5	3.0	0.0	0.0
Government Deposits	0.0	0.0	0.1	60.6	60.6
Government Trust Account	4.9	4.9	5.3	5.6	5.6
Sinking Fund Deposits	23.8	23.8	23.8	23.8	23.8
3.2. Claims on official entities	0.0	0.0	0.0	0.0	0.0
3.3. Claims on commercial banks	0.0	0.0	0.0	15.0	15.0
4. Reserve money	221.7	218.1	207.6	226.3	226.3
4.1. Currency in circulation	168.9	170.4	183.7	192.0	192.0
4.2. Banks' free deposits (BDD)	52.8	47.7	23.9	31.3	31.3
4.3. Call deposits of official entities	0.0	0.0	0.0	3.0	3.0
5. Surplus (+)/ Shortfall (-) [1 - 4]	400.6	401.1	401.2	365.0	365.0
6. Other items net (Denotes net liabilities)	-35.4	-35.9	-36.0	-5.3	-5.3
7. Instruments	365.2	365.2	365.2	359.7	359.7
7.1. RBF Notes/Bonds	295.5	295.5	295.5	290.0	290.0
7.2. Statutory deposits (SRD)	69.7	69.7	69.7	69.7	69.7
System Check [5 + 6 - 7]	0.0	0.0	0.0	0.0	0.0
8. RBF Notes/Bonds Redemptions	0.0	0.0	0.0	-5.5	0.0
9. RBF Notes/Bonds Issues	0.0	0.0	0.0	0.0	0.0

On the basis of the information that the Reserve Bank receives about likely transactions in the days ahead, it is able to form a reasonable picture of the overall liquidity levels that are likely to prevail in the market. That is, it is able to determine whether, on any particular day, banks are likely to owe the Reserve Bank money or be owed money by the Reserve Bank.

If the banks are likely to be owed money the level of banks free deposits with the Reserve Bank (item 4.2 in Table 2) will rise; if the banks are likely to owe money the level will fall. This item is like a balancing item in Table 2 and is a summary measure of the liquidity that is in the banking system at any time.

3.3 The Influence of the Reserve Bank

The Reserve Bank is able to influence conditions in this market by issuing or redeeming its own securities so that it reduces or adds to the amount of money that the banks are holding.

This is a little bit surprising since usually a central bank has very limited control over liquidity conditions under pegged exchange rate arrangements such as those in Fiji. As a rule, under a fixed exchange rate, and in the absence of capital controls, any attempt by a central bank to contract or expand liquidity in the market to influence interest rates would be immediately reversed by offsetting capital inflows or outflows. For example, if a central bank bought securities to inject funds into the market, interest rates would fall below foreign interest rates temporarily, and investors would take their money offshore to get the higher return. This

would drain funds from the market reversing the effects of the initial injection by the central bank.

In practice, however, the Reserve Bank still has good control of liquidity levels in this market. The market is effectively insulated by capital controls and a variety of other factors such as informational asymmetries, an absence of secondary markets, low levels of market sophistication, the nature of approvals processes, transaction costs, issue size and sterilisation. Under these conditions, the Reserve Bank is able to implement policy a little more independently than would otherwise be the case.

The Reserve Bank implements monetary policy by exerting pressure on the market for short-term funds. It does this by selling or redeeming RBF Notes to influence the amount of funds in the market. The tenders for RBF Notes (see Diagram 2) usually occur once per week and are an integral part of monetary policy operations.

Since the Reserve Bank is able to forecast net flows into or out of the system it knows in advance, in the absence of any buying or selling on its own account, the likely net effects of transactions on liquidity levels.

Imbalances arise if the net inflows or outflows on any day make the overall level of deposits in banks' accounts with the Reserve Bank negative or significantly positive. If banks are short of funds overall they will initially be forced to borrow among themselves, often at higher interest rates, and eventually be forced to borrow from the Reserve Bank to meet their legal obligations. If banks overall are holding positive balances (which they generally do not wish to do since they are earning no interest on these balances) they will try to loan them out, often at lower interest rates. Only when net balances of bank's deposits with the Reserve Bank are close to zero (or a little above, if market imperfections mean that banks are required to hold small balances for precautionary purposes) will the system be in balance.

If the Reserve Bank wishes interest rates to remain unchanged it will add or subtract liquidity (by redeeming or issuing securities) to offset any imbalance.

Diagram 2. *RBF Notes Advertisement*

RESERVE BANK OF FIJI NOTES

INVITATION TO TENDER DATED 26 MARCH, 1999

The Reserve Bank of Fiji, invites tenders for RBF Notes up to a limit of $20,000,000 as follows:

Issue Date : 26 March, 1999

Term 28 days (due 23/04/99)
91 days (due 25/06/99)
182 days (due 24/09/99)
245 days (due 26/11/99)

RBF Notes maturing on 26 March, 1999: $17,000,000

Tenders on the special forms provided must be lodged in the RBF Notes Tender Box at the Enquiries counter of the Reserve Bank of Fiji, Reserve Bank Building, Pratt Street, Suva, between the hours of 9.00 am and 11.00 am on Friday 26 March, 1999.
Allotments will be notified the same day.

Payment in full of the amount due in respect of such allotments must be made to the Reserve Bank of Fiji by cheque drawn on the Bank not later than 1.00 pm on Friday 26 March, 1999.

Minimum tender $50,000 (face value) thereafter multiples of $10,000 (face value).

Prospectus and tender forms are available from the Financial Markets Department (Domestic Markets Division) of the Reserve Bank.

There is always, or at least there should always be, a price at which these securities can be sold to the banks. This balancing operation - which is really just smoothing out the liquidity in the system - is the most common day-to-day operation of the Reserve Bank in the market, since monetary policy is changed infrequently.

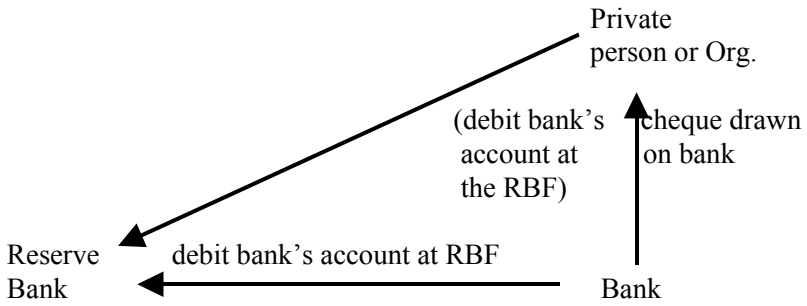
If, however, the Reserve Bank wishes to increase interest rates, it will issue (net of redemptions) an amount of securities that will allow an existing deficit to remain in the system or will more than offset an existing surplus. The banks will end up owing money to the Reserve Bank and the pressure will be on them to find it. This puts upward pressure on interest rates (Diagram 3).

If the Reserve Bank wishes to decrease interest rates, it redeems (net of new issues) an amount of securities that allows an existing surplus to remain in the system or more than offsets an existing deficit. The banks will end up being owed money by the Reserve Bank and the pressure will be on them to find some use for it. Otherwise they will earn zero interest on the funds. This puts downward pressure on interest rates.

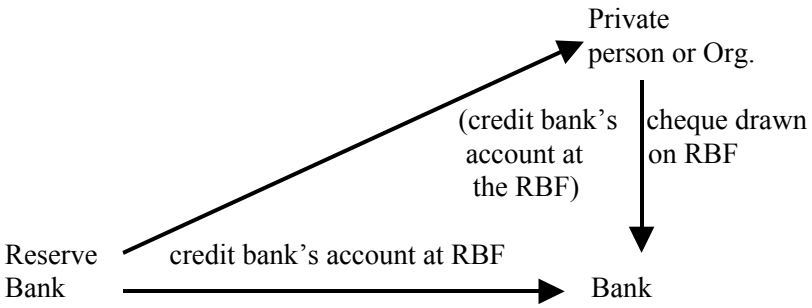
Note that the Reserve Bank does not set or control interest rates (yields) paid on its securities. It simply uses its dominant position in this market to create market conditions that drive short term interest rates to desired levels.

Diagram 3. *Open Market Operations*

Open Market Operations to withdraw funds
(Sale of RBF Notes)



Open Market Operations to inject funds
(Redemption of RBF Notes)



In theory, the Reserve Bank does not need to create much of an excess or deficit to put pressure on interest rates. Indeed, there are safety nets in place to ensure that banks are able to keep their liquidity levels low. To make sure that individual banks are able to meet their obligations to the Reserve Bank in the event that they do not have enough money in their accounts to pay the Reserve Bank and are unable to access funds from other banks, the Reserve Bank offers banks very short term lending facilities. Banks can borrow overnight funds from the Reserve Bank using government guaranteed debt securities (such as bonds or RBF Notes) as collateral[1]. They can borrow for slightly longer periods using repurchase agreements, where the Reserve Bank buys securities from the bank and agrees to resell the security to the bank in a few days time. They may also sell securities (Treasury Bills) to the Reserve Bank.

The 'safety net' facilities are available to banks at interest rates, which include a small premium over market rates to discourage banks from using them too frequently[2]. By providing these safety nets the Reserve Bank is also setting the interest rate on emergency funds, which gives it greater leverage in reaching its interest rate target.

The Reserve Bank can maintain pressure on interest rates in this market by creating continuing excess or deficit liquidity conditions day-after-day until the desired interest rates are reached. Even though banks are

[1] Banks have not actively used this facility in recent years as the interest rate charged by the Reserve Bank had moved out of line with market rates. In late 1997, the interest rates on the various safety net facilities were more closely linked to market conditions by tying the rates to the 91-day RBF Note rate plus a small penalty.

[2] There are no provisions to allow banks to remove excess liquidity at present, except for the judicious use of issues of RBF Notes.

able to meet their obligations at the end of each day (by accessing overnight central bank funds if necessary) the Reserve Bank is able to maintain continuous pressure on interest rates by creating conditions each day where banks are forced to find the necessary funds (or to try to dispose of excess funds). Even though liquidity levels remain close to zero, by continuing to engineer a small deficit or surplus of funds, the Reserve Bank is able to force interest rates up or down.

Since banks also know that the Reserve Bank is able to engineer a prolonged period of tightness or surplus in the market for base money, a clear signal by the Bank backed up by appropriate liquidity operations will see rates converge to the target reasonably quickly.

4.0 The Transmission of Monetary Policy

The transmission of monetary policy describes the channels through which Reserve Bank monetary policy operations are transmitted to the Bank's final objective – inflation. There are three main stages in the transmission mechanism: (i) the flow-on of changes in short-term money market interest rates to other interest rates in the economy, particularly commercial bank lending and deposit rates, (ii) the effects of changes in interest rates on economic activity and (iii) the effects of economic activity on inflation.

4.1 The Transmission to other Interest Rates

By influencing liquidity conditions in the market for base money and hence money market interest rates, the Reserve Bank is able to influence other interest rates in the economy, particularly commercial bank deposit and lending rates.

The initial step in the transmission mechanism is to deposit rates. Commercial banks fund their lending by borrowing, largely through term and saving deposits[3]. There are two main groups of depositors: retail depositors, usually private individuals or small businesses depositing relatively small sums of money, and wholesale depositors, larger organisations often dealing with large and often temporary surpluses of funds. These latter depositors provide a bridge between the money market and the commercial bank deposit market.

If the Reserve Bank increases money market interest rates, for example, wholesale depositors may find it more attractive to remove funds from deposits with commercial banks and purchase money market securities. Commercial banks would then need to raise their own deposit rates to retain these deposits or induce replacement deposits from other sources, including their retail customers.

If the Reserve Bank lowers money market interest rates, however, large depositors may find it more attractive to put their money with commercial banks at current interest rates. Commercial banks, seeing money market rates lower and faced with additional wholesale inflows, are

[3] In many countries, although not yet in Fiji, they also fund their borrowing by issuing their own money market securities, such as bank accepted bills.

likely to lower their interest rates to these depositors. Retail deposits rates would also be lowered since a competing source of funds is now cheaper.

The next link in the chain is between commercial bank deposit rates and lending rates. Most commercial banks calculate their interest rates on loans based on interest rates they pay on deposits - their cost of funds. Lending rates are equal to a bank's cost of funds, plus an allowance for operating costs (including possible bad debts) and a profit margin. The profit margin depends largely on the degree of competition in the industry. If banks' deposit rates change, banks are able to adjust their lending rates accordingly.

Some measure of the average degree of pass-through of changes in RBF Notes rates to various other interest rates can be obtained by estimating the following equation over the period since RBF Notes were introduced in 1989:

$$\Delta i_t = \alpha_0 + \sum_{i=0}^{l} \alpha_{1i} \Delta r_{t-i} + \sum_{i=1}^{m} \alpha_{2i} \Delta i_{t-i} + \alpha_3 i_{t-1} + \alpha_4 r_{t-1} + \varepsilon_t \qquad (1)$$

where i is the relevant interest rate and r is the yield on Reserve Bank Notes.

The results, shown in Table 3, suggest that since 1989 changes in yields on Reserve Bank Notes have been transmitted substantially (and almost completely) to short-term money market interest rates. About 95 percent of the change in Reserve Bank Note yields are passed through to Treasury Bill yields with over half of the transmission occurring in the same month.

The transmission to commercial bank savings deposit rates is incomplete and slower, with one third of any change passed through in the same month and almost all passed through after about six months.[4] The transmission to commercial bank term deposit rates cannot be estimated because of data limitations. This phase of the transmission mechanism is potentially the weakest in Fiji. Since commercial banks fund a large part of their lending through deposits, rather than marketable securities – such as bank bills or certificates of deposits – changes in money market rates are only weakly related to deposit rates.

In countries with more developed money markets, the short-term money market is very liquid and there are a large number of participants. Arbitrage between different instruments ensures that the stance of monetary policy, and the expected stance in the near future, is fully reflected in money market rates across a wide spectrum of maturities. Since banks fund a large part of their lending by raising funds in the short-term money market, these rates influence the rates that banks are prepared to pay on their other main source of funds – deposits. The development of this market in Fiji should strengthen the monetary policy transmission mechanism in coming years.

In the meantime, the Reserve Bank exercises moral suasion to ensure that commercial banks respond appropriately to changes in market interest rates.

[4] Note that the rates were controlled before 1993, so only a small sample is used.

Table 3. *Pass Through of Changes in RBF Notes Yields*

Dependent variable: interest rates; estimation period 1989:01 - 1999:01

Dependant variable	Long-run pass through	Speed of adjustment
Δi	α_4/α_3	α_3
Treasury Bill Rate	0.95	0.57
Savings Deposits Rate*	0.38	0.10
Lending Rate	1.20	0.05

* since 1993 only

The transmission to commercial bank lending rates is complete but much slower. On average, all of the change in yields on Reserve Bank Notes is transmitted to commercial bank lending rates; only about 5 percent of this is passed through in the same month. It is likely however, that these results understate the speed of pass-through: published commercial bank lending rates relate to the stock of outstanding loans (many at fixed rates of interest) rather than rates charged for new loans.

4.2 The Transmission to Economic Activity

The transmission of interest rate changes from short-term policy rates to commercial bank lending and deposits rates is only the first part of the transmission mechanism. The second part is the transmission of changes in lending and deposit rates (and exchange rates) to economic activity.

This part of the transmission mechanism works through several channels. Traditionally, the main channel has been through *intertemporal substitution*. That is, higher interest rates encourage increased saving and lower levels of consumption and investment; lower interest rates have the opposite effect.

There is also a *cashflow channel*. Higher or lower interest rates affect the cash flow of households and businesses who already hold loans. Even if these groups do not change their borrowing behaviour in response to interest rate changes, the level of their disposable income changes. A rise in interest rates, for example, reduces the disposable income of households and reduces the amount they have to spend on consumption. Similarly a rise in interest rates reduces firms' after-interest cash flows and so reduces the amount that they have left over to fund investment. Lower interest rates have the opposite effect.

There is also an *exchange rate channel*. Although the exchange rate does not move very much in Fiji because of the nature of the exchange rate arrangements, it nonetheless is an important aspect of the overall stance of policy. Finally there is a *wealth channel*, through the effect of interest rate

changes on the capital value of physical and financial assets. This channel is probably quite small in Fiji.

The strength of the transmission of changes in interest rates to the rest of the economy is an empirical question. It might be expected that in a developing economy such as Fiji interest rate linkages would be weak. Empirically, however, the historical relationship between interest rates and the real economy has been surpassingly robust. To measure the relationship, the following reduced form growth equation was estimated over the last three decades[5]:

$$\Delta y_t = \alpha_0 + \sum_{i=1}^{l} \beta_{1i} \Delta y_{t-i} + \sum_{i=1}^{m} \beta_{2i} r_{t-i} + \sum_{i=0}^{n} \beta_{3i} \Delta y^*_{t-i} + \sum_{i=0}^{p} \beta_{4i} \Delta z_{t-i} + c_1 y_{t-1} + c_2 y^*_{t-1} + v_{1t} \quad (2)$$

where y and y* are the logarithms of Fiji and foreign GDP, r is the real short-term interest rate and z is a vector of other possible short-term influences (agricultural supply shocks, terms of trade, real exchange rate, government deficit). The interest rate term is lagged to ensure that possible policy responses to stronger growth are not inadvertently captured. The results, shown in Table 4, suggest that the real short-term interest rate has a significant effect on the real economy.

[5] The sample period was determined by the availability of interest rate data.

Table 4. *Determinants of Fluctuations in Output (Unrestricted ECM)*

Dependent variable: economic growth; estimation period 1975 - 1998 (1966-1998)

Explanatory variables: short run	1975 - 1998	1966 - 1998 (constant nominal interest rate pre-1975)
Constant	0.927*	0.641**
	(2.219)	(2.849)
Agricultural supply-side shocks $_t$	0.004**	0.004**
	(5.790)	(5.568)
ΔTerms of Trade $_{t-1}$	0.075	0.076
	(1.491)	(1.227)
ΔTrading partner GDP $_t$	0.935**	0.695
	(2.977)	(1.170)
Real Interest Rate t-1	-0.342*	-0.521**
	(-2.300)	(-3.255)
Dummy1	-0.058**	-0.047**
	(-3.397)	(-4.244)
Dummy2	0.050**	0.047**
	(5.295)	(3.336)
Explanatory variables: long run		
GDP $_{t-1}$	-0.408**	-0.329**
	(-3.450)	(-4.234)
Trading partner GDP $_{t-1}$	0.407**	0.345**
	(3.705)	(3.894)
Implied long-run coefficient	1.002	1.050
Summary statistics		
Adjusted R^2	0.846	0.660
σ	0.019	0.030

Notes: t-values are in parentheses. **(*) denotes significance at the one (five) per cent levels. For the long-run explanatory variables, the implied long-run coefficients were calculated as the ratio of the relevant long-run ECM coefficients to the long-run coefficient on the lagged dependent variable; the Bewley transformation was applied to obtain interpretable t-statistics. The cointegration test proposed by Kremers, Ericsson and Dolado (1992) is employed. σ is the standard error of the equation.

On average, a one-percentage point increase in real short-term interest rates temporarily lowers the growth rate of the economy on average by 0.34 percentage points. The lag between the change in interest rates and economic growth is around one year.

While these effects appear relatively small, they need to be put into perspective. Fiji's economy grows on average at around 2-3 percent per year. A temporary increase in real interest rates of say three-percentage points – a common cyclical movement in policy rates – would take off more than a third of GDP growth in the following year.

These results are similar to results obtained in overseas studies. For example, Shuetrim and Gruen (1994) find that for Australia, a one percentage point increase in real interest rates reduces the level of output by 0.4 percent over an eighteen months horizon.

They describe those results – which are very close to those of Fiji – as showing that "monetary policy has a strong, though temporary and substantially lagged effect on the economy".

4.3 The Transmission to Inflation

The final part of the transmission mechanism is from economic growth to inflation. To measure this relationship, the following inflation equation was estimated over the last three decades:

$$\begin{aligned}\Delta p_t = {} & \alpha_0 + \sum_{i=1}^{l} \beta_{1i} \Delta p_{t-i} + \sum_{i=0}^{m} \beta_{2i} w_{t-i} + \sum_{i=0}^{n} \beta_{3i} \Delta p^m_{t-i} \\ & + \sum_{i=0}^{0} \beta_{4i} \Delta \left(y - y^* \right)_{t-i} + \beta_5 p_{t-1} + \beta_6 w_{t-1} + \beta_7 \, p^m_{t-1} \\ & + \beta_8 \left(y - y^* \right)_{t-1} + v_{1t}\end{aligned} \tag{3}$$

where p is the logarithm of the consumer price index, p^m is the logarithm of an index of import prices in domestic currency, w is the logarithm of an index of nominal unit labour costs and y-y*, is the output gap – the deviation of the economy from some measure of capacity. A dummy variable is added to control for the effects of the changes in the tax regime in the early 1990s.

The derivation of equation (3) is described more fully in another paper (Dewan et al. 1999). A summary of the results is shown in Table 5.

Table 5. *Determinants of Inflation (Unrestricted ECM)*

Dependent variable: inflation; estimation period 1968 – 1998		
Explanatory variables: short run	(1)	(2)
Constant	0.049	
	(2.120)*	
Δ Prices$_{t-1}$	0.207	
	(1.637)	
Δ Import prices$_t$	0.205	
	(10.144)**	
Output gap $_{t-1}$	0.176	
	(2.660)**	
Δ Unit Labour Cost $_{t-1}$	0.087	
	(2.191)*	
Explanatory variables: long run		
Prices $_{t-1}$	-0.165	
	(-3.782)	
Import prices $_{t-1}$	0.130	0.732
		(13.903)**
Unit labour costs $_{t-1}$	0.022	0.202
		(4.411)**
Summary statistics		
Adjusted R^2	0.750	
σ	0.017	

Notes: t-values are in parentheses. **(*) denotes significance at the one (five) per cent levels. For the long-run explanatory variables, the implied long-run coefficients (column 2) were calculated as the ratio of the relevant long-run ECM coefficients to the long-run coefficient on the lagged dependent variable; the Bewley transformation was applied to obtain interpretable t-statistics. The cointegration test proposed by Kremers, Ericsson and Dolado (1992) is employed. σ is the standard error of the equation.

The results presented above show that economic growth has a direct effect on inflation in the short run. On average, a one percentage point rise in the output gap is associated with a 0.2 percentage point rise in inflation in the following year.

Note, however, that this substantially understates the total impact of the output gap on inflation. Most studies find that the main effect of the output gap on inflation is through input costs, particularly labour costs. If labour costs are removed from equation (3) the estimated coefficient on the output gap term sums to 0.35 (spread evenly over two years). That is, to cause a permanent one percentage point fall in inflation, an output gap of a little over 1 percent would have to be maintained for a period of a little over 2 years.

This result, while showing relatively weak effects, is consistent with overseas studies. De Brouwer and Ericsson (1995) find a (annualised) coefficient on the lagged output gap term of around 0.3 percent. To engineer a permanent one percentage point fall in inflation, an output gap of around 3 percent would have to be maintained for a period of around 1 year.

Note that a permanent reduction in inflation of one percentage point is not a trivial outcome, at least for those countries where inflation is relatively low and expected to be held within reasonably narrow ranges.

Together, the results of equations (2) and (3) show that monetary can potentially exercise a strong influence on inflation, although the effects are lagged substantially and there may be substantial output costs if inflation has moved too far from acceptable levels.

5.0 Conclusion

The conduct of monetary policy globally has undergone a remarkable transition over the past decade, underpinned by significant advances in economic theory and economic practice.

The goals of monetary policy are now clearly defined. The acceptance that there is no medium or longer-term tradeoff between inflation and output growth and the growing recognition of the costs of inflation have led to a strong consensus that the appropriate medium term strategy for a central bank is the establishment and maintenance of price stability.

On the operational side, central banks have increasingly adopted market-based policy mechanisms. Open market operations, providing 'control' of short-term interest rates, has replaced direct controls such as interest rate ceilings, directed lending and bank reserve requirements. Market interest rates (and in some cases exchange rates), have replaced money and credit aggregates as the medium through which monetary policy changes are transmitted to economic activity and inflation.

In Fiji, the Reserve Bank has adopted a market-based approach to monetary policy. Monetary policy is implemented through open market like operations in the Bank's own securities to influence short-term interest rates. Monetary policy is transmitted to the Bank's final objective – inflation – through commercial interest rates and through the real economy.

The pass through of changes in RBF Note rates to other short-term money market rates is quick while the pass through to commercial bank rates is much slower. The transmission to the real sector appears to be reasonably strong and the transmission to inflation relatively weak, but broadly in line with other countries.

These estimates, while imprecise, show that the transmission of monetary policy in Fiji can be effective, but substantial changes in interest rates are required to influence inflation. This underscores the need, as has been highlighted in many other countries, for the Reserve Bank to be preemptive in its policy stance, tightening policy at the first sign of inflationary pressures to ensure that inflation stays within acceptable norms. If inflation is allowed to become entrenched, the output costs of bringing inflation back under control are potentially very large.

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