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**FOOD PRICE DYNAMICS AND INFLATION IN SRI LANKA**

**BY  
SELLIAH SIVARAJASINGHAM**



**Thesis Submitted to  
the School of Economics, Finance and Banking,  
Universiti Utara Malaysia,  
in Fulfilment of the Requirements for the Degree of Doctor of Philosophy**

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**Kolej Perniagaan**  
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## ABSTRACT

Food price contributes the largest share in the general price index in developing countries. Consequently, the nature of food price dynamics, global and domestic food price and volatility transmission influence the general price inflation. The main objective of the study is to examine food price dynamics and inflation in Sri Lanka for the period of 2003M1-2014M12 by focusing on two perspectives: i) long memory of food price inflation and ii) food price transmission. This study attempts to examine specifically (i) the long memory properties of food price dynamics, (ii) the transmission of global food price dynamics to domestic prices, (iii) the transmission of global food price volatility to domestic prices, and (iv) the spillover effects of domestic food prices on overall consumer price. Rescaled range statistic, Geweke and Porter–Hudak statistic, Local Whittle estimator, autoregressive fractional integrated moving average model and fractional integrated generalised autoregressive conditional heteroscedastic model were used to estimate the long memory parameter of the food price series. Cointegration technique, error correction models, Granger causality analysis, and impulse response function analysis (IRF) were employed to investigate the price transmission effects. The long memory analysis shows that all food price and volatility series possess long memory. The cointegration and causality analysis show that the global food price and volatility transmit significantly to the domestic prices. In addition, the results also reveal that the domestic food prices influence positively and significantly the overall consumer price. IRF analysis also shows that there is a positive shock of global food price on the domestic prices which lasts for longer periods. Hence, the policy makers are recommended to take into account food prices in computing core inflation which is used for monetary policy in Sri Lanka.

**Keywords:** food price, inflation, long memory, price transmission, volatility



## ABSTRAK

Harga makanan menyumbang sebahagian terbesar dalam indeks harga umum di negara-negara membangun. Oleh itu, sifat dinamik harga makanan, harga makanan global dan domestik dan transmisi turun naik mempengaruhi inflasi harga umum. Objektif utama kajian ini adalah untuk mengkaji dinamik harga makanan dan inflasi di Sri Lanka bagi tempoh 2003M1-2014M12 dengan memberi tumpuan kepada dua perspektif iaitu (i) memori jangka panjang inflasi harga makanan, (ii) transmisi harga makanan. Kajian ini bertujuan untuk mengkaji secara khusus (i) sifat-sifat memori jangka panjang dinamik harga makanan, (ii) transmisi dinamik harga makanan global kepada harga domestik, (iii) transmisi turun naik harga makanan global kepada harga domestik, dan (iv) kesan limpahan harga makanan domestik pada harga pengguna secara keseluruhannya. Statistik julat pengkalaan semula, statistik Geweke dan Porter-Hudak, peramal Whittle tempatan, model purata autoregresif pecahan bersepadu bergerak dan model pecahan bersepadu umum autoregresif heteroskedastik bersyarat digunakan untuk menganggar parameter memori jangka panjang siri harga makanan. Teknik kointegrasi, model pembetulan ralat, analisis sebab-akibat Granger dan analisis fungsi tindak balas dorongan (IRF) telah digunakan untuk menyelidik kesan transmisi harga. Analisis memori jangka panjang menunjukkan bahawa semua harga makanan dan turun naik siri memiliki memori jangka panjang. Analisis kointegrasi dan analisis sebab-akibat menunjukkan bahawa harga makanan global dan transmisi turun naik adalah signifikan bagi harga domestik. Di samping itu, keputusan juga menunjukkan bahawa secara keseluruhannya harga makanan domestik mempengaruhi harga pengguna secara positif dan signifikan. Analisis IRF pula menunjukkan bahawa terdapat satu kejutan positif harga makanan global ke atas harga domestik yang berlaku bagi tempoh yang lebih lama. Oleh itu, pembuat dasar disyorkan untuk mengambil kira harga makanan dalam pengukuran rasmi inflasi teras yang digunakan dalam dasar kewangan di Sri Lanka.

**Kata kunci:** harga makanan, inflasi, memori jangka panjang, transmisi harga, turun naik

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## LIST OF ABBREVIATIONS

ACF	Autocorrelation Function
AD	Aggregate Demand
ADB	Asian Development Bank
ADF	Augmented Dickey-Fuller
AGARCH	Asymmetric GARCH
AIC	Akaike Information Criteria
AR	Autoregressive
ARCH	Autoregressive Conditional Heteroscedasticity
ARFIMA	Autoregressive Fractional Integrated Moving Average
ARIMA	Autoregressive Integrated Moving Average
ARMA	Autoregressive Moving Average
CBSL	Central Bank of Sri Lanka
CFPI	Consumer Food Price Index
CNFPI	Consumer Non-Food Price Index
CII	Core Inflation Index
CIRF	Cumulative Impulse Response Function
CPI	Consumer Price Index
CV	Coefficient of Variation
CVINFGFPI	Conditional Variance of Global Food Price Inflation
CUSUM	Cumulative Sum
DCS	Department of Census and Statistics
DM	Domestic Market
ECM	Error Correction Model
EGARCH	Exponential Generalized Autoregressive Conditional Heteroscedastic
EML	Exact Maximum Likelihood
ER	Exchange Rate
FAO	Food and Agriculture Organization
FER	Food Expenditure Ratio
FIGARCH	Fractionally Integrated GARCH
FIEGARCH	Fractionally integrated exponential GARCH
FIML	Full Information Maximum Likelihood

GDP	Gross Domestic Product
GARCH	Generalized Conditional Heteroscedastic
GCT	Granger Causality Test
GPH	Geweke and Porter-Hodak
GFPI	Global Food Price Index
GJR	Glosten, Jagannathan, and Runkle
GNP	Gross National Product
H	Hurst Exponent
HL	Half Life
HIES	Household Income and Expenditure Survey
HP	Hodrick-Prescott
HPT	Horizontal Price Transmission
HQIC	Hannan-Quinn Information Criterion
IHPT	Indirect Horizontal Price Transmission
IGARCH	Integrated GARCH
IMF	International Monetary Fund
INFCFPI	Inflation of Consumer Food Price Index
INFCPI	Inflation of Consumer Price Index
INFCNFPI	Inflation of Consumer Non-Food Price Index
INFWFPI	Inflation of Wholesale Food Price Index
INFWPI	Inflation of Wholesale Price Index
INFGFPI	Inflation of Global Food Price Index
IP	Inflation Persistence
IPI	Implicit Price Index
IRF	Impulse Response Function
KPSS	Kwiatkowski-Phillips-Schmidt-Shin
LAR	Largest Autoregressive Root
LCPI	Natural log of Consumer Price Index
LCFPI	Natural log of Consumer Food Price Index
LCNFPI	Natural log of Consumer Non-Food Price Index
LER	Natural log of exchange rate
LGFP	Natural log of global food price
LMSV	Long Memory Stochastic Volatility

LOILP	Natural log of Oil price Index
LOP	Law of One Price
LM	Lagrangian Multiplier
LR	Likelihood Ratio
LWE	Local Whittle Estimator
LWFPI	Natural log of Wholesale Food Price Index
LWPI	Natural log of Wholesale Price Index
MLE	Maximum Likelihood Estimation
MPL	Modified Profile Likelihood
NLS	Nonlinear Least Square
OECD	Organization for Economic Co-operation and Development
OILP	Oil Price Index
OLS	Ordinary Least Squares
PCM	Perfect Competitive Market
PP	Phillips–Perron
PT	Price Transmission
R/S	Rescaled Range Statistic
SARC	Sum of Autoregressive Coefficients
SDE	Spectral Density Estimate
SIC	Schwarz Information Criterion
SZF	Spectrum at Zero Frequency
SSA	Sub-Saharan Africa
SV	Stochastic Volatility
TGARCH	Threshold GARCH
UC	Unobserved Component
UK	United Kingdom
U.S	United States
USD	United States Dollar
VAR	Vector Autoregressive
VPT	Vertical Price Transmission
VR	Variance Ratio
VECH	Vector Error Correction Model



UC	Unobserved component
UC-SV	Unobserved Component Stochastic Volatility
UNCTAD	United Nations Conference on Trade and Development
WFPI	Wholesale Food Price Index
WM	World Market
WPI	Wholesale Price Index



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# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of the Study

Price stability is one of the principal economic goals of the central bank in an economy. Potential success in any price stabilization effort depends on understanding the characteristics of the inflation dynamics. The general price dynamics play a prominent role in macroeconomic policy. Price dynamics refers to its behavior over time (Frisch, 1936). According to Luenberger (1979), “The term dynamic refers to the phenomena that produce time-changing patterns, the characteristics of the pattern at one time being interrelated with those at other times”.

The general price level is measured by consumer price index (CPI) of all items; goods and services including food in general. The CPI for food (CFPI) is a component of all items CPI. The CFPI measures the changes in the retail prices of food items only. As food expenditure accounts for the larger portion of CPI, food price dynamics play a vital role in general price dynamics. Food prices are the most visible and best published of all elements of the CPI which are commonly used to measure general price inflation (Davidson, Halunga, Lloyd, McCorriston and Morgan, 2012).

The average general price movements and price movements of food commodities have been one of the most crucial economic, political and social issues in a globalized world. Thus, key properties of price dynamics are of interest in micro and macroeconomics, namely i) average price changes (general price inflation dynamics), the variability of price changes (price volatility dynamics), and iii) long memory of

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