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# Asymmetry of Exchange Rate Pass-Through Shocks on Import Prices with an Emphasis on Regime Change

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## Abstract

The main purpose of this study is to review the asymmetry of exchange rate pass-through shocks on import prices with an emphasis on regime change during 1974-2016. Thus, the Hodrick-Prescott filter has been used to detect an unanticipated exchange rate and Markov switching model to regime changes. The findings of this study show that the import price in Iran follows a two-regime model, and the unpredictable negative and positive exchange shocks are asymmetrically involved in the formation of the degree of exchange rate pass-through on the import price in each of the pricing regimes. So that the effect of negative shocks is more severe compared to the same shocks. The prime cost on the production of imported goods in outside of the country, domestic demand and commercial openness also have a positive and significant impact on import prices in both price regimes.

**Keywords**: Import Prices, Exchange Rate Pass-through, Asymmetry, Markov-Switching Regression, Exchange Rate Shocks.

**JEL Classification**: C22, F31, E42.

## 1. Introduction

The most important principle in comparative advantage and specialization in production is production at a minimum prime cost compared to other countries. We can enjoy the full benefits of international trade when the export goods are produced and exported with the minimum prime cost compared to competing countries, and the imported goods, on the other hand, have the minimum prime cost. According to the Central Bank of Islamic Republic of Iran, on average, 20% of GDP is allocated to imports annually, and the share of capital, intermediaries and primary goods from total imports is about 80%. In developing countries, a part of the cost of export goods is related to the import cost of intermediary, primary and capital goods. As a result, it is necessary to consider the cost and price of the imported goods more than any other issue to maximize the benefits of foreign trade.

Various fundamental factors determine the cost of imports, but the most important ones include the exchange rate, the imported cost of goods in the country of origin and the profit margin of the importing firms. Meanwhile, the

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exchange rate is much more important because, on one hand, all purchases of firms from the foreign countries come from the countries of origin, and, on the other, the exchange rates and fluctuations are mainly influenced by foreign exchange policies. In other words, the government will affect the cost of imports by means of foreign exchange policies, thereby all the importing firms are extensively affected by these pricing policies.

By changing the imports' prices, the volume of imports is also determined, and also, the effects of these price changes will be well represented by overall cost of domestic products, exports and domestic consumption. As a consequence, economic growth will be also influenced. Accordingly, it is necessary that we carefully examine the reaction of the price of imported goods to the exchange rate known in the economic literature as the "exchange rate pass-through". In most studies, the reviews have focused on determining the degree of exchange rate pass-through symmetrically while the importing firms may adopt asymmetric pricing policies in response to negative and positive exchange shocks. In other words, they do not change the imports' prices to the same extent. In addition, according to rational expectations, unpredicted shocks force economic agents to react, and the predicted shocks are primarily taken into account in decisions and pricing schedules. In addition, it is necessary to consider the subject of regime changes in the phenomenon of the exchange rate pass-through, because the policies, conditions and economic environment of the importing and exporting country vary over time, and importing firms select different pricing regimes based on a rational behavior. In each regime, the role of fundamental factors is unique.

Accordingly, the present study examines the asymmetric effects of unexpected exchange shocks on import prices in Iran, with an emphasis on imports pricing regimes during the period of 1974-2016. In line with this purpose, we used the Hodric-Prescott filter to identify unpredicted exchange shocks and the Markov-Switching regression, which is capable of identifying regimes and changing the relationship between variables in different regimes, was also used to model the exchange rate pass-through in asymmetric systems in different pricing regimes.

What distinguishes this study from other studies in this field in Iran is that in this study, the asymmetric effects of unpredicted negative and positive exchange shocks on import prices are examined in the form of some regimes. However, in the studies mentioned above, (1) the effects of the exchange rate on the import price are considered symmetrically, (2) the import price response is also monitored for all exchange rate changes, not just the unpredicted part. However, according to the rational expectation theory, economic agents react to unanticipated shocks rather than unpredictable changes in variables.

## 2. Modeling and analysis

In the theoretical literature, the exchange rate pass-through model is based on the pricing behavior of the importing firms (Barhoumi, 2006; Campa and Goldberg, 2005; Alabri and Goodwin, 2009; Junttila and Karehonen, 2012). Following these studies, the basic model of the exchange rate pass-through based on its fundamental factors and in the form of regime changes is as follows:

$$LPIM_t = \alpha(s_t) + \beta(s_t)NSH_t + \tau(s_t)PSH_t + \gamma(s_t)LPPIUS_t + \delta(s_t)LGDP_t + \mu(s_t)OPEN_t + \varepsilon_t\,(s_t) \quad (1)$$

where $LPIM_t$ : represents the natural logarithm of the implicit index of import prices at constant prices in 2004, $LEMAR_t$ : indicates the natural logarithm of the exchange rate (US dollar per Rials) in free market, ؛$LPPIUS_t$ : is the natural logarithm of the US product price index at constant prices in 2004, $LGDP$ : represents the natural logarithm of GDP at constant prices in 2004, $OPEN_t$ : denotes the trade openness index, $NSH_t$ : shows the negative shock related to the free market exchange rate logarithm and $PSH_t$ is the positive shock related to the free market exchange rate logarithm.

According to research findings, the degree of exchange rate pass-through in regime 0 is not statistically significant in the case of positive exchange shocks, but in the regime 1, it is larger than 1 and is statistically significant. While in regime 0, the importers will not increase prices with unpredicted exchange rate growth, they will reduce their margin of profit. Hence, the positive currency shocks have an asymmetric effect on import prices in different import pricing regimes. Unpredictable negative shocks in both import pricing regimes are negative and, are larger than the unit in terms of absolute value. Comparison of the size and the sign of the coefficients of negative and positive exchange shocks in both pricing regimes show that the negative and positive shocks of the exchange rate in different regimes in terms of sign and size have different effects on the imports prices, and, of course, reaction to unpredictable negative shocks is more severe. Normally, when the exchange rate rises, imports are more expensive and governments grant exchange subsidies to importers to support import-based products as well as prevent the reduction of imports of basic goods (which domestic production is not capable of providing).

Based on the transfer probability functions, if the import pricing pattern is placed at regime 0 at time t, with the probability of 90.8%, it remains in the same regime in the following year and transfers to regime 1 at 9.2% probability. If it is placed at regime 1, it remains in the same regime in the following year with the probability of 89.1% ,and with a 10.9%.probability it transfers to regime 0. The average durability of regime 0 is 11.5 years and for regime 1 it is 6.67 years. Figure 2 shows the probability of occurrence of different behavioral regimes over time.

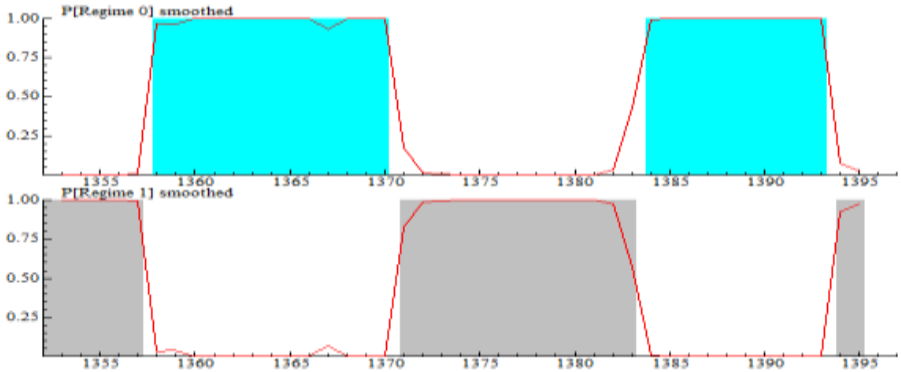


**Chart 1: The probability series of different degrees of exchange rate pass-through**
**Source: Research findings**

## 3. Conclusion

Based on the findings related to the effects of unpredictable negative and positive exchange shocks, the degree of exchange rate pass-through on the imports prices is asymmetrical. Meanwhile, the impact of unpredictable negative shocks is even greater in comparison with the same positive shocks. Hence, if the Central Bank is able to create a good reputation of regulating foreign exchange policies, then it can create unpredictable shocks in the foreign exchange market, and thereby align the foreign exchange market with economic goals.

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