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A MONEY DEMAND FUNCTION OF THE SOLOMON ISLANDS

Kenneth Especkerman-True
Senior Research Analyst
Research Unit
ERS Department, CBSI

Elizabeth Ragimana
Manager (Ag)
ERS Department, CBSI

Patricia Samani
Senior Research Analyst
Money and Banking Sector
ERS Department, CBSI

Vitarina Takana
Research Analyst
Real Sector
ERS Department, CBSI

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A MONEY DEMAND FUNCTION OF THE SOLOMON ISLANDS*

K. Especkerman-True, E. Ragimana, P. Samani, and V. Takana

Abstract

In this paper, we estimate the money demand function for the Solomon Islands using quarterly time-series data for the period 2002Q1–2012Q4. Money demand is proxied by both narrow money (M1) and broad money (M2), both measured in real terms. Our main findings are: 1) money demand is cointegrated with its determinants, namely, real GDP, the real effective exchange rate, short-term domestic interest rate and short-term foreign interest rate; 2) in the long-run, all variables are correlated with money demand although not all variables are statistically significant in the short run; 3) only the foreign interest rate was found to Granger cause money demand; 4) the speed of adjustment in money demand to any shock was found to be 37% and 41% for each quarter when using RM1 and RM2 as dependent variables, respectively; and 5) the Solomon Islands exhibited a stable money demand function, implying that there is evidence to advocate monetary targeting.

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1. Introduction

The Solomon Islands Monetary Authority (SIMA) was first established by the Solomon Islands Monetary Authority Ordinance 1976, which was brought into effect on 21st June 1976 (SIMA, 1976). During its infancy, SIMA had two preoccupations; the promulgation and administration of the new Exchange Control in March 1977 and the transitionary withdrawal of Australian currency and introduction of the new Solomon Island currency, which was first issued on 24th October 1977 and became sole legal tender on 30th September 1978 (SIMA, 1977; 1978). Following the delivery of these objectives, SIMA focused on its provision services to local commercial banks, took responsibility for the adoption of daily exchange rate determination, and established its role as the Registrar of Government Securities issued in the Solomon Islands in 1979. In 1980, the Monetary Authority formalised its role to provide a clearing house for the trading banks (SIMA, 1979; 1980). With additional resources made available, 1980 and 1981 saw the creation and development of a research department within the Monetary Authority. This reflected efforts to improve the collection and dissemination of monetary statistics required to enable the Government to initiate more informed policy decisions for short-term and longer-term management of the monetary system. This is demonstrated in the, arguably, more active monetary policy decisions made by SIMA in 1982 in dealing with the macroeconomic issues facing the Solomon Islands during the continued global recession of the early 1980s (SIMA, 1981;1982).

Through the Solomon Islands Monetary Authority (Amendment) Act 1982, SIMA was superseded by the formal establishment of the Central Bank of Solomon Islands (CBSI) on 24th January 1983, which saw a deepening in the responsibility of the monetary authority, namely through its intended advisory role to Government, a strengthening in supervisory powers of the commercial banks, and the Central Bank's ability to aid in approved lending by commercial banks (CBSI 1983; National Parliament of Solomon Islands 1982). Since then, supplementary amendments have been made to further strengthen the capabilities of the Central Bank in order to act swiftly to changes in domestic and international economic conditions and fulfil its primary objects. From 1st January 2013, the mandate and powers of CBSI have now been enshrined in the CBSI Act 2012 to support its primary objective of achieving and maintaining domestic price stability[1], (National Parliament of Solomon Islands, 2012). The earnestness for CBSI to understand the stability of money demand is high, for it is a fundamental predication for choosing the most appropriate monetary policy target in order to achieve and maintain domestic price stability. Poole (1970) outlines the economic theory underpinning the optimal monetary instrument for an economy, based on the expected losses under each instrument; the interest rate should be selected as the monetary policy instrument when LM is unstable whilst money stock[2] is preferred in the case of random shocks to IS. As a result, stable money demand economies, mainly attributed to countries with less developed financial systems, are likely to minimise stabilisation costs through advocating money supply targeting. In more developed economies, where money demand is found to be less stable, there is a need for monetary policy to move towards inflation targeting through setting interest rates whilst allowing money supply to move freely. However, some developing countries are abandoning money supply targeting in favour of using the interest rate.

The money demand literature is vast and continues to evolve under the auspices of new econometric techniques and as developments in financial instruments alter the nature of the relationship. Studies on estimating money demand have been carried out on both developed and developing countries. A growing body of literature has also started to emerge on the Pacific Island countries. Rao and Singh (2005) found the demand for money to be stable in Fiji while Narayan and Narayan (2008) conclude that the relationship is unstable owing to atypical events in Fiji's history. Kumar and Manoka (2008) found that Tonga has a stable money demand function. Furthermore, Kumar (2010) uses panel data analysis to estimate the money demand functions for Fiji, Samoa,

[1] Its additional objective is to foster and maintain a stable financial system whilst supporting the general economic policies of Government, without the prejudice of attaining its two priority objectives.

[2] Poole (1970) distinguishes between those that would advocate increasing money stock at a constant rate to those that argue for increasing money stock in response to the needs of current economic conditions (reducing money stock in boom times and vice versa during recessions).

Solomon Islands, Vanuatu and Papua New Guinea and concludes that they exhibit stable relationships. However, although helpful in providing lessons and findings for regional monetary policy implications such as dollarization policies and regional monetary unions, a panel money demand function is more limited in application to national monetary policy formulation for Solomon Islands. More specifically, Jayaraman and Choong (2010) find that Solomon Islands exhibit a stable money demand function but this predates recent developments in the CBSI's efforts to develop new monetary policy instruments.

This paper aims to build on this literature on money demand functions and empirically examine the money demand function for the Solomon Islands. In a country that is currently experiencing excessive amounts of excess liquidity, relatively high inflation rates, and more recently, has developed open market operations, understanding the determinants of money demand and, hence, choosing the optimal monetary policy instrument for the economy, is crucial for achieving the primary objective of price stability in the Solomon Islands. Estimating a stable money demand is an important precondition for an effective monetary policy as it enables the existence of a stable channel through which changes in monetary aggregates have effects on prices and output. We investigate this using real GDP, short-term nominal domestic interest rate, short-term nominal foreign interest rate, and real effective exchange rate as the explanatory variables and money aggregates, M1 and M2, in real terms, as the dependent variable. The results are particularly important for the CBSI, which uses monetary policy instruments to influence monetary aggregates to affect the real economy, particularly in the absence of an overnight interbank interest rate.

The rest of the paper is organised in the following manner. Section 2 provides a brief overview of recent literature. Section 3 discusses the applicability of recent literature to the case of the Solomon Islands as well as outlining the methodology adopted for the study. Section 4 presents the results and interpretation. Section 5 is a summary of the findings with policy implications.

2. An overview of the literature and the implications for Solomon Islands

Over the decades, the theory of money is well understood (Fisher 1911; Pigou 1917; Keynes 1930, 1936; Baumol 1952; Friedman 1956; Tobin 1956; Patinkin 1965; Lucas 1980; Barnett 1980; Sargent and Wallace 1982) and money demand functions have received a great deal of attention with mixed results. From these studies, we are able to identify three main features of the literature.

The first feature we identify is the coverage of the literature. As expected, the majority of studies focus on money demand functions of developed countries as well as emerging economies. Far fewer studies, however, have concentrated on low-income countries and countries from the South Pacific region.

The second key feature of the literature relates to the variables used to estimate money demand functions. We find that the choice of variables is likely to be directly influenced by the approach as well as the availability of data. Generally, we discover five main categories of variables used to model the money demand function. These are: a money demand variable, used as the dependent variable; and a range of independent variables, which include a scale variable, a cost of holding money variable, an exchange rate variable, and a foreign interest rate variable.

The non-observability of money demand leads us to estimate this variable by the quantity of money supplied (see Suliman and Dafaalla, 2011). Boughton (1992) suggests that choice of the money supply variable is based on institutional characteristics or by arbitrary means. Ericsson and Sharma (1996), however, highlight that the problem is that broader monetary aggregates appear to be more stable to nominal income although they are less influenced by the actions taken by monetary authorities. Others, such as Goldfeld and Sichel (1990), suggest that the increased focus on M2, as an alternative, has been driven by the blurring of transactions and portfolio money.

The notion of the scale variable seeks to capture the number of transactions that relate to economic activity. Several income and wealth variables have been put forward to measure economic activity of an economy (see Subramanian, 1999).

The premise for including a cost of holding variable centres around capturing the interest foregone of both holding money rather than spending it, and the rate of return on assets of money substitutes. Cesarano (1991) explains this well; by holding one more dollar, the individual not only foregoes the yield on other financial assets but also one more dollar of consumption. In some instances, the expected rate of inflation is used as a measure of the cost of holding money where data restrictions, underdevelopment of the financial system, and government regulation of interest rates are key reasons for using the expected inflation rate. However, Heller and Khan (1979) contend that with the presence of moderate inflation, variations in nominal interest rates will be encapsulated in the expected inflation rate; thereby, not having any additional impact on money demand. Rao and Singh (2005) argue the case for the inclusion of nominal interest rates over the real interest rate in the demand for money, both for narrow and broad money. The rationale behind this is that various liquid assets, which are seen as close substitutes, will be homogenously affected by inflation. Therefore, comparing rates of return, based on the interest rate, should be compared using the nominal rate as opposed to the real rate.

Mundell (1963) highlights the importance of the exchange rate in offsetting central bank changes to money supply due to capital outflows, underpinning the capital mobility hypothesis. Under this premise, where funds are internationally mobile and residents are able to take advantage of rates of return from overseas, favourable exchange rate movements may, at times, yield greater returns. Narayan (2007) articulates this such that a depreciation in the exchange rate, measured by the number of units of domestic currency per foreign currency, implies an increase in the value of foreign assets in terms of domestic currency and hence, increases the demand for transactions. However, if a depreciation leads to speculation of a devaluation, the relationship with money demand will be negative such that residents in the domestic economy will be reluctant to continue holding domestic currency.

Agenor and Khan (1996) develop the argument for currency substitution and identify the role of foreign interest rates in money demand movements. They claim that variations in the ratio of domestic to foreign currency holdings are attributed to changes in foreign interest rates and in the premium of the parallel exchange market[3]. Rao and Singh (2005) acknowledge its importance by including the foreign interest as a return variable for the effective exchange rate, where foreign interest rate represents the weighted average of the deposit rates in trading partner economies. The inclusion of this variable is also found in other studies (see Narayan, 2007), who asserts the view that the foreign interest allows us to capture the responsiveness of money demand to foreign income.

The final feature relates to econometric methodology. There are essentially two directions that the empirical literature has taken. The first group of studies estimate money demand functions on a country-by-country basis. Siddiki (2000) uses the bounds testing approach to cointegration and estimates the money demand function for Bangladesh for the period 1975 to 1995. He finds a stable relationship. Tang (2002) estimates Malaysia's money demand function using the bounds testing approach to cointegration and finds a stable money demand function for Malaysia. Furthermore, Bahmani-Oskooee and Rehman (2005) estimate money demand functions for seven Asian countries using the bounds testing approach to cointegration. In summary, they find that for India, Indonesia and Singapore, M1 is cointegrated with its determinants and the parameters are stable, while the M2 is cointegrated with its determinants for Pakistan, the Philippines, Malaysia and Thailand with stable parameters. Other countries show unstable money demand functions; Bahmani-Oskooee and Shin (2002) estimate South Korea's money demand function using the bounds testing approach to cointegration but find an unstable relationship despite the variables included in the money demand function being cointegrated. Similarly, Pradhan and Subramanian (2003) estimate the money

[3] Agenor and Khan base their findings on a hypothetical world with a dual exchange market consisting of an official market for foreign exchange for general commercial transactions, and a parallel market to account for goods that cannot be imported at the official exchange rate. E.g. luxury goods.

demand function for India using the Gregory and Hansen (1996) residual-based test for cointegration but found no conclusive evidence of a long-run stable relationship between money demand and its determinants. There is also growing body of literature emerging on Pacific island country case studies albeit mainly focussed on Fiji. Katafano (2001) found that money demand for Fiji as stable, further supported by Rao and Singh (2005) who concluded a similar result. However, Narayan and Narayan (2008) argue that Fiji has an unstable money demand relationship attributed to atypical events in Fiji's history. In addition to Fiji, Kumar and Manoka (2008) have estimated the demand for money in Tonga and concluded that the relationship was stable.

The second group of studies used recent developments in panel unit root and panel cointegration (Mark and Sul 2003; Harb 2004) and found that interest rates has a negative coefficient and was statistically significant. Harb (2004) estimated money demand function for six countries namely Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates using Pedroni's (2000) panel cointegration procedures and found evidence that M1 was cointegrated with its determinants. The study also showed theoretically consistent results on the impact of real GDP and interest rate on money demand. In terms of the Pacific region, Kumar and Singh (2009) employed panel data analysis on Fiji, Samoa, Solomon Islands, Vanuatu and Papua New Guinea. They found that for these countries, the money demand function was stable and proposed these countries should target money supply in the conduct of monetary policy.

3. Empirical Framework

3.1. Methodology

This section presents the empirical framework to estimate the stability of money demand in the Solomon Islands. Having reviewed the literature, we have chosen to look at both money supply measures (in real terms), RM1 and RM2, in the following functional forms:

$$RM1 = f(RGDP, REER, DINT, FINT) \quad (1)$$

$$RM2 = f(RGDP, REER, DINT, FINT) \quad (2)$$

We believe that a narrow money measure best reflects the conditions in the Solomon Islands. More recent empirical studies show that in broad terms, developing countries are relatively more likely to observe stable demand relationships with narrower definitions of money. Moosa (1992) and Hossain (1994) assert the argument to weak banking systems and undeveloped financial systems. These explanations go some way to explaining why M1 is a better measure for the Solomon Islands where in many provinces, access to commercial banks is limited, partly attributed to the underdeveloped financial system. Another reason that explains why M1 could be a more suitable money demand measure in the Solomon Islands lies in the notion that residents may not desire to hold bank accounts under current economic conditions. For instance, rural residents face the task of weighing up the gain from storing money in a bank account compared to costs associated with having a bank account. Transport costs connecting to the urban centres may be a significant barrier, together with the prevalent transaction costs attached to holding a bank account such as withdrawal fees and cheque book fees. There is also likely to be a greater time cost compared to those living in urban centres that needs to be considered. All of this is accompanied by the presence of relatively high inflation in recent years. These arguments are very much akin to those proposed in inventory – theoretic approaches developed by Baumol (1952) and Tobin (1956). We conclude that on the assumption that there is a high prominence of cash in the Solomon Islands, motivated by transactions and precautionary demands, M1 may, therefore, be a more suitable measure. For completeness, we will investigate both monetary aggregates, M1 and M2. In the Solomon Islands, M1 is defined as the sum of currency in circulation and demand deposits in the banking system whilst M2 includes both components of M1 as well as total savings deposits.

Furthermore, as mentioned by Heller and Khan (1979) Rao and Singh (2005), we believe that using the domestic nominal interest rate is the most applicable cost of holding money variable. In accordance with well-documented literature, we expect that the relationship between the nominal interest rate and money demand to be negative. This is justified by the interest rate representing the opportunity cost of holding money; therefore, rising interest rates are likely to motivate residents to place money into interest-bearing accounts in order to generate a rate of return. In spite of this, much of the argument for money demand in the Solomon Islands is attributed to transactions and precautionary demands, rather than a driver for a store of wealth. With this in mind, this also provides us with a justification for using a short-term interest as opposed to assets with longer-term yields, as advocated by portfolio models. Together with the argument of prevalent transaction costs associated with bank accounts, we believe that the influence of the nominal interest rate on money demand may have little or no bearing as a determinant. This is more likely to be true for M1 than M2, given their definitions.

We also argue that there is a rationale for including an exchange rate variable in our models. Strict exchange controls prevent the free movement of capital and therefore, the ability to exploit profits from overseas. Instead, the incidence of exchange rate impacts on real money demand relates to the interactions with the terms of trade rather than capital mobility. A real depreciation of the exchange rate implies an improvement in the terms of trade. Export competitiveness in the long-run improves as exports appear to be relatively cheaper, whilst imports are relatively more expensive. Through these channels, real money demand will be affected in two ways. Where import demand is price elastic, demand for imports is likely to fall and so too will real money demand. Increased exports, on the other hand, will increase the demand for real money as foreign exchange associated with exports must be surrendered as per exchange controls imposed by CBSI[4], thus creating demand for domestic currency during conversion. To this end, we decide to use the real effective exchange rate to capture our relative competitiveness.

[4] Exchange controls currently only allow exporters to hold foreign currency accounts onshore and offshore. The amount that must be surrendered is assessed on a company by company basis with some exporters having to surrender a proportion of the export value whilst others must convert a set amount. It should also be noted that imports may also increase if intermediate processes require goods from overseas.

Finally, we include a foreign interest rate variable in both models. However, the strict exchange control policies that prohibit Solomon Island residents from holding foreign bank accounts overseas[5] and restrict the ability of firms to hold bank accounts offshore to only certain exporters, are likely to lessen the influence and importance of this variable on money demand.

3.2. Long-run model specification

Having chosen our variables, we construct our models using four determinants. For the long-run model, we expect, the short-term nominal domestic interest rate, DINT, to exhibit a negative and statistically significant relationship, and RGDP and the real effective exchange rate, REER, to have positive and statistically significant while, the short-term nominal foreign interest rate, FINT, is anticipated to demonstrate a positive yet statistically insignificant relationship. The expected relationships with RM1 and RM2 are shown in the models in Equations 3 and 4.

$$\Delta ln\mathrm{RM1}_{\mathrm{t}} = \alpha_0 + \alpha_1 \Delta ln\mathrm{RGDP}_{\mathrm{t}} + \alpha_2 \Delta ln\mathrm{REER}_{\mathrm{t-1}} - \alpha_3 \mathrm{DINT}_{\mathrm{t}} + \alpha_4 \mathrm{FINT}_{t} + \alpha_5\, \varepsilon_{\mathrm{t}} \quad (3)$$

$$\Delta ln\mathrm{RM2}_{t} = \beta_0 + \beta_1 \Delta ln\mathrm{RGDP}_{t} + \beta_2 \Delta ln\mathrm{REER}_{t-1} - \beta_3 \mathrm{DINT}_{t} + \beta_4 \mathrm{FINT}_{t} + \beta_5\, \varepsilon_{t} \quad (4)$$

3.3. Short-run model specification

The short-run money demand equations are error corrections of the long-run equations. Assuming that there is a long-run relationship (cointegration) between money demand and its determinants, the short-run models are represented by Eq. (5) and (6):

$$\Delta lnRM1_{t} = \alpha_0 + \alpha_1 \Delta lnRGDP_{t} + \alpha_2 \Delta lnREER_{t-1} - \alpha_3 DINT_{t} + \alpha_4 FINT_{t} + \alpha_5\, \varepsilon_{t-1} + \mu_{t} \quad (5)$$

$$\Delta lnRM2_{t} = \beta_0 + \beta_1 \Delta lnRGDP_{t} + \beta_2 \Delta lnREER_{t-1} - \beta_3 DINT_{t} + \beta_4 FINT_{t} + \beta_5\, \varepsilon_{t-1} + \mu_{t} \quad (6)$$

where ε_{t-1} is one-period lagged residuals from Eq. (3) and (4), respectively. The long-run equilibrium between the money demand variables and their explanatory variables will be captured by a negative

[5] There are some exemptions such as resident students studying abroad.

coefficient of the error correction term (ECT), which also represents the speed of adjustment at which a short-run disequilibrium is corrected. The symbol Δ denotes the difference on each of the variables.

3.4. ADF Unit Root Test

The Augmented Dickey and Fuller (1979, 1981) test is based on the following regression model:

$$\Delta y_t = \kappa + \alpha y_{t-1} + \beta_t + \sum_{j=1}^{k} d_j \, \Delta y_{t-j} + \varepsilon_t \quad (7)$$

where Eq. (7) tests for a unit root in y_t, where y consists of each of the six variables in our model, t=1,…,T is an index of time, Δy_{t-j} is the lagged first differences to accommodate serial correlation in the errors, ε_t. Eq. (3) tests the null of a unit root against a trend stationary alternative. The null and the alternate hypotheses for a unit root in y_t are: $H_0 : \alpha = 0$ and $H_1 : \alpha < 0$. To select the lag length (k), we use the '*t*-sig' approach proposed by Hall (1994).

3.5. Cointegration test

We use Johansen's (1988) approach, which uses the maximum likelihood procedure to determine the presence of cointegrating vectors. The procedure is based on the following vector:

$$\Delta Y_t = C + \sum_{i=1}^{k} \Gamma_i \Delta Y_{t-i} + \Pi Y_{t-1} + \varepsilon_t \quad (8)$$

where Y_t is a vector of $I(1)$, non-stationary in level form, variables and C is a constant. The information on the coefficient matrix between the levels of the money supply series is decomposed as $\Pi = \gamma \delta^t$ where the relevant elements of the matrix are the adjustment coefficients and the matrix contains the cointegrating vectors. Johansen and Juselius (1990) recommend the trace test and the maximum eigenvalue test statistics to determine the number of cointegrating vectors.

4. Empirical Analysis

4.1. Data

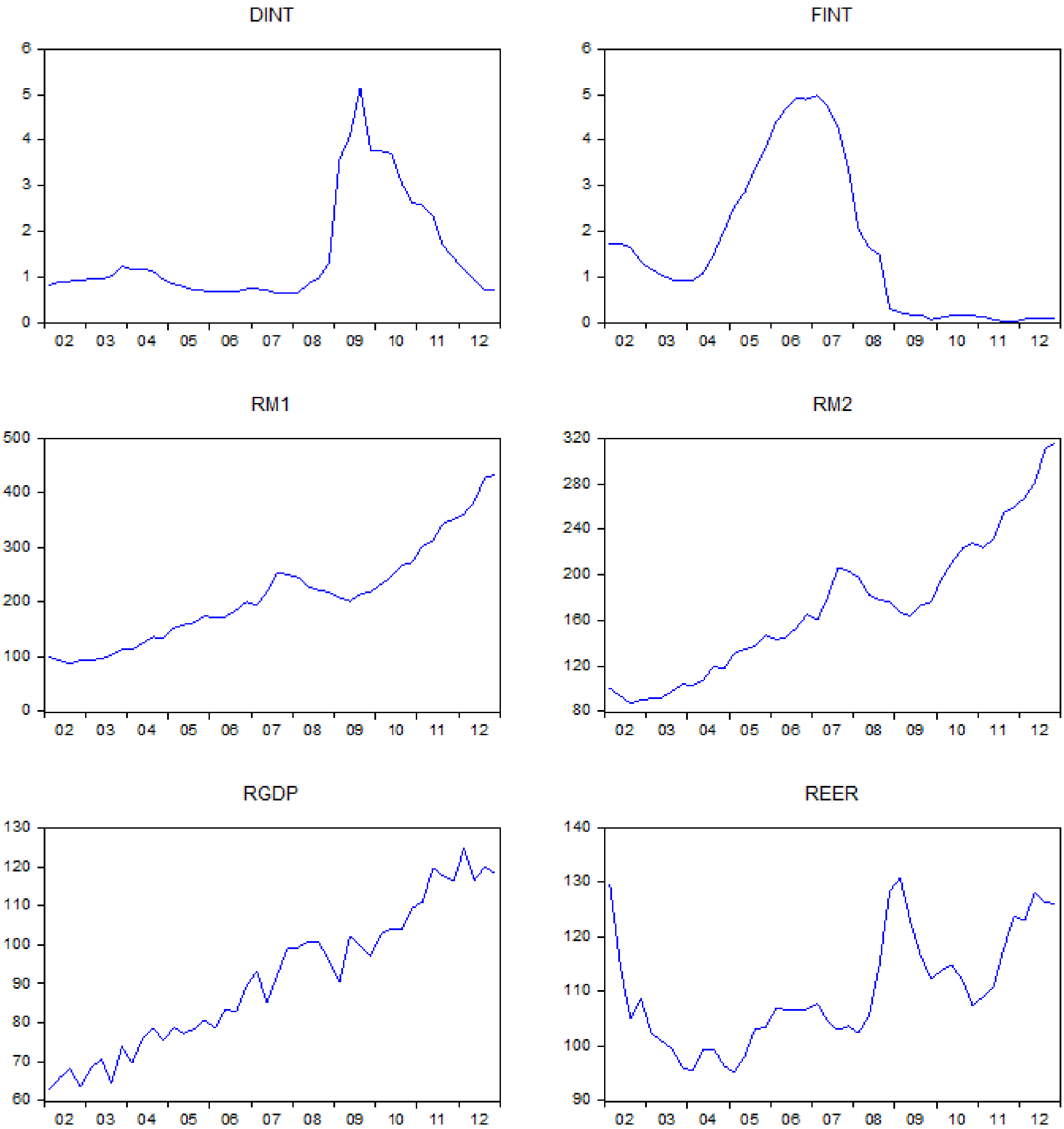
In this study, we use quarterly data for the period 2002Q1 to 2012Q4 where the choice of the sample period is prescribed by the availability of data. The rationale for quarterly as opposed to annual data was to ensure reasonable number of observations for time-series econometrics modelling as well as being the preferred frequency for monitoring and reporting procedures within the CBSI, which can be used for timely monetary policy-making.

All data series are converted to log data form for ease of interpretation with the exception of the interest rates. Real money aggregates, $\mathrm{RM1}$, $\mathrm{RM2}$, RGDP and DINT[6] are obtained from various CBSI departments whilst the short-term nominal foreign interest, FINT, is proxied using the 3-month US treasury bills rate obtained from the Federal Reserve Bank of St. Louis[7]. The real effective exchange rate, REER, is indexed to 2005 and sourced from the *International Financial Statistics* published by the International Monetary Fund. It should be noted that owing to data limitations and in the absence of quarterly GDP data, the annual real GDP data has been decomposed into quarterly estimates using the Chow-Lin (1971) Procedure.

Figure 1 presents the six variables in our dataset. Three observations are worth noting. First, we notice that, in broad terms, $\mathrm{RM1}$, $\mathrm{RM2}$, and RGDP display upward trends. The spikes in $\mathrm{RM1}$ and $\mathrm{RM2}$ in 2007 largely reflect the high food prices while the decline between 2007 and 2009 is explained by the impact of rising domestic interest rates, DINT, which ensued during the global financial crisis, a characteristic also driving the fall in FINT during the same period. The third observation is that changes in the REER can, in part, be explained by changes in exchange rate policy. The relatively stable real effective exchange rate reflects the stabilisation of the SBD against the USD since 2002 whilst increases in the REER indicate depreciations of the Solomon Dollar.

[6] Measured by the monthly weighted average deposit rates
[7] http://www.stlouisfed.org

Figure 1: A plot of the data series, 2002Q1 – 2012Q4



Source: Authors' own plot

Selected descriptive statistics are presented in Table 1. Over the time series, the average value of RM1 and RM2 were $211 million and $171 million, respectively. Meanwhile, the mean deposit domestic interest rate, DINT, stood at 1.5% and the foreign deposit interest rate, FINT, stood at around 1.6% while RGDP stood at $91 million. The real effective exchange rate, REER, registered an average index value of 110 points, implying a depreciation over the time horizon.

Table 1
Selected descriptive statistics

	RM1	RM2	RGDP	FINT	DINT	REER
Mean	211.1164	171.2459	91.0730	1.4914	1.6373	110.0236
Median	205.1850	166.2200	91.3000	0.9400	1.1200	107.1100
Maximum	433.5800	316.0100	124.6500	5.1500	4.9800	130.8400
Minimum	87.1400	87.1000	62.8500	0.6300	0.0100	95.2600
Std. Dev.	92.1580	61.5285	18.0164	1.1705	1.6811	10.2521

Source: Authors' own calculations.

4.1 Unit root test

The aim of this section is to assess the integrational properties of the data series, namely RM1, RM2, RGDP, REER, DINT and FINT. We use a conventional test, namely the ADF (1979, 1981) test, to examine the null hypothesis of a unit root against the alternative hypothesis that the series is trend stationary. The results of the unit root test are presented in Table 2.

Table 2
ADF unit root test results

	Level	First difference
lnRM1	0.3222 [0]	-5.8008*** [0]
lnRM2	0.4861 [0]	-5.3491*** [0]
lnRGDP	-0.6262 [0]	-8.2484*** [0]
lnREER	-1.8459 [1]	-4.9700*** [1]
lnDINT	-1.3359 [0]	-5.1756***[0]
lnFINT	-2.7354* [3]	-2.8313*[0]

Source: Authors 'own calculations.
Notes: The ADF critical values, based on Mackinnon are 2.604, 2.933, and 3.597, at the 10%, 5% and 1% levels, respectively. The optimal lag length for each autoregressive process of the ADF test is determined by the Schwartz Info Criterion (SIC) and presented in [].
*, *** denote statistical significance at 10%, and 1% levels, respectively.

From the results computed for both log-levels and the first difference of the log-levels series, we find that we cannot reject the null hypothesis of a unit root for all variables at the level. However, the first difference of the levels was rejected on the unit root null hypothesis at the 1% level in all variables. These results suggest that all variables are $I(1)$. Since all variables are stationary in their first difference, they can potentially share a cointegrating relationship in the long-run. The next section discusses the cointegration analysis and the results.

4.2 Cointegration test

After ascertaining that all variables are non-stationary in their level form but stationary in the first difference, we now proceed to conducting the cointegration test. In this section, the goal is to investigate whether real money demand ($\mathrm{RM1}$ and $\mathrm{RM2}$) share long-run relationships with their respective determinants. Based on two statistics (the trace test and the maximum eigenvalue test), we achieve this goal using the Johansen (1988) cointegration test. The results are reported in Table 3. Panel A presents the results for the model where $\mathrm{RM1}$ is used as a proxy for money demand, while Panel B presents the results for the model where $\mathrm{RM2}$ is used as a proxy for money demand.

Table 3
Johansen's test for cointegration

$H_0(r)$	$H_1(r)$	Trace statistic	5% CV	10% CV
Panel A: when RM1 is endogenous				
0	1	159.8928***	69.8189	65.8197
≤1	2	104.2582***	47.8561	44.4936
≤2	3	51.1840***	29.7971	27.067
≤3	4	14.6380*	15.4947	13.4288
≤4	5	3.520675*	3.8415	2.7055
$H_0(r)$	$H_1(r)$	Max eigenvalue statistic	5% CV	10% CV
Panel A: when RM1 is endogenous				
0	1	55.6346***	33.8769	31.2392
≤1	2	53.0742***	27.5843	25.1241
≤2	3	36.5460***	21.1316	18.8928
≤3	4	11.1174*	14.2646	12.2965
≤4	5	3.520675*	3.8415	2.7055
$H_0(r)$	$H_1(r)$	Trace statistic	5% CV	10% CV
Panel B: when RM2 is endogenous				
0	1	172.7407***	69.8189	65.8197
≤1	2	106.1704***	47.8561	44.4936
≤2	3	47.3718***	29.7971	27.067
≤3	4	16.7191***	15.4947	13.4288
≤4	5	5.2043***	3.8415	2.7055
$H_0(r)$	$H_1(r)$	Max eigenvalue statistic	5% CV	10% CV
Panel B: when RM2 is endogenous				
0	1	66.5703***	33.8769	31.2392
≤1	2	58.7986***	27.5843	25.1241
≤2	3	30.6527***	21.1316	18.8928
≤3	4	11.5147***	14.2646	12.2965
≤4	5	5.2043***	3.8415	2.7055

Source: Authors' own calculations.
*, *** denote statistical significance at 10%, and 1% levels, respectively.

Beginning with RM1, we find that the trace test suggests that we can reject the null hypothesis, $H_O = 2$, in favour of H_1=3 at the 1% level whilst we cannot reject the null hypothesis of $H_O \leq 3$ in favour of H_1=4 at the 5% level of significance. Similarly, the maximum eigenvalue test identifies the presence of at least three cointegrating relationships at the 1% level of significance. From the results, we conclude that there are at least three long-run cointegrating relationships among real money demand, real GDP, real effective exchange rate and the nominal domestic and foreign interest rates.

With regards to RM2, the trace test shows that we can reject the null hypothesis of H_O=4 in favour of H_1=5 at the 1% level. With similar outcomes, the maximum eigenvalue test also finds at least 5 cointegrating relationships. Therefore, we can conclude that there are at least 5 cointegrating relationship between real money demand, real GDP, real effective exchange rate and nominal domestic and foreign interest rates at the 1% level.

4.3 Long- run elasticities

Having established that a long-run relationship exists between RM1 and its determinants and RM2 and its corresponding determinants, the aim of this section is to estimate the long-run elasticities of the explanatory variables. We achieve this by using the ordinary least squares (OLS) procedures. We report the results in Table 4. We divide the table into two panels: Panel A contains results for the model where RM1 is used as a proxy for money demand, while Panel B contains the results from the model where RM2 is used as a proxy for money demand.

Table 4
Long-run elasticities

Regressor	coefficient	t-statistic
Panel A: when RM1 is endogenous		
lnRGDP	2.2235***	24.4248
lnDINT	-0.0347**	-2.2019
lnFINT	0.0295**	2.5740
lnREER	0.3865*	1.8852
Constant	-6.5422	-7.5181

Regressor	coefficient	t-statistic
Panel B: when RM2 is endogenous		
lnRGDP	1.7798***	22.4349
lnDINT	-0.0268*	-1.9518
lnFINT	0.0228**	2.2848
lnREER	0.3851**	2.1559
Constant	-4.7219	-6.2267

Source: Authors' own calculations.
*,**,*** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Our main findings are as follows. Beginning with RM1, we find that, consistent with economic theory and other studies, RGDP has a positive and significant relationship with real money demand (at 1% significance level). Table 4 shows that the elasticity is 2.22, higher than other studies. This can be explained by the high levels of cash held in the economy, represented in the levels of currency in circulation that is pumped back into the real sector. Also in line with economic theory and other empirical studies, the nominal domestic interest rate has a statistically significant but negative relationship with real money demand at 5% level of significance. The elasticity is small at 0.03, possibly explained by the weak transmission of the interest rate channel into the real sector. Historically, nominal interest rates have been low and negative in real terms due to relatively high levels of inflation over the years. Despite this, people still deposit money in bank accounts and the lack of alternative in financial asset investments available in the Solomon Islands means that the domestic interest rate is still important. Both of these conclusions are consistent with the results in Tonga and the panel data study carried out on the Pacific Islands, which included the Solomon Islands, (see Kumar, 2010). Additionally, although the foreign interest rate is found to be statistically significant in the long-run, the positive relationship and weak coefficient value (0.03) are expected. This can be justified by the current exchange controls in place that prevent capital mobility for businesses and individuals investing abroad; hence, the foreign interest rate exhibiting little relationship. Other factors such as limited information of foreign investment products may also be at play. Furthermore, the real effective exchange rate reports a positive correlation with real money demand but statistically significant at the 10% level of significance. This implies that a depreciation in the Solomon Dollar is associated with an increase in the demand for money such that people prefer to hold domestic currency. In contrast, an appreciation in the Solomon Dollar is associated with a decrease in money demand likely to be caused by the reduction in export earnings filtering through to the real sector.

Similar results arise for the RM2 model. We find that real GDP also has a positive and statistically significant relationship at the 1% level. Similar to the RM1 model, the nominal domestic interest rate has a statistically significant but negative relationship with real money demand at 10% level of significance. The magnitude for real GDP and the domestic interest rate are slightly lower in the RM2 model at 1.78 and 0.03, respectively. In addition to this, the real effective exchange rate is positive and statistically significant at the 5% level, suggesting that a depreciation in the Solomon Dollar is associated with increases in the demand for money. The foreign interest rate has a statistically significant and positive effect on RM2 at the 5% level of significance, as was the case for RM1.

4.4 Short- run elasticities

Having estimated the long equations, we are also able to estimate the short-run equations for real money demand. We report the results in Table 5. We divide the table into two panels: Panel A contains results for the model where RM1 is used as a proxy for money demand, while Panel B contains the results from the model where RM2 is used as a proxy for money demand.

Table 5
Short-run elasticities

Dependent variable	coefficient	t-statistic
Panel A: when M1 is endogenous		
$\Delta ln\mathrm{REER}_t$	-0.3055	-1.2519
$\Delta ln\mathrm{RGDP}_{t-1}$	-0.6903***	-2.8577
$\Delta ln\mathrm{FINT}_{t-1}$	0.0374	1.5352
$\Delta ln\mathrm{REER}_{t-1}$	-0.3612	-1.3701
$\Delta ln\mathrm{RGDP}_{t-2}$	-0.2309	-1.2615
$\Delta ln\mathrm{DINT}_{t-2}$	-0.019	-1.147
$\Delta ln\mathrm{FINT}_{t-2}$	0.0341	1.3743
$\Delta ln\mathrm{REER}_{t-2}$	-0.6195***	-2.4146

$\Delta ln\text{DINT}_{t-3}$	-0.0323**	-2.0778
$\Delta ln\text{RGDP}_{t-4}$	-0.1576	-0.9967
$ECT1_{t-1}$	-0.3723***	-2.996
Constant	0.0654***	6.6303

Dependent variable	coefficient	t-statistic
Panel B: when RM2 is endogenous		
$\Delta ln\text{REER}_{t}$	-0.5379***	-2.6252
$\Delta ln\text{RGDP}_{t-1}$	-0.7334***	-3.8039
$\Delta ln\text{DINT}_{t-1}$	-0.0187	-1.0829
$\Delta ln\text{RGDP}_{t-2}$	-0.3657**	-2.3137
$\Delta ln\text{FINT}_{t-2}$	0.0307	1.5219
$\Delta ln\text{REER}_{t-2}$	-0.6579**	-2.7329
$\Delta ln\text{DINT}_{t-3}$	-0.0129	-0.757
$\Delta ln\text{FINT}_{t-4}$	0.0332	1.4934
$ECT2_{t-1}$	-0.4148***	-3.6161
Constant	0.0570	6.5705

Source: Authors' own calculations.

,* denote statistical significance at 5% and 1% levels, respectively.

For RM1, we find that the lag of RGDP has a statistically significant relationship with real money demand at the 1% level of significance whilst a two-period lag in the REER and a three-period lag in the DINT have statistically significant relationship with money demand at the 5% level of significance. Surprisingly, RGDP has a negative relationship with RM1 in the short-run. This could be characterised by economic agents wanting to save money in the short-run. DINT and REER also exhibit a negative relationship. This is expected of DINT as more people are likely to save as domestic interest rates increase. For the REER, a depreciation leads to a reduction in the demand for money. Furthermore, the error correction term, $ECT1_{t-1}$, is statistically significant at the 1% level. The coefficient value of -0.37 suggests that real money demand recovers from a shock by 37% each quarter. This suggests that the economy will fully recover from the shock to money demand within nine months under this short-run model specification.

With regards to the RM2 model, we find that the REER and a two-period lag of the REER are both statistically significant at the 1% level of significance. In addition, we observe that a one-period and a two-period lag of RGDP are statistically significant at the 1% and 5% level of significance, respectively. The correlation between RGDP and RM2 is negative as are the correlations between

RM2 and the REER and RM2 and the two-period lag of the REER. In addition, the error correction term, $ECT2_{t-1}$, is statistically significant at the 1% level. The coefficient value of -0.41 suggests that real money demand recovers from a shock by 41% each quarter. This suggests that the economy will fully recover from the shock to money demand within nine months under this short-run model specification.

4.5. Granger causality

Having found evidence that substantiates plausible correlations between real money demand and its determinants in the previous section, this section aims to establish whether there are causal relationships among the variables, that is, we are concerned about whether or not real GDP, real effective exchange rate, and interest rates Granger cause RM1 and RM2, respectively. Conversely, we are also assessing whether the relationship operates in the opposite direction such that RM1 and RM2 Granger cause real GDP, real effective exchange rates, or domestic and foreign interest rates. The results on short-run and long-run Granger causality are reported in Table 6[8]. We divide the table into two panels: Panel A contains results for the model where RM1 is used as a proxy for money demand, while Panel B contains the results from the model where RM2 is used as a proxy for money demand.

We begin by looking at the results for RM1, which are reported in Panel A and discover that there is unidirectional causality running from foreign interest rate to real money demand at the 10% level of significance. No other independent variables exhibit causal relationships with RM1. In Panel B, the results for the RM2 model are reported and illustrate a similar picture to that of the RM2 model. We find that there is unidirectional causality running from the foreign interest rate to RM2 at the 10% level of significance, while all other variables do not show causal relationships.

[8] The optimum lag length is chosen based on the Schwarz Information Criterion and Hannan-Quinn Information Criterion.

Table 6
Results of Granger causality test

Dependent variable	$\Delta ln\text{RM1}_t$	$\Delta ln\text{RGDP}_t$	$\Delta ln\text{DINT}_t$	$\Delta ln\text{FINT}_t$	$\Delta ln\text{REER}_t$	$ECT1_{t-1}$ [t-statistic]
Panel A: when RM1 is endogenous						
$\Delta ln\text{RM1}_t$	-	4.0504 [0.1320]	2.7006 [0.2592]	0.5488 [0.7600]	0.4724 [0.7896]	0.0173 [0.8019]
$\Delta ln\text{RGDP}_t$	2.6840 [0.2613]	-	41.1503 [0.0000]	0.7891 [0.6740]	0.0806 [0.9605]	-0.0108 [-0.5262]
$\Delta ln\text{DINT}_t$	0.0458 [0.9773]	1.8445 [0.3976]	-	0.1107 [0.9461]	6.3928 [0.0409]	-0.7020 [-5.5395]
$\Delta ln\text{FINT}_t$	5.8556* [0.0535]	1.1185 [0.5716]	6.5694** [0.0375]	-	0.4722 [0.7897]	0.0343 [0.2637]
$\Delta ln\text{REER}_t$	0.4599 [0.7946]	1.3840 [0.5006]	0.9537 [0.6207]	0.2818 [0.8686]	-	0.0050 [0.3228]
Dependent variable	$\Delta ln\text{RM2}_t$	$\Delta ln\text{RGDP}_t$	$\Delta ln\text{DINT}_t$	$\Delta ln\text{FINT}_t$	$\Delta ln\text{REER}_t$	$ECT2_{t-1}$ [t-statistic]
Panel B: when RM2 is endogenous						
$\Delta ln\text{RM2}_t$	-	2.4040 [0.3006]	0.3387 [0.8442]	0.3214 [0.8515]	1.0247 [0.5991]	0.0638 [0.9633]
$\Delta ln\text{RGDP}_t$	2.9785 [0.2255]	-	41.2172*** [0.0000]	0.4637 [0.7930]	0.6587 [0.7194]	-0.0000 [-0.0004]
$\Delta ln\text{DINT}_t$	2.0437 [0.3599]	1.3825 [0.5009]	-	0.0968 [0.9527]	6.1675** [0.0458]	-2.4035 [-5.8843]
$\Delta ln\text{FINT}_t$	5.0064* [0.0818]	0.6456 [0.7241]	6.0721** [0.0480]	-	0.8917 [0.6403]	-0.0034*** [-0.0082]
$\Delta ln\text{REER}_t$	1.0226 [0.5997]	0.6325 [0.7289]	2.4250 [0.2975]	0.4247 [0.8087]	-	-0.0079 [-0.1582]

Source: Authors' own calculations.

Notes: The probability values are in square brackets.

*, **, *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

4.6. *Diagnostics tests*

Having identified that all variables are cointegrated in both of the estimated models, this section examines some of the commonly used diagnostic tests to check whether or not the data is consistent with the assumptions of OLS estimators.

First, we conduct the Normality Test such that the null hypothesis is normally distributed. We find that we cannot reject the null hypothesis of normality implying that the residuals are normally distributed at the 1% level.

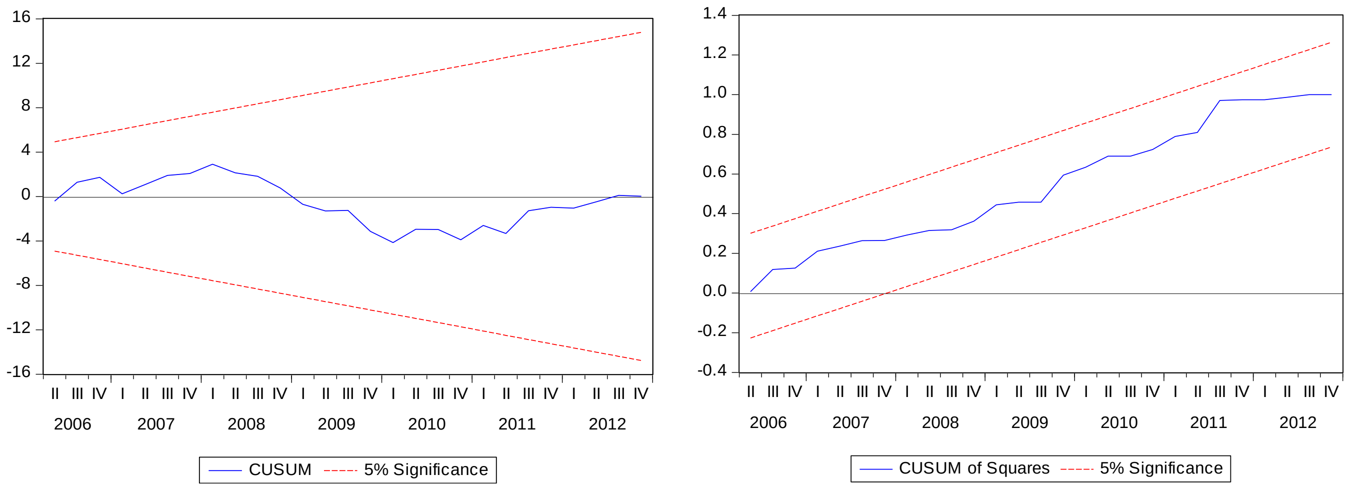
We also test the residuals for serial correlation using the Breusch-Godfrey Serial Correlation LM Test. In this test, the null hypothesis is that there is no autocorrelation among the residuals. For both estimated models, we are unable to reject the null hypothesis of no autocorrelation, implying there is evidence that the residuals are free from autocorrelation at the 1% level.

In conducting the Breusch Pagan-Godfrey Test for Heteroscedasticity, we examine the null hypothesis that the residuals are homoscedastic. Again, we find that that we cannot be reject the null hypothesis at the 1% level, signifying that the residuals of the variables are homoscedastic and that they are independent of one another at the 1% level.

4.7 *Parameter stability*

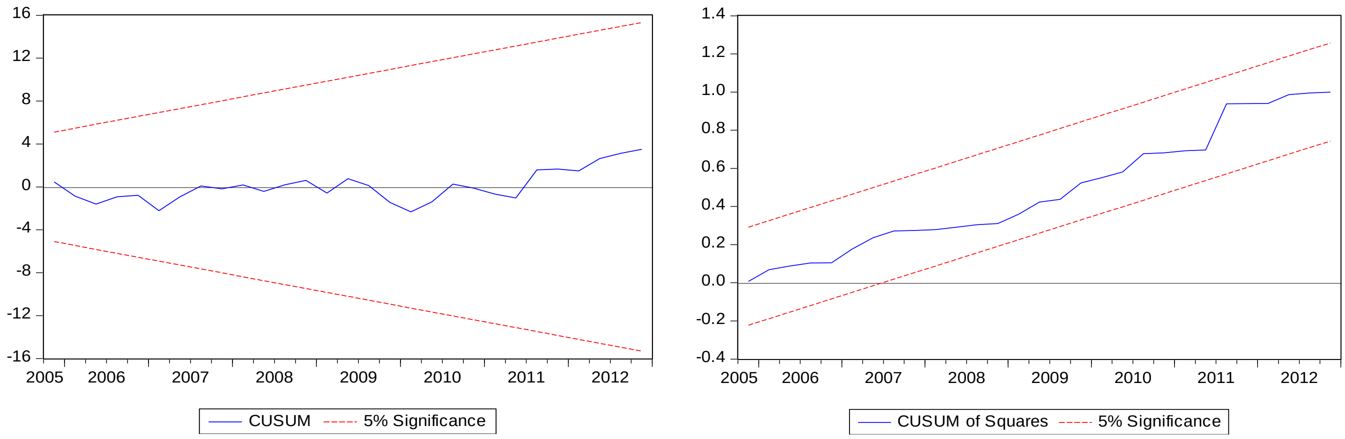
Testing the parameter stability of the money demand function provides policymakers with the evidence to support or oppose the rationale for using money targeting as a monetary policy instrument. In accordance with other studies, we use the $CUSUM$ and $CUSUMSQ$ tests to assess the stability of the Solomon Islands' money demand function based on $RM1$ and $RM2$ estimates. Both tests have a null hypothesis of no sudden shift in the model. A function is deemed stable if the $CUSUM$ and $CUSUMSQ$ statistics remain within the 5% critical bounds. We find that we are unable to reject the null hypothesis that there is no sudden shift in the model and conclude that the parameters for the short-dynamics and the long-run of real money demand ($RM1$ and $RM2$) in the Solomon Islands are stable. This is reflected in Figures 2 and 3 where the parameters of the model are well situated between the two boundaries of 5% significance level.

Figure 2: CUSUM and CUSUMSQ test results for $RM1$



Source: Authors' own plot

Figure 3: CUSUM and CUSUMSQ test results for $RM1$



Source: Authors' own plot

5. Conclusion and policy recommendations

Estimating the money demand function is a pre-requisite for conducting effective monetary policy. A stable money demand relationship argues for the existence of a predictable channel such that monetary policy, aimed at controlling money supply, will achieve price stability through demand management.

The aim of this paper was to estimate a money demand function for the Solomon Islands for the period 2002-2012. Our findings are: 1) money demand is cointegrated with its determinants, namely, real GDP, the real effective exchange rate, short-term domestic interest rate and short-term foreign interest rate; 2) in the long-run, all variables are correlated with money demand although not all variables are statistically significant in the short run; 3) only the foreign interest rate was found to Granger cause money demand; 4) the speed of adjustment in money demand to any shock was found to be 37% and 41% for each quarter when using $RM1$ and $RM2$ as dependent variables, respectively; and 5) the Solomon Islands exhibited a stable money demand function both in terms of $RM1$ and $RM2$ during the period. This is consistent with Kumar (2010), who also found a stable money demand relationship for the Solomon Islands.

The policy implication emerging from our study is that there is evidence to support the notion of implementing monetary targeting as opposed to inflation targeting in the Central Bank of Solomon Islands' efforts to combat inflation. However, although we find that a stable money demand function for Solomon Islands, it is also important to understand the effectiveness of monetary policy in Solomon Islands in the CBSI's ability to influence money supply. Further work on understanding the monetary policy transmission mechanism would help to provide this. Finally, considerations regarding data limitations require the CBSI to proceed with some caution. The analysis could be improved by extending the time series through applying structural breaks to take account of the period during the ethnic tension period that occurred at the end of 1990's.

References

Agenor, P., Khan M., (1996). Foreign currency deposits and the demand for money in developing countries. *Journal of Development Economics*, 50, 101-118.

Bahmani-Oskooee, M., Rehman, H., (2005). Stability of the money demand function in Asian developing countries. *Applied Economics*, 37(7), 773-792.

Bahmani-Oskooee, M., Shin, S., (2002). Stability of the demand for money in Korea. *International Economic Journal*, 6(2), 85-95.

Barnett, W., (1980). Economic monetary aggregates: An application of index number and Aggregation Theory. *Journal of Econometrics*, 14 (1), 11-48.

Baumol, W., (1952). The Transactions Demand for Cash: An Inventory Theoretic Approach. *The Quarterly Journal of Economics*, 66 (4), 545-56.

Boughton, J., (1992). International comparisons of money demand. *Open Economies Review*, 3 (3), 323-43.

Central Bank of Solomon Islands, (1982). *Central Bank of Solomon Islands Annual Report 1982*, Honiara: Solomon Islands Printers Limited.

Central Bank of Solomon Islands, (1983). *Central Bank of Solomon Islands Annual Report 1983*, Honiara: Solomon Islands Printers Limited.

Cesarano, F., (1991). Demand for money and expected inflation. *Applied Economies*, 23 (10), 1649-53.

Chow and Lin (1971). Best linear unbiased interpolation, distribution and extrapolation of time series by Related Series. *Review of Economics and Statistics*, 53, 372-375.

Dickey, D., Fuller, W., (1979). Distributions of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association*, 74, 427–431.

Dickey, D., Fuller, W., (1981). Likelihood ratio statistics for autoregressive time series with a unit root. *Econometrica*, 49, 1057–1072.

Ericsson, N., Sunil S., (1996). Broad money demand and financial liberalization in Greece. *IMF Working Papers No. WP/96/62* (Washington: International Monetary Fund).

Fisher, Irving (1911). *The purchasing power of money, its determination and relation to credit, interest and crises*. New York: Macmillan.

Friedman, Milton (1956). The Quantity Theory of Money - A re-statement. In *Studies in the Quantity Theory of Money*, by M. Friedman. Chicago: University of Chicago Press.

Gregory, A., Hansen, B., (1996). Residual-Based Tests for Cointegration in Models with Regime Shifts, *Journal of Econometrics*, 70, 99-126.

Goldfeld, S., Sichel D. (1990). The demand for money. In *Handbook of Monetary Economics*, by B. M. Friedman and F. H. Hahn, ed., Volume 1, North-Holland, Amsterdam. pp. 300-56.

Hall, A., (1994). Testing for a unit root in time series with pretest data based model selection. *Journal of Business and Economic Statistics*, 12, 461–470.

Heller, H., Khan, M., (1979). The demand for money and the term structure of interest rates. *Journal of Political Economy*, 87 (1), 109-29.

Hossain, A., (1994). The search for a stable money demand function for Pakistan: An application of the method of cointegration. *The Pakistan Development Review*, 33 (4), 969-83.

Harb, N., (2004). Money demand function: a heterogeneous panel application. *Applied Economics Letters*, 11 (9), 551-555.

Johansen, S., (1988). Statistical analysis of cointegration vectors. *Journal of Economic Dynamics and Control*, 12 (2/3), 231-54.

Johansen, S., Juselius, K., (1990). Maximum likelihood estimation and inference on cointegration with applications to the demand for money. *Oxford Bulletin of Economics and Statistics*, 52, 169–210.

Katafono. R., (2001). Demand for money in Fiji, *Reserve Bank of Fiji Working Paper.* (Suva: Reserve Bank of Fiji).

Keynes, J., (1936). *The General Theory of Employment, Interest, and Money*. London and New York: Macmillan.
Kumar, S., (2010). Panel data estimates of the demand for money in the Pacific island countries. EERI Research Paper Series, 12/2010.
Kumar, S., Manoka, B., (2008). Testing the stability of demand for money in Tonga. *The Empirical Economics Letters*, 8, 835-843.
Kumar, S., Singh, R., (2009). Some empirical evidence on the demand for money in the Pacific island countries. *Studies in Economics and Finance*, 1-14.
Lucas, R., (1980). Equilibrium in a pure currency economy. *Economic Inquiry*. 18 (2), 203-20.
Mark, S., Sul, D., (2003). Cointegration vector estimation by panel DOLS and long-run money demand. *Oxford Bulletin of Economics and Statistics*, 65(5), 655-680.
Moosa, I., (1992). The demand for money in India: A Cointegration Approach. *The Indian Economic Journal*, 40 (1), 101-15.
Mundell, A.R., (1963). Capital mobility and stabilisation policy under fixed and flexible exchange rates. *Canadian Journal of Economics and Political Science*, 27, 475-485.
Narayan, P., (2007). Is money targeting an option for Bank Indonesia? *Journal of Asian Economics*, 18, 726-738.
Narayan, P., Narayan, S., (2008). Estimating the demand for money in an unstable open economy: The case of the Fiji Islands. *Economic Issues*, 13 (1), 71-91
Narayan, P., Narayan, S., Mishra, V., (2008). Estimating money demand functions for South Asian countries. *Empirical Economics*, 36, 685-696.
National Parliament of Solomon Islands, (1982). *Solomon Islands Monetary Authority (Amendment) Act No.19 (1982)*, Honiara, Solomon Islands. Retrieved 13th March, 2013, from http://www.parliament.gov.sb.
National Parliament of Solomon Islands, (2012). *Central Bank of Solomon Islands Act No.6 (2012)*, Honiara, Solomon Islands. Retrieved 13th March, 2013, from http://www.parliament.gov.sb.
Pedroni., P., (2000). Fully modified OLS for heterogeneous cointegrated panels. *Advances in Econometrics*, 15, 93–130.
Pigou, A., (1917). The value of money. *The Quarterly Journal of Economics*, Vol. 37, 38-65.
Poole, W., (1970). The optimal choice of monetary policy instruments in a simple macro model. *The Quarterly Journal of Economics*, 84, 192-216.
Pradhan, B., Subramanian, A., (2003). On the stability of demand for money in a developing economy: some empirical issues. *Journal of Development Economics*, 72, 335-351.
Rao, B., Singh, R., (2005). A cointegration and error correction approach to demand for money in Fiji: 1971-2002. *Pacific Economic Bulletin*, 20.
Sargent, T., Wallace N., (1982). The Real-Bills Doctrine versus the Quantity Theory: A Reconsideration. *Journal of Political Economy,* 90 (6), 1212-36.
Siddiki J., (2000). Demand for money in Bangladesh: a cointegration analysis. *Applied Economics*, 32, 1977-1984.
Solomon Islands Monetary Authority, (1976). *Solomon Islands Monetary Authority Annual Report 1976*, Honiara: Solomon Islands Printers Limited.
Solomon Islands Monetary Authority, (1977). *Solomon Islands Monetary Authority Annual Report 1977*, Honiara: Solomon Islands Printers Limited.
Solomon Islands Monetary Authority, (1978). *Solomon Islands Monetary Authority Annual Report 1978*, Honiara: Solomon Islands Printers Limited.
Solomon Islands Monetary Authority, (1979). *Solomon Islands Monetary Authority Annual Report 1979*, Honiara: Solomon Islands Printers Limited.
Solomon Islands Monetary Authority, (1980). *Solomon Islands Monetary Authority Annual Report 1980*, Honiara: Solomon Islands Printers Limited.
Solomon Islands Monetary Authority, (1981). *Solomon Islands Monetary Authority Annual Report 1981*, Honiara: Solomon Islands Printers Limited.

Subramanian, S., (1999). Survey of literature on demand for money: Theoretical and empirical work with special reference to error-correction models," *IMF Working Paper No. WP/99/64* (Washington: International Monetary Fund).
Suliman, Z., Dafaalla, H., (2011). An econometric analysis of money demand function in Sudan, 1960 to 2010. *Journal of Economics and International Finance*, 3(16), 793–800.
Tobin, J., (1956). The Interest-Elasticity of Transactions Demand for Cash. *The Review of Economics and Statistics*, 38 (3), 241-47.