Extended Abstract

Purpose

The exchange rate plays a crucial role in open economies by affecting the price of imported and exported goods and services. An increase in exchange rates, due to economic policies or other reasons, can significantly raise the prices of imports and domestic goods, impacting both wholesale and retail prices..

Exchange-Rate Pass-Through (ERPT) is the percentage change in the domestic price of imported goods due to a one percent change in the currency exchange rate between exporting and importing countries .ERPT is said to be complete if each percent change in the exchange rate results in a one percent change in the domestic price of imported goods and is called partial otherwise.

Methodology

The data collection method in this research was of library studies. The relevant data in the period 1993-2023 were thus extracted from the website of the Central Bank of Iran and the Statistical Centre of Iran. In this study, first, the ERPT to the CPI was investigated, using the recursive VAR. Moreover, The study analyzed structural failures across decades using multivariate tests, investigating the sources of failure and the impact of oil prices on ERPT changes in total CPI through IRFs of disaggregated CPI and real exchange rates.

To shed light on the effects of exchange rates on consumer prices in Iran in this study, the recursive VAR with degree q according to the research by Hyeongwoo et all. (2021) and the following model was used:

$$X_t = \sum_{j=1}^{q} \beta_j X_{i-j} + C u_t$$

$$X_t = [\Delta s_t \quad \Delta y_t \quad \Delta p_t]^r$$

in which, C denotes a lower-triangular (Choleski factorization) matrix, and U_t is a vector of mutually orthonormal structural shocks, that is, $E\mathbf{u}_t\mathbf{u}_t' = \mathbf{I}$. S_t Represents the real exchange rate, Y_t is the real gross domestic product (GDP), and P_t shows the CPI. All the variables were also log transformed and differed.

This study focused on the IRFs of the CPI in the next period (j), relative to the structural shock that occurred at time t.

The variables used here included real GDP logarithm, exchange rate logarithm (viz. free market), the Organization of the Petroleum Exporting Countries (OPEC) crude oil price logarithm (ROP), total CPI logarithm, and separate CPI sub-indices such as food, apparel, transportation, medical care, energy, all items except energy, all items except food, and all items except food and energy.

Finding

To prevent false regressions in the present study, the significance of the variables was first investigated, using the Dickey-Fuller, and Phillips-Perron, and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests. The results show that all the research variables are at the 95% confidence level as the value of the reported significant level of these variables is less than 0.05. The null hypothesis that there is a unit root is also rejected and all the variables are stable based on the first-order difference. In addition, the results indicate that the Lagrange multiplier (LM) test statistic does not reject the hypothesis significance of the variables tested by KPSS, and all are in the first-order difference.

The next step was to determine the optimal number of intervals. In this study, the Bayesian, Akaik, and Hannan-Quinn information criteria were exploited to determine the optimal interval length. In the three-

variable VAR, the Akaik information criterion and the final prediction error of the optimal interval length were p=3, the Schwartz information criterion considered the optimal interval length as p=3, the Hannan-Quinn information criterion also assumed the optimal interval length by p=3 .In the four-variable VAR, the Akaik information criterion and the final prediction error set the optimal interval length as p=2. Based on the results, interval 3 is used for optimal interval in three-variable equations and interval 2 is optimal for four-variable ones.

After determining the optimal interval, the ERPT to the CPI was investigated using VAR (1). In this process, much attention was paid to identifying the structural changes in the x_t data generation over time.

To demonstrate the statistical significance of the estimated IRF, the CPI responses of two sub-sample periods (namely, 1993-2009 and 2010-2023) are presented. the total CPI responses to exchange rate shocks are significant and negative only in the post-2010 sample period (i.e., 2010-2023). Nevertheless, firstly positive reactions and then negative ones can be observed in the period before 2010 (vi. 1993-2009). The qualitative difference in the reactions reveals that the exchange rate to the CPI in Iran changes over time.

After confirming the statistical evidence of the structural failure of the ERPT to the CPI, the search for the source of failure began. The highest absolute value of the ERPT was thus related to the CPI of food and energy and the lowest absolute value was associated with the CPI of apparel and medical care.

Conclusion

In this study, the ERPT to the CPI and the effect of oil price fluctuations on it were evaluated using three- and four-variable VAR analysis, IRFs, and multivariate structural failure tests. The occurrence of structural failure was investigated over different decades and the results showed that the ERPT to the CPI could change viz. rise or fall over time. In addition, the highest absolute value of ERPT was related to the food and energy CPI. Examining the four-variable VAR, the study results revealed that oil price fluctuations were the main factors affecting the changes in the ERPT to total CPI in Iran.

Based on the empirical findings, economic policymakers are recommended to avoid severe currency shocks in their plans to stabilize prices by adopting appropriate policies. In addition, considering the impact of oil revenue instability on the ERPT, Iran's government is suggested to properly manage economic instability, whose main source is oil revenue instability, based on the objectives of the National Development Fund.