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ANALYZING THE INFLATION IN SRI LANKA USING JOHENSEN CO-INTEGRATION APPROACH

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Abstract

The purpose of this study is to examine how factors related to both demand side and supply side, affect inflation in Sri Lanka. Another objective is to explore the causal relationships between the macroeconomic variables used in this study. Annual time series data from 1960 to 2020 are used for this study. Johansen co-integration and vector error correction approach are used to test the evidence for long-run and short-run estimates. The evidence of causal relationships among macroeconomic variables are explore using granger causality test. The analytical results of the study reveal that, in the long run Money Supply, Import Good and Services, Government Expenditure and Government Revenue have positive and significant impact on Consumer Price Index of Sri Lanka. On the other hand, in the long run Consumer Price Index has found to be negatively influenced by Gross Domestics Product and Export Good and Services. Whereas, the impact of Export Good and Services is not significant. The estimated coefficients of the factors Money Supply, Gross Domestics Product, Imports, Government Expenditures, Government Revenue that encountered with inflation in the long-run are 0.39, -2.61, 1.29, 0.28 and 1.79 respectively. Build targeted action plans and avoid unwanted actions while reduction of Money Supply, reduction of Government Expenditure, controlling Import Goods and Services, controlling wages, increase of production of goods and services are some of the measures that can be taken to control inflation in Sri Lanka.

Keywords: Consumer price index, Johansen co-integration, Money supply, Long-run estimates.

1. Introduction

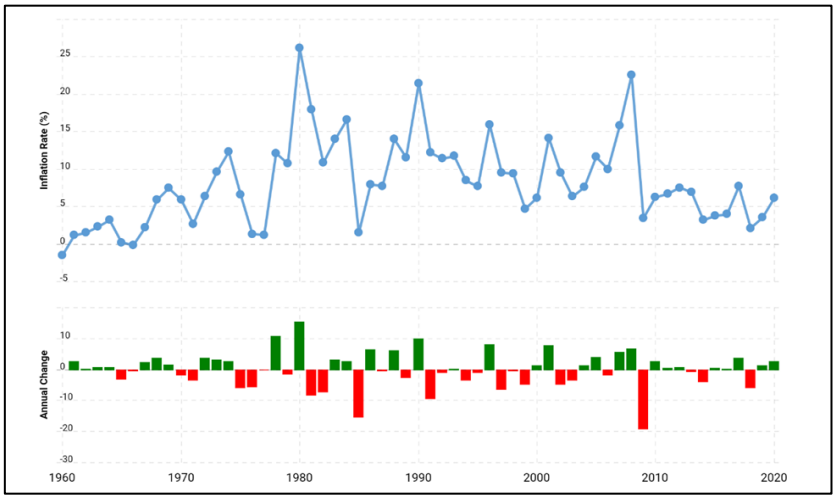
Inflation can be defined as depreciation of purchasing power of a given currency over time. Inflation is one of the major and dynamic macroeconomic problem facing almost every economy in the world. Considering the adverse effects of inflation on economic growth and social welfare, stabilizing the average price level or preventing high inflation has become a major macroeconomic objective of the financial authorities in Sri Lanka as well as many countries. Inflation has adverse effects on the economy in many ways. High inflation raises a number of major issues facing society. It weakens the equity of the purchasing power of the country and reduces the real value of money (Bandara, 2011). The prices of different commodities go up in different sectors in an inflationary situation and because of the high price level, people need more money to do everyday transactions and as the value of the money goes down, every consumer has to carry more money with them. Therefore, high inflation has the ability to distorting relative prices as well as consumer behavior. This leads to incorrect allocation of resources. Inflation undermines business confidence, discourages savings and promotes consumption. Another major adverse effect of inflation is the weakening of export competition and discouragement of exporters. This helps to weaken the export competitiveness of the domestic economy. Another factor that exacerbates inflation is the depreciation of the exchange rate. Also, fixed income earners are particularly vulnerable to inflation. Inflation can also occur due to an increase in aggregate demand or a decrease in aggregate supply. Demand inflation occurs when aggregate demand exceeds aggregate supply (Bashir, 2011). Many factors contribute to this, some of which are government spending, gross domestic product or exports, government expenditure, etc. An increase in the price of the

production factors is one of the reasons for the increase in the overall price level of goods. Furthermore, rising productivity factors may reduce the supply. This process is known as cost push inflation. Decreased overall supply due to the increasing wages, cost of production, rising taxes, higher imports, budget deficit or fiscal deficit, are the main sources of cost push inflation.

It is increasingly recognized around the world that it is appropriate to control inflation or maintain price stability as a major objective of macroeconomic policy. Accordingly, price stability has become a major focus of central banks when designing monetary policy in many countries. Maintaining economic and price stability are key objectives of modern central banking practices. Sri Lanka has experienced high inflation over the past few decades. Therefore, taking into account the adverse effects of inflation on local economic activity, maintaining low inflation is one of the main objectives of the government and the central bank of Sri Lanka. Therefore, the central banks of many other countries including Sri Lanka have given high priority to the objective of price stability in its monetary policy framework (Colombage, 2005). Control of inflation has been an integral part of macroeconomic policy in Sri Lanka since its economic liberalization in 1977. It is clear that Sri Lanka has been plagued by internal conflict for nearly 30 years and has been a major impediment to the country's economic growth.

In Sri Lanka, the annual average rate of inflation was only 2.8 percent more than one decade from 1960 to 1972 and it remained as single digit number during that period. But first time, in 1974 it increased up to 12.3 present due to the crude oil price hike happen in 1973. Then the inflation rate had begun to decrease rapidly and in 1976 it reached a meager 1.2 present. As the whole during 1960-1976 the average annual inflation rate was only 3.9 present. Hence, it was proved that low inflation was the one of the main characteristics of the economy of the pre-liberalization government. Figure 1 describes the inflation of Sri Lanka from year 1960 to 2020.

Figure 1: Inflation Trends in Sri Lanka in 1960 to 2020 (Source: World Bank)



In 1977, after introducing the liberalization economy policy the existing situation entirely changed as the results of the elimination of most of the administrative price controls and consumer subsidies by the economic reforms. In addition, instead of fixed exchange rate, liberalization regime was introduced flexible exchange rate system. When removing exchange controls and trade barriers Sri Lanka was able to expose to the rest of the world and it cause to made fluctuations of domestic consumer price as an impact of the commodity prices fluctuations happen abroad. Thus, these reforms indicate to increase the general price level by hastening level of inflation. In the meantime, as a result of liberalization increased the public investment and it led to growth in the money supply. Finally, it indicated to increase the level of inflation. Also, after the liberalization, accelerated the growth of GDP and it cause to increase the pressures of demand. Hence, between the time period 1978 to 1984, every year inflation

rate continued as double-digit number. Then, between 1985 to 1987 due to the exchange rate stability and slow money growth inflation rate had declined.

In the next five years (1988-93) the average annual inflation rate was 14.1 present and it remained at double digit number consistently. The reason behind that was monetary expansion, bad weather circumstances and civil conflicts specially happen in 1988-89. Then in 1990, as the results of depreciation of rupee in the past years inflation rate increased up to 21.5 present and next three years the inflation rate remained at double digit number. After that, it declined progressively and reached a single digit level in 1994. As a result of reduction of prices of some consumer goods, tariff and increased the level of supplies goods indicated to contain inflation rate until 1995.

In 1996, due to the shortfalls in domestic food production, increased the prices of energy sources and cut down of consumer subsidies again inflation rate tends to increase, and it reflected the double-digit inflation rate. But next four-year time period inflation rate declined consistently, and it remained at single digit number in cause of prudent monetary management, low import prices and some of fiscal discipline. Then, in 2001 the annual inflation rate again increased due to the currency depreciation and increase of international commodity prices and supply shortages. In next two years, from 2002 to 2003 inflation declined gradually and it favorably affect to the both demand and supply side factors. In 2004, impact of cost-push factors and impact of fuel price increase the inflation rate begun to increase.

However, since 2003, the inflation rate has been rising gradually until 2008. In 2008, the inflation rate reached its peak level which was 22.6 percent. During that period inflation rate remained at two-digit number and several factors impact to that highly unstable situation. Mainly, increase the energy prices, increase the prices of consumer goods, depreciation of Sri Lankan currency against the dollar and specially it was impacted the civil war conditions happen during that period in Sri Lanka. Then, since 2009-2019 the annual average rate was only 5.01 present and annual inflation rate remained at one-digit number throughout that period.

In the years 2019 to 2020, inflation rate in Sri Lanka shows an increasing trend. The expansion of inflation in 2020 is about 2.63% compared to 2019. The impact of the global COVID-19 epidemic crisis is a major factor in this. The first wave of COVID-19, which began on 27 January 2020 and lasted until October 2020, and then the second wave, which began on 4 October. This caused a new crisis situation in the country. In particular, with the issue of lockdown the country, there was a huge surplus of demand in the market due to the unfounded fears that arose among the people of the country. At the same time, the sharp rise in the commodity prices was due to the fact that domestic production and distribution were affected by the country's lockdown situation. In this period, the import restrictions imposed by the government have led to a significant decline in the country's imports, which has resulted in higher prices of imported goods. Also, the closing down of the airport and port was one of the reasons for that. One of the reasons for further rise in prices of the imported goods is the depreciation of the Sri Lankan rupee, which has increased the pressure on domestic prices. For all these reasons, inflation in the country increased during this period.

By analyzing the above graph, it was proved that inflation rate had fluctuated year to year in Sri Lanka. According to many studies conducted on inflation in Sri Lanka as well as foreign countries by individuals such as Ratnasiri, (2011), Cooray, (2008), Arif, and Ali, (2012), Lim, and Sek, 2015), as the key determinants of inflation rate can be identified changes happen in exchange rate, economic growth, government expenditure, money supply, energy prices and interest rates. Therefore, it is important to identify inflationary sources in order to implement the proper policies to reduce the fluctuation happen in domestic price level. This study aims to find out the causes

and criteria for certain macroeconomic variables on inflation in Sri Lanka, including both demand pull and cost push factors based on statistical criteria as well as economic criteria.

This research paper was composed into five sections. Section two illustrates the review of literature. In section three methodology is given. Section four clearly describes research results and discussion. In the last section conclusions are given.

2. Literature Review

Colombage (2005) analysis of the main determinants for inflation in Sri Lanka using different econometric methods has shown that money supply has a significant impact on inflation in Sri Lanka, both in the long-run as well as short-run. Exchange rate has a significant impact on inflation in the short-run, but it has been pointed out that the main determinant of inflation in the short-run is the money supply. It is also explained that in the long-run, in addition to the money supply, the exchange rate contributes to the inflationary process.

Bandara (2011) examined the determinants of inflation in Sri Lanka using Vector autoregressive (VAR) model. The study was performed using quarterly time series data from 1993: 1 to 2008: 4 under five factors, namely money supply, exchange rate, real Gross Domestic Product, interest rates, interest rates. The analysis concludes that money supply, exchange rate and GDP have a significant impact on inflation in Sri Lanka.

Cooray (2008) has focused on investigate the factors influencing the rate of inflation in Sri Lanka using annual, quarterly, monthly time series data spanning the 1978-2006 period. Here the variables of money supply, real GNP, import prices and exchange rate are used and the effects of those variables on the Colombo consumer price index (CCPI) is analyzed. In this study, two models are used which are known to be closed economy model and open economy model. The study has traced out that supply side factors are most important in the determination of inflation in Sri Lanka. In the long-run, The results illustrate that the money supply has a important influence on general price level of Sri Lanka. According to the findings, the study has shown that exchange rates and import prices became important factors on the general level of prices after the liberalization of the economy.

Ratnasiri (2011) has focused on the main determinants of inflation in Sri Lanka using Vector Autoregressive analysis. The variables used for the analysis are Colombo Consumers Price Index, GDP, Money Supply, exchange rate, Rice price, Interest rate. The quarterly data over the sample period, January 1980 through February 2005 are used. The results of the analysis revealed that in the long-run and short-run, money supply growth and rice price increases are the main determinants of inflation in Sri Lanka. In the short-run, rice price has been pointed out as a very important variable affecting inflation. Also, in the short-run, effect of money growth and exchange rate effect, has been shown to be statistically significant. The results of this study have revealed that both demand and supply side factors have long-run and short-run effects on inflation in Sri Lanka.

3. Methodology

3.1 Study Variables

The study variables are dependent variable is LCPI = Log of Consumer Price Index based on 2010 prices and independent variables are LBM = Log of Broad Money (current LCU), LGDP = Log of Gross Domestic Product (current US$), LIGS = Log of Import Goods and Services (current US$), LEGS = Log of Export Goods and Services (current US$), LGE = Log of Government Expenditure (current US$), LGR = Log of Government Revenue (current US$).

Annual time series data from 1960 to 2020, collected from the Central Bank of Sri Lanka and World Bank have been used for this study. The equation that incorporates the demand and supply side determinants of inflation is as follows:

$$LCPI_i = \alpha + \beta_1 LBM_i + \beta_2 LGDP_i + \beta_3 LIGS_i + \beta_4 LEGS_i + \beta_5 LGE_i + \beta_6 LGR_i \quad (1)$$

The ADF test is carried out to examines whether these time series variables are stationary or non-stationary. Johansen cointegration and vector error correction techniques are used for check the long-run and short-run estimates in this analysis process.

3.2 Johansen Cointegration Approach

The Johansen technique can be described as follows, suppose that, we have set of p (p≥1) variables. They are considered to be I(1) and which are thought may be cointegrated. The VAR model with k lags containing these variables is as follows:

$$y_t = \beta_1 y_{t-1} + \beta_2 y_{t-2} + \cdots + \beta_k y_{t-k} + u_t \quad (2)$$

For the Johansen test, the above VAR model should be converted to the VEC model (VECM).

$$\Delta y_t = \Pi\, y_{t\text{-}k} + \Gamma_1 \Delta y_{t\text{-}1} + \Gamma_2 \Delta y_{t\text{-}2} + \ldots + \Gamma_{k\text{-}1} \Delta y_{t\text{-}(k\text{-}1)} + u_t \quad (3)$$

where, Π - long-run coefficient matrix, $\Pi = (\sum_{i=1}^{k} \beta_i) - I_p$ and $\Gamma_i = (\sum_{j=1}^{k} \beta_j) - I_p$

3.3 Vector Error Correction Model

Vector Error Correction Model (VECM) is a restricted vector autoregressive (VAR) that can be used for non-stationary series that are known to be co-integrated. Where, restricts the convergence of the endogenous variables to their co-integrating relationships by limiting the long-behaviors and allows for short-run adjustment dynamics. The short-run equation can be interpret as shown below.

$$\Delta LCPI = \begin{bmatrix} \beta_0 + \sum_{j=0}^{p} \beta_1 \Delta LCPI_{t\text{-}j} + \sum_{j=0}^{p} \beta_2 \Delta LBMP_{t\text{-}j} + \sum_{j=1}^{p} \beta_3 \Delta LGDP_{t\text{-}j} + \sum_{j=0}^{p} \beta_4 \Delta LIGS_{t\text{-}j} \\ + \sum_{j=0}^{p} \beta_5 \Delta LEGS_{t\text{-}j} + \sum_{j=0}^{p} \beta_6 \Delta LGE_{t\text{-}j} + \sum_{j=0}^{p} \beta_7 \Delta LGR_{t\text{-}j} + \gamma_1 ECM_{t\text{-}1} + \varepsilon_{1t} \end{bmatrix} \quad (4)$$

$$\Delta LCPI = \begin{bmatrix} \beta_0 + \sum_{j=0}^{p} \beta_1 \Delta LCPI_{t\text{-}j} + \sum_{j=0}^{p} \beta_2 \Delta LBMP_{t\text{-}j} + \sum_{j=1}^{p} \beta_3 \Delta LGDP_{t\text{-}j} + \sum_{j=0}^{p} \beta_4 \Delta LIGS_{t\text{-}j} \\ + \sum_{j=0}^{p} \beta_5 \Delta LEGS_{t\text{-}j} + \sum_{j=0}^{p} \beta_6 \Delta LGE_{t\text{-}j} + \sum_{j=0}^{p} \beta_7 \Delta LGR_{t\text{-}j} + \gamma_1 ECM_{t\text{-}1} + \varepsilon_{1t} + \\ \gamma_1 [LCPI_{t\text{-}1} - \alpha_0 - \alpha_1 LBMP_{t\text{-}1} - \alpha_2 LGDP_{t\text{-}1} - \alpha_3 LIGS_{t\text{-}1} - \alpha_4 LEGS_{t\text{-}1} - \alpha_5 LGE_{t\text{-}1} \\ \alpha_6 LGR_{t\text{-}1}] \end{bmatrix} \quad (5)$$

where, Δ depicts the difference operator, p is the lag length that we have selected, β_i and α_i are parameters, γ_1 is the error correction parameter that measure how variables react to deviations from the long-run equilibrium and ε is the error term.

3.4 Granger Causality Test

The Granger causality test is a statistical hypothesis test used to determine whether one time series is useful for making predictions about another time series. This procedure can only be applied to pairs of variables. Suppose x_t and y_t are two time series variables. To conduct granger causality test for these two variables, make an assumption that these two variables are stationery and errors are uncorrelated.
The hypothesis can be stated as follows:

H_0 : y_t does not Granger Cause x_t / x_t does not Granger Cause y_t

H_1 : y_t does Granger Cause x_t / x_t does Granger Cause y_t

if x_t does granger cause y_t or y_t does granger cause x_t, then it is said that there is unidirectional causal relation between the two time series variables. When both x_t and y_t time series shows granger cause each other, it is called

bidirectional causal relationship. There is no causality exist between x_t and y_t, if both x_t and y_t does not shows the granger cause each other.

4. Results and Discussion

4.1 Unit Root Test

Confirming order of integration of the all variables used in the study is a requirement of Johansen co-integration technique. Therefore, Augmented Dickey-Fuller (ADF) test was carried out and results are shown in table 1. In this test, the unit roots for three cases were considered which are with intercept, intercept and trend, without intercept and trend. According to the unit root results given in Table 1, all variables are non-stationary at level. Whereas, at first difference, all the variables are stationary. Therefore, test results of the unit root test for first difference shown in the Table 1 corroborate that all the variables are integrated at order one.

Table 1: ADF test results

Augmented Dickey-Fuller Test			
Variables	Constant	Constant and Trend	Decision
LCPI	0.9563	0.3907	
LBM	0.9908	0.1095	
LGDP	0.9683	0.3032	
LIGS	0.8467	0.1269	
LEGS	0.8613	0.0767	
LGE	0.9738	0.3444	
LGR	0.9717	0.2441	
ΔLCPI	0.0006***	0.0042***	I(1)
ΔLBM	0.0001***	0.0005***	I(1)
ΔLGDP	0.0000***	0.0000***	I(1)
ΔLIGS	0.0000***	0.0000***	I(1)
ΔLEGS	0.0000***	0.0000***	I(1)
ΔLGE	0.0000***	0.0000***	I(1)
ΔLGR	0.0000***	0.0000***	I(1)
(**)Significant at the 5%, (***) Significant at the 1%			

4.2 Lag Order Selection

Table 2: Information Criterions Results

Lag	LogL	LR	FPE	AIC	SC	HQ
0	149.8347	NA	1.57E-11	-5.011745	-4.760844	-4.914237
1	609.2916	789.9434	8.85E-18	-19.41374	-17.40653*	-18.63367*
2	667.3469	85.5552	6.95e-18*	-19.73147	-15.96796	-18.26884
3	705.4032	46.73577	1.25E-17	-19.34748	-13.82766	-17.20229
4	773.2772	66.68324*	1.00E-17	-20.00973*	-12.7336	-17.18197
* Indicates lag order selected by the criterion, LR: sequential modified LR test statistic (each test at 5% level), FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion HQ: Hannan-Quinn information criterion						

Selection of appropriate lag length using proper information criterions is the second step of Johansen co-integration technique. According to the Table 2, lag 4 value is the minimum for AIC. Therefore, lag 4 was selected as the lag length in this research study.

4.3 Number of Co-integration Vectors

According to the probabilities given in Table 3, the analysis rejects the null hypothesis that there is no co-integrated vector (None), there is at most 1 co-integrated vector (At most 1), there is at most 2 co-integrated vector (At most 2), there is at most 3 co-integrated vector (At most 3), there is at most 4 co-integrated vector (At most 4). It means there is 5 co-integrated vectors in long run results. It implies that the association between explanatory and dependent variables used in current study is high.

Table 3: Trace and Max-eigenvalue test results

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.738284	241.5896	125.6154	0.0000
At most 1 *	0.645236	166.5218	95.75366	0.0000
At most 2 *	0.514603	108.4889	69.81889	0.0000
At most 3 *	0.463592	68.01273	47.85613	0.0002
At most 4 *	0.335943	33.13259	29.79707	0.0199
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.738284	75.06784	46.23142	0.0000
At most 1 *	0.645236	58.03288	40.07757	0.0002
At most 2 *	0.514603	40.47616	33.87687	0.0071
At most 3 *	0.463592	34.88013	27.58434	0.0048
At most 4 *	0.335943	22.92573	21.13162	0.0277
Trace & Max-eigenvalue test indicates 5 cointegrating eqn(s) at the 0.05 level, *denotes rejection of the hypothesis at the 0.05 level				

4.4 Johansen Co-integration Test (long Run Estimates)

Table 4: Johansen Co-integration Long-run results

Variables	Coefficients	Standard Errors	t - statistics	conclusion
LBM	0.391696	0.10468	3.741842	Significant
LGDP	-2.60997	0.73430	-3.554365	Significant
LIGS	1.29338	0.34840	3.712342	Significant
LEGS	-0.369427	0.26639	-1.386790	Insignificant
LGE	0.28451	0.13421	2.119887	Significant
LGR	1.796733	0.83460	2.152807	Significant
CONSTANT	-14.80113	- -	- -	- -

The long run estimates of inflation model are reported in Table 4. The test results revealed that, in the long run Money Supply (LBM), Import Good and Services (LIGS), Government Expenditure (LGE) and Government Revenue (LGR) have positive impact on Consumer Price Index (LCPI) of Sri Lanka and these relationships are

statistically significant at the 5% level. Gross Domestics Product (LGDP), Export Good and Services (LEGS) has a negative impact on LCPI and the impact of GDP is statistically significant at the 5% level, whereas, the impact of EGS is not Significant.

4.5 Vector Error Correction Model (Short Run Results)

Table 5 describes the short run results using vector error correction model (VECM). The adjustment term shows that previous year deviation from long run equilibrium is corrected as a speed of 31.74% and also, the value of the coefficient of the speed adjustment term is statistically significant. Furthermore, test results revealed that Broad Money of three years before and four years before (2017, 2016) are found to be negatively related with consumer price index of 2020 while government revenue of last year (2019) has positive effect on consumer price index of 2020. Consumer price index of three years before (2017) has appeared to be positive correlated with broad money of current year (2020). Export goods and services of two years before (2018) is negatively related with gross domestic product of 2020. Export goods and services of current year (2020) is negatively affected by export goods and services of last year (2019). Export goods and services of last year and three years before (2019, 2017) give inverse influence on government revenue 2020.

Table 5: VECM Short-run results

Error Correction	D(LCPI)	D(LBM)	D(LGDP)	D(LGE)	D(LGR)
CointEq1	-0.317352 [-3.70428] D(LBM(-3)) [-2.23462] D(LBM(-4)) [-2.96698] D(LGR(-1)) [2.17981]	D(LCPI(-3)) [2.18883]	D(LEGS(-2)) [-2.01002]	D(LEGS(-1)) [-2.30165]	D(LEGS(-1)) [-2.38424] D(LEGS(-3)) [-2.15257]

4.6 Granger Causality Test

Table 6 shows the Granger Causality test results. Bi-directional relationship is found between Government Expenditure & Broad Money. Also, the study has traced out uni-directional relationship between Broad Money & Consumer Price Index; Consumer Price Index & Gross Domestic Product; Consumer Price Index & Export Goods and Services; Consumer Price Index & Government Expenditure; Consumer Price Index & Government Revenue; Import Goods and Services & Broad Money; Export Goods and Services & Broad Money; Export Goods and Services & Gross Domestic Product; and Export Goods and Services & Government Revenue.

4.7 Residual Diagnostics Tests

4.7.1 Serial Correlation Test

According to the probability values shown in the Table 7 the analysis has failed to reject the null hypothesis of no serial correlation, because the p-values are greater than α=0.05. Hence, it can be concluded that at 5% significant level the residuals are not serially correlated.

Table 6: Granger Causality Test Results

Null Hypothesis:	Obs.	F-Statistic	Prob.
Uni-directional relationships			
LBM does not Granger Cause LCPI	59	6.71439	0.0025
LCPI does not Granger Cause LGDP	59	4.44878	0.0163
LCPI does not Granger Cause LEGS	59	3.52830	0.0363
LCPI does not Granger Cause LGE	59	6.07878	0.0042
LCPI does not Granger Cause LGR	59	4.77299	0.0123
LIGS does not Granger Cause LBM	59	5.43778	0.0071
LEGS does not Granger Cause LBM	59	4.82599	0.0118
LEGS does not Granger Cause LGDP	59	3.37042	0.0417
LEGS does not Granger Cause LGR	59	3.59396	0.0342
Bi-directional relationships			
LGE does not Granger Cause LBM	59	8.05560	0.0009
LBM does not Granger Cause LGE	59	6.53367	0.0029

Table 7: Serial Correlation LM Test Results

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.0428	Prob. F(2,24)	0.9582
Obs*R-squared	0.19904	Prob. Chi-Square(2)	0.9053

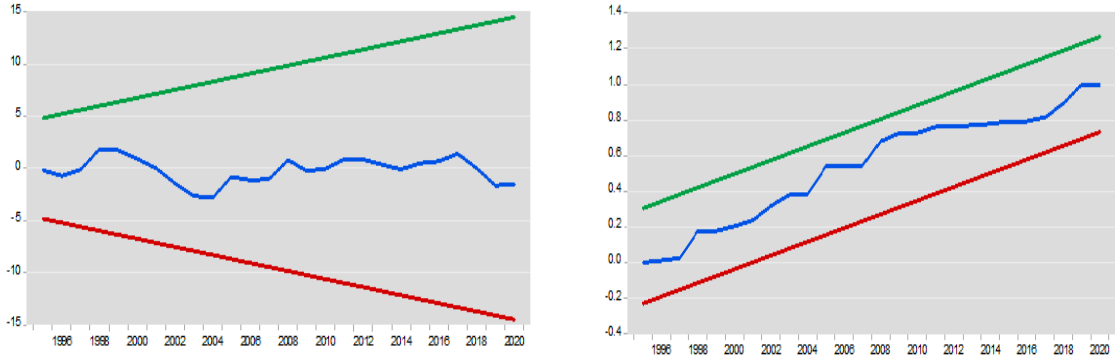
4.7.2 Heteroskedasticity Test

Heteroskedasticity test results are shown in the Table 8. In this table two probability values are greater than 0.05. Hence, it can be concluded that VEC model residuals are not heteroskedasticity at 5% significant level.

Table 8: Heteroskedasticity test results

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.42901	Prob. F(35,20)	0.9862
Obs*R-squared	24.014	Prob. Chi-Square(35)	0.9194
Scaled explained SS	10.9134	Prob. Chi-Square(35)	1

Figure 2: CUSUM & CUSUMQ charts



4.8 Model Stability Test

The CUSUM & CUSUMQ charts are shown in Figure 2. Cumulative sum and cumulative sum of squares statistics are not going beyond the 5% critical line boundaries. This means, the stability of the VEC model is significant.

5. Conclusion

The purpose of this study is to explore the short-run and long-run impact of selected certain factors in both demand and supply sectors of inflation on inflation in Sri Lanka. The results of the analysis confirm that, in the long-run, Money Supply, Import Good and Services, Government Expenditure and Government Revenue have a positive impact on inflation in Sri Lanka and Gross Domestics Product, Export Good and Services have a negative impact on inflation in Sri Lanka. Whereas, the impact of Export Good and Services is not significant. Therefore, it appears that in the long-run both demand side and supply side determinants are influencing inflation in Sri Lanka during this investigation period. The coefficient of error correction term contained in the short-run results indicates that previous year deviation from long run equilibrium is corrected as a speed of 31.74%. Also, short-run results revealed that, Broad Money of three years before and four years before (2017,2016) are found to be negatively related with Consumer Price Index of 2020 while Government Revenue of last year (2019) has positive effect on Consumer Price Index of year 2020. The causality results showed that there are relationships to the bi-directional as well as uni-directional among few variables. After examining all the results, it appears that rising in Money Supply, Import Good and Services, Government Expenditure and Government Revenue are not constructive to the economy in Sri Lanka.

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