

An Empirical Study of the Fisher Effect and Price Puzzle in Sri Lanka

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Keywords: *Fisher Effect, Price Puzzle, Co-integration, Error Correction Model*

Introduction

Maintaining price stability is one of the primary objectives of monetary policy in any economy. Because, price instability particularly high inflation, will cause economic growth to reduce, by reducing investments and productivity. Since, interest rates are one of the main channels that monetary policy uses to achieve the above goal, it is important to understand the relationship between interest rates, inflation and expected inflation. The “Fisher Hypothesis” and “Price Puzzle” provide the theoretical basis for these relationships.

Fisher (1930) postulates that there is a one-to-one relationship between the nominal interest rate and expected inflation and assumes a constant real interest rate over the long-run. The Fisher hypothesis continued to generate a series of debates among economists. In the Fisher hypothesis the real interest rate is basically determined by real factors of the economy. This implies that the monetary policy measures are less effective to influence the real interest rate. On the other hand, Price puzzle simply states the positive relationship between nominal interest rate and inflation. According to the conventional view of monetary policy transmission mechanism there should be a negative association between nominal interest rates and inflation. This dynamic relationship between nominal interest rate and inflation will enable policy makers to conceive the nature, extent and dynamics of effective monetary policy.

Cooray (2002) identified some evidence for Fisher relationship in Sri Lanka. The final conclusion of that study is, the market is likely make systematic mistakes in predicting the actual rate of inflation. Moreover, Jayasinghe and Udayaseelan (2008) have done an empirical study about the Fisher Effect in Sri Lanka. According to that study, monthly and quarterly data clearly display the absence of a long-term Fisher relationship in financial markets of Sri Lanka and annual data during the

period 1953-1977 provide some evidence for such a relationship. Furthermore, Javid and Munir (2011) have done an empirical study to address the issue of monetary policy effectiveness and the price puzzle in Pakistan economy. The main findings of this study suggest that a positive interest rate shock (contractionary monetary policy) leads to persistent rise in the price level over a 48-month horizon.

Objectives

The primary objective of this study is to investigate the existence of Fisher Effect and Price Puzzle in Sri Lanka.

Methodology

Nominal interest rates (i_t), inflation (π_t) and expected inflation (π_t^e) are the main variables of the study. Annual Colombo Consumer Price Index (*CCPI*) is used to derive the inflation and 91-days Treasury Bill (*T-bill*) rates are used as nominal interest rates. All data has been collected from the Central Bank annual reports for the period 1959-2011.

The study employs a model to derive a proxy for inflation expectations. Subsequently, graphical inspection (line graph, kernel fit, nearest neighbour fit and confidence ellipse) is used to identify the basic features and the trending behaviour of variables. In the preliminary analysis, ADF and KPSS tests are used to test for stationarity and the order of integration for i_t , π_t and π_t^e . Thereafter, co-integration technique and Error Correction Model (ECM) are used to identify the existence of Fisher Effect and Price Puzzle both in the short run and long run, respectively.

Results

The line graphs of all three variables shows a positive trend. The confidence ellipses of inflation/T-Bill rates and expected inflation/T-bill rates indicate positive associations and stochastic relationships.

Under the preliminary analysis the study employed ADF and KPSS tests to identify the time series properties of the variables. According to both tests, it proves that T-Bill rates are non-stationary. But inflation and

expected inflation indicate unit root properties only in KPSS test. KPSS test results are being accepted due to the low power of ADF test.

Engel Granger Co-integration test was adopted to identify the long-run relationship and this test indicates that both nominal interest rates and expected inflation move together (one-to-one) and have a long-run equilibrium relationship. The long-run coefficient of expected inflation is 0.939 and statistically significant.

Table 1: Engle-Granger Test Results (Long-term Fisher Effect & Price Puzzle)

Variable	Coefficient	Prob.	KPSS Test (Level with intercept)	
			Test statistic	CV (5%)
Inflation (Independent - Treasury Bill Rate)	0.6603	0.0000	0.16	0.46
T-Bill rate (Independent- Expected Inflation)	0.9397	0.0000	0.42	0.46

Null hypothesis- Residual series is stationary

The Wald test results showed that the null hypothesis of one to one relationship is not rejected (p-value is greater than 0.05), which indicates that long-run Fisher Hypothesis is valid in Sri Lanka. This proclaims that monetary policy does not affect the real side of the economy in the long run. Similarly, the dynamic relationship between nominal interest rate and inflation was examined by using the same method and identifies a positive relationship between the two variables. The long-run coefficient of nominal interest rate is 0.66 and statistically significant. Therefore, the study finds evidence of the Price Puzzle in the long run (due to positive and significant relationship between inflation and nominal interest rates).

ECM results show that in the short-run there is a positive relationship between T-Bill rates and expected inflation. The coefficient of expected inflation is 0.536 (0.007), indicates a positive and significant relationship and the absence of Fisher Effect in the short-run. Likewise, the same model was employed to identify the short-run nexus between inflation and interest rate and identified a significant positive association between the two variables. In this case the slope coefficient of T-bill rate is 0.61

(0.0023). Therefore, the study concludes existence of price puzzle in the short run as well.

Conclusion and Policy Recommendations

This study mainly inquires the existence of Fisher Effect and Price Puzzle in the Sri Lankan context for the period of 1959-2011.

Based on the nature of results it is provided that long-run Fisher Hypothesis is valid in Sri Lanka, which indicates the real interest rate is constant in long run. In the short-run positive nexus between nominal interest rate and inflation existed but we rejected the notion of full Fisher Effect. When considering the dynamic relationship between nominal interest rate and inflation, the results show that the two variables are positively associated in both short-run and long-run. This indicates the existence of the Price Puzzle in Sri Lanka.

The existence of the Price Puzzle both in the short run and long run implies that monetary policy could be ineffective in both cases. Therefore this study recommends that Sri Lanka should move away from monetary targeting framework to inflation targeting framework in order to have an effective monetary system. Because, inflation targeting framework uses an internal conditional inflation forecast as an intermediate target variable. This proclaims that inflation expectations plays a vital role in this framework. Accordingly, since the study identified the existence of long term Fisher Effect, we can anticipate inflation targeting framework might operate more effectively and successfully in Sri Lanka.

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