

Dynamic Linkages between Import Prices and Consumer Price: Evidence from Sri Lanka

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Introduction

Sri Lanka is a small economy and its consumer and intermediate goods accounts for more than 80% of total import expenditure where sugar, wheat, milk and milk products, fuel, fertilizer and red dhal share a larger proportion of imports. Hence domestic consumer prices and wholesale prices are influenced by world market prices. Further, import prices highly influence the inflation rate in the country which is also a politically sensitive issue.

There were a number of empirical studies focused on the dynamic relationship between consumer price and import price. Yunculer (2009) used the vector-autoregressive (VAR) model to investigate the relationship between the consumer price and external factors such as import price, oil price and exchange rate in Turkey. The results showed that pass-through of external shocks on wholesale price is greater than consumer price, though, import price and exchange rate affect consumer price while import price quickly pass-through than exchange rate. Hahn (2003); Takatoshi, et.al (2005); Campa (2005); Hampton (2001); and Kiptui (2009) investigated causal relationship between import price and consumer price. Duma (2008) examined the pass-through of external shocks to inflation in Sri Lanka for the period of 2003 to 2007. The findings indicate that pass-through of external

shocks is incomplete on domestic price inflation while internal factors mostly influence on inflation. However, only few studies have investigated the relationship between import prices and domestic prices. Dynamic linkages between import prices and consumer price in Sri Lanka are not adequately investigated.

Objectives

The objectives of this study are to investigate the dynamic linkages between consumer price and import price and to identify Granger causality between import price and domestic consumer price in Sri Lanka.

Methodology

Monthly time series data of Consumer Price, Wholesale Price Index and Import Price Index (unit value) are used as proxy variables for consumer price, wholesale price and import price respectively. The data are collected from the Central Bank of Sri Lanka for the period of January 2000 -December 2012. All variables are transformed into natural logarithmic values and defined as Log of Consumer Price (LCPI) and Log of Import Price (LIM).

This study employed confidence ellipse with non-parametric regression models to exhibit the association between the CPI and LIM. ADF test is used to identify the stationarity of variables. Engle-Granger co-integration procedure was used to investigate long-run relationship and Error Correction Model (ECM) was employed to investigate the short-run relationships between variables while Granger causality test is applied to find the direction of causality. Impulse Response Function (IRF) was used to trace out the responsiveness of the domestic prices in the VAR model.

Results and Discussion

Simple scatter plot with confidence ellipse, non-parametric regression show (Figure 1 Annexure A) that there is a strong positive relationship between LCPI and LIM.

The results of the unit root test shows that all variables are non-stationary in level form while, they are 1st differenced stationary. The co-integration equation between LCPI and LIM is estimated using OLS and the coefficient of the covariance matrix is estimated using Newey-West method. The residuals from the estimated co-integration regression are stationary at level form, [ADF statistics -4.170 with probability (0.001)]. Hence, import price and consumer price is co-integrated. Consumer price is elastic with respect to import price. The effect of Import price on consumer price is positive and significant. The estimated cointegrating equation is given below.

$$\hat{LCPI} = -1.18 + 1.30LIM \quad \dots\dots\dots(1)$$

P value (0.000) (0.0001)

The co-integration equation between LWPI and LIM is estimated by OLS and covariance matrix is estimated using Newey-West method. As the estimated residual from co-integration equation is stationary, (ADF statistics=-4.416 (with probability 0.0004), LWPI and LIM are also co-integrated. According to the estimated results, import price has positive and significant impact on LWPI than on LCPI.

$$\hat{LWPI} = 2.0 + 1.33LIM \quad \dots\dots\dots(2)$$

P value (0.00) (0.000)

Error correction model estimation results are given in (3) and (4) equations in Annexure A.

The results from ECM show that import price significantly influences on CPI in the short run. The coefficient of error correction term (speed of adjustment) in equation (3) is negative and statistically significant, suggesting that 3% of the disequilibrium is corrected in each month.

The result of ECM of equation (4) shows that error correction term is not significant. LIM is not significant in the short run. Causality analysis shows that there are no short-run causality relationship between LWPI and LIM. However, in the long run, there exists long-run causality relationship indicated by the significance of error correction term in the LCPI equation.

Further, we analysed error correction model for CPI and WPI using import price components (consumption, intermediate and investment) separately. The results of ECM of CPI indicate there is a significantly positive relation between imported investment goods price and CPI in the short run (see equations 5 and 6 in Annexure A).

Error correction term is significant and has expected sign. This indicates that imported investment goods price has long run causality relationship with CPI.

Figure 2 in Annexure A shows the estimated impulse response functions for consumer price to a shock (one unit standard deviation innovation) in import price.

A shock to growth of import price (GRMP) affects (increases) growth of CPI (GRCPI) for one year then its effects eventually dies out in about six years. Producer price (wholesale price) also has similar effects from the shocks on import price.

Conclusion and Policy Recommendations

The results of this study show that there is a strong positive relationship between log of consumer price (LCPI) and log of import price (LIM). The parametric approach results indicated that import price and consumer price are co-integrated both in the long-run and the short-run. Further, import price causes domestic price in the long run. Imported consumer goods price and intermediate goods price shock have immediate and positive impact on consumer prices in Sri Lanka

The results of this study are useful in trade policy analysis. Future research could accommodate exchange rate, oil prices which might have various trade policy implications.

References

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Annexure A

Figure 1: Confidence Ellipse between Import Price and Consumer Price

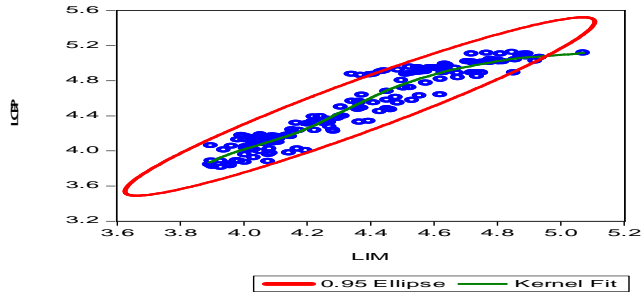
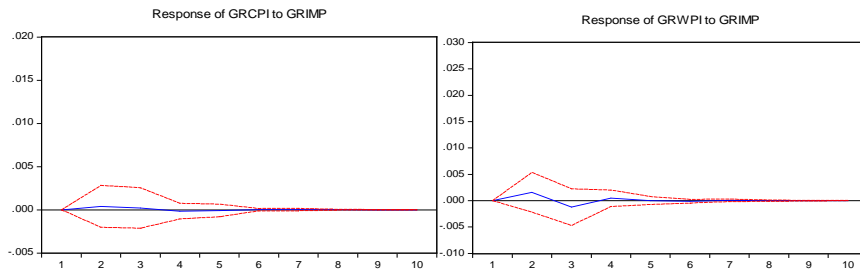


Figure 2: Impulse Response Function (IRF)



ECM estimation results are.

$$\Delta \widehat{LCPI} = 0.0082 + 0.03543\Delta LIM - 0.0311\widehat{U}_{t-1} \dots\dots\dots(3)$$

P value (0.000) (0.028) (0.0058)

$$\Delta \widehat{LWPI} = 0.007 + 0.047\Delta LIM - 0.024\widehat{U}_{t-1} \dots\dots\dots(4)$$

P value (0.00) (0.069) (0.298)

$$\Delta \widehat{LCPI} = 0.008 + 0.009\Delta LM_c - 0.004\Delta LM_{int} + 0.011\Delta LM_{inv} - 0.035\widehat{U}_{t-1} \dots(5)$$

P value (0.000) (0.387) (0.794) (0.034) (0.004)

$$\Delta \widehat{LWPI} = 0.008 + 0.009\Delta LM_c - 0.012\Delta LM_{int} + 0.005\Delta LM_{inv} - 0.029\widehat{U}_{t-1} \dots(6)$$

P value 0.000 (0.567) (0.616) (0.455) (0.137)