PROSIDING PERKEM ke-9 (2014) 249 - 256
ISSN: 2231-962X

Dynamic Linkages Among Price Indices and Type of Inflation in Malaysia

Rafiqa Murdipi
Department of Economics
University Putra Malaysia

Siong Hook Law
Department of Economics
University Putra Malaysia
lawsh@upm.edu.my

ABSTRACT

This study examines the dynamic linkages among consumer price, producer price, industrial production and import price indices in Malaysia using monthly data from 2005 to 2011. The empirical results based on the Johansen multivariate cointegration test reveal that there is a long-run relationship among these indices. The long-run estimations indicate that industrial production and import price are statistically significant determinants of consumer price index, which indicate the phenomenon of demand-pull and international transmission or imported inflation in the long-run. However, the higher producer price is associated with higher inflation or cost-push inflation in the short-run.

Keywords: inflation, demand-pull inflation, cost-push inflation, imported inflation, international transmission of inflation

ABSTRAK

Kajian ini mengkaji hubungan dinamik antara harga pengguna, harga pengeluar, pengeluaran industri dan indeks harga import di Malaysia dengan menggunakan data bulanan dari tahun 2005 hingga 2011. Keputusan empirik berdasarkan ujian kointegrasi Johansen multivariat menunjukkan bahawa terdapat hubungan jangka panjang di kalangan indeks ini. Anggaran jangka panjang menunjukkan bahawa pengeluaran perindustrian dan harga import adalah penentu yang ketara indeks harga pengguna, dimana ianya menunjukkan bahawa fenomena tarikan permintaan dan penghantaran antarabangsa atau inflasi yang diimport dalam jangka masa panjang. Bagaimanapun, harga pengeluar yang lebih tinggi dikaitkan dengan inflasi yang lebih tinggi atau inflasi tolakan kos dalam jangka masa pendek.

Katakunci: inflasi, inflasi tarikan permintaan, inflasi tolakan kos, inflasi diimport, penghantaran antarabangsa inflasi

INTRODUCTION

Recently the issue of inflation in Malaysia has received considerable attention from the media, economists, and general public, not least because of its implications for development policy. Millions of low and middle-class Malaysians are grappling with increasing of prices of goods, threatening the consumer spending and reducing the purchasing power, subsequently increasing cost-of living. Although inflation rate is reported relatively low compared to other countries, it is associated with the welfare of the society and economic development. Since higher inflation rate causes a negative effect on the nation, it is crucial for policy makers to design appropriate policies to curb inflation. The consumer price index, which is employed to measure the inflation, is interrelated with other prices such as producer price, industrial production and import price indices. Thus, recent developments in the inflation issues have led to a renewed interest in the dynamic linkages among the price indices, which also intend to identify the type of inflation in Malaysia.

Malaysia has experienced episodes of high in 1973-1974 and 1980-1981, and low in 1985-1987. During the high economic growth from 1988-1996, Malaysia was able to maintain low and stable inflation rate. The 1997-1998 Asian financial crisis gave another greater impact on inflation rate, rose

above 5.5%. However, during 1990s, Malaysia has maintained low and stable inflation rate averaging approximately 3% in annual inflation (except the 1997-1998 Asian financial crisis period). Furthermore, in the early 2000s, the global fuel and food prices are dominant caused inflation in Malaysia increased. Inflation in Malaysia began rising in 2005, reaching a peak in July 2008 by 8.5%. In short, inflation rate in Malaysia from previous years are caused by international transmission or imported inflation.

In the literature, there are three main types of inflation, namely (i) demand-pull inflation, (ii) cost-push inflation and (iii) international transmission inflation or imported inflation. Demand-pull inflation occurs when there is rising of aggregate demands for goods in economy and these aggregate demands rising more rapidly than the economy's productive capacity; consequently increase of the prices of goods. The cost-push inflation takes place when the price of production process inputs increase. In order to maintain the profit margin, producers increase the price of goods. On the other hand, the international transmission inflation or imported inflation is caused by the external factor such as import goods that affect the price of goods or inflation rate in domestic economy.

The study investigates the dynamic linkages among consumer price index, producer price index, import price index and output (income) using recent time series datasets during 2005 to 2011. This study contributes to the literature in three important aspects. First, the public perception toward inflation in Malaysia is due to cost-push factor, where higher prices of goods and services are caused by higher production cost, resulting from higher fuel price and tax, where it leads the producer to increase the price of goods. However, this argument has been descriptive in nature without any empirical evidence. Therefore, it is crucial to carry out an empirical study on this issue to identify the type of inflation in Malaysia. Second, the econometric methods employed are able to evaluate the dynamic linkages among the price indices, namely vector auto-regressive (VAR) model. This method allows three types of inflation to be identified in the system, rather than only one type of inflation as shown in the previous studies. Third, this study utilizes the recent monthly datasets, covers from 2005 to 2011, and two import price indices are used in the analysis, namely oil price and food price in influencing consumer price index.

This paper is organized as follows: Section 2 reviews the literature; Section 3 lays out empirical model, the econometric method, and the data; Section 4 contains a discussion of the empirical findings; and Section 5 provides a summary and conclusion.

LITERATURE REVIEW

A large number of empirical studies have been conducted to investigate inflation on their area specific country or group of countries using various econometric techniques. For literature that studies of group of countries, some of them provide evidence in which they demonstrates that the dominant type of inflation is demand-pull inflation. For example, Jongwanish and Park (2009) examine type of inflation in Developing Asia from 2007-2008 using vector autoregression (VAR) model. Their empirical results show that excess aggregate demand is highly significant describing inflation in developing Asia compare to cost-push. Jongwanish and Park (2011) extent their investigation of inflation in developing Asia by analyzing the pass-through from global food and oil price shocks. Their empirical results suggest that in developing Asia the pass-through of global food and oil price shocks to domestic prices has been very limited.

The existing studies of cross-countries or group of countries that find the demand-pull inflation are in line with monetarist view of inflation, where money supply play an important role in influencing inflation, such as Deme and Fayissa (1995), Dwyer and Fisher (2009), Amisano and Fagan (2013). They point out that the money supply or money growth is positive and statistically significant determinant of inflation. There is widely accepted that money growth and inflation are one-to-one related in the long-run, but in the short run, there are disagreement between money supply and inflation. Many studies demonstrate that money supply affects inflation in the long run but not in the short run (Deme and Fayissa, 1995; Dwyer and Fisher, 2009; and Christensen, 2001). For the country specific experience, Dhaka *et al*. (1994) investigates inflation in United States from 1947-1978, suggests that the money supply is the dominant determinant of inflation. Their empirical results are contradicted with Castelnuovo (2010), where this study shows that the global indicator plays a statistically significant role in shaping forecaster's inflation expectation in US.

With respect to cost-push inflation, Tiwari *et al*. (2014) examine the relationship between consumer price index (CPI) and producer price index (PPI) for Mexico. Their empirical results demonstrate that there is a bi-directional relationship between CPI and PPI where in short period (1-7 month period) CPI is leading PPI, while for longer periods (8 to 32 months scale), PPI is a leading

variable. Christensen (2001) shows that in the short run real supply shock is important factor that affect inflation rather than money growth. He finds that the low inflation rates are indeed consistent with relatively higher growth rate in money, if the economy is exposed to significantly higher real supply shock.

Numerous studies have attempted to explain international transmission inflation (Yang *et al*., 2006; and Kim and Hammoudah, 2013; Juselius, 1992; Milani, 2010) or the impact of international transmission on domestic inflation. In general, their empirical results show that the important of external factors or foreign output in affecting domestic inflation. The US inflation and global output fluctuations contribute large effect on domestic inflation. From an empirical point of view, considerable research finds that oil price shocks have affected output and inflation (Álvarez*et al*., 2011; Valcarcel and Wohar, 2013). Durevall *et al.* (2013) suggest that movements in international food and goods prices determined the long-run evolution of domestic prices. In the short run, agricultural supply shocks affected food inflation, causing large deviations from long-run price trends.

In terms of Malaysia case, Cheng and Tan (2002) highlight that inflation in Malaysia is mainly caused by external factors or international transmission inflation. Tan and Cheng (1995) examine the causal nexus of money, output and prices in Malaysia. Their empirical results suggest that by controlling by controlling money supply, the central bank might be able successfully price stability at producer level but not at consumer level.

EMPIRICAL MODEL

To test the interactions among the price indices and also to identify the type of inflation in Malaysia (such as demand-pull, cost-push and imported inflation), this study employs the following four-variable vector autoregressive (VAR) model:

$$\begin{bmatrix} \alpha_1 \\ \alpha_2 \\ \alpha_3 \\ \alpha_4 \end{bmatrix} + \begin{bmatrix} \beta_{1,1}(L) & \Lambda & \beta_{1,4}(L) \\ \mathrm{M} & \Lambda & \Lambda \\ \mathrm{M} & \Lambda & \Lambda \\ \beta_{4,1}(L) & \Lambda & \beta_{4,4}(L) \end{bmatrix} \begin{bmatrix} CPI_t \\ PPI_t \\ IP_t \\ IM_t \end{bmatrix} + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \\ \varepsilon_4 \end{bmatrix} \qquad (1)$$

where *CPI* is consumer price index; *PPI* is producer price index; *IP* is industrial production index; *IM* is import price index and β (*L*) is a matrix of polynomial in the lag operator L. The VAR model is system of equations introduced by Sim (1980) where it treats all the variables as endogenous. All variables are in the logarithm form as a means to render homoscedastic observation and it can be interpreted as percentage relationship.

If producer price index is statistically significant determinant of consumer price index, then this implies a cost-push phenomenon. On the other hand, if industrial production index (IP) and money supply (M2) are statistically significant determinants of consumer price index, this indicates a demand-pull phenomenon. [1] Following the literature, this study utilizes three import price indices, namely total import price, oil price and food price to evaluate the international transmission inflation (Jongwanich and park, 2011; Álvarez*et al*., 2011; Durevall *et al.*, 2013). In addition, the Annual report of the Central Bank of Malaysia also states that the oil price and food price affect the domestic price.

ECONOMETRIC ANALYSIS

As the first step of time series analysis, it requires to determine whether the variable is stationary or not and their integration order, I(d). Therefore, this study employs the Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) unit root tests to evaluate the time series properties of the variables. To examine the existence of the long-run relationship among the variables within a multivariate framework, this study employs a cointegration test suggested by Johansen and Juselius (1990). There are two test statistics, namely trace and maximum eigenvalue, which are used to determine the number of cointegrating vectors.

Once the co-integrating relationship (if any) is present, the next step is to analyse the short-run Granger causality using a vector error correction model (VECM) framework. In this framework, if the

[1] Following the monetarists' view, if money supply increases inflation, and thus M2 is used as money supply for demand-pull inflation.

variables are co-integrated, the short-run analysis should incorporate the error-correction term (ECT) to model the adjustment for the deviation from its long-run equilibrium. This modified model to which an ECT is added is referred to as the VECM. However, if co-integration does not exist, the analysis may be conducted as a standard VAR model. The Granger causality (or the endogeneity of the dependent variable) test is applied by calculating the *F*-statistic based on the null hypothesis that the set of coefficients on the lagged values of independent variables are not significantly different from zero. If the null hypothesis is not rejected, then it can be concluded that the independent variables do not Granger-cause the dependent variable.

To evaluate the test of dynamic interaction between variables, the impulse response function (IRF) and variance decomposition (VDC) are employed, which both IRF and VDC can give the forecast of dynamic interaction of variables. IRF trace the impact of a one standards deviation shock of variables on itself and in other variables in the system. To reaffirm the significant impact of one shock of variable to another variable, VDC test is applied as it estimate the percentage of the variations or forecast error variance due to shocks or innovations in other variables.

THE DATA

The source of data is from International Financial Statistics (IFS), and Department of Statistics Malaysia. Due to availability constraint on the starting dates of the data on the monthly import price index, oil price index and food price index, the sample period spans from 2005:1-2011:12. Another challenges to measure demand-pull inflation indicator of Gross Domestic Product (GDP) provided only in quarterly and yearly data, therefore, the industrial production (IP) is used as indicator for demand-pull inflation. IP is the best for a monthly indicator of GDP (Salazar *et.all* ,1997; Mitcell *et.al* ,2005). In order to present the data series in the same scale, the index of based year of 2005 is used for all indicators except M2. Figure 2

EMPIRICAL RESULTS

The ADF and PP unit root results indicate that all series are non-stationary and integrated of order one or I(1). The empirical results of Johanson- Juselius (JJ) cointegration test are reported in Table 1, which suggest that the presence of cointegration in Models 1, 2, and 3. In model Model 1, the trace statistics suggest that there exists a unique cointegration vector in the model. In contrast, the maximum eigenvalue statistic suggests that there is no cointegration in the model. Lutkepohl *et. al* (2001) suggest that the trace test is slightly superior than maximum eigenvalue, and thus, there is one cointegrating vector in Model 1. For Models 2 and 3, both trace and maximum eigenvalue test statistics indicate the presence of cointegration in the models. However, for Model 4, both trace and maximum eigenvalue tests statistics indicate no cointegration exist in the model.

By normalizing the vector on LCPI to one, we obtained the long-run cointegration relationship from Johansen and Juselius cointegration as shown in Table 2. As shown in Model 1, the industrial production and import price are statistically significant determinants of consumer price index in the long run. Given the log-log nature of estimated equation, the coefficient can be interpreted as pseudo-elasticities reflecting the relative influence of each variable on CPI. From the result, the finding indicates that 1% increase in IP and IM will result 0.237% and 1.103% increase in CPI, respectively. The industrial production (IP) represents an indicator for output, where higher the IP tends to increase the demand for goods as subsequently increase the price of goods and services. Similarly, higher prices of import goods from abroad also tend to increase domestic prices of goods in services.

Model 2 repeats the same estimation, but with M2 variable in the specification. The result is similar as reported in Model 1, where M2, PPI and IM have a positive effect on CPI. However, only M2 and IM are statistically significant determinants of CPI. This shows that the money supply is strongly significant affect the inflation in the long-run and in line with the monetarist view of inflation, as shown in previous empirical literature (Deme and Fayissa, 1995; Dwyer and Fisher, 2009, Amisano and Fagan, 2013). This finding also implies that when the central bank expand or contract the money supply, it will affect the inflation rate in the long-run. Increase money supply from central bank will lead to increase in demand for goods and services, and this consequently affects the price of goods and services. In terms of international transmission or imported inflation of oil price (OIL) as shown in Model 3, the findings demonstrate that oil price is insignificant determinant of CPI in the long-run.

In order to examine the dynamic causal interaction among variables, the VECM are adopted for models 1, 2 and 3. On the other hand, the Granger causality based on VAR is adopted for model 4.

As shown in Table 3, the producer price index Granger causes consumer price index in the short-run in all models. This finding suggests that there is a price transmission from producer to consumer, or cost-push inflation in the short-run. However, there is no causal effect running from IP, M2, IM and Oil prices to CPI.

Finally, the GIRF and VDC are conducted for future assess of dynamic interaction among the variables. The most important is to know which shocks of variables impact significantly for future value of CPI. Figures 2 (a) - (f) depict the results of the GIRF for the four VAR models, where the responses are plotted out to the 20-month. The figures trace out the response of CPI to a one standard error (positive) shock in IP, PPI, IM, Oil and M2. As shown in these figures, the CPI responds positively and statistically significant to shocks in PPI, IM and M2. The significant influences of PPI, M2 and IM on CPI is reaffirm by the VDC. For example, Table 4 indicates that the PPI attributed for simulation of CPI more than 20%, 56% and 46%, respectively in Models 1, 3 and 4.

CONCLUSION

This study examines the dynamic linkages among consumer price, producer price, output and import price in Malaysia during 2005:1 – 2011:12. By examining the linkages among these prices, the type of inflation can also be identified. The time series techniques, which consists of multivariate Johanson cointegration, Granger causality, impulse response function, and variance decomposition are employed in the analysis. Four VAR models are employed and each model includes the price indices that measure the demand-pull, cost-push, and international transmission or imported inflation. Besides using the import price index, this study also analyze whether oil price and import food price to analyze the international transmission phenomenon.

The empirical findings suggest that industrial production index, money supply and import price are statistically significant determinants of consumer price index in the long-run. This implies that the long-run higher price phenomenon is due to demand-pull and international transmission. In the short-run, the results indicate that producer price index Granger causes consumer price index, which imply cost-push inflation phenomenon in the short-run. The shocks of producer price index, money supply (M2) and import price are found positively and significantly affect the consumer price index.

REFERENCE

Álvarez, L. J., Hurtado, S., Sánchez, I., & Thomas, C. (2011). The impact of oil price changes on spanish and euro area consumer price inflation. *Economic Modelling, 28*(1–2), 422-431.

Amisano, G., & Fagan, G. (2013). Money growth and inflation: A regime switching approach. *Journal of International Money and Finance, 33*(0), 118-145.

Christensen, M. (2001). Real supply shocks and the money growth–inflation relationship. *Economics Letters, 72*(1), 67-72.

Castelnuovo, E. (2010). Tracking US inflation expectations with domestic and global indicators. *Journal of International Money and Finance, 29*(7), 1340-1356.

Cheng, M. Y. and Tan, H. B. (2002). Inflation in Malaysia. *International Journal of Social Economics, 29*(5/6), 411-425.

Deme, M., &Fayissa, B. (1995). Inflation, money, interest rate, exchange rate, and causality: The case of Egypt Morocco, and Tunisia. *Applied Economics, 27*(12), 1219-1224.

Dhakal, D., &Kandil, M. (1994). Determinants of the inflation rate in the United States: A VAR investigation. *Quarterly Review Of Economics & Finance, 34*(1), 95.

Durevall, D., Loening, J. L., &AyalewBirru, Y. (2013). Inflation dynamics and food prices in ethiopia. *Journal of Development Economics, 104*, 89-106.

Dwyer, G. P., & Fisher, M. (2009).Inflation and monetary regimes. *Journal of International Money and Finance, 28*(7), 1221-1241.

Johansen, S., &Juselius, K. (1990).Maximum likelihood estimation and inference on cointegration—with applications to the demand for money. *Oxford Bulletin of Economics and Statistics, 52*(2), 169-210.

Johansen, S., &Juselius, K. (1992).Testing structural hypotheses in a multivariate cointegration analysis of the PPP and the UIP for UK. *Journal of Econometrics, 53*(1), 211-244.

Juselius, K. (1992). Domestic and foreign effects on prices in an open economy: The case of denmark. *Journal of Policy Modeling, 14*(4), 401-428.

Jongwanich, J., & Park, D. (2009). Inflation in developing Asia. *Journal Of Asian Economics*, *20*(5), 507-518.

Jongwanich, J., & Park, D. (2011). Inflation in developing asia: Pass-through from global food and oil price shocks. *Asian-Pacific Economic Literature*, *25*(1), 79-92.

Kim, W. J., &Hammoudeh, S. (2013). Impacts of global and domestic shocks on inflation and economic growth for actual and potential GCC member countries. *International Review of Economics & Finance*, *27*, 298-317.

Lüutkepohl, H., Saikkonen, P., &Trenkler, C. (2001). Maximum eigenvalue versus trace tests for the cointegrating rank of a VAR process. *The Econometrics Journal*, *4*(2), 287-310.

Milani, F. (2010). Global slack and domestic inflation rates: A structural investigation for G-7 countries. *Journal of Macroeconomics*, *32*(4), 968-981.

Mitchell, J., Smith, R. J., Weale, M. R., Wright, S., & Salazar, E. L. (2005).An indicator of monthly gdp and an early estimate of quarterly gdp growth*.*The Economic Journal*, *115*(501), F108-F129.

Sims, C., 1980. Macroeconomics and Reality.Econometrica 48, 1–48.

Salazar, E., Smith, R., Weale, M., & Wright, S. (1997). A monthly indicator of GDP. *National Institute Economic Review*, *161*(1), 84-89.

Tan, K. G. and Cheng, C. S. (1995).The causal nexus of money, output and prices in Malaysia.*Applied Economics*, *27*(12), 1245

Tiwari, A. K., Suresh, K., Arouri, M., &Teulon, F. (2014). Causality between consumer price and producer price: Evidence from mexico. *Economic Modelling*, *36*, 432-440.

Valcarcel, V. J., &Wohar, M. E. (2013).Changes in the oil price-inflation pass-through. *Journal of Economics and Business*, *68*, 24-42.

Yang, J., Guo, H., & Wang, Z. (2006). International transmission of inflation among G-7 countries: A data-determined VAR analysis. *Journal of Banking & Finance*, *30*(10), 2681-2700

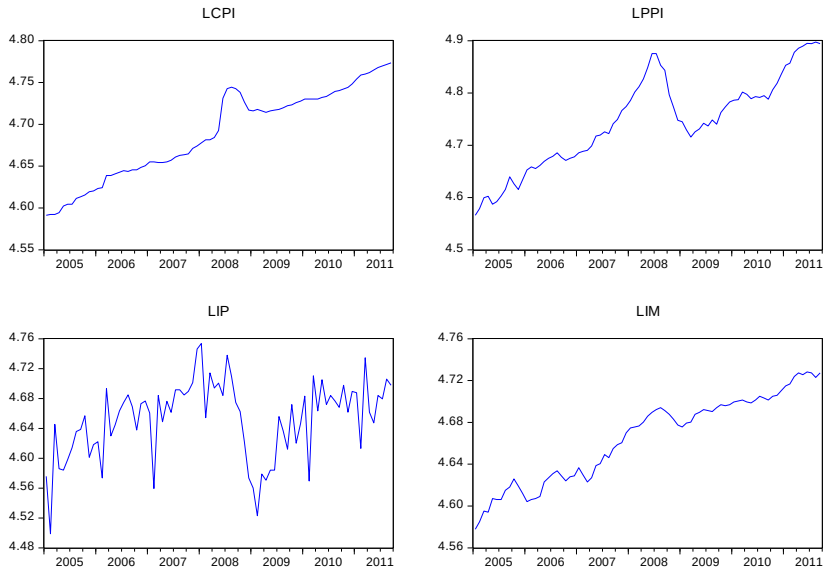

FIGURE 1: Time plots of Consumer Price Index (CPI), Producer Price Index (PPI), Industrial Production (IP) and Import Price Index (IM)

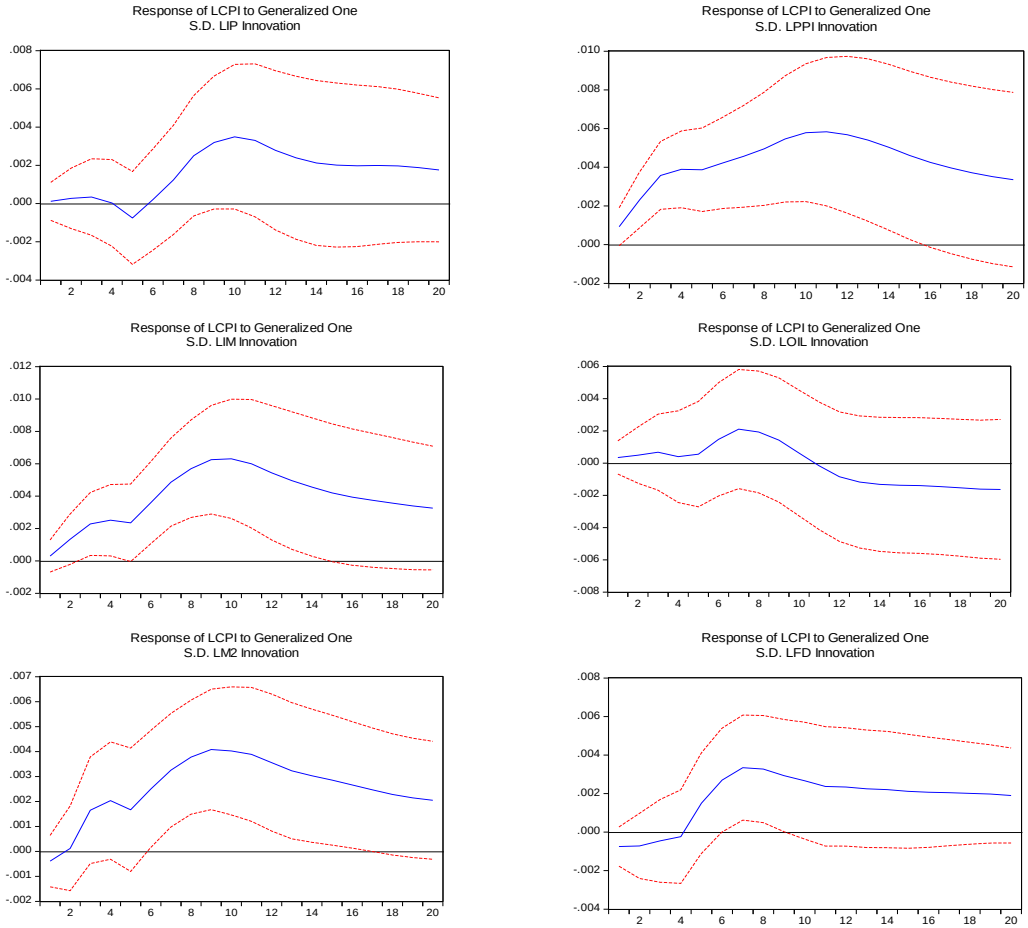

FIGURE 2(c): Response of CPI to Generalizaed One Standard Deviation IP, PPI, IM, OIL, FD and M2 Innovations

TABLE 1: Results of Johansen-Juselius Cointegration Test

Model	Null hypothesis			
	None	At most 1	At most 2	At most 3
Model 1 (CPI, IP, PPI, IM)				
Trace	54.325**	27.007	13.527	2.740
Max	27.317	13.480	10.787	2.741
Model 2(CPI, M2, PPI, IM)				
Trace	54.516**	23.162	10.739	2.951
Max	31.355**	12.426	7.788	2.951
Model 3 (CPI, IP, PPI, OIL)				
Trace	55.236**	22.605	10.500	1.941
Max	32.632**	12.103	8.559	1.941
Model 4(CPI, IP, PPI, FD)				
Trace	43.103	24.285	10.983	1.548
Max	18.818	13.302	9.435	1.548

Note: ** denotes significant at 5% significance levels.

TABLE 2: Long-run Cointegration Equation

Model 1: $CPI_t = 0.237\ IP_t + 0.056\ PPI_t + 1.103\ IM_t$
(0.063)* (0.785) (0.033)**

Model 2: $CPI_t = 0.180\ M2_t + 0.014 PPI_t + 0.289\ IM_t$

(0.000)*** (0.786) (0.027)**

Model 3: $CPI_t = 0.239\ IP_t + 1.105\ PPI_t + 0.323\ OIL_t$

(0.000)*** (0.701) (0.1251)

Notes: Figures in the parentheses are p-values. IP = Industrial Production; PPI = Produce Price Index; IM = Import Price; OIL = Oil Price.

TABLE 3: Results of Granger Causality Test

Dependent variable	χ^2 **-test statistics of the first-differenced terms**							
	ΔCPI	ΔIP	ΔM2	ΔPPI	ΔIM	ΔOIL	ΔFD	ECT_{t-1} (t-stat)
Model 1:CPI, IP, PPI, IM								
ΔCPI	-	1.022		15.524***	0.588			-0.178
ΔIP	0.231	-		8.335**	0.039			1.366
ΔPPI	22.963**	25.590***		-	5.517			-0.436***
ΔIM	2.725	1.737		3.196	-			-0.060
Model 2: CPI, M2, PPI, IM								
ΔCPI	-		0.596	12.279**	6.245			-0.172**
ΔM2	1.562		-	2.214	0.361			-0.139
ΔPPI	4.114**		0.594	-	5.005			-0.758***
ΔIM	0.054		5.286	4.945	-			-0.034
Model 3: CPI, IP, PPI, OIL								
ΔCPI	-	3.742		16.060***		3.080		-0.003
ΔIP	4.249	-		4.808		1.651		1.233***
ΔPPI	18.683**	7.854		-		7.019		0.018
ΔOIL	4.227	7.852		2.221		-		-0.711**
Model 4: CPI, IP, PPI, FD								
ΔCPI	-	3.356		17.903***			2.860	-
ΔIP	1.812			10.379**			3.161	-
ΔPPI	9.594**	5.534					14.433	-
ΔFD	0.858	2.578		2.327				-

Notes: ***, ** and * indicate significant at 1%, 5% and 10% levels, respectively.

TABLE 4: Variance Decomposition

Variance	Period	LCPI	LIP	LM2	LPPI	LIM	LOIL	LFD
Model 1: CPI, IP, PPI, IM								
LCPI	10	55.46	15.21	-	20.20	9.10	-	-
LIP	10	25.78	64.14	-	7.05	3.01	-	-
LPPI	10	44.43	26.26	-	24.93	4.36	-	-
LIM	10	35.36	14.33	-	18.52	31.76	-	-
Model 2: CPI, M2, PPI, IM								
LCPI	10	44.20	-	33.42	11.88	10.49	-	-
LM2	10	0.67	-	90.83	1.24	7.25	-	-
LPPI	10	38.25	-	37.91	21.68	2.15	-	-
LIM	10	8.56	-	25.48	4.87	61.08	-	-
Model 3: CPI, IP, PPI, OIL								
LCPI	10	25.40	3.69	-	55.61	-	15.28	-
LIP	10	16.81	57.79	-	15.58	-	9.80	-
LPPI	10	20.23	7.71	-	63.00	-	9.04	-
LOIL	10	17.72	9.54	-	23.66	-	49.05	-
Model 4: CPI, IP, PPI, FD								
LCPI	10	18.52	6.00	-	45.97	-	-	29.49
LIP	10	2.39	66.38	-	20.71	-	-	10.51
LPPI	10	0.46	26.32	-	48.34	-	-	24.86
LFD	10	0.56	12.06	-	12.41	-	-	74.95