

ISSN 1391 – 3743

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CENTRAL BANK OF SRI LANKA

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CENTRAL BANK OF SRI LANKA

Volume 39, Nos. 1 & 2

2009

The views presented in these papers are those of the authors and do not necessarily indicate the views of the Central Bank of Sri Lanka.

Printed at the Central Bank Printing Press

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The Main Determinants of Inflation in Sri Lanka

A VAR based Analysis

H. P. G. S. Ratnasiri

Abstract

This paper attempts to examine the main determinants of inflation in Sri Lanka over the period 1980 – 2005 using Vector Autoregressive analysis. The results presented in this paper indicate that money supply growth and rice price increases are the main determinants of inflation in Sri Lanka in the long run. In contrast, It is evident that exchange rate depreciation and out put gap have no statistically significant effect on inflation. In the short run, rice price is the most important variable as it is a totally endogenous variable. However, money growth and exchange rate are not so important variables as they are weakly exogenous in the adjustment process. Output gap does not have a statistically significant effect on inflation in both the long run and the short run.

I. Introduction

There is a widespread agreement that high and volatile inflation can be damaging both to individual businesses as well as to consumers and hence, to the economy as a whole. Persistent inflation in goods and services can result in high social costs, too.

When inflation is volatile from year to year it becomes difficult for individuals and businesses to correctly predict the rate of price inflation in the near future. When people are able to make accurate predictions of inflation, they can anticipate what is likely to happen and take steps to protect themselves. Therefore, identification of determinants of inflation and forecasting accurately becomes vital for the economic agents. Accurate predictions of inflation could also enable the Central Bank to conduct its monetary policy effectively and efficiently to achieve its objective of price stability. This study, is aimed at identifying the main determinants of inflation in Sri Lanka.

Inflation Measures in Sri Lanka

Inflation is measured using a number of indices such as Colombo Consumers' Price Index (CCPI), Colombo District Consumer Price Index (CDCPI), Greater Colombo Price Index (GCPI), Wholesale Price Index (WPI) and Sri Lanka Consumer Price Index (SLCPI). The CCPI is the official measure of price changes with food items representing 62 per cent, clothing 9 per cent, fuel and light 4 per cent, rent 6 per cent, miscellaneous 19 per cent in total weights. Food is an important item in all of the indices representing relatively larger portion in all of the above mentioned baskets.

Theoretical background

Inflation is a multidimensional phenomenon with different views of economists. Orthodox view holds that inflation results from money creation by governments with limited borrowing options. New structuralists' views are different. They maintain that inflation results from the worker – capitalist conflict over the distribution of income between real wages and profits. The new structuralists' approach links between stresses the importance of the inflation, food supply and competing claims for the distribution of income. According to their model of inflation, monetary policy accommodates changes in the price level. In this model, the link between prices, money supply, and fiscal deficits are captured by introducing food subsidies, which account for the government budget constraint.

II. Literature Review

Several attempts have been made to investigate the determinants of inflation in several countries.

Bandara (2000) investigated the short run dynamics of the inflation, using a cointegration approach and found that both money supply and exchange rate movements have significant influences on the behaviour of the rate of inflation in the long run. Based on the error correction model he indicated that money supply doesn't have any significant impact on the rate of inflation. The OLS model he used is $\text{Log}(p_t) = \alpha_0 + \alpha_1 \log(P^F_t) + \alpha_2 \log(e_t) + \alpha_3 \log(M_t) + U_t$ and variables are foreign price (P^F_t), Money supply (M_t) and Exchange rate (e_t). While the exchange rate depreciation and the foreign price levels have significant effects, the driving force behind domestic inflation appears to be inflation inertia.

Chaudhry and Chaudhry (2005) examined the determinants of inflation in Pakistan using ARDL approach to cointegration using the following model:

$$\text{Log}(p_t) = \alpha_0 + \alpha_1 \log(m_t) + \alpha_2 \log(Y_t) + \alpha_3 \log(F_t) + U_t$$

p_t = Price level,

Y_t = real output,

m_t = M₂ definition of money supply,

F_t = unit price of imported goods

They found that the growth rate of import prices is the most important determinant of inflation in Pakistan both in the short run and long run, which is followed by the growth rate of output in terms of importance. The effect of Money supply on inflation is negligible and statistically insignificant.

Samuel and Ussif (2001) investigated determinants of inflation in Tanzania OLS estimation and Error correction model.

$$\text{Log}(p_t) = \alpha_0 + \alpha_1 \log(M_t) + \alpha_2 \log(GDP_t) + \alpha_3 \log(EXRATE_t) + U_t$$

In this model, the variables are price level (p_t), money supply (M_t), GDP (GDP_t) and exchange rate ($EXRATE_t$). They found that in Tanzania, output and monetary factors are the main determinants of inflation. In addition, the exchange rate also becomes a significant variable in inflation in the long run.

Determinants of Inflation in Sri Lanka

Determinants of inflation in Sri Lanka are grouped into the following categories, based on different models of the inflationary process. Inflation in developing countries is often linked to money growth (M_2).

- (a) Overheating economy and its influence by an activity variable (output gap).
- (b) Exchange rate depreciation (USD/SLRS rate)
- (c) Climatic changes (Rice Price).
- (d) Inertial component arising from the sluggish adjustment of inflationary expectations (CCPI).
- (e) Interest rate (91 day Treasury bill rate)

Methodology

Several statistical methods and econometric tests were carried out to explore the determinants of inflation in Sri Lanka. These include Unit root tests, Co integration tests, Vector Auto Regressive model, impulse response function, variance decomposition and Vector Error Correction Model (VECM).

VAR Model Representation

$$A_0 y_t = c + A_1 y_{t-1} + A_p y_{t-p} + \hat{a}_t$$

Where y_t is a (6) dimensional vector of variables: Output gap, Colombo Consumer Price Index, Rice Price, Interest rate, Exchange rate depreciation. A_0 is a (6*6) dimensional matrix with contemporaneous coefficients, c is a (6) dimensional vector of constants and A_1, \dots, A_p are (6*6) dimensional autoregressive coefficient matrices. \hat{a} is a vector of pair wise uncorrelated structural innovations with unit variance.

Data

The data used in this analysis is quarterly data over the sample period, January 1980 through February 2005. The software employed in this analysis is Eview 4.0.

Variables in the study are Colombo Consumers Price Index, GDP, Money Supply, exchange rate, Rice price, Interest rate.

III. Stationarity of series

Augmented Dicky fuller test (ADF) under Schwartz information criteria and the Philip Perron (PP) test under Bartlett Kernel and newly west bandwidth were conducted to test the stationary of the series. All the series except TB91 were obtained in Log form. The test results are given in the table.

Table 1 – Unit root test results

	ADF Test			Philip perron test		
	Lag	Level	Lag	First difference	Level	First difference
ln GDPSA	4	0.026482	3	- 3.66075 *	- 0.09584	- 11.1136 *
ln CCPI	4	- 1.69407	3	- 4.34113 *	- 1.90985	- 14.7036 *
ln M2	4	- 0.69465	3	- 3.56109 *	- 1.680448	- 9.77374 *
ln Rice Price	4	- 2.11159	3	- 5.54127 *	- 1.83094	- 8.99881 *
ln Exchange Rate	4	- 2.06576	3	- 8.98401 *	- 1.961024	- 8.98910 *
TB 91	4	- 3.29482	3	- 11.3389 *	- 3.23703 *	- 11.5046 *

* 1% critical value - 3.4940

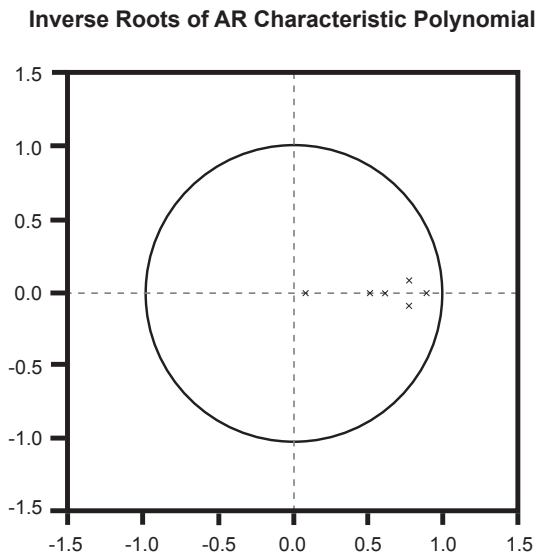
** 5% critical value - 2.8892

*** 10% critical value - 2.5813

It shows that all the variables are stationary at first differences at 1 per cent level. Both ADF and PP tests confirmed the results. However, the PP test shows that interest rate TB 91 is stationary at levels. Therefore, it could be said that TB91 is stationary at level while other variables are stationary at first differences.

Figure A shows that $gdpsa$, $ccpi$, $m2$, $Rice_p$, Usd_rs are integrated of order one and Tb_91 is integrated at level. Stationarity of the series is confirmed by the graph of the inverse roots of AR characteristic polynomial as well. According to theory^{1/}, the estimated VAR is stable (stationary) if all roots have modulus less than one and lie inside unit circle.

The figure 1 shows that all roots of AR characteristics polynomial of the series lie inside the unit circle.



Co-integrating relations

Co integration test was performed for the series that are integrated at first difference. It has been shown by the Johanson Cointegration test that there is at least one cointegration vector in the series. Linear deterministic trend was assumed in the test.

1/ If the VAR is not stable, certain results (impulse response, standard errors are not valid).

Table 2 – Co-integration test results

Cointegrating relations		Trace	5 Per cent	1 Per cent	Max-Eigen	5 Per cent	1 Per cent
Null hypothesis	Eigen value	Statistics	Critical Value	Critical Value	Statistic	Critical Value	Critical Value
None	0.312695	68.95713	68.52	76.07	38.99767	33.46	38.77
At most 1	0.136102	25.95946	47.21	54.46	15.21526	27.07	32.24
At most 2	0.093073	14.74420	29.68	35.65	10.16011	20.97	25.52
At most 3	0.041328	4.584088	15.41	20.04	4.389504	14.07	18.63
At most 4	0.001869	0.194584	3.76	6.65	0.194584	3.76	6.65

Trace statistics for null hypothesis for no cointegration relations is rejected at 5 per cent level. It is confirmed from the Maximum –Eigen statistic, that the null is rejected at the 1 per cent and 5 per cent levels. This implies that there is a cointegrating relationship among the variables.

IV. Long run relationship

The results of the Unrestricted cointegration rank test confirmed that there is a long run significant relationship among CCPI, money supply, exchange rate, and rice price. All the series are in natural logarithmic form. The coefficients measure the long run income, money supply, exchange rate and rice price elasticities respectively. A percentage increase in money supply will raise inflation by 0.49 per cent at 1 per cent level. Also, one percentage increase in rice price will increase inflation by 0.33 per cent at 1 per cent level. In line with theory, these tests demonstrate that in the long run, Inflation in Sri Lanka is positively related money growth, and rice price. However, the relationship between inflation and exchange rate depreciation and GDP is not significant. The findings of this study relating to Money supply growth and exchange rate depreciation are consistent with the findings of Amarakoon Bandara(2000). However it is I have observed inconsistent results for exchange rate depreciation with his findings. Amarakoon Bandara (2000) found that exchange rate depreciation has a significant long run impact on inflation where as my study reveals that has no statistically significant impact. Both studies that Amarakoon Bandara's and this agree that Money supply growth has a significant effect on inflation in Sri Lanka.

Table 3 – Cointegrating relationship
Dependent variable : CCPI

Regressor	Coefficient	Standard error	T-ratio
LNGDPSA	-0.118221	(0.26011)	(0.45450)
LN_M2	0.494197	(0.09396)	(-5.25974)*
LNUSD_RS	0.136229	(0.09682)	(-1.40699)
LN_RICE_P	0.332155	(0.05986)	(-5.54843)*
Constant	-1.296057		

* Significant at 1 per cent level.

Unrestricted Vector Autoregressive Model

The Unit root test results show that variables are integrated at order and lower. Thus we can apply VAR method for estimation.

Unrestricted Vector Autoregressive Model was estimated using following variables.

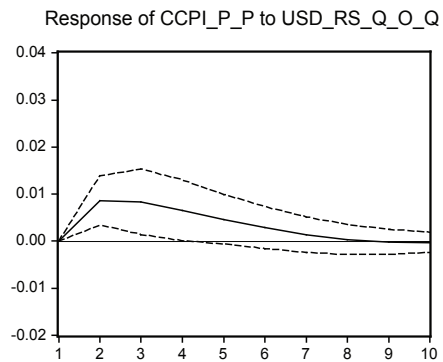
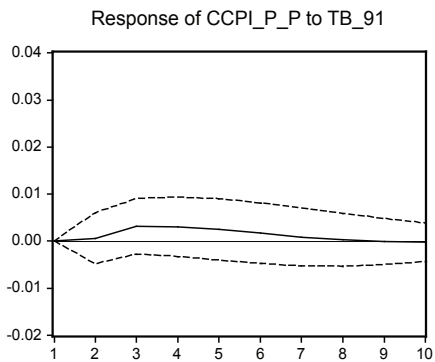
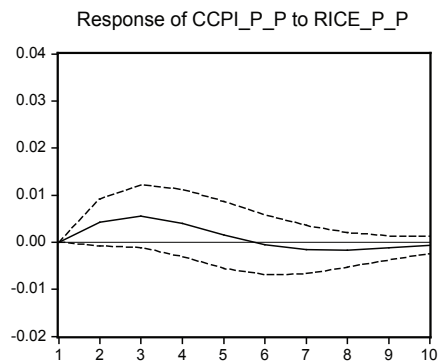
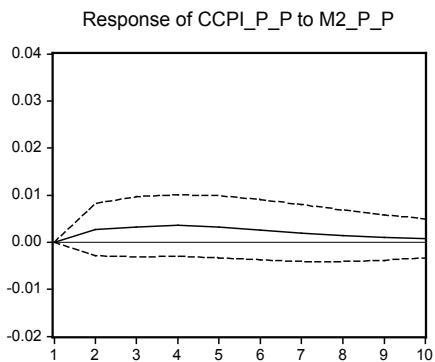
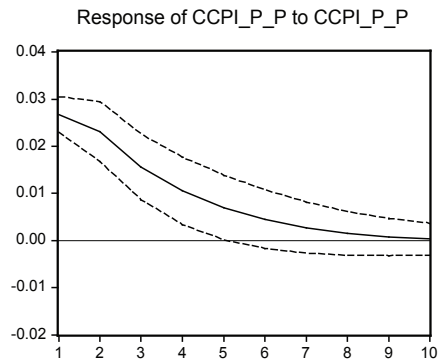
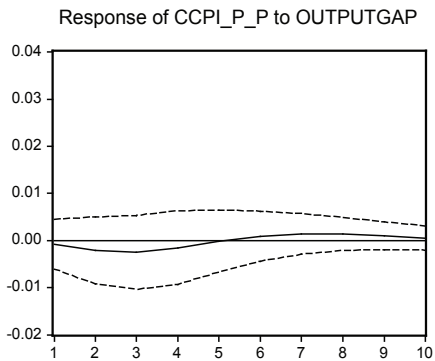
VAR specification variables :

- (1) Output gap : Derived from Seasonally adjusted log form GDP – Using HP filter (Output gap).
- (2) CCPI – point-to-point growth (ccpi_p_p)
- (3) Money Supply – M_2 – point-to-point growth (m2_p_p)
- (4) Rice price – point-to-point growth (rice_p_p)
- (5) Interest rate – 91-day Treasury bill yield (tb_91)
- (6) Exchange rate depreciation – quarter-on-quarter growth (usd_rs_q_o_q)

Impulse Response

This section analyses the dynamic property of the model using variance decomposition and impulse response functions. Figure 2 shows the response of the inflation rate to a standard deviation shock to the output gap, money supply, rice price, 91 day treasury bill rate, and exchange rate. The x-axis gives the time horizon or the duration of shock whilst the y-axis gives the direction and intensity of the impulse or the per cent variations dependent variable.

Response to One S.D. Innovations ± 2 S.E.



Analytic (Asymptotic) simulations within one hundred repetitions from the unrestricted VAR were used to generate the standard error for the impulse and variance decomposition coefficients.

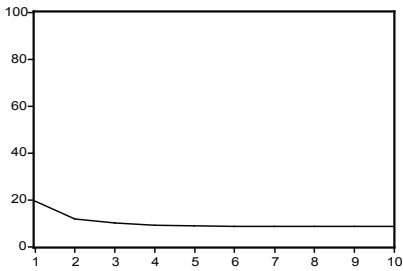
The impulse responses meet a priori expectations in terms of the directive of impact a positive shock to output gap represent the aggregate supply relationship. A positive shock to output gap will have a contractionary effect on inflation in the initial 5 periods and expansionary effect on periods later on. This is consistent with the theory that increase in output will reduce the price level. The response of direct shock (CCPI) to the inflation such as expectations and discrete price adjustments resulting from increased mark-ups, removal of subsidies etc. will have a significant effect in inflation high in the first quarter then it declines gradually. The response of inflation (CCPI) to money supply (M2_P_P) shows that the effect of one standard deviation shock to money supply on the CCPI occur after first period and reached its peak between 3–5 periods after and stabilizes thereafter. The impact of the rice price has a rather immediate and positive effect on first 5 periods and it will show a negative effect after 6th period. The relationship between monetary policy reaction shows that Increase in 91 day Treasury bill rate will have a contractionary effect after 2nd period and will prevail for the 8th period. The impact of the exchange rate is rather immediate and reaches its peak during 2–3 periods and will prevail only for 8 periods. (new charts to be inserted)

Variance decomposition

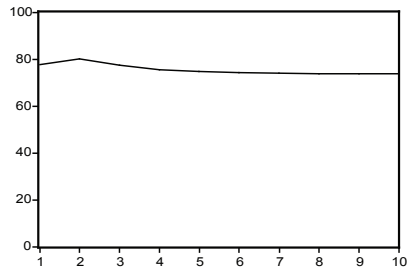
Figure 3 shows that the variance decomposition over the 10 Quarters. The statistics and graphs indicate the percentage contribution of innovations in each of the variables in the systems of the variance of inflation. About 80 per cent of the variance in inflation is from itself. This variance is partly reflecting the impact of variables not included in the model such as prices of imported goods etc. The results show inflation itself and the USD-Rs exchange rate depreciation account for over 90 per cent most of the variability in the inflation overall horizons. This implies that imports of commodities will have a relatively greater impact on the variation of inflation in Sri Lanka.

Variance Decomposition

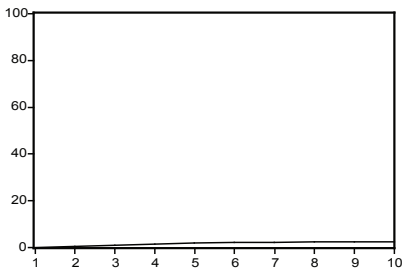
Percent CCPI_P_P variance due to OUTPUTGAP



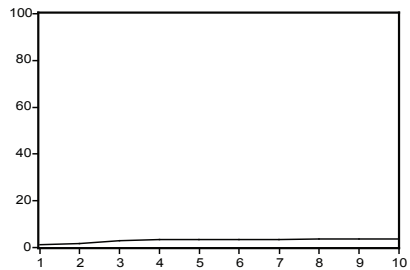
Percent CCPI_P_P variance due to CCPI_P_P



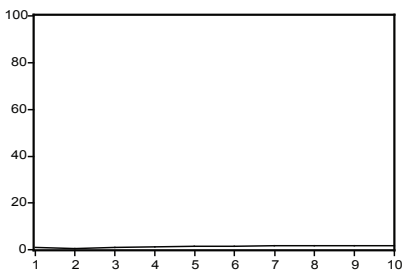
Percent CCPI_P_P variance due to M2_P_P



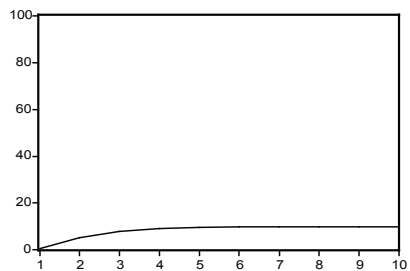
Percent CCPI_P_P variance due to RICE_P_P



Percent CCPI_P_P variance due to TB_91



Percent CCPI_P_P variance due to USD_RS_Q_O_Q



Vector Error Correction Model (VECM)

The short-run dynamics of the model using log form of ccpi, gdp, M2, USD_Rs exchange rate, rice price was examined by estimation of error correction model using the following model.

$$\Delta \ln_{ccpi}_t = \delta_1 + \gamma_1 (\beta_1 \ln_{gdpsa}_{t-1} + \beta_2 \ln_{m2}_{t-1} + \beta_3 \ln_{usd_Rs}_{t-1} + \beta_4 \ln_{rice-p}_{t-1}) + \beta_5 \Delta \ln_{ccpi}_{t-1} + V_t$$

Estimates of error correction representation is given in the table 4.

Table 4 – Error correction representation of VECM model
Dependent variable D (LN_CCPI)

Regressor	Coefficient	Standard error	T-Ratio
Error correction term	-0.125841	(0.06341)	(-1.98443)*
D(LN_CCPI(-1))	-0.152034	(0.11337)	(-1.34099)
D (LN_CCPI (-2))	0.442314	(0.09479)	(4.66637)**
D (LNGDPSA(-1))	-0.116603	(0.16349)	(-0.71321)
D(LNGDPSA(-2))	-0.050264	(0.16522)	(-0.30424)
D(LN_M2(-1))	0.158496	(0.09913)	(1.59893)
D(LN_M2(-2))	0.289201	(0.10156)	(2.84763)**
D(LNUSD_RS(-1))	0.388893	(0.11755)	(3.30825)**
D(LNUSD_RS(-2))	-0.113653	(0.11773)	(-0.96534)
D(LN_RICE_P(-1))	0.098195	(0.3696)	(2.65707)**
D(LN_RICE_P(-2))	-0.145213	(0.03897)	(-3.72581)**
C	0.000652	(0.00741)	(-0.08809)
R-squared	0.574495		
Adj. R-squared	0.521904		
Sum sq. resids	0.045016		
S.E. equation	0.022490		
Log likelihood	246.3378		
Akaike AIC	246.5754		
Schwarz SC	246.8861		
Mean dependent	0.025427		
S.D. dependent	0.032526		

* Significant at 10 per cent level.

** Significant at 1 per cent level

Examination of the error correction model in table 4 indicates that the increase in the rice price has the strongest effect on inflation in the short-run which is followed by growth in money supply and exchange rate depreciation. The coefficient of the error correction term has correct sign and significant at 10 per cent level. However, the coefficient of the ECM term suggests that adjustment is quite slow. Approximately 13 per cent of the previous quarter's disequilibrium in inflation from its equilibrium path will be corrected in the current year. The R² at 54 per cent indicate a fairly good fit. Money growth, exchange rate depreciation are weakly exogenous variables in the adjustment process. Only lag 1 of Money growth, and lag 2 of exchange rate depreciation are significant. Rice price is a totally endogenous variable. Therefore, the evidence presented in this section suggests

that inflation in Sri Lanka is mainly determined by Money growth increases in the price of rice and exchange rate depreciation in the long run and short run. Output growth is not an important determinant in the short run and the long run. Amarakoon Bandara (2000) found that exchange rate depreciation has a significant impact on inflation growth and money supply growth has a insignificant effect. In this study reveals both money supply growth and exchange rate depreciation have significant impact on inflation in short run.

V. Summary and conclusion

Identification of determinants of inflation and forecasting accurate inflation are vital for the economic agents. On the other hand it facilitates the central bank to conduct its monetary policy efficiently and effectively. This paper attempted to examine the determinants of inflation for Sri Lanka over the period 1980 – 2005 using VAR based cointegration approach.

The results presents in section IV of this paper indicate money supply growth and the increases in rice price are the most important determinants of inflation in Sri Lanka in the short run and long run. The effect of GDP growth and exchange rate depreciation on inflation negligible and statistically not significant. The short run effect of money growth, rice price and exchange rate effect on inflation is statistically significant. However GDP growth is not significant in short run too. It is obvious that the supply side effect on inflation in Sri Lanka is reflected through rice prices. Therefore, it is evident that inflation in Sri Lanka is influenced by both demand and supply side factors in the long run and short run.

The estimation results points to two policy considerations. First, money supply is to be maintained at desired level. Also, if the supply of rice can be raised the inflation will come down. This is because food accounts for more than 60 per cent of the weight used in the Colombo Consumer Price Index.

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Interest Rate as a Policy Instrument – Recent Experience of Sri Lanka

Dr. W. M. Hemachandra

Abstract

Interest rate is used as a monetary policy instrument in most countries. Sri Lanka too, uses interest rates as one of the policy instruments to achieve the objectives of the Central Bank. In this paper, the relationships between policy rates and other macroeconomic variables are identified and empirical estimations are carried out to find out to what extent the interest rates could be used to manage macroeconomic variables, based on which some policy implications are suggested.

1. Introduction

Interest rate which is expressed in percentage terms, is a fee paid on borrowed capital. In other words, it is a fee attached to financial instruments. Many Central Banks use the interest rate both as a source of information in determining policies and as an operating instrument for conducting monetary policy. Interest rate mechanism, among other instruments, is used for achieving objectives of the Central Bank. The objectives of the Central Bank of Sri Lanka (CBSL) are to maintain economic and price stability and to maintain financial system stability.

According to classical theory, savings are generally invested through an interest rate mechanism. When savings are equal to investment, the equilibrium rate of interest is determined. It assumes a positive relationship between interest rate and savings and an inverse relationship between the interest rate and investment. One of the major policy instruments in the classical theory is interest rate.

In the Keynesian theory, the interest rate may not determine the equilibrium level of savings and investment. The process of interest rate determination was regarded as a monetary phenomenon and the interest rate is purely a monetary phenomenon in the Keynesian's version. In this version, low interest rates were advocated to raise income. A large number of developing countries followed these policies until McKinnon and Shaw in 1973 presented their findings, recognising high interest rates.

Liberalization policies which came later did not allow controls on interest rates. McKinnon and Shaw presented a strong case against the low interest rate policy as advocated by neo-classical and Keynesian paradigms. According to framework of McKinnon and Shaw, the interest rate is positively associated with the savings, investment and economic growth. They assumed an increase in interest rates stimulates savings, especially bank deposits and thereby provides more investible funds thus leading to economic growth. They advocated the removal of interest rate ceilings.

Neo-structuralists expects a substitution effect to come from curb market loans to deposits when the deposit rates are raised, and therefore increasing the interest rate is likely to reduce rate of economic growth by reducing the availability of credit.

Later on market failure school related equilibrium rate of interest to asymmetry of information. In this version, the government has to intervene to rectify market malpractices. Therefore, market failure school suggests to have a government intervention in determining interest rates and efficient allocation of resources.

The use of interest rate as a monetary policy instrument was intensified along with active open market operations (OMO) started in Sri Lanka in 2003. Prior to that, the Central Bank's main policy instruments were the Bank Rate, Statutory Reserve Requirement (SRR) and moral suasion. The interest rate at OMO is a short-term policy instrument, which is used to achieve monetary policy targets, although the behaviour of interest rate has long-term repercussions on macroeconomic variables such as savings, investment, economic growth and inflation.

Under the OMO system, monetary policy operations are conducted to achieve a path of reserve money targets while maintaining short-term interest rates stable around a level which is consistent with the reserve money targets. CBSL manages market liquidity actively through OMO. The interest rate corridor formed by overnight repurchase (Repo) rate and the reverse repurchase (Reverse Repo) is the instrument used to achieve the reserve money targets. If the reserve money is not consistent with the targets the corridor is adjusted upward or downward depending on the requirements. Daily auctions at OMO are used to maintain comparable overnight interest rates. If the CBSL absorbs more liquidity through OMO, overnight auction rates would go up while the reverse will happen when the CBSL

absorbs less liquidity. Therefore, maintaining liquidity in the market is essential to maintain a stable short-term interest rate. The changes in the liquidity levels would reflect in the changes in the market rates which would take place depending on liquidity management through OMO.

Currently, OMO, through which daily short-term interest rates are determined, are used as one of the most effective instruments in achieving monetary policy targets, and thereby as an instrument to control inflation so as to maintain price stability. Interest rates for overnight repurchase (Repo) and the reverse repurchase (Reverse Repo) are called Central Bank's policy rates. The boundaries of these two rates form an interest rate corridor of which the lower end is the repo rate and the upper end is the reverse repo rate.

The ultimate aim of the management of policy rates is to maintain reserve money as expected by influencing the aggregate demand of the economy. When there is a tight monetary policy, the policy rates adjusted upward, and thereby to reduce aggregate demand, which in turn reducing the demand pull inflation leading to reduce overall inflation.

The interest rate is an instrument available to a Central Bank to achieve reserve money targets which is determined by the behaviour of Net Domestic Assets (NDA) and Net Foreign Assets (NFA).

At present, the CBSL uses reserve money as the operational target with money supply (M_2) as an intermediate target in achieving price stability. It is assumed that inflation could be controlled by controlling money supply in this way. The aim of conducting OMO while adjusting interest rates is to achieve the monetary targets, *i.e.*, reserve money. OMO interest rates are expected to influence the market interest rate structure and thereby control credit to government and the private sector which are components of NDA.

In the recent decades, there have been few years when there was a somewhat relaxed monetary policy prevailed. Since 1981, when open market operations were started, 1984, 1986, 1987, 1995 – 1998, 2001 – 2003 were the years in which relaxed monetary policy was prevailed. These relaxations were warranted due to favourable domestic and external economic conditions that the country faced. All other years after 1981, there was a tight monetary policy in Sri Lanka and policy rates were adjusted upward accordingly.

The CBSL, since November 2004, has been implementing a tight monetary policy, as one of the measures to control rising inflation. The interest rate corridor was revised upward starting from November 2004 following which market interest rates also increased.

Changes in the policy rates have influenced the behaviour of macroeconomic variables. The objective of this paper is to evaluate to what extent the interest rate is

responsible in managing price stability and other macro economic variables in Sri Lanka. In this study, Section 2 is devoted to explain the behaviour of interest rates in the recent past and its impact on macroeconomic variables in Sri Lanka. Section 3, through an empirical estimation, attempts to ascertain the effects of policy interest rates on long term interest rates (securities market), credit of the banks, aggregate demand and to comment on the relationships between the variables. The same section carries an analysis on the effect of interest rates on long-term macroeconomic variables such as savings, investment, and growth. Section 4 draws attention to policy implications based on the results of empirical estimations. Section 5 concludes by summarizing findings of the research.

2. Behaviour of Interest Rates in the Recent Past

Prior to commencement interest rate corridor along with OMO in 2003, the CBSL used Bank Rate and interest rates at secondary market as policy rates. In addition to these policy rates, market interest rates were determined on the basis of rates on the government securities primary market. Interest rates in the long-term market were guided by the rates of medium and long-term credit fund schemes operated by the Central Bank and those of rupee securities market. The effectiveness of the Bank rate as a monetary policy instrument diminished as a result of existence of interest rates at OMO. OMO rates (policy rates) were one of the determinants of market interest rates. The market rates changed as a result of changes in the repo/reverse repo rates fixed by the CBSL from time to time. Short term market interest rates were fluctuated with the changes in the overnight repo and reverse repo rates of Treasury bills at the secondary market window. Since 1997, Treasury Bonds became one of the determinants of the long term rates structure in the market. Introduction of Treasury Bonds to the market paved the way for a market based interest rate structure for long term instruments, deviating from the basis of long term rates of standard rupee securities market hitherto existed. Table 1 gives the information on policy rates and market rates in the recent past.

Table 1 – Interest Rates in the Recent Past

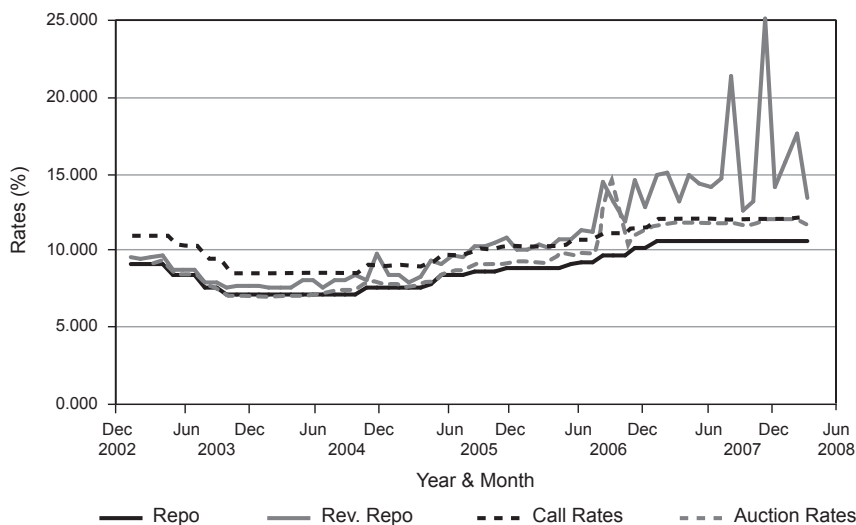
(per cent per annum)

Date	Policy Rates					Market Rates	
	Bank Rate	OMO		Medium & Long Term Rates			
		REPO	Reverse REPO	Rupee Loan	T-Bonds * (2 Years)	AWDR	WALR
31 Dec 2002	18.000	9.750	11.750	13.000	11.860	7.470	12.170
07 Jan 2003	18.000	9.000	11.000	11.000	10.120	7.180	11.420
09 May 2003	18.000	8.250	10.250	11.000	10.120	6.140	10.780
15 Aug 2003	15.000	7.500	9.500	8.000	10.120	5.660	10.040
16 Oct 2003	15.000	7.000	8.500	8.000	10.120	5.430	9.140
12 Nov 2004	15.000	7.500	9.000	8.900	8.270	5.120	9.850
13 May 2005	15.000	7.750	9.250	9.150	9.300	5.430	10.190
15 Jun 2005	15.000	8.250	9.750	9.150	10.320	5.450	10.600
13 Sep 2005	15.000	8.500	10.000	10.600	10.390	5.840	11.510
22 Dec 2005	15.000	8.750	10.250	11.000	10.390	6.240	12.140
16 Jun 2006	15.000	9.000	10.500	10.600	11.220	6.610	12.280
24 Jul 2006	15.000	9.125	10.625	10.600	11.220	6.590	12.620
28 Sep 2006	15.000	9.625	11.125	10.600	11.050	6.890	13.580
15 Dec 2006	15.000	10.000	11.500	10.600	12.920	7.600	14.740
23 Feb 2007	15.000	10.500	12.000	10.600	14.070	8.180	15.350
31 Dec 2007	15.000	10.500	12.000	18.400	15.500	10.310	17.000

* Primary Market rates

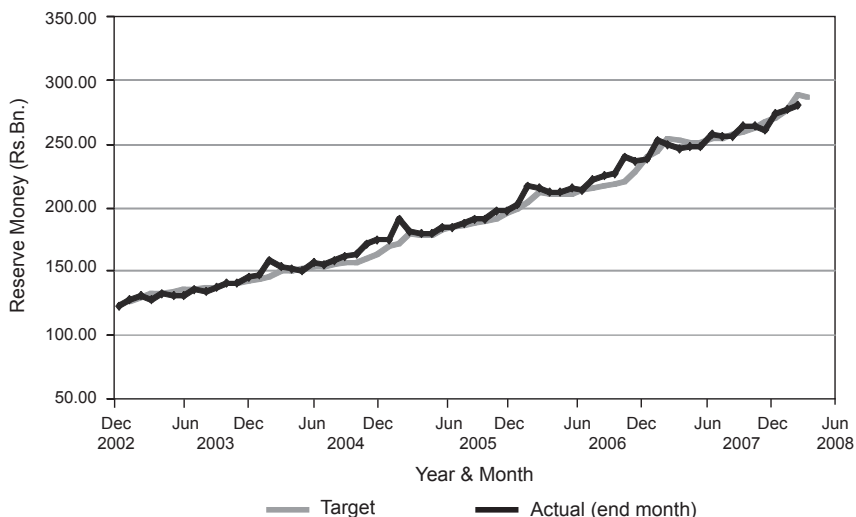
Source: Central Bank of Sri Lanka

The CBSL increased policy rates (overnight repo/reverse repo rates) from 7.00 per cent p.a. and 8.50 per cent per annum in 2003 to be 10.50 per cent p.a. and 12.00 per cent p.a. in 2007, respectively. Following these, the market rates also shifted. For instance, the Weighted Average Deposit Rate (AWDR) increased from 5.43 per cent p.a. in 2003 to 10.31 per cent p.a. in 2007. Similarly, the Weighted Average Lending Rate (WALR) increased from 9.14 per cent p.a. in 2003 to 17.00 per cent p.a. in 2007. Not only the short term rates but also the long term interest rates increased. For instance, the two-year primary market rate for Treasury Bonds increased from 8.27 per cent p.a. in 2004 to 15.50 per cent p.a. in October 2007. In the Section 3 of this paper, the empirical estimations in this regard have been reported. Figure 1 presents the behaviour of some of these interest rates in the recent past.

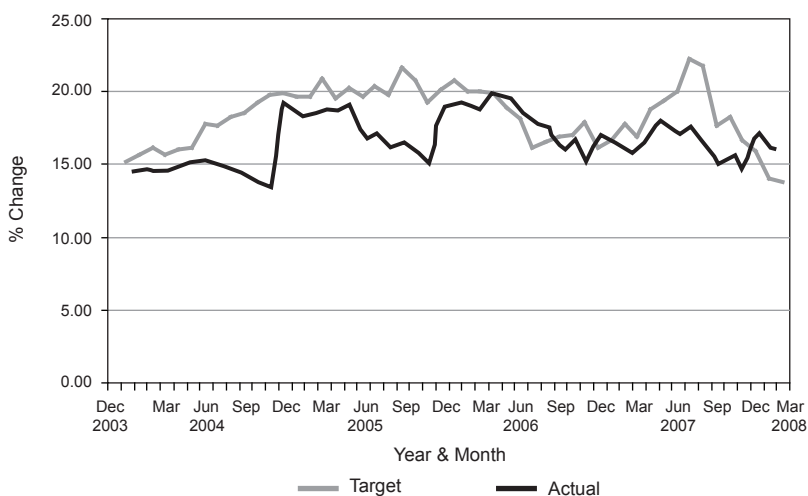
Figure 1 – Call Rates, Policy Rates, Auction Rates

Although the market rates have been higher than the reverse repo rates of the CBSL, the rates of daily secondary market auctions behaved within the corridor. The auction rates were closer to reverse repo rates (which is the upper bound of the corridor) reflecting the tightness of the money market. The difference between the market rates and the policy rates can be attributed to many reasons such as cost of funds, nature of instrument, regulations such as SRR and limits, liquidity levels of the market, maturity period of the financial instrument, transaction size, level of government borrowing, seasonality, preferences of the market and taxation. These other factors have contributed to exist different market rates compared to policy rates.

Coupled with other reasons, the CBSL has been able to achieve the reserve money targets in the recent past, based on the tight monetary policy. Specially, in the first quarter of 2008, monthly actual reserve money has been within the target expected, showing a positive response to demand management policies. Figure 2 shows the behaviour of actual reserve money as against the expected targets. This is one of the favourable outcomes of the tight monetary policy.

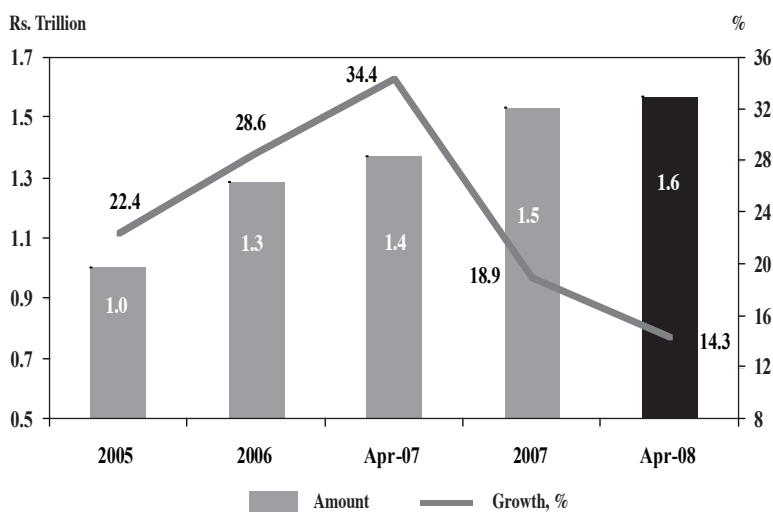
Figure 2 – Reserve Money – Targets Vs Actuals

Following the downward adjustments in the reserve money growth, the growth of broad money supply (M_2) has also declined in the first quarter of 2008. This is also a positive result of the tight monetary policy. Figure 3 shows the growth of broad money supply during the recent past. It shows that broad money was higher than that was expected prior to 2008, but during the first quarter 2008 it has been below the targets, satisfying the expectations.

Figure 3 – Growth of Money Supply

Following these developments in the monetary conditions, credit granted by commercial banks has decreased during the first quarter of 2008 compared to the same period in 2007. Figure 4 shows the declining trend of commercial bank credit to private sector which has happened due to tight monetary policy of the Central Bank.

Figure 4 – Credit Disbursed by Commercial Banks

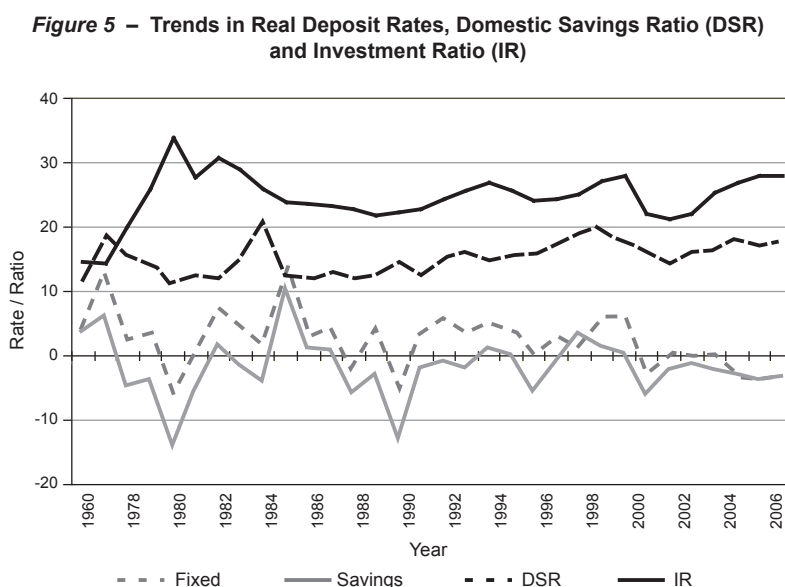


The tight monetary policy has resulted in a decline in the aggregate demand. For instance, increase in real domestic aggregate demand as measured by consumption plus investment in 2007 was 13.6 per cent compared to 20.5 in 2006. Therefore, a conclusion can be made as to following the tight monetary policy Central Bank has been able to achieve its monetary targets.

On the other hand, interest rate is one of the determinants of savings and investment. Savings are expected to increase due to increase in interest rates which in turn will provide investable funds. According to historical data, real interest rates in Sri Lanka have been negative for many years. However, the savings levels of the country have behaved irrespective of the behaviour of interest rates. It appears that domestic savings have no response to the changes in interest rates. Mostly, savings of Sri Lankans are low both due to high proportion of consumption out of the income and low income. In addition to these, domestic savings do not respond to the interest rates due to other reasons such as existence of contractual savings and social habits, which do not respond to interest rates. However, it is to be noted that financial savings (bank deposits) are responding to the changes in interest rates.

A similar conclusion can be made in regard to investment as well. It is found that financial investments (based on credit of banks) have responded to increased interest rates. Borrowings from banks have responded negatively to increase in interest rates in the recent past. However, long term total domestic investment has not responded to varying interest rates. Investment, other than financial investment (credit from banks) has not behaved according to the changes in short-term interest rates in Sri Lanka.

Figure 5 depicts the behaviour of real interest rates, savings ratios and investment ratios of the country. Accordingly, the savings ratio (DSR) and the investment ratio (IR) have behaved irrespective of real interest rates (*i.e.*, Fixed = real interest rate on fixed deposits of commercial banks and Savings = real interest rate on savings deposits of commercial banks).



3. Empirical Estimations & Analysis

A series of OLS estimations was carried out to find out the relationships among selected macroeconomic variables discussed in the previous sections. The hypotheses tested are given below. The study period is from 1978 to 2008. Monthly data used for estimations on short-term effects are for the period from February 2003 to May 2008 whilst for long-term effects annual data from 1978 to 2007 are used.

Table 2 – Hypotheses Tested

	Hypothesis	Status
1.	Policy rates of the Central Bank are positively influencing long-term interest rates.	Confirmed*
2.	Policy rates have a positive effect on bank deposit rates.	Confirmed*
3.	Policy rates have a positive effect on deposits of banks.	Not confirmed*
4.	Interest rates have a positive effect on deposits of banks.	Confirmed*
5.	Interest rates have a positive effect on domestic savings / private savings.	Not Confirmed**
6.	Interest rates are negatively impacting on total investment.	Not Confirmed**
7.	Lending rates have a negative effect on private investment.	Confirmed**
8.	Increase in interest rates reduces credit to private sector.	Confirmed*
9.	Increase in policy rates of the Central Bank leads to reduce aggregate demand.	Not Confirmed**
10.	Aggregate demand is influenced by consumption and total investment / private investment.	Confirmed**
11.	Investment has a positive impact on economic growth.	Confirmed**
12.	Policy rates have a positive impact on inflation.	Not confirmed*

* Monthly data from February 2003 to May 2008 were used for estimation.

** Annual data from 1978 to 2007 were used for estimation.

The following are the relationships tested (*t* statistics are given in parentheses).

(1) Relationship between Policy Rates and Long-Term Interest Rates

Equation Tested

$$\text{TBOND} = -0.5871 + 1.1978 \text{ PR} + 0.8601 \text{ AR} \quad (1)$$

(-0.19) (3.77) (9.80)

$$R^2 = 0.93 \quad \text{D.W.} = 2.18$$

According to the equation, policy rates are highly significant in determining the long-term interest rates as measured by two year Treasury Bond rates. As shown in the equation, one percentage point increase in the policy rates will increase Treasury Bond rate by 1.20 percentage points. Therefore, policy rates in Sri Lanka contributes to changes in long-term interest rates *i.e.*, Treasury Bond rates.

(2) Relationship between Policy Rates and Commercial Bank Deposit Rates**Equation Tested**

$$(i) \quad \text{AWDR} = -4.0978 + 0.4453 \text{ PR} + 0.6915 \text{ PR}_{-1}$$

$$(-7.29) \quad (1.38) \quad (2.10)$$

$$R^2 = 0.87 \quad \text{D.W.} = 0.19$$

$$(ii) \quad \text{REALAWDR} = -2.3147 + 0.6590 \text{ REALPR} + 0.2661 \text{ REALPR}_{-1}$$

$$(-1.99) \quad (6.72) \quad (2.79)$$

$$+ 1.0866 \text{ AR (1)} - 0.1356 \text{ AR (2)}$$

$$(7.14) \quad (-0.83)$$

$$R^2 = 0.99 \quad \text{D.W.} = 2.03$$

Policy Rates will influence in determining commercial bank deposit rates. According to the equation, rather than current policy rates, previous periods policy rates affect current deposit rates of the commercial banks. One percentage point increase in previous period policy rates will increase current weighted average deposit rate by 0.69 percentage points. On this basis not the current policy rates but historical policy rates will affect for AWDR.

In the equation (ii), the effect of real policy rates on real interest rate has been tested. Accordingly, real policy rates will influence in determining real average deposit rates. One percentage point increase in the real policy rates will increase real average deposit rate by 0.65 percentage points.

(3) Relationship between Policy Rates and Deposits of Banks**Equation Tested**

$$\text{QM} = -1038.341 + 712.0760 \text{ PR} - 1179.691 \text{ PR}_{-1} + 1.0245 \text{ QM}_{-1}$$

$$(-0.20) \quad (0.25) \quad (-0.44) \quad (135.41)$$

$$R^2 = 0.99 \quad \text{D.W.} = 1.84$$

According to this equation, the policy rates do not influence the total deposits of the banks. However, increase in total deposits in the previous period will influence the total deposits in the current period.

(4) Relationship between Interest Rates and Deposits**(i) Weighted Average Deposit Rates****Equation Tested**

$$QM = -280.7368 + 6342.897 AWDR - 6774.733 AWDR_{-1} + 1.0199 QM_{-1}$$

(-0.10) (1.67) (-1.92) (107.76)

$$R^2 = 0.99 \quad D.W. = 2.05$$

According to this equation in determining financial savings *i.e.*, deposits of commercial banks, there is no strong influence from the interest rates. As seen from the equation, the average deposit rate is significant at 10 per cent level and thus, there is some influence from interest rate to deposits of the banks. In addition, the previous trends of the deposits will also be a factor that determines the current level of deposits of commercial banks.

(ii) Fixed Deposit Rates**Equation Tested**

$$QM = 3094043.0 + 4171.15 FR + 1.3387 AR(1) - 0.189 AR(2) - 0.150 AR(3)$$

(0.28) (2.24) (8.45) (-0.76) (-0.90)

$$R^2 = 0.99 \quad D.W. = 1.97$$

This equation tests the relationship between fixed deposits rates and the total deposits. Accordingly, one percentage point increase in the fixed deposit rates will increase Rs. 4,171 million quasi money.

(iii) Savings Deposit Rates**Equation Tested**

$$QM = 54323.32 + 5965.86 SR - 135.03 SR_{-1}$$

(0.35) (3.05) (-0.07)

$$+ 1.1789 AR(1) + 0.222 AR(2) + 0.058 AR(3)$$

(7.98) (-0.96) (0.38)

$$R^2 = 0.99 \quad D.W. = 1.95$$

This equation tests the influence of the savings deposit rate on total quasi money. Accordingly, one percentage point increase in savings deposit rates will increase total quasi money of the banks by Rs. 5,965.9 million.

(5) Relationship between Deposit Rates and Domestic Savings/Private Savings

(i) Domestic Savings

Equation Tested

$$\text{DSGDP} = -7.8689 + 0.3445 \text{FR}_{-3} + 0.0659 \text{PGDP} + 0.3684 \text{AR} \quad (1)$$

(2.37) (1.84) (2.99) (1.89)

$$R^2 = 0.49 \quad \text{D.W.} = 1.96$$

This equation tests the relationship between deposit interest rates, and savings ratio. Accordingly, fixed deposit rates will not affect in determining domestic savings as the coefficient is not significant at 5 per cent level. However, one thousand rupees increase in per capita GDP will increase domestic savings ratio by 0.06 percentage point.

(ii) Private Savings

Equation Tested

$$\text{PSGDP} = 22.6652 - 0.0606 \text{FR}_{-3} - 0.0151 \text{PGDP}_{-2} + 0.7032 \text{AR} \quad (1)$$

(1.60) (-0.44) (-0.21) (3.24)

$$+ 0.2058 \text{AR} \quad (2)$$

(0.90)

$$R^2 = 0.85 \quad \text{D.W.} = 1.90$$

According to the results of this equation, private savings ratio has also no influence from interest rates. Even the changes in per capita income is not significant in determining the private savings ratio.

(6) Relationship between Interest Rates and Investment**Equation Tested**

$$\text{TIGDP} = 32.0354 + 0.31015 \text{ LR} - 0.5229 \text{ TIGDP}_{-1} + 1.1166 \text{ AR (1)} - 0.5790 \text{ AR (2)}$$

(4.02) (1.19) (-2.69) (6.57) (-3.92)

$$R^2 = 0.52 \quad \text{D.W.} = 2.04$$

As seen from this equation, interest rates do not affect in determining the investments/GDP ratio of the country. As stated in the equation, lending rates are not significant in determining the investment/GDP ratio.

(7) Relationship between Lending Rates and Private Sector Investment**Equation Tested**

$$\text{PI} = 84549.57 - 4203.879 \text{ LR} - 1.1628 \text{ PI}_{-1}$$

(1.97) (-2.01) (44.29)

$$R^2 = 0.99 \quad \text{D.W.} = 2.04$$

According to this equation, lending rates of the banks will influence the private sector investment. Lending rates of the commercial banks will reduce private investment. One percentage point increase in lending rates will reduce private sector investment by Rs. 4,203.8 million.

(8) Relationship between Bank Credit and Private Investment**Equation Tested**

$$\begin{aligned} \text{PIGDP} = & 11.0456 + 0.6754 \text{ CPGDP} - 0.0925 \text{ CPGDP}_{-1} - 0.0075 \text{ PGDP} \\ & (1.23) \quad (2.38) \quad (0.29) \quad (-0.36) \\ & - 0.1797 \text{ LR} + 0.4727 \text{ AR (1)} - 0.2413 \text{ AR (5)} \\ & (-0.57) \quad (3.08) \quad (-1.93) \end{aligned}$$

$$R^2 = 0.69 \quad \text{D.W.} = 2.01$$

According to the results of this equation, credit to private sector is responsible for private sector investments. One percentage point increase in credit/GDP ratio will

increase private investment/GDP by 0.68 percentage point concluding that credit to private sector from banks will determine private investment.

(9) Relationship between Lending Rates and Credit to Private Sector

Equation Tested

$$\begin{aligned}
 \text{(i) } CP = & 401414 - 3822.75 LR - 4922.7 LR_{-1} - 6304.78 LR_{-2} - 4366.18 LR_{-3} \\
 & (2.89) \quad (-1.82) \quad (2.08) \quad (-2.62) \quad (-1.98) \\
 & + 0.8522 CP_{-1} - 0.3193 CP_{-2} + 0.8815 AR (1) - 0.4301 AR (3) \\
 & (3.44) \quad (1.11) \quad (7.05) \quad (-4.46)
 \end{aligned}$$

$$R^2 = 0.99 \quad D.W. = 2.05$$

Results of this equation confirm that private sector credit is influenced by the lending rates. The interest rate variable is significant. One percentage point increase in lending rates will decrease credit to private sector by Rs.38,220 million. There is also a lag effect from credit to private sector in determining current credit to private sector. Rs. 1 million increase in previous year's credit will increase current credit to private sector by Rs.0.85 million.

(10) (i) Relationship among Policy Rates, Total Investment, Total Consumption and Aggregate Demand

Equation Tested

$$\begin{aligned}
 AD = & 4134.025 - 650.874 PR + 0.5751 TI + 0.7295 TC + 0.3468 TC_{-1} \\
 & (0.60) \quad (-1.54) \quad (9.82) \quad (10.45) \quad (5.12)
 \end{aligned}$$

$$R^2 = 0.99 \quad D.W. = 2.21$$

This equation tests the relationship among real domestic aggregate demand (as measured by consumption plus investment), policy rates, investment and consumption. Accordingly, policy rates are not responsible in determining aggregate demand of the economy. Total investment and total consumption will influence the aggregate demand. As seen in this equation, Rs. one million increase in total investment will increase Rs. 0.575 million of aggregate demand and Rs. one million increase in total consumption will increase Rs. 0.729 million of aggregate demand.

(ii) Relationship among Consumption, Private Investment and Aggregate Demand

Equation Tested

$$AD = -912.36 + 0.8227 TC + 0.4079 PI + 0.8103 M2_{-1}$$

(-0.29) (8.86) (4.33) (2.85)

$$R^2 = 0.99 \quad D.W. = 2.22$$

This equation tests the relationship among consumption, private investment and aggregate demand. According to the equation, both private investment and consumption have influenced in determining aggregate demand. As seen from the equation, Rs. one million increase in total consumption will increase aggregate demand by Rs. 0.822 million and Rs. one million increase in private investment will increase aggregate demand by Rs. 0.408 million.

(11) Relationship between Investment and Economic Growth

Equation Tested

$$(i) \quad YG = 3.159 + 0.5344 \text{ PIGDP} - 0.4404 \text{ PIGDP}_{-1} - 0.3662 \text{ CPGDP}$$

(0.61) (3.09) (-2.86) (-1.24)

$$+ 0.3411 \text{ CPGDP}_{-1} + 0.112 \text{ YG}_{-1}$$

(1.21) (0.058)

$$R^2 = 0.36 \quad D.W. = 2.09$$

According to this equation, private sector investments are responsible in determining economic growth. One percentage point increase in private investment/GDP ratio will increase the economic growth by 0.53 percentage point.

$$(ii) \quad YG = -15.2738 + 0.4486 \text{ TIGDP} + 0.2855 \text{ M2GDP}_{-2} - 0.6293 \text{ AR} (8)$$

(-2.30) (2.43) (2.14) (-2.36)

$$R^2 = 0.52 \quad D.W. = 1.99$$

Total investment has also positively influenced the economic growth. According to this equation, one percentage point increase in total investment

to GDP ratio will increase economic growth by 0.45 percentage point. Other variable tested in this equation is money supply to GDP ratio which is also significant in determining current economic growth.

(12) Relationship among Policy Rates and Inflation

Equation Tested

$$\text{IN} = -5.684 + 0.968 \text{IN}_{-1} + 0.5157 \text{PR} - 0.5677 \text{PR}_{-1} + 0.0644 \text{USD}$$

(-2.99)
(25.29)
(1.55)
(-1.81)
(2.97)

$$R^2 = 0.98 \quad \text{D.W.} = 0.41$$

According to this equation, since the variable is not significant there is no influence from the policy rates in determining inflation. One of the other variables that determines inflation is exchange rate. According to the equation, one rupee increase in the dollar rate will increase inflation by 0.06 percentage point. Other than this, historical inflation rate will influence the current inflation.

4. Policy Implications

From the empirical estimations, given in Section 3 a number of hypotheses was tested facilitating to draw conclusions based on the results. According to the empirical analysis, policy interest rates affect positively in determining long-term interest rates. Therefore, whenever there is an increase in the policy rates, there can be a corresponding increase in long-term interest rates. Similarly, policy rates are influencing the interest rate structure of the country. In the estimations, it was seen that the policy rates are influencing in determining savings deposit rates and the fixed deposit rates of the banks. Therefore, whenever there is an increase in policy rates subsequent rate increases in the financial market have to be expected. An increase in the interest rates will increase the cost of borrowings of the government.

Through the empirical estimations, it was also tested the relationship between policy rates and deposits of the commercial banks. Accordingly, policy rates are not influencing level of deposits of the banks thus concluding deposits of the banks are not variable due to changes in the policy rates. This may be due to the fact that policy rates are not changed very often and the deposit rates of banks are varied according to auction rates which are determined based on liquidity levels of the market. However, interest rates of the savings deposits and those of fixed deposits are influential in determining volume of deposits in the

banks. It was seen from the estimations weighted average deposit rates, fixed deposits rates and the savings deposits rates are responsible in determining total deposits of the banks. Therefore, rather than policy rates, interest rates are important determinants of financial savings *i.e.*, commercial bank deposits in the country. The coefficients for weighted average deposit rates, fixed deposit rates and savings deposit rates are significant in explaining the behaviour of total deposits of the country.

According to the estimations carried out, there is no influence from the interest rates to domestic savings and the private savings of the country. Domestic savings used in the estimation are normally estimated as residuals from the national accounts and they contain both financial savings and other forms of savings. As indicated in the previous Section, interest rates are determinants of financial savings, which are required for investment. Since the domestic savings are residuals derived from the national accounts, they are not determined by the movements of interest rates. Further, domestic savings consist of savings of both government and private sector. Since the government savings are negative and government requirements are funded through borrowed funds they are not varied according to interest rates. Similarly, private savings which also are derived figures in the national accounts have no influence from the interest rates. Interest rate is an instrument in deciding financial savings in the country, but not the total domestic or private savings. Domestic and private savings in the national accounts consist of various other types of savings which may not be necessarily financial. A part of the domestic/private savings emerged from contractual savings which are not decided by interest rates. Accordingly, interest rates as a policy instrument influence the financial savings but not the domestic savings or the private savings, at large. Financial savings which are required for investments can be encouraged by increasing interest rates. In order to promote domestic/private savings changes in other factors such as habits and cultural changes are required.

According to item 6 of Section 3, interest rate is not influencing the total investment of the country as measured by investment/GDP ratio. This may be due to several reasons. Firstly, country's savings finance a part of investment and other sources such as borrowing and foreign direct investment finance the balance. The latter two sources do not depend on interest rates. Larger investment projects in the country are financed from donor funding which are not determined according to interest rates. Secondly, government investments (which is a major part) is not dependent on interest rates. Thirdly, there is a part of private investments, which is not varied based on the interest rate fluctuations. Accordingly, since a substantial part of total investment is not determined by the behaviour of interest rates, total investment is not influenced by interest rate behaviour of the country. However, the private sector investment is behaved based on the interest rates *i.e.*, higher the lending rates the lower the private sector investment. Since a part of the private investments is financed from the credit of the banks, credit of the banks is responsible in deciding private investment

(item 8 of Section 3). It appears that interest rate is a deciding factor in determining private sector investment since private sector investment are financing through credit. Item 9 of Section 3 indicates that lending rates are a determinant of private sector credit which are used for investment.

Hence, any increase in interest rates will reduce credit and thereby investment. In this way, by changing the interest rate, the policy makers can influence only the private sector investment by managing credit channels but not the total investment in which there is a proportion from the non-private sector, which is not determined on the basis of the interest rates. Hence, only the private sector investment can be influenced through interest rate mechanism in the country.

In the empirical analysis, it was also tested the relationship between the interest rates and the aggregate demand. According to the equation tested, item 10 of Section 3, the policy rates are not responsible in determining aggregate demand. Therefore, by merely changing the policy rates the aggregate demand cannot be changed. It appears that in order to change aggregate demand, policy instruments other than interest rate have to be used. Some of the policies that can be used are quantitative restrictions, limits on credit, selective credit controls, moral suasions and fiscal policies. According to the equation tested, the total investment and the total consumption are responsible in deciding aggregate demand. Therefore, rather than the policy rates, other measures to control investment and consumption have to be implemented. Since the private sector investment is affected by interest rate increases, inappropriate interest rates increases are harmful for investment. It is required to influence/change consumption patterns of the public in order to manage aggregate demand. Rather than using interest rate in order to manage aggregate demand it is preferable to use other instruments such as Statutory Reserve Requirement (SRR), direct credit controls and moral suasion for effective results.

Empirical estimations also tested the relationship between the investment and economic growth. It was clearly seen from the estimations that the total investment as a percentage of GDP is responsible in determining economic growth. Since the interest rate is instrumental in deciding private sector investment which are financed through credit lines of the commercial banks, the interest rate can be used to influence private sector investment through which total investment can be increased/decreased and economic growth targets can be achieved. Appropriate level of interest rates are required since investment can be discouraged due to high interest rates although aggregate demand can be managed and therefore a balanced policy is required. Since the savings are positively related to interest rates by increasing interest rate the savings can be promoted and in this way availability of funds can be increased.

As seen from the equation tested, there is no influence from the policy rates to inflation. However, inflation increased along with other factors such as depreciation of foreign exchange rates as proxied by dollar rate in the equation. The dollar rate in the equation tested is highly significant in explaining inflation of the country.

5. Conclusions

In this study it was attempted to measure the effects of interest rates on macroeconomic variables based on which some policy implications were highlighted. The first section covered the sequences of events took place after increasing the policy interest rates, particularly after 2004. The objective of increasing the policy rates, was to achieve price stability by controlling aggregate demand. In the empirical analysis, it was seen that aggregate demand has not been influenced by changes in the policy rates and therefore other policies as suggested are preferable to manage aggregate demand. It was seen that policy rates changes affect the interest rate structure, *i.e.*, both short-term and long-term rates. It was also revealed that interest rate has not influenced in determining domestic savings and private savings. According to the estimations, total investment has not been influenced by the changes of interest rates. However, private sector investment has an influence from the interest rates since they have been financed by credit of the financial institutions, which has an impact from interest rates. Further, it was recognised that GDP growth is influenced by investment and to achieve economic growth, investment, particularly the private investment has to be encouraged and credit has to be provided. Finally, it was found that the policy rate changes have not directly affected inflation in Sri Lanka. Policies, specially the monetary policy in Sri Lanka have to be decided considering the impacts from the interest rates as identified in the study.

Variables used in the Study

<i>Variable</i>	<i>Description</i>
<u>Monthly Data</u>	
TBOND	= Yield Rates of Treasury Bonds (percent p.a.)
PR	= Average of maximum and minimum Policy Rates (per cent p.a.)
AWDR	= Weighted Average Deposit Rates (per cent p.a.)
REALAWDR	= Real Weighted Average Deposit Rates (per cent p.a.)
REALPR	= Real Average Policy Rates (per cent p.a.)
QM	= Quasi Money (Rs.mn)
FR	= Commercial Bank Interest Rates for 24 months Fixed Deposit Rates (per cent p.a.)
SR	= Commercial Bank Interest Rates for Savings (per cent p.a.)
LR	= Commercial Bank Lending Rates secured by immovable property (per cent p.a.)
CP	= Credit to private sector by Domestic Banking Units (Rs.mn)
IN	= Inflation as measured by changes in CPI (per cent p.a.)
USD	= US Dollar / Rupee Rate (Rs.)

Annual Data

DSGDP	= Domestic Savings as a per cent of GDP (percentage)
PGDP	= Per capita GDP (Rs.)
PSGDP	= Private Savings as a per cent of GDP (percentage)
TIGDP	= Total investment as a per cent of GDP (percentage)
PI	= Private Investment (Rs.mn)
PIGDP	= Private Investment as a per cent of GDP
CPGDP	= Credit to Private Sector by Domestic Banking Units as a per cent to GDP
AD	= Domestic Aggregate Demand as measured by Domestic Consumption plus Domestic Investment (Rs.mn)
TI	= Total Domestic Investment (Rs.mn)
TC	= Total Domestic Consumption (Rs.mn)
M2	= Broad Money Supply (Rs.mn)
YG	= Economic Growth Rate (per cent p.a.)
M2GDP	= Broad Money Supply as a per cent of GDP

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A Regional Analysis of Credit Needs and the Unmet Demand for Microfinance

A. S. De Alwis

Abstract

This paper compares and contrasts borrowing patterns of households at the bottom of the pyramid with those of the non-poor in the seven provinces, Western, Central, Southern, North Western, North Central, Uva, and Sabaragamuwa in order to determine the features required to be incorporated in microfinance products to make them low-end market friendly. The information reveals that regional disparity is much greater than income wise disparity in borrowing patterns pointing to the fact that there is no strong case for designing specific loan products for the poor. Overall however, as expected, the poor had lesser access to institutional credit and expended proportionately more of their borrowing for consumption and other non-productive purposes than the non-poor. However, financial inclusion among the poor was found to be much greater in this country when compared to other countries in the region. Despite high financial inclusion among the poor, both the poor and the non-poor tend to borrow from the informal sector as well, particularly from friends and relatives. The poor in the Southern Province had greater dependence on informal sector credit despite the high financial inclusion reported from that province. Figures on financial inclusion indicate that the number of households still to be reached by poverty alleviation microfinance programmes in these seven provinces was below 300,000. Resource requirement for initial loans to be provided to these persons in order to enroll them in a poverty alleviation microfinance programme was estimated to be less than Rs. 6 billion.

A Regional Analysis of Credit Needs and the Unmet Demand for Microfinance

Introduction

The poor require financial services particularly savings services and credit as much as do the rich, or even more. Among financial services, savings services are considered to be the most important for the poor because their incomes are often irregular and seasonal and they do not have access to risk management instruments like insurance. Accordingly, the poor need savings for consumption smoothing (*i.e.*, to meet consumption needs during the period they do not earn income) and for working capital (*e.g.* meeting cultivation costs in the case of cultivators). Further, savings are needed to meet unanticipated expenditure arising out of emergencies and man-made/natural disasters, to which the poor are more vulnerable and for which they do not usually have insurance cover. Other reasons for which they require savings include life cycle events such as births, deaths and marriages, education and health expenditure, exploiting of investment opportunities when they arise, business activities, purchase of productive assets and construction and improvements of houses. The poor require to borrow for the same purposes for which they require to save. Access to credit enables the poor to engage in income generating activities and to manage the growth and diversification of these activities.

Formal financial institutions often do not meet the financial service needs of the poor. Institutions such as banks which are driven by the profit motive are often reluctant to provide savings services to the poor because maintaining a large number of very small accounts is more costly than maintaining a few large accounts. Imposition of minimum deposit requirements for the opening and maintaining of bank deposits and placing restrictions on the frequency of fund withdrawal are some of the means by which the poor are excluded from banking services. Further, the required formalities for opening bank accounts, such as completion of numerous forms, providing documents of identity *etc.* sometimes tend to intimidate the poor, particularly if they are not well educated. As a result, the poor are often forced to use alternative methods of saving such as accumulating excess funds at home and/or saving in kind (*e.g.*: accumulating gold, livestock and consumer durables). They also tend to use “informal” savings arrangements such as rotating savings and credit associations (ROSCAs), mutual aid societies *etc.*, to save. Yet these forms of saving suffer from many disadvantages. For example, the poor will find it difficult to resist spending money saved at home, while investment in kind cannot be liquidated easily to meet contingency requirements. Similarly, funds in ROSCAs are also difficult to access in times of need.

Financial institutions are also in general reluctant to lend to the poor because they lack assets that could be used as collateral, which makes them high risk customers.

Further, the poor tend to borrow in small amounts and often live in inaccessible regions. A higher level of interaction is also required with poor borrowers to ensure loan recovery. All these factors make the provision of loans to the poor more expensive to banks. Further, when borrowing for income generating activities, the poor are unable to provide acceptable business plans. Risks of lending to poor agricultural communities are further enhanced by the high covariance of rural incomes, which would result in heavy defaults in the event of crop failure or adverse climatic conditions for cultivation. The poor, on their part, are also reluctant to approach formal financial institutions both because they lack acceptable collateral and because the procedure involved in dealing with formal financial institutions is costly, time consuming and complex, particularly if the credit seeker is ill educated. As a result, even at present, the credit needs of the poor, particularly in developing countries are being largely met by informal arrangements and a notable proportion of the poor remain unbanked. Due to the limited flow of funds from the formal financial sector to the poor, informal money lenders continue to have a thriving business when meeting the credit needs of the poor. Loans provided by money lenders generally involve high interest rates and servicing these loans results in the poor sinking further into poverty. It is now increasingly accepted that lack of access to financial services lies at the root of persistent poverty and inequality problems in most developing societies.

Various schemes have been in operation the world over, even prior to the 1970s, for delivery of credit to the poor. However, the perception four decades or more ago was that lending to the poor was not commercially viable and should therefore be undertaken by the government and/or “not for profit” NGOs. Early schemes for providing credit to the poor were accordingly often government directed and due to flaws in their design and political influence *etc.*, often unsuccessful. As such programmes often suffered from significant loan default rates, they were generally not sustainable and were of limited outreach.

In the mid 1970s the perception with regard to the bankability of the poor underwent a revolutionary transformation when noble laureate Professor Mohamud Yunus exploded the myth that the poor do not repay loans. The Nobel Prize for peace was awarded to Prof. Yunus recently in recognition of the role poverty alleviation plays in sustaining stability and peace in society. During the last 2-4 decades, financial services provided for the poor which came to be known collectively as “Microfinance Services” have developed rapidly due to commercialisation. Microfinance has now been accepted as a new development paradigm for alleviation of poverty through the social and economic empowerment of the poor.

What is Microfinance?

The definition of Microfinance has undergone substantial transformation over the years. In the early years, Microfinance was considered to merely be a credit methodology that

employed effective collateral substitutes to deliver and recover short term working capital loans to micro entrepreneurs or potential micro entrepreneurs. However, at present, the definition has been broadened to include an array of financial services provided to low income households including savings, insurance and money transfer. Even now, official definitions vary and even in countries like India, where the micro finance sector is relatively prominent, there is no single uniformly accepted definition of Microfinance. In Sri Lanka's proposed Microfinance Act, the definition for Microfinance is as follows:

“Micro finance business means acceptance of deposits or receiving and/or obtaining external funds and providing financial accommodation in any form and other financial services, mainly to low income persons and to small and micro enterprises (external funds) referred to here means grants, donations, borrowings, security deposits and any other sources of funds that may be specified by the (Monetary) Board from time to time).”

The Asian Development Bank defines Microfinance more simply as *the provision of a broad range of financial services such as deposits, loans, payment services, money transfers and insurance to poor and low-income households and their micro enterprises.*

Sometimes Microfinance is defined even more broadly, to cover activities related to skill upgrading and entrepreneurial development of the poor, that are aimed at lifting them out of poverty.

Use of both the terms “poor” and “low-income” households above is significant as it implies that Microfinance is not a service to be exclusively limited only to those in poverty (*i.e.*, those below a country's official poverty line), although it has been recognized globally as an effective poverty alleviation tool. Low income households just above the poverty line (the near poor) also are a vulnerable group liable to experience transitory poverty from time to time owing to shocks such as natural and man-made disasters *etc.* Even if this was not so, the enterprises operated by the near poor are usually micro enterprises, which employ persons poorer than themselves. Therefore, it is argued that by the ripple affect of microfinance, it is possible to reach out to the ultra poor who do not have the capacity or inclination to become entrepreneurs in their own right by providing support to micro enterprises belonging to the near poor in which the ultra poor are employed. Further, by having as clients those that are “less poor” Microfinance Institutions (MFIs) would become more sustainable than would be the case if they limited their activities to serving only the ultra poor and the cost of finance to the ultra poor would also be thereby reduced.

The first part of this study will analyse borrowing patterns of low income households on a regional basis in order to identify specifically the credit needs of the poor and to

obtain insights on features that could be incorporated into microfinance products in different regions in Sri Lanka to make them low-end market friendly. All households in a province below the poverty line and 5 per cent of households just above the poverty line are considered to be households in need of microfinance services, for the purpose of this study. Using a terminology that has gained currency recently, these households would be henceforth referred to as those at the Bottom of the Economic Pyramid (BOP households), while all other households are to be classified as non-poor (NP). The estimates of unbanked BOP households on a provincial basis undertaken in the second part of the study would give an indication of the potential available for expanding micro finance services regionally, and would therefore be useful in identifying the geographical areas which should be given priority when pursuing the goal of financial inclusion of the poor. This figure would in fact represent an aspect of the unmet demand for microfinance. An estimate is also made of the initial resources required to enroll the unbanked BOP households in poverty alleviation microfinance schemes. The estimates made in this part of the study would be useful not only to policy makers but also for financial institutions, NGOs and other agencies involved in microfinance delivery.

Borrowing patterns of BOP and non-poor households are analysed in this paper on a provincial basis using data from the Consumer Finance and Socio Economic Survey (CFSES) of the Central Bank 2003/04. The present unmet demand for microfinance, that is the number of households in the BOP category which are unbanked, is also estimated using CFSES data for 1996/97 and 2003/2004 and future projections are made under two broad assumptions.

The CFSES 2003/2004 collected details of loans taken by households in the 6 month period immediately prior to the date of enumeration of the household as well as all loans taken outside this reference period, in respect of which payment of interest and principle was undertaken during the reference period. Information on the source of borrowing, purpose of borrowing, interest rate under which credit was obtained and security provided for such credit are available by household income decile. However, the CFSES did not collect information on the ownership of bank accounts by households, but collected data on credits and debits to bank accounts (inclusive of crediting of interest) during the reference period of 6 months. Due to these limitations in the data, a household was considered to have access to formal financial institutions if it:

- (a) had undertaken any transactions relating to its financial assets such as crediting and/or debiting bank accounts within the 6 month period prior to the date of enumeration, or
- (b) had interest credited to it from a financial institution during the same period, or

- (c) had obtained a loan from a financial institution or made capital/interest payments on a loan obtained earlier from a financial institution during the same period.

All other households were defined to be those without access to formal financial services.

Limitations of Data

Estimates of the unmet demand for micro finance are subject to limitations owing to the assumptions mentioned earlier on the basis of which financially excluded households were identified. Financial assets, for the purpose of this survey, were defined to be savings accounts (in banks), term deposits (in banks and finance companies), government securities and private sector investments. Households not having access to banks are unlikely to invest in government securities or own shares, debentures *etc.* Therefore, it is quite safe to assume that all households undertaking transactions relating to assets have access to formal financial institutions. Accordingly, it is highly unlikely that the number of unbanked households would be under-estimated by employing this assumption. However, there is a likelihood of under estimation of financial inclusion when using this methodology. In this paper the undermentioned categories of households which ideally should be counted as financially included would be deemed to be financially excluded.

- (a) Households holding current accounts only which have not undertaken any loan transactions (obtaining of a loan, payment of capital or interest) during the reference period of 6 months prior to date of enumerations.
- (b) Households without fixed/savings account which have loans taken earlier in respect of which no payment has been made during the reference period.
- (c) Households which have access to formal financial institutions but choose not to use them including those who had dealt with financial institutions in the past but no longer do so (These households are described as the self-excluded in the literature).

It is therefore clear that there is some underestimation of financial inclusion with households in the category (a) - (c) being deemed to be financially excluded whereas they are in fact financially included. The situation described in (a) would be more frequent among the non-poor than the poor, and therefore the unbanked poor will not be greatly over estimated even if households in category (a) are considered to be financially excluded. The situation described in (b) would arise if the loanee household was enjoying a grace period in respect of loan repayment during the reference period or was defaulting on loan repayment. The situation described in (c) would mostly arise in instances where financial access is

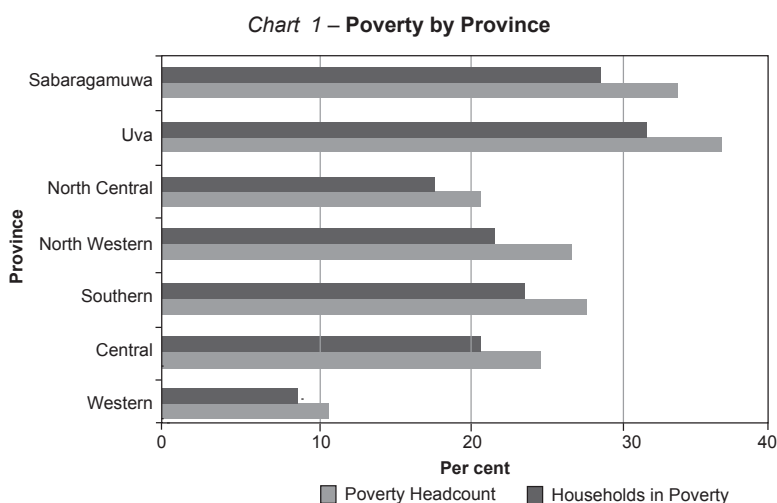
partial; with the financial products offered being either not useful or difficult to access due to obstacles being placed on access. Households belonging to category (c) therefore often lack full access to finance and no significant bias is created in the analysis by considering them to be without access to financial institutions. In fact, as it is difficult to estimate the number of households self-excluded, it is the usual the practice of researchers to use the utilization of financial services as a proxy for access to finance.

The foregoing makes it clear that the figures derived here **should be considered to represent upper bounds** for unmet demand for microfinance.

Borrowing patterns of BOP households are determined using information on borrowing of households by income deciles. As this information is only available by income decile, it was necessary to use linear interpolation methods to make estimates relating to BOP and non-poor households which would therefore be only approximations. However, this level of accuracy is sufficient to reveal broad trends. Another shortcoming of the analysis is that information is not available for the Northern and Eastern Provinces for which poverty lines are not available. The analysis is therefore limited to 7 provinces.

BOP Households

In Sri Lanka, there is wide variation in the level of poverty across the provinces as indicated in Chart 1 and Table 1, [which give the poverty headcount, the estimated



Source : Department of Census and Statistics Household Income and Expenditure Survey 2002

proportion of households in poverty and the poverty density (number of poor per square kilo meter) by province]. These statistics were based on the percentage of households in poverty as estimated by the Department of Census and Statistics in its Household Income and Expenditure Survey (HIES) 2002. Although more recent poverty statistics are available, HIES 2002 data is used owing to the fact that it was the closest year to the CFSES 2003/04. The table also gives the proportion of BOP households in each province estimated as explained earlier.

Table 1 – Provincial Poverty and BOP Households

Province	Poverty Headcount	Percentage of Households in Poverty	BOP Households	Poverty Density
Western	11	9	14	166
Central	25	21	26	110
Southern	28	24	29	120
NWP	27	22.	27	61
NCP	21	18.	23	31
Uva	37	32	37	53
Sabaragamuwa	34	29	34	125

Source : Department of Census and Statistics HIES 2002

The data in Table 1 indicates that of the seven provinces considered, poverty in terms of headcount and proportion of households in poverty was greatest in the Uva Province and least in the Western Province. However, statistics of poverty density reveal a completely different story with the highest figure being recorded in the Western province at 166 poor persons per square km while the lowest figure was recorded in the NCP. Tables 2-5 below give the borrowing patterns of BOP and non-poor households.

Purpose of Borrowing-BOP and Non-Poor Households

Table 2 gives a comparison of the distribution of the number of loans by purpose for BOP and non-poor households on a regional basis, while Chart 2 gives the distribution of the number of loans for productive purposes, housing and other purposes by province. The distribution of the value of loan by major purposes and sources for BOP and non-poor households is given in Table 3.

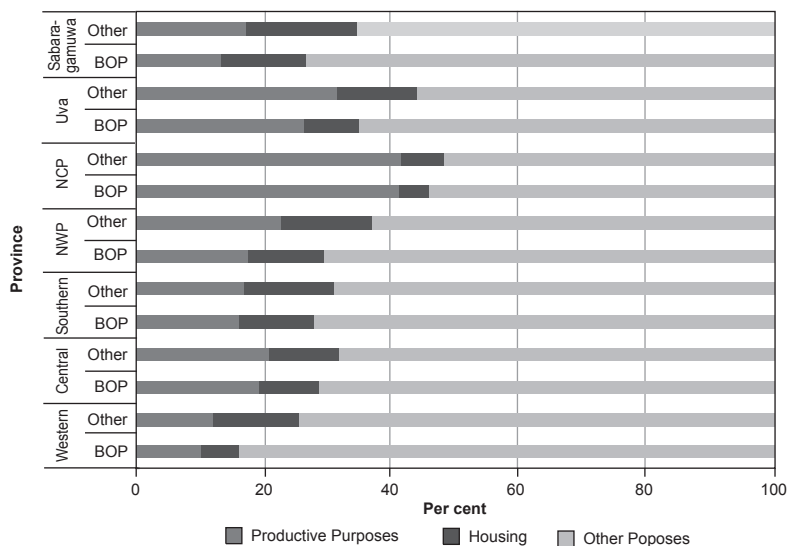
**Table 2 – Distribution of Number of Loans by Purpose of Borrowing
BOP and Non-Poor households**

	Western		Central		Southern		NWP		NCP		Uva		Sabaragamuwa	
	BOP	NP	BOP	NP	BOP	NP	BOP	NP	BOP	NP	BOP	NP	BOP	NP
Paddy Cultivation	1.5	0.5	2.9	1.4	5.2	3.5	3.2	6.1	27.3	22.9	6.6	3.2	1.4	2.0
Other Crops	1.5	0.3	12.1	10.9	5.9	2.5	5.0	2.0	9.8	8.9	13.7	13.9	7.8	3.0
Livestock	0	0.5	1.4	0.4	0	0.7	1.0	2.4	0.8	0.7	0.8	0.2	0.9	0.0
Industry	5.9	1.1	0.5	0.6	1.3	1.3	1.8	1.7	0	0.7	0	0	0	2.0
Business / Trade	1.5	9.5	2.2	7.5	3.4	8.9	6.4	10.7	3.3	8.5	5.1	14.3	3.2	10.1
Housing	5.9	13.4	9.5	10.8	11.9	14.1	11.8	13.8	4.7	6.5	8.8	12.4	13.5	17.3
Consumption	63.2	41.9	44.8	24.5	49.1	32.3	41.9	25.4	31.8	19.4	42.5	26.6	43.1	23.3
Ceremonial / Ritual	1.5	12	16.6	27.5	7.7	16.9	3.8	8.6	6.9	9.4	9.6	15.5	14.9	19.7
Settlement of Dues	7.4	8.4	4.8	5.5	5.2	6.4	12.8	11.6	6	9.1	3.9	3.5	5.3	9.5
Consumer Durables	0	5.2	0.3	4.1	3.1	4.7	2.1	8.4	2.2	5.8	2.6	3.3	2.1	6.6
Other	11.8	7.2	5	6.5	7.2	8.8	10.2	9.4	7.2	8.2	6.5	7.3	8.9	5.6
Not Specified	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Productive Purposes	10.3	11.9	19.1	20.9	15.9	16.9	17.4	22.9	41.3	41.7	26.2	31.4	13.4	17.0
Housing	5.9	13.4	9.5	10.8	11.9	14.1	11.8	13.8	4.7	6.5	8.8	12.4	13.5	17.3
Other Purposes	83.8	74.6	71.5	68.3	72.2	69.0	70.8	63.4	54.1	51.8	65.1	56.2	73.2	64.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source : Central Bank of Sri Lanka, Consumer Finance and Socio Economic Survey (CFSES) 2003/04

The table above indicates that in terms of numbers, loans taken for consumption and other less productive purposes substantially exceeds loans taken for productive purposes in all provinces. In terms of value also this situation prevails in all provinces, (other than in the case of the non-poor in the Western Province), although the disparity is comparatively less, as loans taken for productive purposes are generally of greater value than those taken for other purposes such as consumption (see Table 3). In terms of numbers, loans taken for productive purposes was greater for the “non-poor” category of households than for BOP households in all provinces, although in the NCP, income wise disparity was insignificant. Meanwhile, table 3 indicates that in value terms, loans devoted for productive purposes by the non-poor category exceeds the corresponding proportion for the BOP category in all provinces except in the Southern Province and NCP. In fact, in the NCP, where both in terms of numbers and values, loans for productive purposes were relatively high, the value of loans devoted for productive purposes by BOP households significantly exceeded the corresponding figure for the non-poor category.

Chart 2 – Distribution of Loans by Purposes



Source : Central Bank of Sri Lanka, Consumer Finance and Socio Economic Survey (CFSES) 2003/04

There is a significant province wise disparity and in fact such disparity is much more evident than poor – non-poor disparity in borrowing patterns within a province. In terms of numbers, the share of loans taken for productive purposes is significantly higher among households in the NCP when compares with other provinces. As much as 41.3 per cent of the number loans of BOP households and 41.7 per cent of the number loans of the non-poor category in the NCP were for productive purposes. It was observed above that in value terms, the proportion of loans devoted to productive purposes by BOP households in fact exceeded that of the non-poor group in the NCP. When the detailed breakdown of the number of loans is considered, it is clear that the bulk of these loans pertain to those obtained for agricultural activities. In fact, the proportion of loans obtained for paddy cultivation by the BOP households in the NCP exceeds marginally that of the non-poor category of households. It will be seen later, that the bulk of these loans have been obtained from institutional sources. These statistics reflect the level of success achieved by schemes such as the New Comprehensive Rural Credit Scheme (NCRCS) and schemes operated by the National Development Trust Fund in reaching poorest groups in the NCP. In these schemes, proportionately more credit is provided to the NCP when compared to other provinces. It is also observed that next to the Western Province, poverty levels were least in the NCP which suggests that these targeted loan schemes may have helped to contain rural poverty to a certain extent in the province. Ranking next to the NCP in the proportion of loans taken for

productive activities was the Uva Province. However, in this case, a larger number of loans has been taken for cultivation of crops other than paddy which could be expected given that cultivation of crops such as vegetables and potatoes is undertaken on a significant scale in the Province. Loans given for livestock was generally low (below 2 per cent of the total number of loans) in all provinces as were loans given for industries. Proportion of total loans obtained for trade and business was significantly higher for the non-poor category when compared with the BOP category in all provinces; the relevant proportion varying between 7.5 per cent in the Central Province and 14.3 per cent in the Uva province for the non-poor category and between 1.5 per cent in the Western province and 6.4 per cent in the NWP, for the BOP category.

The proportion of loans taken for housing purposes was greater for the non-poor category when compared to the BOP households. In all provinces other than the Western Province, the proportion of the value of loans devoted to housing by the non-poor category also exceeded the relevant proportion for the BOP households as could be expected given that the non-poor would aspire for better housing facilities. The figures for the Western Province for the distribution of the value of loans for housing seems to be an outlier, which was probably caused by just a few large housing loans taken by BOP households. Interestingly, the highest proportion of loans for housing was reported in the Sabaragamuwa Province; this share being 13.5 per cent among the BOP households and 17.3 per cent among the non-poor group. In terms of value of loans, the proportion devoted to housing by the non-poor in the Sabaragamuwa province exceeded the corresponding proportion for BOP households by a wide margin indicating, that good quality housing is a priority for the non-poor in that province.

Meanwhile, among BOP households in the Western Province, the total value of loans devoted to productive purposes was significantly low at 6.7 per cent reflecting partly the occupation mix in this most urbanized of provinces. Loans for productive purposes are taken mainly by the self employed and employer categories, and the relatively lower proportion of households in the Western Province in this category is probably reflected in the low share of the value of loans devoted to productive purposes.

As observed earlier, in terms of numbers, consumption activities accounted for a much higher proportion of loans among BOP households when compared with the non-poor category. This reflects the fact that the poor frequently have to borrow to meet their day to day basic needs including food fuel and clothing whereas the more affluent are generally able to meet such needs out of their incomes, and only resort to borrowing for consumption purposes under special circumstances. In terms of number of loans, the highest borrowing for consumption was recorded in the Western Province where 63.2 per cent of loans taken by BOP households and 41.9 per cent of loans taken by the non-poor category were for

consumption expenditure. Comparison of Table 2 and 3 indicates that such loans are of lesser value than those for productive activities. Loans for ceremonials and rituals, which include life cycle events, was significantly lower among BOP households when compared to the non-poor category in all provinces. There was considerable province-wise variation in this share, with the highest proportion of loans for both groups being registered in the Central Province where 16.6 per cent of loans of the BOP category and 27.5 per cent of loans of the non-poor category were for ceremonials and rituals. These borrowing patterns probably reflect regional variations in social obligations and traditions. The comparatively low proportion of loans taken for ceremonials and rituals by BOP households in the Western Province probably reflects the fact that urbanization has eroded traditions to some extent and as a result, the poor in the Western Province choose to dispense with such ceremonies and rituals, due to financial constraints. Loans for settlement of debt also displayed substantial regional diversity with the highest figures for both the BOP households (12.8 per cent) and non-poor category (11.6 per cent) being registered in the NWP.

The above analysis confirms the pressing need for the poor to borrow in small amounts for their basic consumption requirements. Having to service a heavy debt burden on account of basic consumption requirements is likely to discourage them from borrowing further to establish income generating activities, impairing their ability to move out of poverty.

Table 3 – Distribution of the Value of Loans by Major Purposes and Sources

	Western		Central		Southern		NCP		NWP		Uva		Sabaragamuwa	
	BOP	NP	BOP	NP	BOP	NP	BOP	NP	BOP	NP	BOP	NP	BOP	NP
Purpose														
Productive	6.7	42.4	30.9	33.6	18.3	12.6	37.1	32.7	15.1	24.6	32.4	36.8	21.3	24.0
Housing	62.3	22.5	19.6	28.0	16.1	27.1	4.2	12.8	23.8	27.0	21.9	26.9	27.0	32.7
Other	31.0	35.1	49.4	38.4	65.6	60.2	58.7	54.5	61.1	48.5	45.7	36.2	51.7	43.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Source														
Formal / Semi-formal	75.6	59.2	71.6	79.1	47.6	73.2	53.9	83.9	65.1	68.8	68.6	80.3	55.0	82.2
Informal	24.4	40.8	28.4	20.9	52.4	26.8	46.1	16.1	34.9	31.2	31.4	19.7	45.0	17.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

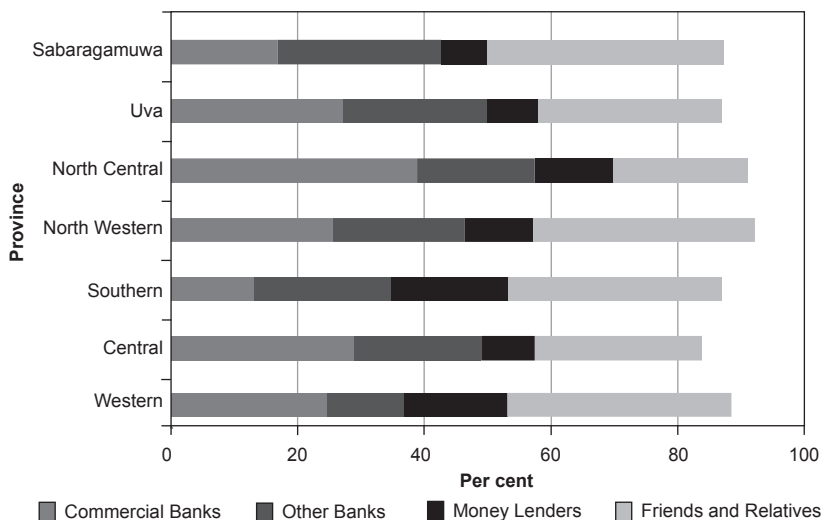
Source : Central Bank of Sri Lanka CFSES 2007/0

Table 4 – Comparison of the Distribution of Loans by Source-BOP and Non-Poor Households

Source	Western		Central		Southern		NWP		NCP		Uva		Sabaragamuwa	
	BOP	NP	BOP	NP	BOP	NP	BOP	NP	BOP	NP	BOP	NP	BOP	NP
Commercial Banks	24.7	29.2	29.0	32.5	13.2	17.5	25.7	22.8	38.8	40.0	27.3	38.3	17.0	22.3
Development Banks	6.2	5.7	7.2	5.6	4.1	7.2	9.8	12.4	8.3	8.4	6.9	8.3	10.2	13.7
DFIs	0.0	0.9	0.0	1.7	0.7	3.6	0.8	1.7	0.8	0.6	1.0	1.5	1.0	3.1
Rural Banks / Co-operatives	2.6	4.3	6.6	3.6	9.7	9.3	4.7	5.3	4.2	3.4	6.8	5.5	7.2	5.8
Samurdhi / Janashakthi Banks etc.	3.4	1.5	6.3	4.2	7.3	3.1	5.6	3.4	5.5	4.5	8.0	1.3	7.3	3.8
Loan Boards / Thrift Societies	2.1	1.4	0.9	0.8	3.4	4.5	2.1	3.8	3.5	5.5	4.7	3.2	0.7	2.2
Formal Sector Employers	3.9	11.5	10.3	20.0	4.4	14.5	0.7	5.3	2.5	6.2	3.6	10.3	5.4	10.2
Finance / Leasing Companies	4.1	3.0	0.0	0.6	0.0	0.3	0.5	1.2	0.0	1.2	0.3	0.2	1.4	2.8
NGOs	0.0	0.4	1.7	1.4	0.0	1.1	2.8	0.6	2.9	2.6	1.4	1.0	0.5	1.2
Formal & Semi-Formal Sources	47.0	58.1	62.1	70.4	42.7	61.1	52.6	56.5	66.5	72.6	60.1	69.4	50.7	65.2
Money Lenders	16.1	13.2	8.5	6.8	18.3	9.7	10.6	10.0	12.4	6.6	8.2	6.6	7.3	9.7
Friends and Relatives	35.4	27.3	26.4	20.8	33.8	26.7	35.0	31.2	21.1	18.3	29.0	20.4	37.5	22.0
Other	1.5	1.3	3.1	1.8	5.1	2.4	1.8	2.4	0.0	2.5	2.7	3.7	4.4	2.6
Not Specified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source : Central Bank of Sri Lanka, CFSES 2003/04

Table 4 above gives the distribution of loans by source for BOP and non-poor households while Chart 3 gives the distribution of borrowing (in terms of the number of loans) of BOP households by selected major sources. As could be expected, the proportion of the total number of loans taken from formal and semiformal sectors was higher for the non-poor category when compared to BOP households in all provinces. When the distribution of the value of loans is considered, the disparity is even greater in provinces other than the Western Province. However, while formal and semi formal sources accounted for over 50 per cent of the number of loans taken by the non-poor category in all provinces, such sources also accounted for over 50 per cent of loans taken by BOP households in the Central, NWP, NCP, Uva and Sabaragamuwa Provinces as well, implying that even the poor have a fair exposure to formal sources of credit in these provinces. Share of loans obtained from formal sources by BOP households was least in the Southern Province (42.7 per cent) and greatest in the NCP (66.5 per cent). It is significant that in value terms loans from formal/semiformal sources accounted for over 50 per cent of loans in all provinces other than in the case of BOP category in the Southern Province, indicating that the Sri Lanka financial market has reached the stage of institutional predominance in credit. In the Southern Province however, 52.4 per cent of the value of loans of the BOP households was still supplied by informal sources.

Chart 3 – Distribution of Loans by Selected Sources – BOP Households

Source : Central Bank of Sri Lanka, Consumer Finance and Socio Economic Survey (CFSES) 2003/04

When the breakdown of individual sources of credit is considered, commercial banks were easily the most prominent individual source, among formal sources, in all provinces. It is observed that in provinces other than the NWP, commercial banks accounted for a larger share of loans taken by the non-poor category than by the BOP households. As could be expected, share of loans obtained from commercial banks was greatest in the NCP where 38.8 per cent and 40.0 per cent of the number of loans taken by BOP and non-poor households respectively, were from commercial banks. The corresponding share was least in the Southern Province where only 13.2 per cent of the number of loans taken by BOP households and 17.5 per cent of the number of loans taken by the non-poor category were sourced from commercial banks. Meanwhile, the share of loans obtained from development banks by BOP households varied from a high of 10.2 per cent in the Sabaragamuwa Province to a low of 4.1 per cent in the Southern Province. In the case of the non-poor category, the corresponding figure varied between a high of 13.7 per cent of loans in the Sabaragamuwa Province to a low of 5.6 per cent in the Central Province, indicating that Development Banks play a relatively more prominent role in credit delivery in the former Province. The share of loans taken from Development Banks by the BOP households exceeded the relevant share taken by the non-poor category only in the Western and Central Province which seems to indicate an absence of poverty focus in lending by Development Banks in the other five provinces. Credit exposure to other Development Finance Institutions was

very low in all provinces. Meanwhile, rural banks were a relatively more important source in the Southern Province accounting for 9.7 per cent of the number of loans taken by the BOP households and 9.3 per cent of the number of loans taken by the non-poor category in that province. The corresponding figures for the other provinces were relatively lower. As could be expected, Samurdhi/Janashakthi banks, given their poverty focus, were a more important source of credit for BOP households than for non-poor households. Among BOP households, the share of loans taken from these banks were relatively high in the Southern and Uva Provinces where 7.3 per cent and 8.0 per cent respectively of the number of loans of BOP households were sourced from Samurdhi Banks. To a certain extent therefore, borrowers in the Southern Province, particularly the poor appear to have substituted rural banking and Samurdhi/Janashakthi banking services for commercial banking services. We shall see later that financial inclusion is greatest in the Southern Province and therefore, rural banks and Samurdhi/Janashakthi Banks appear to have achieved significant outreach in the Province. However, we also observed that despite this situation, BOP households in the Southern Province have taken a relatively large share of loans from informal sources. This suggests the presence of factors that lead to a preference for informal financing among borrowers in the Southern Province despite having access to the formal financial sector. These may be due to a number of factors to be discussed later.

The importance of formal sector employers as a source of credit varied across provinces. For BOP households, the proportion of loans obtained from such sources varied between a low of 0.7 per cent of the number of loans in the NWP to a high of 10.3 per cent of the number of loans in the Central Province. Among the non-poor, this variation was from a low of 5.3 per cent of the number of loans, again in the NWP, to a high of 20.0 per cent of the number of loans, again in the Central Province. This source of credit was more prominent among the non-poor group as could be expected, owing to the fact that a larger proportion of employees in this category would be in formal sector employment. However, the relatively high proportion of loans from this source, even among BOP households, in the Central Province probably partly reflects credit extended to estate workers by the estate management.

Among informal sources of credit, the most important source was friends and relations reflecting the social safety net provided by the “kinship and friendship network” in times of vulnerability. The proportion of loans taken by BOP households from this source varied between a high of 37.5 per cent in the Sabaragamuwa Province to a low of 21.1 per cent in the NCP. Further, among BOP households, the number of loans taken from friends and relations exceeded those taken from commercial banks in all provinces other than the NCP and Central Province. However, if the distribution is considered in terms of the value of loans taken, the ranking could be different as friends and relations generally provide loans of lesser value than institutional sources. Meanwhile, even in the non-poor category, friends

and relations are an important source of credit accounting for between 18.3 per cent (NCP) and 31.2 per cent (NWP) of the number of loans for the different provinces, by this category. In fact, in the Southern Province and NWP, friends and relations ranked above commercial banks in terms of the number of loans taken even by households in the non-poor category. It should be noted that all informal loans provided without interest were considered to be from friends and relations in the CFSES. Thus these sources could also be linked to the borrowers in ways other than kinship and friendship (*e.g.*: being the landlord, employer, input supplier, output purchaser, of the borrower). Such links would reduce the risk to the lender. Further, although interest was not charged, hidden costs including reciprocal credit obligations when the lender is in need, obligations to provide free/subsidized labour, payment in kind and obligation to sell produce at a specified price may be involved in these loans.

The other major source of informal credit were money lenders. It should be noted that all informal sources of credit which charged an interest were categorised as money lenders, even if such sources did not traditionally engage in professional or semi professional money lending. Therefore, a large proportion of those categorised as money lenders are also likely to be those maintaining links described in the previous paragraph with the borrower. In such instances, risks involved in the loans would be less and hence interest rates could also be expected to be lower than those charged by professional/semi professional money lenders but hidden costs discussed earlier could be involved.

The proportion of loans obtained from money lenders by BOP households varied from a high of 18.3 per cent in the Southern Province to a low of 7.3 per cent in the Sabaragamuwa Province. The corresponding variation in respect of the non-poor category ranged from 13.2 per cent in the Western Province to 6.6 per cent in both the Uva and NCP. The proportion of loans taken from money lenders was less for the non-poor category when compared to BOP households in all provinces other than Sabaragamuwa. In the Central, Uva and Sabaragamuwa Provinces, the proportion of loans taken from money lenders by BOP households was significantly lower than the corresponding proportion in the other four provinces. Next to friends and relations, the most prominent source of credit (in terms of number of loans taken) for the BOP households in the Southern Province was money lenders. It is somewhat paradoxical that BOP households in the Southern and the Western Provinces have a greater dependence on money lenders than BOP households in the most backward Uva Province. As mentioned earlier, despite the relatively higher share of loans obtained from the informal sector, financial inclusion will also be found to be greatest in the Southern Province. High dependence on informal sources despite access to formal sources may be due to a number of reasons including lack of flexibility in terms and conditions attached to lending, lack of suitable financial products and inadequacy/deficiencies in the service provided by the formal financial sector institutions.

Meanwhile, for BOP households, money lenders were the third most prominent source of credit (ranking after commercial banks and friends and relations) in terms of number of loans provided in the Western, NCP, NWP, and Uva Provinces. However in the Central, Uva and Southern Provinces, formal sector employers were the third most important source of credit for the non-poor category, while in the Sabaragamuwa Province development banks were the third most prominent source of credit for that category.

**Table 5 – Distribution of Loans by Type of Collateral and Province
BOP and Non-Poor Households**

	Western		Central		Southern		NWP		NCP		Uva		Sabaragamuwa	
	BOP	NP	BOP	NP	BOP	NP	BOP	NP	BOP	NP	BOP	NP	BOP	NP
No Security	56.0	48.0	42.3	46.3	60.1	49.9	50.5	44.2	25.3	32.3	45.9	34.9	56.3	45.6
Pronotes	1.5	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.8
Personal Guarantees	6.0	11.3	15.9	12.4	16.8	21.9	18.0	16.1	21.8	23.6	15.7	20.7	11.8	18.4
Immovable Property	0.0	1.7	0.0	0.0	0.7	2.4	1.8	1.6	0.0	0.0	0.6	4.3	0.0	2.8
EPF	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.7	0.8	1.3
Jewellery / Consumer														
Durable Goods	36.5	35.4	40.9	34.8	21.3	23.5	28.8	35.7	46.5	39.6	35.2	37.8	30.6	30.8
Machinery	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	1.2	0.0	0.0	0.0	0.0	0.9	0.3	1.1	1.2	0.0	0.0	0.5	0.0
Not Specified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.1	100.0	100.0	100.0	100.0

Source : Central Bank of Sri Lanka, CFSES 2003/04

Table 5 above gives the distribution of the number of loans taken by type of security for BOP and non-poor households. It is clear that a substantial proportion of loans have been granted without security. This proportion for BOP households varied from a high of 60.1 per cent in the Southern Province to a low of 25.3 per cent in the NCP. For the non-poor category, the relevant proportion varied from a high of 49.9 per cent in the Southern Province to a low of 32.3 per cent again in the NCP. NCP is the province which has the largest share of loans sourced from banks and this is probably the reason for collateral free loans being relatively low, as banks usually require some sort of security, even if not in a physical form. On the other hand, the availability of sources providing collateral free loans from the informal sector could be a contributory factor for the high informal borrowing observed in the Southern Province, despite that province having the greatest access to formal sector sources of credit, as we shall see later. In the Western, Southern, NWP and Sabaragamuwa Provinces, the proportion of collateral free loans taken by BOP households exceeded 50 per cent. As in some instances the proportion of collateral free loans exceeded the

proportion of loans taken from informal sources, it is clear that there are sources providing collateral free credit in both the formal and informal sectors.

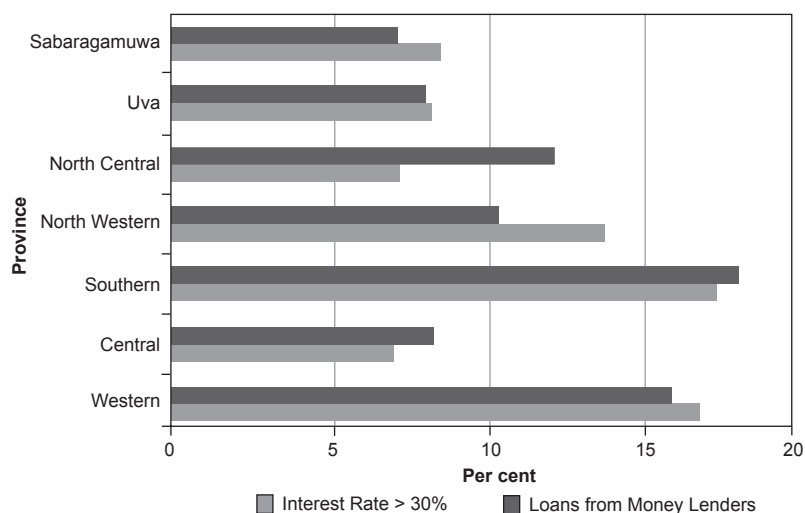
Among the types of collateral, the most popular by far was jewellery and consumer durables. The proportion of loans taken against jewellery and consumer durables by BOP households varied from a high of 46.5 per cent in the NCP to a low of 21.3 per cent in the Southern Province. The corresponding proportion for the non-poor category varied between 39.6 per cent in the NCP to 23.5 per cent in the Southern Province. In three of the provinces, Western, Central and NCP, the proportion of loans taken against jewellery and consumer durables was higher for the BOP households than for the non-poor category, whereas in the other 4 provinces the converse was true. Therefore, both the poor and the non-poor resort to the practice of putting up jewellery as collateral when borrowing. Further, jewellery is taken as collateral by both informal sector sources such as money lenders as well as formal sector lenders such as banks which offer pawning facilities.

Next to jewellery and consumer durables, the most frequently used form of collateral was personal guarantees. Use of personal guarantees as collateral was more frequent among borrowers in the NCP; 21.8 per cent of loans taken by the BOP households and 23.6 per cent of loans taken by the non-poor category in that province was taken on personal guarantees. As the share of credit sourced from commercial banks was highest in the NCP, it could be deduced that a fair share of these loans were granted against personal guarantees. Loans given under inter-se guarantee under the NCRCS would also have been included in this category. However, even in this province, the share of loans granted against jewellery and consumer durables exceeded by far the share granted against personal guarantees. Meanwhile, reliance on personal guarantees was least in the Western Province. In this more urbanised province where economic activity is more complex and social ties are less strong, mutual knowledge among residents on the financial positions of their counterparts would be lacking and this would result in a general reluctance to stand as guarantors for another person's loan. Except in the Central Province and the NWP, the proportion of loans taken under personal guarantees was higher for the non-poor category than for the BOP households. This could be expected as the more affluent would be in a better position to be more closely associated with persons with sufficient wealth and status to stand as personal guarantors. However, the significant share of loans obtained under personal guarantees even by BOP households indicate that the poor are not incapable of finding individuals to guarantee their loans. This is in stark contrast to the situation existing in Bangladesh at the time of Prof. Yoonus's pioneering work on lending to the poor, where the ultra poor were not in a position to produce guarantors and as a result were shut out from institutional credit.

Table 6 – Distribution of Loans taken by Interest Rate and Province

	Western		Central		Southern		NWP		NCP		Uva		Sabaragamuwa	
	BOP	NP	BOP	NP	BOP	NP	BOP	NP	BOP	NP	BOP	NP	BOP	NP
Interest Free	33.5	34.1	36.2	39.1	38.8	35.5	32.1	33.0	20.9	21.2	32.0	30.3	44.6	31.6
1 – 10	6.9	9.1	8.0	9.6	6.7	10.6	5.3	7.4	13.2	11.3	9.4	6.3	2.9	4.7
11 – 20	36.5	36.8	40.6	39.4	27.6	34.5	40.0	40.1	47.0	46.9	40.6	50.5	33.4	43.1
21 – 30	6.2	7.1	8.1	7.4	9.2	9.2	8.7	7.5	11.4	13.5	9.6	5.6	10.3	8.8
31 – 40	0.0	0.6	0.0	0.6	0.7	1.1	3.2	2.6	3.3	0.6	1.9	0.5	0.9	1.2
41 – 50	2.1	1.2	0.0	0.2	0.4	0.4	0.0	1.2	0.0	0.3	0.0	0.5	0.7	0.6
51 – 60	2.6	1.4	2.6	1.6	2.0	0.9	2.1	1.7	3.6	2.1	1.5	0.5	1.4	2.4
61 – 70	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71 – 80	0.4	0.3	0.3	0.3	0.4	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.4
81 – 90	0.0	0.2	0.5	0.0	0.0	0.1	0.0	0.9	0.0	0.0	0.3	0.2	0.0	0.4
91 – 100	1.1	0.7	0.0	0.2	0.3	0.4	0.3	0.6	0.0	0.6	0.0	0.0	0.5	0.0
Over 100	10.7	8.2	2.9	1.7	13.8	7.2	8.4	4.7	0.5	3.5	3.7	4.7	5.3	5.9
Not Specified	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% borrowing at over 30%	17.0	12.9	7.2	4.6	17.6	10.1	14.0	12.0	7.4	7.2	8.4	7.3	8.7	11.7

Source : Central Bank of Sri Lanka, Consumer Finance and Socio Economic Survey (CFSES) 2003/04

Chart 4 – Composition of Loans obtained at High Level Interest and Loans obtained from Money Lenders – BOP Households

Source : Central Bank of Sri Lanka, Consumer Finance and Socio Economic Survey (CFSES) 2003/04

Table 6 above gives the distribution of loans by the rate of interest for BOP households and the non-poor category, while Chart 4 below compares the share of loans taken from money lenders with the share of loans obtained at interest rates exceeding 30 per cent for BOP households. This table indicates that in most provinces, the distribution is bi-modal for both categories of households, peaking at interest rate 0 (interest free) and the 11-20 per cent range. Interest free loans are provided mainly by friends and relations, a relatively prominent source of credit, while the interest range 11-20 per cent corresponds roughly to interest rates prevailing in formal sector financial institutions.

The proportion of loans obtained interest free varied from a high of 44.6 per cent in the Sabaragamuwa Province to a low of 20.9 per cent in the NCP for BOP households, while for the non-poor category the corresponding variation was from a high of 39.1 per cent in the Central Province to a low of 21.2 per cent, again in the NCP. Interest free loans are of course mainly provided by friends and relations whereas all financial institutions generally charge interest. In the Central, Southern, Uva and Sabaragamuwa provinces, the proportion of loans obtained interest free by BOP households exceeded the proportion of loans provided by friends and relations. This implies that there are sources other than friends and relations prepared to provide interest free loans. As it is unlikely that banks and other financial institutions would resort to such a practice, probably these loans are provided mainly by formal sector employers.

Except in the case of both categories of households in the Southern Province and BOP households in the Sabaragamuwa Province, loans taken at interest rates ranging from 11-20 per cent exceeded loans taken without interest. The share of loans taken at the interest range 11-20 per cent by BOP households in the different provinces ranged between a high of 47.0 per cent in the NCP to a low of 27.6 per cent in the Southern Province. For the non-poor category, the corresponding proportion varied between a high of 50.5 per cent in the Uva Province and a low of 34.5 per cent in the Southern Province. This is consistent with our earlier observations that the share of loans sourced from commercial banks was least in the Southern Province. Therefore, one of the reasons for informal sector preference of Southern Province households is possibly the greater availability of interest free loans in the informal sector in that province. The higher share of loans obtained from the banking system in the NCP was earlier attributed to the popularity of special loan schemes that provide a relatively higher quantum of loans to that province. In fact, the proportion of loans obtained in the interest range 1-10 per cent was also relatively higher in the NCP suggesting participation in interest subsidy schemes. It should be noted that the share of loans in the interest range 11-20 per cent taken by BOP households in the Uva and Sabaragamuwa provinces was about 10 percentage points less than the corresponding share for the non-poor category in these two provinces. The situation is different in the case of loans in the next higher interest range of 21-30 per cent, reflecting clearly the disadvantage suffered

by the poor when obtaining loans at a reasonable rate of interest in these two provinces. On the other hand, although the poor – non-poor disparity in access to loans in the interest range 11-20 per cent is sharp in the Uva and Sabaragamuwa Provinces, the share of loans obtained at this relatively moderate interest range by BOP households in these two provinces, exceeds the corresponding figures for BOP households in the Southern Province. In fact, the proportion of loans obtained by BOP households in the Southern Province at interest rates below 20 per cent was 73 per cent whereas for BOP households in Uva and Sabaragamuwa the corresponding proportion exceeded 80 per cent implying that low income households in the Southern Province are at an even greater disadvantage than those in the more poverty stricken Uva and Sabaragamuwa Provinces when it came to obtaining loans at a reasonable cost.

In most cases, institutional credit, even micro credit would have carried interest rates below 30 per cent during the survey period and therefore it is very likely that interest rates above 30 per cent would have been charged mainly by informal money lenders. This is consistent with the earlier finding that the proportion of loans taken with interest rates above 30 per cent by BOP households corresponds closely with the proportion of loans taken from money lenders in most provinces (see chart 4). The chart indicates however that in the NCP, the share of loans obtained from money lenders significantly exceeds the share of loans taken at interest rates above 30 per cent, implying that a notable proportion of money lenders providing loans to low income households in this province in fact do so at interest rates below 30 per cent. This could be attributed both to the relatively greater competition offered by the formal sector institutions to moneylenders in the province and given the predominance of agriculture in this province the fact that a substantial amount of those classified as money lenders are in fact providing “produce based credit” as produce buyers and land lords *etc.* On the other hand, in the NWP, the share of loans obtained at interest rates above 30 per cent by BOP households exceeds the proportion of loans obtained by them from money lenders indicating that sources other than money lenders also charge exorbitant interest rates in the province. Earlier, we observed that in the NWP a notable share of loans was taken for debt servicing by the BOP category. This suggests that there is a fairly serious debt problem in that province. It is significant that the proportion of loans with interest rates above 30 per cent was higher for BOP households than for the non-poor category in all provinces other than Sabaragamuwa, again highlighting the disadvantage suffered by the poor in obtaining loans at a reasonable cost. Sabaragamuwa Province seems to be an outlier with BOP households enjoying substantial access to interest free credit. In the Western, Southern and NWP, the share of loans taken at interest rates in excess of 30 per cent were at double digit levels for both categories of households with the corresponding proportion for BOP households in the Western and Southern Provinces exceeding 17 per cent (see Table 6). In fact, in these two provinces, the proportion of loans taken at interest rates above 100 per cent by BOP households was also at double digit

levels implying greater dependence on exploitative money lenders. This is consistent with our findings earlier that it is the poor in the Western and Southern Provinces that are most dependent on money lenders. In the Southern Province, the proportion of BOP households obtaining loans at interest rates exceeding 30 per cent was 7.5 percentage points higher than the corresponding proportion for the non-poor category in the same province. Despite the greater poverty headcount in the Uva province, the proportion of loans taken at interest rates exceeding 30 per cent was at low single digit levels, even for the BOP group.

While the above analysis indicates that the poor are at a comparative disadvantage when accessing institutional credit and are therefore more dependent on informal sources, there does not appear to be a very strong difference between the borrowing patterns of BOP households and the non-poor category. In fact, provincial variations were seen to overshadow poor – non-poor disparity in borrowing patterns.

Generally, the source of loan chosen is determined by the purpose for which the loan is sought. Loans for day to day general consumption purposes and exigencies are more likely to be sourced from informal sources, even among persons with access to financial institutions, due to the lesser availability of loans for consumption purposes in the institutional sector. On the other hand, loans related to production purposes have a greater likelihood of being sourced from formal sources, particularly if there is a special credit scheme in place for such loans by which the bank benefits (i.e. receives interest subsidy payments or refinance) or if the business plan relating to the project is acceptable and indicates a cash flow by which the loan could be serviced with ease.

Table 7 below gives the unbanked households by income quintiles, computed as explained earlier.

Table 7 – Percentage of “Un-banked Households” by Income Quintile 2003/2004

Quintile / Category	Western	Central	Southern	NWP	NCP	Uva	Sabara-gamuwa
1	33.1	36.9	24.9	32.6	36.8	42.9	35.7
2	24.5	29.3	18.9	19.6	19.0	31.2	28.5
2	19.1	27.5	15.9	21.6	13.7	21.7	23.1
4	16.2	22.1	11.9	12.0	11.1	17.2	18.2
5	11.5	12.4	5.6	7.6	11.8	12.2	7.4
Unbanked BOP Households (a)	33.1	35.2	23.0	29.2	34.5	37.5	34.5
Unbanked BOP Households as a % of Total Households	4.6	9.1	6.7	7.9	7.9	13.9	8.3

(a) Proportion in the BOP category deemed to be unbanked.

Source : Central Bank of Sri Lanka, CFSES 2003/04

As could be expected, in general, the percentage of un-banked households declines with increasing income. However, the relationship with income is not as strong as expected due to the fact that the figures for the proportion of unbanked households is much more likely to be overestimated for non-poor households than for BOP households. Accordingly, the proportion of unbanked households is likely to be substantially lower for the upper quintiles than indicated by the figures given in the table above.

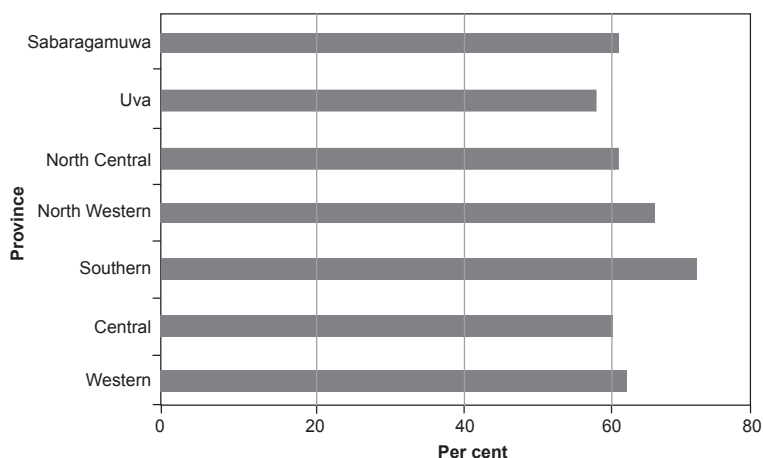
The table reveals that the highest proportion of unbanked BOP households is found in the Uva province where 37.5 per cent of such households were unbanked. All provinces other than the Southern Province and NWP had over a 30 per cent of BOP households falling into the unbanked category. The Southern Province has the least proportion of unbanked BOP households (23.0 per cent), which at a first glance seems to contradict the earlier finding that there was significantly greater dependence on informal sources for credit by the poor in that province.

Table 8 below gives estimates of financial inclusion by income quintile and province based on above estimates for unbanked households while chart 5 compares the estimates for financial inclusion for BOP households across the provinces. In accordance with the estimation methodology explained earlier, a household that had undertaken any transactions relating to financial assets (inclusive of receipt of interest to their savings/fixed deposits) or engaged in a loan related transaction with a financial institution during the 6 months preceding the date of enumeration was deemed to have access to formal sector financial institutions. Consequently, as discussed earlier, households with access to financial services not undertaking any of the above mentioned transactions during the reference period and the self excluded would erroneously not be counted as households with access to finance. This makes the figures for financial inclusion given in the table 8 below, underestimates. Therefore, these estimates could be considered lower bounds for financial inclusion.

Table 8 – Estimates of Financial Inclusion by Quintiles for Provinces

Quintile	Western	Central	Southern	NWP	NCP	Uva	Sabara-gamuwa
1	66.9	63.1	75.1	67.4	63.2	57.1	64.3
2	75.5	70.7	81.1	80.4	81.0	68.8	71.5
3	80.9	72.5	84.1	78.4	86.3	78.3	76.9
4	83.8	77.9	88.1	88.0	88.9	82.8	81.8
5	88.5	87.6	94.4	92.4	88.2	87.8	92.6
All	79.1	74.3	84.5	81.3	81.5	75.0	77.4

Source : Central Bank of Sri Lanka, CFSES 2003/04 – Special Tabulations

Chart 5 – Financial Inclusion by Province

Source : Central Bank of Sri Lanka, CFSES 2003/04 – Special Tabulations

Interestingly, as mentioned earlier, overall financial inclusion was greatest, not in the most developed Western Province, but in the Southern Province where 84.5 per cent of households had reportedly used formal financial services, while the least access is found in the Central and Uva provinces with the corresponding figures standing at 74.3 per cent and 75 per cent of households respectively. In the Southern Province, NWP and NCP, over 80 per cent of households had access to financial services. In fact, these three provinces scored better with respect to financial inclusion than the most developed and affluent Western Province. Despite the underestimation explained earlier, the above figures confirm that financial inclusion in Sri Lanka is substantially higher than in other countries in the region such as India, Pakistan and Bangladesh. According to the Rural Finance Survey of 2003 for India, 79 per cent of households did not have access to formal loans and 59 per cent did not have access to formal savings services. Another study revealed that less than 20 per cent of rural Indians have access to formal financial services. In Pakistan, it is revealed that only 30 per cent of adults have bank accounts and the total number of borrowers from banking institutions constitutes only 3 per cent of the population. Despite this situation, there is no room for complacency in Sri Lanka, particularly as substantial borrowing from the informal sector is observed among the household population alongside borrowing from the financial sector, suggesting that financial access could be only partial for a notable proportion of the population. Ironically, in the Southern Province where financial access is greatest, even for low income households, borrowing, in terms of proportion of loans taken, from the informal sector is also highest. It was noted earlier that in the Southern Province, households obtain a substantial amount of loans from rural and cooperative banks rather than from commercial

banks. It may be worthwhile investigating as to why a notable proportion of households in this province prefer not to borrow from conventional commercial banks and instead opt to borrow from other banks and informal sources. For this purpose, an assessment should be made as to the extent to which products offered by commercial banks and terms and conditions attached to such products meet the needs of Southern Province households. Data suggests that the preference for borrowing from the informal sector by households in this province could be the greater availability of loans without interest and collateral requirements in the informal financial sector in the province. Therefore, relaxation of rigid collateral requirements and offering of products suited to the special needs of the province would encourage borrowing from formal sector institutions.

Unmet Demand for Microfinance

Table 9 – Unmet Demand for Micro Finance

	Western	Central	Southern	NWP	NCP	Uva	Sabara- gamuwa
No. of Households 1996/97	1,020,600	503,005	509,461	498,603	251,657	244,683	391,010
Percentage of Total Households which are unbanked and belonging to the BOP category 1996/97	3.9	10.4	7.8	9.8	7.4	12.7	11.7
Estimated unbanked BOP households 1996/97	39,803	52,313	39,738	48,863	18,623	31075	45,748
No. of Households 2003/2004	1,291,833	573,857	521,502	541,810	271,967	280,301	434,718
Percentage of Total Households which are unbanked and belonging to the BOP category 2003/04	4.6	9.1	6.7	7.9	7.9	13.9	8.3
Estimated unbanked BOP Households in 2003/2004	59,424	52,221	34,941	42,803	21,485	38,962	36,082
Scenario 1* – No. of Estimated Unbanked Households in the BOP category in 2008	74,903	52,335	32,540	39,765	23,381	44,492	31,570
Scenario 2** – No. of Estimated Unbanked Households in the BOP category in 2008	63,064	58,239	39,922	46,488	25,135	43,768	39,549
Resources required to enroll unbanked BOP households in microfinance programmes – Scenario 1 (Rs.mn.)	1,498.1	1,046.7	650.8	795.3	467.6	889.8	631.4
Resources required to enroll unbanked BOP households in microfinance programmes – Scenario 2 (Rs.mn.)	1,261	1,167	798.4	930	503	875	791

* Scenario 1 – Assuming that the annual rate of growth of unbanked BOP between the period 1996/97 and 2003/04 has continued until 2007/08.

** Scenario 2 – Assuming that the proportion of unbanked BOP households would not have changed from the level existing in 2003/04.

Estimates of the number of households in the BOP group without bank exposure given in Table 9 reflects the regional potential for expanding microfinance. Province wise estimates in the table were undertaken on the basis of 2 scenarios. In the first scenario, it was assumed that the annual growth trend in the number of unbanked households between the survey years 1996/97 and 2003/2004 would continue until 2008. In the second scenario, the proportion of unbanked households was assumed to be invariant at the level that prevailed in 2003/04.

According to the above projections, the number of unbanked potential microfinance client households in the seven provinces under review was estimated to be 298,986 under scenario 1 and 316,255 under scenario 2. Accordingly, it would be safe to conclude that the number of potential microfinance clients yet to be reached by poverty alleviation micro finance programmes in Sri Lanka in these seven provinces would be around 300,000. The lowest proportion of unbanked BOP households in both surveys was observed in the Western Province. However, CFSES information indicates that over the survey years, this proportion has increased from 3.9 per cent in 1996/97 to 4.6 per cent in 2003/04, suggesting that the informal financial sector actually expanded in the province. In fact, as discussed below, the absolute number of unbanked households estimated for the year 2008 is highest in the Western Province due to its high population density. Accordingly, one fourth of potential microfinance client households yet to be reached, live in the Western Province. In the NCP and Uva Provinces also, financial inclusion appears to have deteriorated between the two survey periods, although the deterioration in the case of the NCP is marginal and may be due to fluctuations in the demand for cultivation loans, which are dictated by extraneous factors like the receipt of rain/water on time *etc.*, in those particular years. In any event, the NCP has the lowest number of potential micro finance client households still to be reached by formal sector financial institutions. In the Central, Southern, NWP and Sabaragamuwa Provinces, financial inclusion of the poor has improved as could be expected given the growth in bank branch networks *etc.* The deterioration in the financial inclusion situation in the Western and Uva Provinces are however a matter for concern as it appears that either the availability of formal financial services has not kept up with the population growth or that informal financial services offering more flexible terms and conditions have expanded possibly due to formal financial services not catering to the needs of poor households. This situation needs to be further investigated.

Chart 6 and 7 give the distribution of the absolute number of potential microfinance client households still to be reached by province. The number of unbanked BOP households was highest in the Western Province due to the relatively high population in the province under both scenarios described above: under scenario 1, this number is estimated at 74,903 while under scenario 2 it is 63,064. As observed earlier, one fourth to one fifth of the households that need to be reached by poverty alleviation microfinance programmes live

Chart 6

**Distribution of Microfinance Clients
still to be reached – Scenario 1 Estimation**

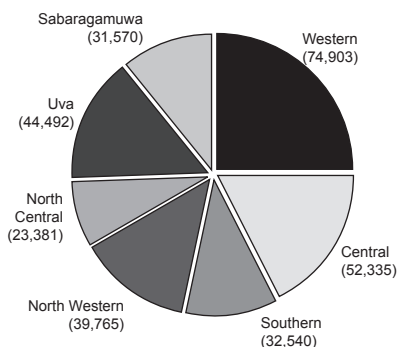
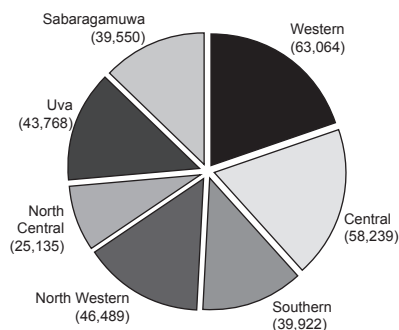


Chart 7

**Distribution of Microfinance Clients
still to be reached – Scenario 2 Estimation**



in the Western Province. Ranking next to the Western Province, in terms of the number of financially excluded BOP households is the Central Province for which the corresponding figures are estimated at 52,335 under scenario 1 and 58,239 under scenario 2. In both the Uva and NWP, the estimated number of financially excluded BOP households exceeds 39,000. Formal financial sector penetration is relatively much more favourable in the less populated NCP where under both scenarios, the number of unbanked BOP households, were below 26,000, although the number of unbanked households increased slightly between the survey years 1996/97 and 2003/2004. The sharpest improvement in financial inclusion between the survey years is observed in the Sabaragamuwa Province. It is estimated that the number of BOP households needing microfinance services is 31,570 under scenario 1 and 39,549 under scenario 2, for this province.

Table 9 also gives the initial resources required to enrol all unbanked households into poverty alleviation microfinance programmes under both scenarios. The figures reveal that around Rs. 6 billion is required for this purpose for the 7 provinces under consideration. (This is estimated on the basis of providing an initial loan of Rs.20,000 to each unbanked household.) Of this, Rs.1.3 to Rs.1.5 bn is required in the Western Province. It should be emphasized that this is not the total unmet demand for microfinance in the sense that as low income households already borrowing under microfinance programmes may be in need of further funds.

Summary and Conclusion

Although banking services have expanded over the years, informal sources continue to provide an appreciable proportion of credit not only to the poorest households but also to the relatively more affluent. Friends and relations provide a notable proportion of credit for all categories of households, implying that strong social ties of kin-ship and friendship continue to be an important support mechanism in this country particularly during exigencies. Borrowing for non-productive purposes including consumption was significant for both the poor and non-poor although a larger share of loans of the poor were devoted for such non-productive purposes. This raises the issue as to whether micro-credit should be provided for non-productive purposes as well. In Sri Lanka, many microfinance programmes provide loans only for income generating activities. However, provision of loans for purposes such as education, health and general consumption is common in many microfinance schemes operated in other countries in the region and the design of such loan products should be studied before designing such products for the micro credit market in Sri Lanka. In any event, it should be noted that, money is fungible and there is no mechanism to prevent funds provided for income generating activities being diverted to other purposes. Further, all poor people do not have the entrepreneurial ability to set up and run independent micro enterprises. Wage labour could also benefit from poverty alleviation microfinance programs, if loan facilities are made available for purposes such as housing, health, education, lifecycle events emergencies and general consumption *etc.* This would be more relevant in an urbanized atmosphere, where the proportion of wage labour is high and opportunities for self employment relatively low. It is also very important to encourage savings in poverty alleviation microfinance programmes and ensure the availability of a flexible mechanism to permit the poor to access their own savings and/or group savings in times of need to meet their consumption and other needs that are not related to income generating activities. Perhaps, provision of bulk loans several times the value of group savings to groups could be considered for intra group lending for purposes not related to income generating activities. This would prevent loans given for livelihood activities being diverted for other purposes. Micro-insurance services need also to be in place to help the poor manage risks and emergencies.

As regional patterns dominate over income disparity, there appears to be no strong reason to design special loan products exclusively for the poor and any product which is popular for the non-poor in a region is likely to be popular among the poor as well. For example a loan product for life cycle events would be popular for both the poor and non-poor in the Central Province. However, flexible and high quality financial services should be provided at a reasonable cost to the poor to wean them away from usurious money lenders.

The proportion of loans taken from formal and informal sources was higher for the non-poor category, when compared to the BOP category, supporting the premise that the poor face greater financial exclusion. However, the data shows that a greater proportion of the poor in Sri Lanka are served by the banking system than in other countries in this region. Despite this, both poor and non-poor resort to borrowing from the informal sector as well, suggesting that they are to some extent underserved by the formal financial sector and pointing to the need for infusing further flexibility in loan products to make them customer friendly. It should also be kept in mind that it is not possible to eliminate borrowing from informal sources totally, as a large proportion of such borrowings are from friends and relations on very flexible terms and conditions which the formal sector cannot match.

A somewhat paradoxical observation was that the proportion of loans taken from informal sources was high in the Southern Province, particularly for the poor, despite the access to formal finance being greatest in the province, with even the low income groups having comparatively greater access to credit. Although in all provinces households with access to finance also borrow from the informal sector, the situation seems to be more acute in the Southern Province. As observed earlier, this may be due to several factors such as having very rigid terms and conditions relating to credit delivery from formal sector institutions particularly collateral requirements which are unsuitable to borrowers and the availability of loans on more flexible and favourable terms and conditions in the informal sector *etc.* Further expansion of micro finance programmes under the Self Help Group (SHG) mechanism could help to alleviate the problem with regard to collateral to a certain extent as beneficiaries could then make use of inter-se guarantee. Banks would also be willing to accept such guarantees particularly if these microfinance programmes are managed by reputable organizations with good financial standing.

The precise level of interest charged by money lenders cannot be derived from the data, as all informal sector credit which included an interest component were lumped together and considered to have been sourced from money lenders in the CFSES 2003/04. For a better analysis of interest rates charged by professional money lenders it is necessary to separate money lenders with links to the borrower from those who lend to borrowers without such links. It seems that BOP households in the Western and Southern Provinces are more vulnerable to exploitation by money lenders than BOP households in the less developed Uva and Sabaragamuwa Provinces, as the proportion of loans taken at interest rates above 30 per cent was much higher for BOP households in the two former provinces than is the case with BOP households in the two latter provinces. This points to a need for a more flexible approach in credit delivery by financial institutions involved in micro credit activities in both the Western and Southern Provinces. The expansion of poverty alleviation micro finance programmes which use the SHG methodology by reputable entities in the Western and Southern provinces is therefore called for.

Loans obtained at interest rates below 30 per cent varied between 82.4 per cent and 92.8 per cent for BOP households in the different provinces while the relevant figures ranged between 87.1 per cent and 95.4 per cent for the non-poor category. Although a larger proportion of loans with interest rates above 30 per cent was recorded for BOP households when compared to the non-poor category, the fact that even the BOP category were able to obtain over 80 per cent of their loans at interest rates below 30 per cent implies that it would be unlikely for the demand for microfinance to be completely interest inelastic in Sri Lanka as is the case of some other countries where the poor are completely cut-off from the financial sector. There is evidence in the NCP which suggests that where the formal sector successfully competes with the money lenders the interest rate charged by the latter can be driven down.

The number of microfinance clients yet to be reached is estimated to be around 300,000 in the seven provinces under consideration. Around a fourth of them reside in the Western Province. The share of unbanked population is observed to have increased in the Western and Uva provinces during the period 1997-2004. It may be worthwhile to study the causal factors that have led to this situation. As in absolute figures the number of unbanked households was in fact highest in the Western Province owing to its higher population density, there is ample scope for expanding micro finance activities in the province despite the fact that it is by far the richest province. However, most poverty alleviation programmes, particularly those that are donor funded exclude the Western Province on account of greater affluence. In negotiations undertaken relating to such programmes, it should be brought to the notice of donor agencies that the number of unreached potential micro finance client households is greatest in the Western province and that a large proportion of poor households in the province are dependent on the informal sector for credit. It is therefore extremely important to identify pockets of poverty within the province and target such pockets specifically under poverty alleviation microfinance programmes. It is worthwhile noting that urban poverty could cause greater social unrest which would have much graver implications for the law and order situation in the country.

In order to improve financial inclusion in the country, a deliberate attempt should be made to enrol unbanked households in poverty alleviation microfinance programmes. Targeting is very important as interest rates for ordinary commercial borrowing and microfinance overlap at present making the elite capture of microfinance in Sri Lanka a strong possibility. It is observed that field staff involved in microfinance programmes tend to enrol persons already with access to finance to programmes targeted to the poor and the relatively low level of interest rates in such programmes gives an incentive to the non-poor also to join such programmes. One way in which poverty alleviation microfinance programmes could improve financial inclusion is by providing bonus payments and incentives to field staff who enrol households without any previous access to formal sector finance.

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Bilateral J-curve between Sri Lanka and its major trading partners

W T K Perera^{1/}

Abstract

It is widely believed that the short run effect of exchange rate depreciation on trade balance is different from the long run. In the short run, first, the trade balance deteriorates before resulting in an improvement, suggesting a J-curve pattern. Most of the empirical studies have employed aggregate trade data, while recent studies have used bilateral trade data. These studies are mostly between industrial countries, a few developing countries, but none so far for Sri Lanka. Hence, in this study, the impact of real depreciation of Sri Lankan Rupee (SLR) on the trade balance in the short run and the long run has been examined, employing bilateral trade data between Sri Lanka and its six major trading partners using the autoregressive distributed lagged (ARDL) model. The results reveal that the trade balance between Sri Lanka and its trading partners does not support the J-curve phenomenon, and also it does not have any specific pattern in response to depreciation of real exchange rate.

1. Introduction

Exchange rate devaluation is one of the important policy tools that can be adopted in open macroeconomics to improve a country's competitiveness as well as the trade balance. According to the Marshall-Lerner condition, currency devaluation may succeed in improving the trade balance in the long-run, if the sum of export and import elasticities

^{1/} The author wishes to thank Dr. Satish Chand of the Australian National University for his valuable comments and guidance throughout this study. The views expressed in this paper are the author's own and do not necessarily reflect those of the Central Bank of Sri Lanka.

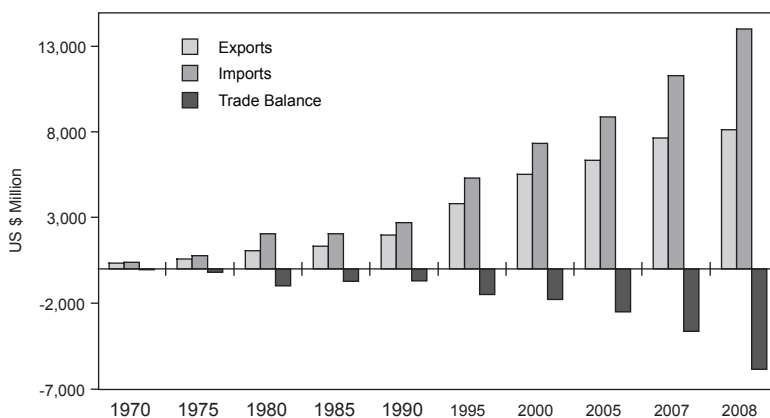
becomes greater than unity (Bhamani-Oskooee *et al.* 2006). Policy makers closely follow this condition before making decisions. The intuition behind this elasticity approach is that due to currency devaluation, exporters have a chance to earn more money when they convert foreign exchange earnings from exports into domestic currency. At the same time, importers have to pay more in terms of domestic currency for imports. Hence, currency devaluation encourages exports and discourages imports. This is expected to improve the trade balance. Nevertheless, the impact of exchange rate devaluation on the balance of trade is not instantaneous (Arora *et al.* 2003). It is widely believed that currency depreciation worsens the trade balance in the short-run, but improves it in the long-run. As this represents the shape of the letter J, Magee (1973) named this the ‘J-curve phenomenon’.

The delay in the improvement of trade balance is identified as the time lag that producers and consumers take to adjust to the new prices. Five different types of lags have been identified; recognition lag, decision lag, delivery lag, replacement lag and production lag (Junz and Rhomberg 1973). The trade balance may improve only after the realization of these lags.

Background

Sri Lanka has continuously recorded a trade deficit, which has worsened over the period (Chart 1). This deficit is mainly due to high oil prices and the increased demand for imports. On the other hand, the income elasticity of demand for primary commodities in world trade is less than unity, while the income elasticity of demand for manufactured goods is greater than unity. Hence, as world income grows the demand for primary commodities grows at a slower rate. However, if Sri Lanka grows at the same rate as the world economy, its

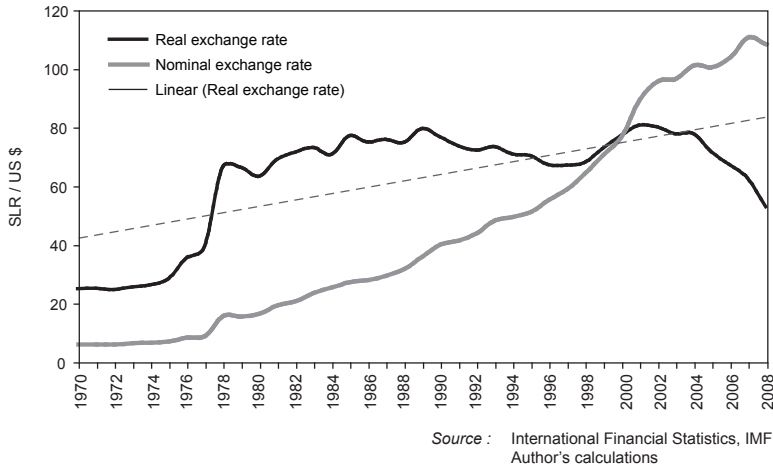
Chart 1 – Change in Trade balances in Sri Lanka, 1970–2008



Source : International Financial Statistics, IMF

demand for manufactured goods grows at a faster rate. Therefore, as a consequence, Sri Lanka which specializes in the production of primary commodities suffers the difficulties in the trade balance.

Chart 2 – Exchange rate behaviour in Sri Lanka, 1970–2008



As shown in Chart 2, SLR has depreciated against the US dollar over this period both in real and nominal terms. During this period Sri Lanka has undergone several exchange rate regimes. In 1977, Sri Lanka liberalised its economy and moved to a managed floating exchange rate regime from a dual exchange rate regime. As a result, the real exchange rate has depreciated against US dollar by 69 per cent from Rs.39 in 1977 to Rs.66 in 1978. Further, in 2001 the country adopted a floating exchange rate system with Central Bank intervention.

Chart 3 – Relationship between real exchange rate and trade balance

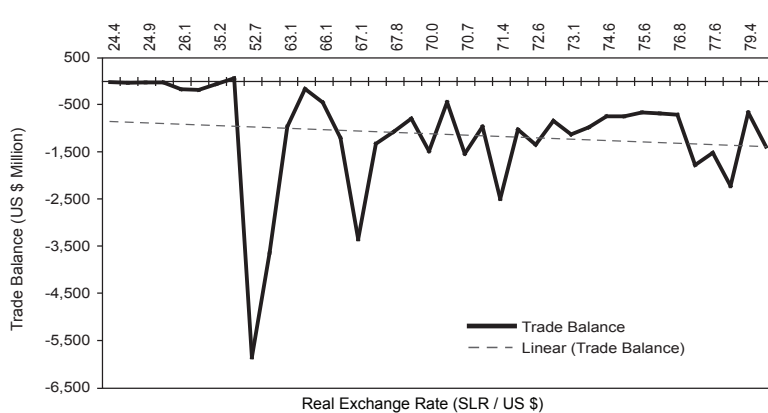


Chart 3 reveals that, in general, with the real depreciation of the SLR, the trade balance has deteriorated. Sri Lanka's main export items are textiles and garments, and primary goods including tea. Earnings from these items are relatively low due to high competition in the world market. In contrast, the country has to import crude oil, other intermediate and manufactured goods and defence related items which are essential. Hence, even though the exchange rate depreciates, Sri Lanka cannot limit the import of these essential goods. Therefore, with depreciation of the SLR, the trade balance has worsened.

Literature Review

The impact of currency devaluation on the trade balance (J-curve phenomenon) has been investigated by many researchers by using different econometric techniques and models. Most of the earlier studies used aggregate data, while recent studies have employed bilateral trade data. The use of aggregate data suppresses the actual movements of those variables involved. This is the main reason for moving to bilateral data. The empirical results of these studies are mixed. For instance, some studies have found no evidence for the J-curve effect (Narayan 2006; Bhamani-Oskooee and Wang 2006). Others have found that trade balance is improved in the long run (Bahmani-Oskooee and Ratha 2004; Arora *et al.* 2003). Most of the studies have found that, in the long run, a country's balance of trade would improve with one trading partner, while it can deteriorate with another with devaluation of the local currency (Bhamani-Oskooee and Wang 2006; Bahmani-Oskooee *et al.* 2005).

Bahmani-Oskooee and Ratha (2004), analysed the J-curve effect for the US bilateral trade with 18 major trading partners employing the autoregressive distributed lagged (ADRL) model. They concluded that, in the long run, devaluation of the US dollar improved the US trade balance with Austria, Denmark, Ireland, Italy, Japan, New Zealand, Sweden, and Switzerland. They found no evidence for the J-curve pattern in the short run. Nadenichek (2006), employed the structural vector error correction model to examine the behaviour of the US's trade balance with other G-7 countries. He found that the J-curve pattern exists for the bilateral trade balance between the US and the other G-7 countries.

According to Narayan (2006), China's trade balance with the US has improved not only in the long run but also in the short run with the depreciation of the Chinese RMB reflecting that the J-curve phenomenon does not hold. Bhamani-Oskooee and Wang (2006) have done a similar study for China and its 13 major trading partners. Their findings are compatible with Narayan's (2006) in the case of China's trade balance with the US. However, they found that in the short run, depreciation of the RMB has a significant impact in most cases.

More recently, Bahmani-Oskooee *et al.* (2006) tested the J-curve phenomenon employing quarterly bilateral data from 1970:Q1- 2001:Q3 for the UK and its 20 major

trading partners. They came up with mixed results. In most cases, they found no support for the J-curve effect in the short run, while in the long run the UK's trade balance improved in only six cases (Australia, Austria, Greece, South Africa, Singapore and Spain). Only the UK's trade balances with Canada and USA support the J-curve phenomenon.

According to the findings of Bahmani-Oskooee *et al.* (2005), in the case of Australia, only the trade balance with Norway follows the J-curve phenomenon. They found that the depreciation of the Australian dollar has a positive and significant impact only on the trade balance with Denmark, Korea and New Zealand out of its 23 major trading partners.

Buluswar *et al.* (1996) analysed the effect of depreciation of the Indian rupee on its trade balance using stationarity and cointegration by employing aggregate data. He revealed that there is no evidence that India's trade balance follows the J-curve phenomenon and the trade balance has not even improved in the long run. In contrast, Arora *et al.* (2003), using bilateral trade data and employing the ARDL model for India's major trading partners found that its trade balance with Australia, Germany, Italy and Japan improved in the long run. Nonetheless, their findings are compatible with Buluswar *et al.* (1996) in the case of the J-curve phenomenon.

Narayan (2004) asserted that, with devaluation of the New Zealand dollar, its trade balance followed the J-curve pattern. Similarly, Bahmani-Oskooee and Kantipong (2001) found that Thailand's trade balance with the US and Japan also followed the J-curve pattern. Wilson (1999), examined the impact of currency devaluation between Malaysia and its two major trading partners (the US and Japan). He concluded that exchange rate depreciation does not have any significant impact on the bilateral trade balance and found no evidence for the J-curve effect. Further, Wilson (2001) argued that there is no evidence to suggest that the trade balance for Singapore and Malaysia with the USA and Japan follows the J-curve phenomenon, while Korea's trade balance with respect to both the US and Japan followed the J-curve phenomenon.

There has been little literature for the case of Sri Lanka. De Silva and Zhu (2004) examined the effect of SLR devaluation on the trade balance and GDP employing VAR and ECM analysis and using aggregate data. They found that currency depreciation has improved the Sri Lanka's overall trade balance.

Many researchers have attempted to find the J-curve effect especially for industrial countries, but only a few for developing countries. However, the literature does not reveal any attempt to examine the J-curve effect for Sri Lanka with its trading partners or at least as a trading partner of any other country concerned. Sri Lanka, as a developing country needs to have a better idea about the behaviour of the trade balance due to currency depreciation, as its currency depreciates continuously over the time. This is important, because if the trade balance is worsening, the government has to find solutions to finance this deficit.

The objective of this study is, therefore, to examine the short-run and the long-run effects of depreciation of the Sri Lankan Rupee on its trade balance with six major trading partners; the United States, the United Kingdom, Japan, India, Hong Kong and Singapore using bilateral trade data. These countries have been selected as they accounted for more than 50 per cent of Sri Lanka's total international trade. Table 1 shows Sri Lanka's trade with these trading partners in 2007. The rest of the paper is structured as follows. Section 2 discusses the data and limitations, while the Model and the Methodology are given in Section 3. Section 4 discusses the empirical results and Section 5 presents the conclusion.

Table 1 – Sri Lanka's trade with major trading partners in 2007 (US\$ million)

Trading partner	Exports		Imports	
	Value	%	Value	%
Hong Kong	65.80	1.04	724.81	6.41
India	515.28	8.12	2,610.14	23.10
Japan	159.64	2.52	413.17	3.66
Singapore	80.19	1.26	1,118.54	9.90
United Kingdom	1,018.04	16.04	229.82	2.03
United State	1,969.98	31.04	412.14	3.65
World	7,740.43	100.00	8,863.00	100.00

Source : Direction of Trade Statistics, IMF.

2. Data

Quarterly bilateral time series data from 1996:Q1 to 2008:Q2 are used in this analysis. The data are obtained from CD-ROMs of the Direction of Trade Statistics and International Financial Statistics of the International Monetary Fund, except for quarterly GDP data for Sri Lanka. This has been obtained from the Statistical Monthly Bulletin of the Central Bank of Sri Lanka. The trade balance (TB) is defined as the ratio of Sri Lanka's exports to country i (trading partner) over its imports from the same country. Hence, TB is expressed in unit free term and both real and nominal TBs are the same. Bilateral real exchange rate (REX) is defined as $(NEX * P_i / P_{SL})$, where P_i is the Consumer Price Index (CPI) (2000 = 100) in trading partner i , P_{SL} is the CPI (2000 = 100) in Sri Lanka and NEX is the bilateral nominal exchange rate (period average) defined as the number of SLR per unit of trading partner i 's currency. Consequently, an increase in REX reflects the real depreciation of the SLR with respect to trading partner i 's currency. Quarterly

GDP (2000 = 100) data are used as real income both for Sri Lanka and the trading partner country.

In the case of Sri Lanka and India, quarterly GDP data are available only from 1996 and for Singapore from 1984:Q3. Hence, due to unavailability of data, the study has been limited to the period 1996:Q1 to 2008:Q2.

3. Model and the Methodology

First, particularly for time series data it is necessary to check for stationarity of the individual data. Then the ARDL model can be used to capture the short term dynamics.

Test for Stationarity

As a result of using non-stationary data, sometimes misleading results can be obtained through spurious regression. Therefore, to avoid this problem, this study first examines the stationarity of the logarithms of all individual variables using the unit root test. The most commonly used Augmented Dickey Fuller (ADF) test is employed to test the unit roots. If the individual variable is Y_t , then the ADF test is based on the following regression;

$$Y_t = \rho Y_{t-1} + u_t ; \quad -1 < \rho < 1 \quad (1)$$

Where, u_t is a white noise error term with mean zero and constant variance.

If, $\rho = 1$, then Y_t has a unit root and, therefore, it is non-stationary.

Equation (1) is often expressed in an alternative form as;

$$\Delta Y_t = (\rho_{-1}) Y_{t-1} + u_t = \delta Y_{t-1} + u_t \quad (2)$$

Where, $\delta = (\rho_{-1})$ and Δ is the first difference operator.

After running the regression in (2), the hypothesis $H_0 : \delta = 0$ is tested against $H_1 : \delta \neq 0$. If we fail to reject H_0 , this implies that the variable is non-stationary in its level, and then the first difference of the variable is tested for unit roots.

Regression Model

The trade balance model employed in this study follows the model used by Bahmani-Oskooee and Wang (2006). It is expressed in a log-linear format as in equation (3).

$$\text{Log } TB_{i,t} = \alpha + \beta \text{Log } Y_{SL,t} + \gamma \text{Log } Y_{i,t} + \lambda \text{Log } REX_{i,t} + \varepsilon_t \quad (3)$$

Where,

- $TB_{i,t}$ – Trade balance between Sri Lanka and a trading partner country (i)
- $Y_{SL,t}$ – Domestic income (GDP)
- $Y_{i,t}$ – Income in trading partner i
- $REX_{i,t}$ – Bilateral real exchange rate between Sri Lanka and trading partner i

It is assumed that an increase in domestic income ($Y_{SL,t}$) would increase the demand for imports and, therefore the trade balance will deteriorate. Hence, the estimated value of β is expected to be negative. Similarly, the estimated value of γ would be positive, if it is assumed that an increase in the trading partner's income would result in an increase in Sri Lanka's exports. Finally, an increase in the REX, that is real depreciation of SLR, would lead to increased exports and reduced imports. Therefore, the estimate of λ would be positive.

Equation (3) gives the long run relationship among the variables. As the J-curve is a short-run phenomenon, it is necessary to incorporate the short-run dynamics into this model. This is done by adding the error correction terms into the model. This study employs the error correction model used by Engle and Granger (1987):

$$\begin{aligned} \Delta \text{Log } TB_t = & \alpha + \sum_{k=1}^n \omega_k \Delta \text{Log } TB_{t-k} + \sum_{k=0}^n \beta_k \Delta \text{Log } Y_{SL,t-k} + \sum_{k=0}^n \gamma_k \Delta \text{Log } Y_{i,t-k} \\ & + \sum_{k=0}^n \lambda_k \Delta \text{Log } REX_{t-k} + \varepsilon_{t-1} + u_t \end{aligned} \quad (4)$$

Where, ε_{t-1} is the lagged stationary residual of the equation (3). In equation (4), existence of cointegration among four variables can be confirmed either if ε_{t-1} (lagged error correction term) retains a negative and significant coefficient or the residuals of equation (3) are stationary though all variables are non-stationary at their levels. However, Pesaran *et al.* (2001) have modified this model replacing ε_{t-1} by linear combination of the

lagged level of all four variables and have shown that for this model it is not necessary to test for unit roots. This is known as ARDL model and the model takes the form:

$$\begin{aligned} \Delta \text{Log } TB_t = & \alpha + \sum_{k=1}^n \omega_k \Delta \text{Log } TB_{t-k} + \sum_{k=0}^n \beta_k \Delta \text{Log } Y_{SL,t-k} + \sum_{k=0}^n \gamma_k \Delta \text{Log } Y_{i,t-k} \\ & + \sum_{k=0}^n \lambda_k \Delta \text{Log } REX_{t-k} + \delta_1 \text{Log } TB_{t-1} + \delta_2 \text{Log } Y_{SL,t-1} + \\ & + \delta_3 \text{Log } Y_{i,t-1} + \delta_4 \text{Log } REX_{t-1} + u_t \end{aligned} \quad (5)$$

The F -test has to be carried out to check the validity of the inclusion of these variables into the model and to check whether these variables have long run relationships. The null hypothesis of $H_0: \delta_1 = \delta_2 = \delta_3 = \delta_4 = 0$ (no cointegration) is tested against alternative $H_1: \delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq 0$ (cointegration). If the calculated F statistic is greater than its critical value, then the null hypothesis is rejected. That is, variables are retained in the model and they are cointegrated. If variables are cointegrated, then the short run effect is given by the value and the sign of λ 's. The J-curve phenomenon is supported if the first few λ s have negative values and then positive values. The long run effect of the real depreciation of the SLR on trade balance is given by the estimated value of δ_4 , which is normalized on δ_1 .

4. Empirical Results and Discussion

Although it is not necessary to check for the unit roots to confirm the validity of the results, the ADF unit root test was carried out and the results are reported in Appendix A. This reveals that each variable is non-stationary at their levels (except for LogTBHK and LogTBUS), and they are stationary at their first difference, at 10 per cent significance level. Hence, the variables are integrated of order one.

Equation (5) was estimated using quarterly data over the period of 1996:Q1 to 2008:Q2. First, we check whether lag level of these variables are cointegrated and whether they should be retained in the model. For this purpose, the F -test was carried out and the joint significance of these variables was checked. Bhamani-Oskooee and Brooks (1999, cited in Arora *et al.* 2003: 1039) have concluded that 'the results of the F -test is sensitive to the number of lags imposed on the each first differenced variable'. Therefore, the F -test was carried out by imposing lags from one to six (applied the same lag for all variables

and had to restrict maximum of six lags due to insufficient observations). The results of the *F*-test are reported in Table 2.

Table 2 – The results of F-test for cointegration

Trading Partner	1 Lag	2 Lags	3 Lags	4 Lags	5 Lags	6 Lags
Hong Kong	4.81	3.25	3.80	3.16	2.33	2.51
India	7.45	2.51	2.93	2.04	3.08	2.40
Japan	3.61	4.57	4.26	2.93	1.74	1.61
Singapore	5.32	2.55	3.45	3.94	2.00	2.46
United Kingdom	2.80	2.34	4.05	2.25	1.26	6.66
United State	4.47	6.25	4.37	3.48	1.71	0.85

It is clear from Table 2, that the calculated *F*-statistics are sensitive to the number of lags employed in the model. For instance, at one lag there are five cases greater than the critical value^{2/} which is 3.52 at 10 per cent significance level. Therefore, we reject the null hypothesis of no cointegration and it can be concluded that there is evidence for cointegration among these variables. Hence, these variables should be retained in the model. Nonetheless, at five lags none of the cases supports the existence of cointegration. Therefore, we pursue the Bhamani-Oskooee and Brooks (1999, cited in Bhamani-Oskooee and Kantipong 2001), and keep the lag level variables considering it as preliminary, because it can lead to results that would strongly support cointegration in the second step.

In the second step, the maximum of six lags were imposed on each of the first difference variables in equation (5), and then the best model for each country was selected, employing the Schwarz Bayesian criterion (SBC)^{3/}. As we only consider the effect of real depreciation of the SLR on trade balance, only the short run dynamics relating to real exchange rate are reported in Table 3, for simplicity.

2/ Critical value is taken from Pesaran et al. (2001), Table CI(iii) Case III, page 300.

3/ We can also employ the AIC and adjusted R squared as the model selection criterion and will get the different number of lags as optimal. These are given in the Appendix B.

Table 3 – Estimated coefficients of the real exchange rate and error correction term based on SBC

	Trading Partners					
	Hong Kong	India	Japan	Singapore	United Kingdom	United State
$\Delta \text{Log REX}$	0.27 (0.18)	5.01 (2.98)	-0.80 (0.54)	1.49 (0.94)	0.02 (0.01)	3.56 (2.03)
$\Delta \text{Log REX}_{t-1}$		-5.25 (1.50)	-2.82 (1.47)		0.87 (0.41)	
$\Delta \text{Log REX}_{t-2}$		-6.94 (2.42)	-3.00 (1.87)		6.24 (1.70)	
$\Delta \text{Log REX}_{t-3}$		-4.73 (1.96)	-2.28 (1.11)		7.19 (2.14)	
$\Delta \text{Log REX}_{t-4}$		-1.44 (0.75)	-1.08 (0.59)		8.43 (2.59)	
$\Delta \text{Log REX}_{t-5}$		-0.02 (0.01)	0.06 (0.04)		5.32 (1.98)	
$\Delta \text{Log REX}_{t-6}$		-2.67 (-1.73)	-0.41 (0.27)		5.31 (2.01)	
EC_{t-1}	-1.14 (7.15)	-0.08 (0.26)	-0.72 (1.47)	-0.40 (2.77)	-1.54 (2.31)	-1.38 (9.38)

Note : Figures in the parentheses are absolute values of t-statistics.

The results reported in Table 3, reveal that in the short run, there is no specific pattern for the trade balance between Sri Lanka and its trading partners in response to the change in real exchange rate. None of the cases supports the J-curve phenomenon. In the case of India, the trade balance first improved, and then deteriorated. With depreciation of the SLR, the trade balance between Sri Lanka and the United Kingdom has improved in the short run, but it is not significant up to two lags. However, there is no significant impact on Sri Lanka's trade balances with Hong Kong, Japan and Singapore with the depreciation of the SLR.

The long run coefficients are reported in Table 4. In this case estimates of $\delta_2 - \delta_4$ are reported after normalizing them on δ_1 .

Table 4 – Estimated long run coefficient of the bilateral trade balance model based on SBC

Trading Partner	Constant	Log Y_{SL}	Log Y_i	Log REX_i
Hong Kong	1.35 (0.21)	-0.54 (0.51)	-0.26 (0.27)	0.06 (0.08)
India	4.16 (1.35)	-14.37 (2.79)	12.57 (2.79)	2.70 (2.88)
Japan	11.75 (0.44)	0.04 (0.02)	-2.67 (-0.35)	1.09 (0.59)
Singapore	-6.02 (0.94)	-7.52 (2.69)	6.15 (2.12)	4.60 (2.57)
United Kingdom	54.67 (3.45)	34.32 (4.21)	-39.26 (4.19)	-6.18 (1.57)
United State	2.22 (0.96)	0.41 (0.73)	-0.44 (-0.37)	-0.31 (-0.62)

Note : Figures in the parentheses are absolute values of t-statistics.

In Table 4, we can observe that a positive and statistically significant coefficient against the real exchange rate has existed only with respect to India and Singapore. Hence, in the long run, Sri Lanka's trade balance improved only with India and Singapore. All the other cases demonstrate that the real depreciation of the SLR does not play a significant role in determining the trade balance between Sri Lanka and each of the countries.

The expected sign has been received in the case of the trading partners' income, only for India and Singapore. This implies that an increase in income in India and Singapore will increase exports in Sri Lanka to those countries, and therefore increase the trade balance. The increase in income in the United Kingdom has a negative and significant impact on the trade balance between Sri Lanka and the United Kingdom. However, in the case of income in Sri Lanka, a negative and significant coefficient has been received only in the cases of India and Singapore confirming that the increase in Sri Lanka's income will increase the imports from those countries.

Finally, to verify the retaining of lag level variables, model (5) is re-estimated incorporating the error correction term. In doing so, we have calculated the lagged linear combination (denoted by EC_{t-1}) as included in equation (5) by using the estimates, calculated for $\delta_1 - \delta_4$. Then the linear combination of the lagged level variables was replaced by EC_{t-1} . The model was re-estimated employing the optimal number of lags. According to Pesaran *et al.* (2001) a negative and significant coefficient in EC_{t-1} denotes existence of cointegration among variables. These results are also reported in Table 3, and can be observed that in most of the cases the coefficients of EC_{t-1} are negative and highly significant. Hence, there is strong support for cointegration among these variables.

5. Conclusion and Policy Implications

The impact of currency devaluation on the trade balance is an important characteristic that policy makers are interested in. With the introduction of the J-curve phenomenon many researchers have shown interest in finding the short run as well as long run effects on trade balance due to real depreciation of the exchange rate. Most studies have used aggregate trade data between a respective country and the rest of the world, while the most recent studies have employed bilateral trade data between a particular country and its trading partners. The findings of these studies are mixed.

In this study the impact of real depreciation of SLR on the trade balance in the short run and the long run have been examined, employing bilateral trade data between Sri Lanka and its six major trading partners. The methodology that has been used is based on the ARDL model advanced by Pesaran *et al.* (2001). The main conclusion that can be drawn is that in the short run, there is no specific pattern for the trade balance between Sri Lanka and its trading partners in response to the change in real exchange rate, and none of the cases supports the J-curve phenomenon. In the long run, only in the cases of India and Singapore has there been a positive and significant impact on trade balance with the depreciation of the SLR.

This study emphasises that Sri Lanka has to take action to improve its income from exports and reduce the expenditure on imports to overcome the problem in the trade deficit. By improving the quality of exports, Sri Lanka can have a better price in the world market. On the other hand, adopting structural adjustments for exports to move from primary goods to manufactured goods would also be important as the income elasticity of manufactured goods is greater than unity. This would be an area for future research.

The study also reveals that both domestic and trading partners' real incomes are important determinants of Sri Lanka's trade balance. As domestic income has a negative impact on trade balance, policy makers have to consider proper policy measures to reduce expenditure on imports to reduce the trade deficit. This would also be an area for future research.

Appendix A – Result of the Unit root test

Variable	Level (with trend)	First Difference (with trend)
LogGDP _{SL}	-1.9513	-17.9740
LogTB _{HK}	-3.8471	-7.5014
LogGDP _{HK}	-0.8427	-12.6551
LogREX _{HK}	-0.4118	-5.9120
LogTB _{IND}	-0.3386	-4.9809
LogGDP _{IND}	-1.9082	-15.4708
LogREX _{IND}	-2.1855	-6.0862
LogTB _{JP}	-2.5525	-5.8218
LogGDP _{JP}	0.1740	-4.2001
LogREX _{JP}	-1.3980	-5.0778
LogTB _{SIN}	-1.8911	-5.8814
LogGDP _{SIN}	-0.1287	-5.5238
LogREX _{SIN}	0.5911	-4.4891
LogTB _{UK}	-1.7312	-6.3795
LogGDP _{UK}	-1.5359	-3.3450
LogREX _{UK}	-2.1989	-4.5495
LogTB _{US}	-4.0992	-5.3286
LogGDP _{US}	-1.3297	-2.7317
LogREX _{US}	-1.2217	-4.4915
Critical Values		
1%	-3.5973	-3.6019
5%	-2.9339	-2.9358
10%	-2.6048	-2.6059

Appendix B – Values of AIC, SBC and Adjusted R-squared with different lags

Trading Partner	Number of Lags						
	0	1	2	3	4	5	6
AIC							
Hong Kong	0.11	0.20	0.37	0.20	-0.30	0.00	-0.59
India	0.18	-0.79	-0.65	-0.77	-0.97	-1.27	-2.21
Japan	-0.23	-0.15	-0.51	-0.72	-0.73	-0.95	-1.39
Singapore	-0.01	-0.16	-0.11	-0.08	-0.33	-0.56	-1.04
United Kingdom	-0.55	-0.49	-0.32	-0.48	-0.52	-0.51	-2.03
United States	0.23	0.32	0.18	0.27	0.29	0.24	0.09
SBC							
Hong Kong	0.44	0.71	1.05	1.05	1.00	1.22	0.81
India	0.51	-0.29	0.03	0.08	0.07	-0.05	-0.80
Japan	0.10	0.35	0.17	0.13	0.30	0.27	0.01
Singapore	0.32	0.34	0.57	0.78	0.70	0.65	0.36
United Kingdom	-0.22	0.01	0.36	0.37	0.52	0.71	-0.63
United States	0.56	0.82	0.86	1.13	1.33	1.46	1.49
Adjusted R-squared							
Hong Kong	0.51	0.51	0.46	0.57	0.64	0.58	0.61
India	0.22	0.73	0.71	0.75	0.77	0.77	0.85
Japan	0.31	0.30	0.55	0.64	0.64	0.66	0.65
Singapore	0.38	0.52	0.48	0.48	0.59	0.60	0.59
United Kingdom	0.42	0.42	0.36	0.48	0.48	0.40	0.79
United States	0.66	0.66	0.72	0.71	0.70	0.67	0.53

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