



AN EMPIRICAL ANALYSIS ON THE DETERMINANT OF FOOD PRICE INFLATION IN MALAYSIA

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The identification on the main determinants of food price inflation in Malaysia was the focus of this study. Using the data from 1960 to 2013, the long run relationship among food price inflation and its determinants (per capita GDP, petrol prices, GST, population and unemployment) were found by utilizing Johansen's co-integration technique. All determinants affected food price inflation positively and significantly in the long run except GST which was proxied by the sale and service tax was insignificant with correct positive sign. The short run dynamics using the Vector Error Correction Model (VECM) indicated that food price inflation was only affected by per capita GDP, sale tax, petrol price, and population.

Keywords: Food price inflation, VAR models, Co-integration technique.

Introduction

Abel and Bernanke (1998) define inflation as a situation in which the prices of most good and services are rising over time. Food prices are measured by the Consumer Price Index (CPI) corresponding to food and non-alcoholic beverages (Xavier Irz, 2011). Food price became a major issue when it came to an increase in Malaysia which subsequently has a direct effect to an increase in the cost of living in developing countries (Abdullah and Kalim, 2009; Joiya and Shahzad, 2013). The formation of consumers' expectations on inflation was played by food prices (Van Duijne, 1982). In Malaysia, these include the recent price adjustments arising from subsidy rationalization and the spillover effects of these adjustments on the prices of other goods and services (BNM, 2014). Food price also became a major issue for the world because higher food price caused reduction in some area of food consumption leading to malnutrition (Abdullah and Kalim, 2009). Alderman (2005) claimed that productivity decreases by ten percent of live time earning and GDP losses between 2 to 3 percent in the worse inflation affected countries. Some researchers also stated that high inflation will benefit growth but leaves the poor worse off (Easterly and Ficsher, 2001; Abdullah and Kalim, 2009).

This situation makes the poor more worse off, since more than half of the budget of low wage earners goes towards food. It redistributes income from fixed income groups to the owners of assets and businessmen and increases the gap between rich and poor. Abdullah and Kalim (2009) found per capita GDP effect foods price inflation positively and significantly in the long run. These findings on food price inflation were supported by other researchers (Kapur, 2013; Joiya and Shahzad, 2013; Eckstein and Heien, 1978). Meanwhile, a study on the effect of tax on food price was found by Nourzad (1986). The researcher found tax burdens are complicated by inflation, Aaron (1978) and Sackey (1981) explained

taxes will rise as a proportion of income when individuals enter higher tax brackets; price of energy significantly influence the food inflation (Lamm & Westcott, 1981; Irz, Niemi, & Liu, 2013; Jalil, Tariq, and Bibi, 2014).

Alem and Söderbom, (2012), Abdullah and Kalim (2009) claimed that population has factor effect on food price inflation. Population growth causes the increase in domestic consumption. Lloyd & Morgan, (2011) found increase on food price due to unemployment. If economy is already operating at full employment it will result in the increase in price level (Jalil et al., 2014).

According to Commodity Research Bureau (2009), overall food inflation rates at global level stand at 16.5 and 30.2 percent respectively in November 06, 2007. This high food inflation persists in most of the countries in the world (Abdullah and Kalim, 2009). A relatively high share of total consumer expenditure on food and its impact on household was always a concern (Lloyd & Morgan, 2011). Food security arise through hike in prices, which cause the food being unaffordable for a significant number of people or food being unavailable at any price (Hubbard & Hubbard, 2013). The spike in inflation in 2007 and 2008 was led by the boom in the price of commodities (Lloyd & Morgan, 2011). Even the weight of the food products was included in the calculation of consumer price inflation in many countries. Therefore question arises on what are the determinant factors that caused this price food inflation in Malaysia? Does the determinants differ in the short run and long run?. Therefore, the study aims to investigate the determinant factors of food price inflation in Malaysia in the long run and short run.

Literature Review

Food price inflation is a supreme problem being faced by developing countries (Joiya and Shahzad, 2013). Food prices plays a special role in the formation of consumers' expectations on inflation appeared to be widely held by policy makers and economists in the United States (Van Duyne, 1982). One of the earlier studies that relates to determinants of food prices was conducted by Lamm & Westcott, (1981) who found that farm foodstuffs prices do not cause retail food prices to increase and can be rejected with ninety nine percent confidence (Lamm & Westcott, 1981). This is because there was no immediate impact on restaurant and cafeteria prices from current increase in farm level meat prices (Lamm & Westcott, 1981). However, some other researchers found increase in agricultural price on the world market is associated with a sixth point thirty three percent increase in food prices at the retail level (Lloyd & Morgan, 2011) and statistically significant in the long-run. There is an equilibrium relationship between the prices of food with agricultural commodities (Irz et al., 2013). Hence, Durevall, Loening, and Ayalew Birru, (2013) argued that agricultural supply shocks and inflation in one hundred forty world development inertia strongly affects domestic inflation in Ethiopia in the short to medium run, causing large deviations from long-run price trends (Alem and Söderbom, 2012). More recently, agricultural supply shocks affected food inflation in the short run causing large deviations from long-run price trends (Durevall et al., 2013).

Some of the researchers used per capita GDP for proxy of income and found the per capita GDP effects foods price inflation positively and significantly in the long run (Abdullah and Kalim, 2009). Increase in GDP growth rate caused the high food prices in Pakistan and it can be observed that in the agriculture sector, a high food price helps the farmers to earn more by selling their product in the market. Then, increase in GDP also makes the food prices to be high (Joiya and Shahzad, 2013). Thus, it is highly significant in the long-run as well as in the short-run (Joiya and Shahzad, 2013). Contrary to overall increase in food prices were dampened somewhat by a slight decline in their relative price and by a negative relationship between real income growth and food prices (Belongia and King, 2014). The major cause of the meat price inflation during 1973 was the effect of domestic real income growth (Eckstein and Heien, 1978).

Nevertheless, some researchers found energy is significant in influencing the food inflation (Durevall et al., 2013). The impact of an increases in other resource prices dominated by energy leads to a ten percent rise in the PPI for energy, which reflects increase in both power and transportation cost.

(Lamm & Westcott, 1981). According to the study conducted by Lamm & Westcott, (1981) the food inflation also has a lag effect on high energy price. The immediate impact of a one percent increase in energy prices on the CPI for food is a zero point zero fifty five percent increase. Meanwhile, some of the researchers found statistically significant long-run equilibrium relationship exists between the prices of food and energy (Irz et al., 2013). Domestic food prices are also significantly influenced by energy price inflation, both directly (lagged energy inflation is significant in the food inflation equation) and indirectly through deviations of domestic energy prices from their long-run relative PPP value (Adam, Kwimbere, Mbowe, Connell, and John, 2012). An oil shortages factors are adjudged to pose a threat to food security in the 21st century (Hubbard & Hubbard, 2013). A threat to food security may arise in one way or the other: either through higher prices, making food unaffordable for a significant number of people, or through food being unavailable at any price (Hubbard & Hubbard, 2013).

Mazumder, (2014) found support for the Phillips curve relationship in India by using quarterly data for the period of 1970 to 2008 with economic activity proxied by industrial production and movements in oil prices as a control for supply shock. The relationship was found to be stable across various monetary regimes. Kapur (2013) found international crude oil prices to be positively but statistically insignificant. These factors create a wedge between movements in international crude oil prices and domestic fuel prices, which makes it difficult to estimate the impact in the equation (Kapur, 2013). Similar findings were reported by Dua and Gaur (2009) on the role of oil prices in the inflation process for India as well as the other three developing Asian countries (China, Philippines and Thailand). Mohanty and Klau (2001) too reported a similar finding in only five out of fourteen EMEs in their sample, oil prices were found to have a significant impact on inflation.

A well recognized work by Sargent and Wallace (1981) documented that the government running with persistent deficits have to finance those deficits with money creation causing higher inflation. The famous statement by Friedman (1956), inflation is always and everywhere a monetary phenomenon that links the price fluctuation to monetary policy and to money supply specifically. The increase in money supply is positively linked with inflation. The money supply effect food price inflation (Durevall, Loening, & Ayalew Birru, 2013; Zhang, 2010) found to be significantly positive relationship between excess money and food-price inflation. The World Bank (2007) and the IMF (2008) argue that excess aggregate demand generated by expansionary monetary policy were key driving factors of overall inflation but money supply growth affected short-run non-food price inflation. More recently, the change in the growth rate of food prices would be related solely to the money growth rate and the results suggest that there exists a positive and almost one to one relationship between the rate of growth of M1 and the growth of retail food prices (Belongia & King, 2014).

However, excess money supply does not seem to have a direct impact on inflation in the long run (Abdullah, 2008; Durevall et al., 2013). Hence, Van Duijne (1982) found in the long run, output in the model is money supply. Inflation rate depends solely on the rate of growth of the nominal money stock and also statistically positive and has an insignificant effect towards excess money growth on food inflation. It also has a direct short-run effect from the growth rate of broad money, both acting with a one-quarter lag (Adam et al., 2012).

Few researchers found that unemployment affects the food price inflation. 10 percent increase in the rate of unemployment leads to a 1.59 percent decrease in food prices found in United Kingdom (Lloyd & Morgan, 2011). If economy is already operating at full employment the result will be the increase in price level (Jalil et al., 2014). Kapur (2013) mentioned that if the output gap (or unemployment gap) is within a certain threshold, the relationship between inflation and activity will be weak, but when the output gap is outside these thresholds, there is a significant impact between economic activity and inflation.

Little evidence was found on population as the determinant of food price inflation. Such as Alem and Söderbom, M. (2012) claims rising population will result in increase in the food demand. These is because domestic consumption is increasing due to growth in population and eventually food price inflation. These is because poverty might make the population so dependent on non-durable goods, such as food and buying durables as a protection against inflation is uncommon in the case of Ethiopia. Demand is influenced by the average and distribution of changes in the demographic composition of the

population (Adam et al., 2012). Hence, increase in food prices will have adverse distributional or welfare effects on the poor because of the larger proportion of food in their expenditure patterns (Rangasamy, 2010). Food has been a dominant contributor to overall inflation among the lower expenditure groups in South Africa (Oosthuizen, 2007). The rising population and rapid economic growth in emerging economies would result in increased food demand (Alem & Söderbom, 2012).

The fiscal view of inflation gets a special attention in the case of developing countries because it is generally accepted that the developing countries have less efficient tax collection, political instability, and a limited access to external borrowing (Alesina and Drazen, 1991; Calvo and Vegh, 1999) and these tend to lower the relative cost of seigniorage and increase dependence on the inflation tax (Jalil et al., 2014). To be sure, an increase in corporate taxes will reduce the amounts available for dividends, and individual income. On the other hand, increases in corporate taxes will also tend to increase the prices of commodities, and price increases are just what we wish to avoid (Magill, 1944). Meanwhile, if risk aversion increases with real disposable income, a positive relationship between the rate of inflation and evasion may be expected (Nourzad, 1986). In this paper of analysis on the effect of inflation on aggregate tax evasion in the United States over the period 1947-81 claims equitable distribution of tax burdens becomes complicated with inflation. Taxes rise as a proportion of income as individuals enter higher tax brackets as a result of inflation (Aaron, 1978). These is because the higher the initial tax burden, the greater will the absolute loss in tax revenue associated with a given increase in the rate of inflation (Sackey, 1981).

Data and Methodology

In this study, CPI food has been used as a proxy of food price inflation (FPI). Per capita GDP (PGDP) was retrieve from World Bank database. Total unemployment rate (TUNR) from 1981 was also retrieved from World Bank from 1960 until 1980. Petrol (PET) was retrieved from internet source published by World Bank. Meanwhile, sale and service tax (SST) was retrieved from the year book of the Department of Statistic Malaysia at Sabah main office. Food consumer price index (FCPI), and population growth (POPG) was retrieved from the same official web site.

The central role in the modeling strategy is the incorporation of the trend-like behaviour of variable, allowing models to incorporate information pertinent to the long run when deriving short run forecasts. The variable enters the equilibrium (or long run) relationship exhibits this trending behaviour, known technically as a stochastic trend is required in cointegration analysis. The variable possess a stochastic trend can potentially play a role in both the long and short run parts of the model (Lloyd & Morgan, 2011).

The vector autoregressive (VAR) model of food prices contains five equations, one equation for each of the variables that form an econometric relationship with food prices, so that there is an equation for income, good and services tax, oil prices, population, and unemployment (Lloyd & Morgan, 2011). The data and methods adopted above aims to analyse the following model:-

$$FCPI = \alpha_0 + \beta_1 PGDP + \beta_2 SST + \beta_3 FPI + \beta_4 PET + \beta_5 POPG + \beta_6 TUNR + \varepsilon_1$$

The hypothesis are as follows:

- H_{1a}: Income does influence the food price inflation.
- H_{2a}: Tax does influence the food price inflation.
- H_{3a}: Oil price does influence the food price inflation.
- H_{4a}: Population does influence the food price inflation.
- H_{5a}: Unemployment does influence the food price inflation.

According to Abdullah and Kalim (2009), most of the macroeconomic time series variables like income, consumption, money, prices and trade are non-stationary. The results will be misleading for economic analysis, if we treat the nonstationary series with Ordinary Least Squares (OLS) (Abdullah and , 2008). Similarly to Jalil, Tariq, and Bibi, (2014), it cannot be estimated directly through Ordinary Least Square method because in a the time series data, literature points out that those spurious results may exists when variables are specified in the level or non-stationary form. It is widely used in economic literature to investigate the stationarity of a time series data is Augmented Dickey-Fuller test proposed by Dickey and Fuller (1979, 1981).

Johansen Co-integration Test was used to find long run relationship between variables, Johansen Co-integration test is a popular econometric technique to test long run equilibrium (Cheng & Tan, 2002; Abdullah and Kalim, 2009; Lloyd & Morgan, 2011). This long run information helps to improve short-term forecasting that requires the application of a set of econometric techniques known as cointegration analysis (Lloyd & Morgan, 2011). The existence of a long-run equilibrium among variables was tested by applying the Johansen approach (Xavier Irz, 2011). There are many research using error correction model (Van Duyne, 1982), (Cheng & Tan, 2002), (Erik Hjalmarsson, 2007), (Abdullah and Kalim, 2009), (Durevall & Birru, 2009) and (Lloyd & Morgan, 2011). Meanwhile co-integration analysis may be undertaken in a single equation model, there are a number of conceptual advantages in using a multi-equation framework, known formally as a vector autoregressive (VAR) model (Lloyd & Morgan, 2011). The error correction modeling shows the short run relationship between these variables.

Results

The data was first tested with OLS estimation. The results for all OLS test was summarized and tabulated in Table 1.

Table 1. Ordinary Least Square Test

Dependent Variable = FCPI			
Variable	Coefficient	T-Statistic	Prob- Value
Constant	51.470940	6.908475	0.000000
PET	-31.176270	-4.241237	0.000100
PGDP	0.004452	9.301258	0.000000
POPG	-0.099142	-0.209654	0.834800
SST	0.000000	-1.335381	0.188000
TUNR	0.735546	0.784289	0.436700
R-Square = 0.929247			
Adjusted R-squared = 0.921877			
F-statistic = 126.0833			
Prob(F-statistic) = 0.0000			
Durbin-Watson stat = 0.387484			

Based on Table 1, most of the variables are insignificant, Population Growth (POPG), Sale and Service Tax (SST) and Total Unemployment Rate (TUNR) has a t-value (-0.21, -1.34 and 0.78) which is less than the critical value, respectively. Hence, probability value of 0.83, 0.19 and 0.44 is more than 0.05 indicating do not reject the null hypothesis with 5 percent level of significance. The Petrol Price (PET) and Per capita Gross Domestic Product (PGDP) indicated highly significance with the t-value of (-4.24)

and (9.30) more than critical value as well the probability for both PET and PGDP were lesser than 0.05, indicating rejection of null hypothesis with 95 percent confidence interval. The R-square determines how strong were all the independent variable in explaining the Food Consumer Price Index (FCPI). The value of R-squared was 0.929247 meaning that 92.92 percent of FCPI were explained by PET, PGDP, POPG, SST, and TUNR remaining 7.08 percent were influenced by other factors.

The value of Durbin Watson 0.387484 was less than the critical value of 2 indicating failing to reject the null hypothesis that state the data is non stationary. Most of the variables were insignificant but the R-square was high. It indicated the data has autocorrelation problem and the unit root test was needed to check the stationarity of the data with integrating first level or second level by using ADF test. The variables need to be stationary in order to avoid the regression being spurious by integrating it to first difference or second difference.

Unit root test were carried out on all of the variables to determine the stationarity of the data in their levels, first differences or second difference as shown in Table 2. Both intercept and trend were included in testing the variables. Table 2 showed the unit root test result for the Food Consumer Price Index (FCPI). Using an Augmented Dickey-Fuller (ADF) test at level, the variable Food Consumer Price Index (FCPI) exhibited an absolute t-statistic value of 3.217488 that is lesser than the critical values at one per cent, five per cent, and ten per cent significance level. Thus, this variable has unit root problem. By using the trend and intercept in the test equation the following result was observed and the first difference was then used to check the stationarity of the variable using ADF test. The same was repeated using the level and intercept in the test equation and the result can be observed in Table 2

Table 2. Augmented Dickey-Fuller (AFD) Test for Unit Root.

At Level (Without Trend)			At level (Trend and Intercept)	
Variables	t-statistics for ADF	Prob. value	t-statistics for ADF	Prob. Value
FCPI	3.217488	1.0000	-2.797482	0.2048
PET	0.151456	0.9667	-1.530724	0.8060
PGDP	4.815110	1.0000	3.614418	1.0000
POPG	0.474447	0.9840	-1.002348	0.9337
SST	0.374749	0.9800	-3.375586	0.0657
TUNR	-0.4156658	0.0018	-4.213988	0.0082
At 1 st Difference (Without Trend)			At 1 st Difference (Trend and Intercept)	
Variables	t-statistics for ADF	Prob. value	t-statistics for ADF	Prob. Value
FCPI	-4.469316	0.0007	-5.098594	0.0006
PET	-11.14462	0.000	-11.33015	0.0000
PGDP	1.17982	0.9975	-8.872208	0.0000
POPG	-12.28306	0.0000	-12.16153	0.0000
SST	-8.471974	0.0000	-6.361677	0.0000
TUNR	-12.31961	0.0000	-12.22098	0.0000

From the results, the t-statistic value for the first difference were larger than the test critical values for both intercept and trend and intercept at 1%, 5%, and 10% significance level. This indicated the data was stationary and there was no sign of autocorrelation. Thus, the data that were differentiated were used for the OLS analysis, Co-integration test and Vector Error Correction model analysis. The Ordinary Least Square (OLS) were run again for all the variables by converting onto first difference to test the hypothesis. Thus, the data that were differentiated were used for the OLS test.

Table 3. Ordinary Least Square (OLS) After the Data was Stationary

Dependent Variable = LOG(FCPI(-1))			
Variable	Coefficient	T-Statistic	Prob-Value
Constant	-0.620178	-4.714277	0.000000
LOG(PET(-1))	-0.223699	-6.984211	0.000000
LOG(PGDP(-1))	0.515372	65.215530	0.000000
LOG(POPG(-1))	0.042993	2.372242	0.021800
LOG(SST(-1))	0.000407	0.058242	0.953800
LOG(TUNR(-1))	0.050670	3.333673	0.001700
R-Square = 0.996794			
Adjusted R-squared = 0.996453			
F-statistic = 2922.453			
Prob(F-statistic) = 0.0000			
Durbin-Watson stat = 1.511233			

Table 3 shows the OLS regression result after running the ordinary least squares by using integrated variable at first difference. The Durbin Watson Stat (1.511233) is more than critical value (1.172) derived from a Durbin-Watson significance table model with an intercept indicating the model has no autocorrelation. The R-square is 0.996794 shows the 99.6794 per cent of LOG(FCPI(-1)) was explained by the LOG(PET(-1)), LOG(PGDP(-1)), LOG(POPG(-1)), LOG(SST(-1)), and LOG(TUNR(-1)) and 0.3206 per cent explained by other factors that were not included in these model. The result of OLS test between dependent variable LOG(FCPI(-1)) and independent variable LOG(PET(-1)), LOG(PGDP(-1)), LOG(POPG(-1)), LOG(SST(-1)), and LOG(TUNR(-1)) were shown above in Table 3. The test result showed that the value of t-statistic for all the independent variables except LOG(SST(-1)) were more than the critical value. This indicated rejection of null hypothesis for all independent variable except for LOG(SST(-1)).

The result of the Johansen co-integration test between variable LOG(FCPI(-1)) and LOG(PET(-1)), LOG(PGDP(-1)), LOG(POPG(-1)), LOG(SST(-1)), LOG(TUNR(-1)) were shown in Table 4. Both trace statistic and max-Eigen statistic were more than the critical value. This indicated the variables are cointegrated in the long run. Therefore, the variables have long run relationship. From the normalized cointegrations coefficients, the value t were obtained (8.706861382), (80.94227769), (6.165714286), (0.373472429), and (8.194467728). The t value showed that the variables were significant in explaining the food price inflation in the long run at 5 percent significance level.

Table 4. Johenson Cointegration Test

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized	Trace			0.05
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.663546	123.0299	95.75366	0.0002
At most 1	0.474892	67.47588	69.81889	0.0758
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized	Max-Eigen			0.05
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.663546	55.55401	40.07757	0.0004
At most 1	0.474892	32.85173	33.87687	0.0659

Table 5. Unrestricted Co-Integration Rank Test (Trace and Maximum Eigen Value).

Unrestricted Co-Integration Rank Test (Trace)				
H ₀	H ₁	Trace Statistics	0.05 Critical Value	Prob.*
r=0*	r≥1	123.0299	95.75366	0.0002
r≤1*	r≥2	67.47588	69.81889	0.0758
r≤2	r≥3	34.62415	47.85613	0.4680
r≤3	r≥4	15.42572	29.79707	0.7518
Unrestricted Co-Integration Rank Test (Maximum Eigen value)				
H ₀	H ₁	Trace Statistics	0.05 Critical Value	Prob.
r=0*	r≥1	55.55401	40.07757	0.0004
r≤1*	r≥2	32.85173	33.87687	0.0659
r≤2	r≥3	19.19843	27.58434	0.3994
r≤3	r≥4	8.393505	21.13162	0.8781

From Table 5, the observed variable does have cointegration relationship among them and this indicated long run relationship occurred. Thus, Vector Error Model (VECM) was necessary to test for their short run relationship.

The VECM was adopted since there was long run relationship in this model. VECM was used to find out the short run relationship. The results of short run relationship among the variables were shown in Table 6. The result on the Table 6 indicates that all independent variables LOG(PET(-2)), LOG(PGDP(-2)), LOG(POPG(-2)), and LOG(SST(-2)) have a statistically significant effect on food price inflation LOG(FCPI(-1)) except for variable LOG(TUNR(-2)) that was statistically insignificant in the short run but with correct positive sign.

Table 6. Vector Error Correction Model (VECM)

Dependent Variable = LOG(FCPI(-1))		
Variable	Coefficient	T-Statistic
LOG(PET(-2))	-0.097641	[-2.76970]
LOG(PGDP(-2))	0.274124	[5.41019]
LOG(POPG(-2))	0.023699	[2.00864]
LOG(SST(-2))	-0.025021	[-3.59445]
LOG(TUNR(-2))	0.019585	[1.97375]
R-Square = 0.999156		
Adjusted R-squared = 0.998889		
F-statistic = 3747.600		

Table 6 showed short run relationships of all explanatory variables with positive relation with food inflation in second difference except for Petrol and SST. The entire variable showed the correct sign and statistically significance except for Petrol that showed negative sign and total Unemployment was insignificant in the short run.

Conclusion & Recommendation

The study was conducted to explore the factors that determine food price rise in Malaysia using yearly data from 1960 until 2013 to provide information to us about the main factor that contribute to rising of

price of food. Namely macroeconomic variable GDP per capita, unemployment rate, population, tax, and petrol price were found to be strong contributors to the rising of food price in Malaysia. Per capita GDP increase will increase the food price inflation. These found to be significant in both long run as well as short run. High population caused increase in consumption that led the demand of food to create demand pull inflation for food. Tax found to be positively affecting price of food. These will increase the price of food when the taxes increase. Reduction on subsidy of petrol will led to increase of petrol price. Thus, increase in petrol price will cause the cost of production on food to increase. These burden was transferred by the producer to the consumer by increasing the price of food. These will cause the cost pull inflation on the food product and generally in the price of other good and services to increase.

The results suggested that increase in good and service tax will increase Malaysia food inflation in the long run using sale and service tax as proxy. Consistent with previous studies the prices of commodities and the price as a whole increases when the corporate tax is increased. (Magill, 1944). According to Magill, (1944) an increase in corporate taxes will reduce the amount available for dividends, which is one of the item for individual incomes. Since, the GST will become the part of the item of individual income it will influence the food price in Malaysia statistically in the long run as well as the short run. But according to Aaron, (1978) the tax rise as a proportion of income as individuals enter higher tax brackets due to inflation. Sackey, (1981) explained the higher the initial tax burden, the greater will the absolute loss in tax revenue associated with it in a given increase in the rate of inflation. The government should give subsidy to reduce the impact of good and service tax when it is applied to the economic so the poor will not suffer from the implementation of the GST since it has a significance impact on the food price inflation of Malaysia. For the future researcher the impact of the food price inflation expectation is left to be discovered.

The results also suggested that the petrol price has a significant influence towards Malaysian food inflation increase in the long run as well in the short run. This is consistent with Lamm & Westcott (1981), Adam, et al (2012), Hubbard & Hubbard, (2013), Irz, et al (2013), Durevall, et al (2013) Mazumder (2014) and Jalil, et al (2014). According to Adam, et al (2012) domestic food prices are also significantly influenced by energy price inflation, both directly (lagged energy inflation is significant in the food inflation equation) and indirectly through deviations of domestic energy prices from their long-run relative PPP value. Hubbard, et al (2013) explained an oil shortage factors are adjudged to pose a threat to food security in the 21st century. Then, a threat to food security may arise in one of two ways, first through higher prices, making food unaffordable for a significant number of people, or secondly through food being unavailability at any price (Hubbard, et al 2013). Similar finding by Jalil, et al (2014) who found oil prices is positively and significant in the regression and implies that there are many other factors as well contributing to inflation. Hence, long run model shows the petrol is significantly and positively affecting food price inflation. This is consistent to Kapur, (2013) who found oil prices have a significant impact on inflation. Jalil, et al (2014) finding indicates oil prices positively and significantly in the regression implies that there are many other factors as well which are contributing in the inflation in Malaysia. Government and policy makers should take action by reducing the price of petrol in order to reduce the cost of living especially cost of food in Malaysia. These is because the petrol price has immediate impact and as well as significant in the long run on food price inflation. This study also found that population played significant role in impacting the food price inflation in Malaysia in the long run and as well as the short run with positive sign in short run and negative sign in the long run.

The result was supported by previous studies done by Alem and Söderbom, M. (2012), (Abdullah and Kalim, 2009), Durevall & Birru, (2009)), (Xavier Irz, 2011), (Adam et al., 2012), (Alem & Söderbom, 2012). The rising population and rapid economic growth in emerging economies resulted in increase in the food demand (Alem and Söderbom, M. 2012); (Ahmed, 2008) and (Alem & Söderbom, 2012). The increase in demand will increase the price of food these created the food price inflation. The positive impact of population growth on food price Malaysia indicated that Malaysia economic association of higher degree dependent on non-durable goods, such as food and buying durables as a protection against inflation were uncommon. This was similar to the finding by Durevall & Birru, (2009) and Loening and Oseni, (2008) in the case of Ethiopia. The population growth has a negative and positive

relationship both in long run and short run. They suggested to the government policy makers to propose policy that can reduce the cost burden of an increase of food price in the short run due to increase in population. But, the food price inflation decreased in the long run. Finally they suggested government should provide more incentives in order to increase the population in order to reduce the food price inflation in the long run by improving the facility to produce human capital that will bring positive wealth effect to the economy of Malaysia.

The results also suggested that the GDP per capita significantly affect Malaysia food inflation in the long run as well as significantly in short run with positive sign. The GDP per capita found to be significant in long run similarly to previous research done by (Abdullah, 2008), (Joiya and Shahzad, 2013), and (Eckstein and Heien, 1978). The food prices tend to be high when GDP is high. This is because increase in GDP growth rate caused the high food prices it can be observed that in the agriculture sector where a high food price helps the farmers to earn more by selling their product in the market (Joiya and Shahzad, 2013). Similarly, according to Eckstein and Heien (1978) the effect of domestic real income growth is the major cause of the meat price inflation during 1973. Consistent to Joiya and Shahzad, (2013) were found the long and short run relationship of these variables are highly significant. But inconsistent to Belongia and King, (2014) found it with negative sign. Belongia and King, (2014) explained the real income growth and food prices were negative relationship because an overall increases in food prices would dampened by a slight decline in their relative price. The economic growth (per capita GDP) contributed to the increase of price inflation then the government should increase the real per capita where it will represent the real economic growth in order to reduce the food price inflation by brought new technology, encourages innovation and productivity as well.

The findings suggested the changes in total unemployment rate (LOG(TUNR(-1))) is highly and positively significant indicating 1 per cent changes in total unemployment rate increased the food consumer price index by 5.0670 per cent. These was consistent to previous finding by Jalil et al., (2014) who found if economy was already operating at full employment which referred to long run the result will suit the increase in price level which was referred to inflation. Lloyd & Morgan, (2011) explained ten percent increase in the rate of unemployment leads to a one point five nine percent decrease in food prices found in United Kingdom. Meanwhile, short run relationship was found to be weak between total unemployment and food inflation. The government should reduce the unemployment rate so the economic will be in full employment in order to reduce the food price inflation by providing more job match for fresh graduate and increase investment by encouraging the foreign direct investment in order to boost the economic activity.

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