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The Asymmetric Exchange Rate Pass-Through to Import Price Index: The Case Study of Iran

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Abstract
The main objective of this paper is to investigate the asymmetric effects of exchange rate on import price index in Iran using quarterly time series data over the period 1990- 2011. For this purpose, positive and negative shocks of the exchange rate have been separated from each other using dummy variables and the effects of the size of the exchange rate shocks by determining a threshold.

The empirical results indicate that the positive and negative shocks of the exchange rate both have positive and asymmetric effects on the import price index. The results show that the effect of negative shocks of the exchange rate on the imports price index is more than the positive shocks effect. In addition, the experimental findings of the research indicate that the effect of foreign exchange rate shocks size on the imports price is asymmetric and the effectiveness extent of smaller shocks is significantly more than that of bigger exchange rate shocks.

Moreover, according to the results, the effects of positive and negative shocks based on the size of foreign exchange shocks (small & big) on the imports price is asymmetric and the results show that the effect of small negative shocks is more than big ones and also the effects of small positive shocks is more than big ones.

1. Introduction

One of the basic factors for economic growth and the development of countries is an expansion in foreign trade and, as a result, a relationship among the economy of countries is created. Import is one of the effective factors of foreign trade; therefore using the appropriate and a consistent framework of imports management policy, helps the country to achieve the main purposes of imports such as supporting national production, maintaining competitiveness, preventing monopoly in the national economy, and improving the country's foreign exchange reserves. In this regard, the imports price index is one of the

indexes for imports investigation; therefore, considering the significance of the issue, investigating the effective factors on the imports price index is important.

One of the effective factors on countries imports price is the foreign exchange rate that as the value criteria of the equality of the national currency of one country against the currency of other countries is the indicator of the economic situation of that country in comparison with the economic conditions of other countries, because any increase or decrease in the foreign exchange rate can have a direct effect on the balance payments of the country. Imports and exports are two effective elements on the balance of payments that are influenced by the policy on the foreign exchange rate, in a way that increasing the foreign exchange rate (based on the national currency) causes the imported goods' to become more expensive (based on the national currency) and the exported goods' become cheaper (based on foreign exchange) (Mashhadi Mohammadi et al., 2014).

The imported goods' becoming more expensive causes a decrease in the demand for imports and as a result causes a decrease in the demand for foreign exchange, and the exports becoming cheaper causes an increase in exports and as a result causes an increase in the foreign exchange supply. In addition, the increase in the foreign exchange rate can influence indirectly the level of national prices. In fact, increasing the foreign exchange rate (decreasing the currency value) means increasing the price of foreign goods in the country, and in case of the national products' being dependent on foreign raw materials, increasing the foreign exchange rate causes an increase in the cost of production and finally increases the level of the national prices. Therefore, an increase in the imports price that is influenced by an increase in the foreign exchange rate can be significant in determining the national prices. Hence, in order to control inflation and implement successful policies, the determination of the sensitivity of imports compared to the changes in the foreign exchange rate is important for the authorities of the country, and various studies have been done in this regard.

The exchange rate pass-through[1] on imports indicates the elasticity of imports compared to the foreign exchange rate; that is, if for one percent of foreign exchange rate change, the imports price changes for one percent, the exchange rate pass-through on imports price is complete, and if by one percent changing of the foreign exchange rate the imports price changes for less than one percent, the exchange rate pass-through is incomplete.

The foreign exchange rate pass-trough's being complete or incomplete can be different considering increasing or decreasing the national currency value of a country, and in this regard we can point to the degree of uncertainty existing in macroeconomic activities, the ability of the firm to defer the payments and use the agreed foreign exchange rate, the high adjustment costs for more sale of exported products, trading among the industries, ascending toward the market

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[1] The reaction of the imports price to the foreign exchange rate is called the transfer of foreign exchange rate effect on imports price.

center, high degree of goods substitution, various foreign producers, the goal of the corporation based on maintain a certain market share, non-tariff restrictions' being considerable, and the capability of the corporation in goods production in various geographical areas (Mozayani & Yavari, 2015).

In this regard, different theories and study results have mentioned that the effects of increasing and decreasing the foreign exchange rate on the imports price are the same; but new theoretical discussions and performed experimental investigations indicate that the effect of foreign exchange rate fluctuations on imports price can be asymmetric; that is, the effects of increasing the foreign exchange rate on imports price is different from the effects of decreasing the foreign exchange rate. Various factors including market share, inflation conditions, market size, transferring production technology, Binding Quantity Constraints, and Menu Costs can create an asymmetric reaction.

Theoretically, positive and negative shocks of the foreign exchange rate have been effective on supply and demand through the following channels, and the asymmetry resulting from foreign exchange rate shock is obvious:

On the part of the economy demand in the goods market, one positive shock for the foreign exchange rate (decreasing the value of national currency) gets the domestically produced exported goods cheaper for the foreign countries and gets the imported goods more expensive; as a result, the demand for the domestic products, domestic production, and domestic prices is increased and vice versa.

On the part of the economy supply, one unexpected positive shock for the foreign exchange rate increases the cost of imported intermediate goods and causes a decrease of the production level and an increase in prices, and vice versa. Therefore, considering the asymmetry of foreign exchange rate pass-through, results in a more precise understanding of it (Sameti et al., 2010).

Hence, it is necessary that the policymakers pay enough attention to the asymmetry of the reactions of the imports prices to the fluctuations of the foreign exchange rate in designing macroeconomic policies.

In this regard, considering that, as a developing country, Iran has confronted many political, economic, international, and foreign exchange system evolutions, the investigation of the effects of foreign exchange rate on macroeconomic variables such as the imports price index is important. Therefore, in this study the asymmetric effects of the foreign exchange rate on the imports price index during 1990–2011 are investigated using the cointegration methods of Johansen-Juselius and the Fully Modified Ordinary Least Squares Method.

The discussions of the paper are organized as follows: in the second section, the performed studies are mentioned. In the third and fourth sections, the database of the research and the research methodology has been introduced. In the five section, the model estimation and analyzing the research findings are performed. In final section, the conclusion is mentioned.

2. Literature Review

Many research has been done in the field of the subject being investigated. In the primary studies the effects of the foreign exchange rate fluctuations on imports price index have been investigated, that is, they have regarded the effects of these fluctuations as symmetric. In this regard, the studies by Goldberg (1995), Rangasamy and Farrell (2002), Campa and Linda (2005), Mumtaz et al. (2006), Tekin and Yazgan (2009), Choudhri and Hakura (2012), Brun-Aguerre et al. (2012), Belke et al. (2013), Lee (2013) and Bandt and Rezafindrabe (2014) can be mentioned .

But since different opinions have later proposed the asymmetry probability of these effects, that is the effects of increasing the foreign exchange rate is different from those of its decrease, so in the recent studies, the exchange rate asymmetric pass-through on imports price index has been investigated and in these studies a group have confirmed the asymmetry pass-through effect of foreign exchange rate; for example, we can point to the studies performed by Kadiyali (1997), Webber (2000), Wickremasinghe and Silvapulle (2004), Pollard and Coghlin (2004), Karoro et al. (2009), Campa et al. (2006), Bussiere (2007), Alvarez et al. (2008), Kilic (2010), Delatte and Villavicencio (2012), Aron et al. (2012) and Elbejaoui (2013), who have attained the asymmetric effects of the foreign exchange rate on the imports price index; and another group have rejected the asymmetry effect of foreign exchange rate; in this regard, the studies of Lawrence (1990) and Przystupa and Wrobel (2009) can be mentioned who have concluded that the effects of the fluctuations of the foreign exchange rate on imports prices index are not asymmetric. Pollard and Coghlin (2004) have analyzed the pass-through effect of the foreign exchange rate for imports prices in 30 industries of America, and concluded that more than half of the industries respond asymmetrically to increase and decrease of the foreign exchange rate, although the asymmetry is different from one industry to another. Bussiere (2007), in a study investigated the issue that if the imports and exports prices of the G7 countries show asymmetric and nonlinear reaction toward the fluctuations of foreign exchange rate. The results of this study indicate that there is a nonlinear relationship that the direction of asymmetry and the size of the nonlinearity are different among the countries. Byrne et al. (2010) confirmed the asymmetry about asymmetric reaction of the foreign exchange rate fluctuations on the price of imported goods of 14 developing countries of Argentina, Brazil, Bolivia, Venezuela, Thailand, Philippine, Pakistan, Mexico, Indonesia, Ecuador, Colombia, Venezuela, Malaysia, India, and Chili .

In addition, their obtained results for Asian and Latin America countries have shown that the effects of the foreign exchange rate on imports price index is asymmetric and this foreign exchange rate asymmetric pass-through effect is more in Asian countries .

Delatte and Villavicencio (2012) in their paper have investigated the asymmetric effects of the foreign exchange rate on short term and long term changes of four main developed countries using cointegration method. The

results indicate the confirmation of asymmetric effects of foreign exchange rate on price changes. Elbejaoui (2013), in a paper have investigated the asymmetric effects of foreign exchange rate on imports and exports price for four developed countries for quarterly data from the first quarter of 1981 to second quarter of 2011 using ARDL method. The obtained results have indicated the asymmetric effects of foreign exchange rate on imports and exports prices.

Xu et al. (2017) have investigated exchange rate pass-through in China, Euro zone and the U.S. with using VECM method during 1995-2015. The results indicate that the exchange rate pass-through effect on inflation in China is much weaker than it is in the Euro zone and the United States.

So, many studies have confirmed the exchange rate asymmetric pass-through on imports price index, but the number of studies that investigated this issue in the economic structure of the developing countries is few.

Also, in the present paper, the effects of exchange rate asymmetric on import price index are investigated in two cases:

1. The positive and negative shocks of the exchange rate are differentiated and then the exchange rate pass-through is estimated in positive and negative shocks.
2. The size of the shocks of the exchange rate is divided into large and small, and then the exchange rate pass-through is estimated in two cases of large and small shocks.

Therefore, considering the importance of the issue, in this study, we deal with investigation of asymmetric effects of the foreign exchange rate on imports price index in Iran using cointegration methods of Johansen-Juselius and FMOLS Method.

3. Data

In this research the data of the imports price index, nominal foreign exchange rate[1], gross domestic product to fixed price of 1997 in quarterly form from 1990 to 2011 in order to estimate the asymmetric effects of foreign exchange rate fluctuation in Iran have been used. The data have been extracted from the Central Bank of Islamic Republic of Iran. Finally, in order to ensure the accuracy of the data and statistical information, the data have been described. The description of the data provides the opportunity to have a review of the used information before model estimation. In the following Table a summary of the descriptive statistics of the variables used in the model has been presented.

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[1] It should be mentioned that the foreign exchange rate used in this research is the value of one dollar based on Rial.

Table 1. The Descriptive Statistics of the Variables

Variable	Description	Mean	Std. Dev	Min	Max
LIPI	Import Price Index	4.69	0.97	2.48	5.99
LEX	Exchange Rate	8.63	0.72	7.21	9.85
LGDP	Gross Domestic Product	11.36	0.30	10.80	11.99

4. Methodology

This study investigates the exchange rate asymmetric pass-through on imports price index in Iran during 1990 - 2011, and according to theoretical foundations and experimental studies such as those by Pollard and Coghlin (2004) and Byrne et al. (2010) the model used in this research is stipulated as follows:

$$P_{IPI} = f(EX, X) \tag{1}$$

where P_{IPI} is the price index of the imported goods, EX is the nominal foreign exchange rate and X is other exogenous variables including GDP and P_{IPI} (-1), and GDP is gross domestic product and P_{IPI} (-1) is the lagged imports price index. After taking the logarithm from the mentioned variables, the abovementioned equation can be rewritten as follows:

$$LP_{IPI} = \beta_0 + \beta_1 LEX + \beta_2 LGDP + \beta_3 LP_{IPI}(-1) + \varepsilon \tag{2}$$

To investigate the asymmetric effects of the foreign exchange rate on imports price index following Pollard and Coghlin (2004), the positive and negative shocks can be analyzed using dummy variables as follows, and the equations (3), (4) and (5) can be estimated. These equations presented in Table 2.

5. Analyzing the Research Findings

There is a tendency for undirected movement in most of the variables of the time series. One way to avoid spurious regression is making difference and using the difference of the variables in the model. But such a model does not offer any information about long term relationship of the variables. Under these conditions, we can resort to cointegration methods and estimate the intended model without being spurious according to the variables level. One of these methods is FMOLS that offers an optimized estimation from cointegration vector.

Before estimating the long term relationship among the variables based on FMOLS method it is necessary to investigate stationarity or non-stationarity of the time series variables used in the model and also the existence of cointegration vector. So, before processing the model, we investigate the stationary and determining the number of cointegration vectors.

The first stage in estimating time series is investigation of stationary condition of the variables. In this part, the stationarity of the variables is

investigated using the Augmented Dickey-Fuller (ADF) Unit Root test and the results are presented in Table 3.

Table 2. Equations

	Dummy Variables	Equations
The Effects of the Exchange Rate Positive and Negative Shocks	A: 1 for $\Delta LEX > 0$ 0 for otherwise D: 1 for $\Delta LEX < 0$ 0 for otherwise	$LP_{IMPORT} = \beta_0 + \beta_{1A}(A_t\Delta LEX)$ $+\beta_{1D}(D_t\Delta LEX) + \beta_2 LGDP$ $+\beta_3 LP_{IMPORT}(-1) + \varepsilon$ (3)
The Effects of The Exchange Rate Shocks Size	A: 1 for $|\Delta LEX| < t$ 0 for otherwise D: 1 for $|\Delta LEX| \geq t$ 0 for otherwise	$LP_{IMPORT} = \beta_0 + \beta_{1L}(L_t\Delta LEX)$ $+\beta_{1S}(S_t\Delta LEX) + \beta_2 LGDP$ $+\beta_3 LP_{IMPORT}(-1) + \varepsilon$ (4)
The Simultaneous Effects of the Exchange Rate Positive and Negative Shocks and the Exchange Rate Shocks Size	LA: 1 for $L = 1, A = 1$ 0 for otherwise LD: 1 for $L = 1, D = 1$ 0 for otherwise SA: 1 for $S = 1, A = 1$ 0 for otherwise SD: 1 for $S = 1, D = 1$ 0 for otherwise	$LP_{IMPORT} = \beta_0 + \beta_{1LA}(LA_t\Delta LEX)$ $+\beta_{1SA}(SA_t\Delta LEX)$ $+\beta_{1LD}(LD_t\Delta LEX)$ $+\beta_{1SD}(SD_t\Delta LEX)$ $+\beta_2 LGDP$ $+\beta_3 LP_{IMPORT}(-1) + \varepsilon$ (5)

Table 3. The results of ADF Test

Variables	Level	The First Difference
LP_{IPI}	-2.117	-3.213[***]
LEX	-1.403	-4.849[*]
LGDP	-2.251	-17.655[*]

Note: [*], [**], [***] *denote statistically significant results at 1%, 5%, and 10% level of significance.*

As it is seen in the Table 3, all variables is stationary at first difference at 1% level after showing non-stationarity at level at 5% level. Therefore, the cointegration tests can be used to investigate the long- run relationship among model variables.

In this research, in order to determine the number of cointegration vectors in model (2) statistical quantities of the λ_{trace} and $\lambda_{\max}$ tests have been used. Based on both statistics (Maximum Eigen value and Trace tests) the existence of maximally two cointegration vectors is confirmed.

Table 4. Johansen Cointegration Test for Model (2)

λ_{trace}				λ_{max}			
H_0	H_1	statistics	5% critical value	H_0	H_1	statistics	5% critical value
$r=0$	$r \geq 1$	2658.85	54.64	$r=0$	$r=1$	2574.93	30.33
$r \leq 1$	$r \geq 2$	83.92	34.55	$r \leq 1$	$r=2$	74.39	23.78
$r \leq 2$	$r \geq 3$	9.52^*	18.17	$r \leq 2$	$r=3$	6.22^*	16.87

The FMOLS method provides the opportunity for estimation of the parameters of one cointegration equation. In this study, the FMOLS technique is applied to investigate the existence of a long term relationship among the variables. Firstly, model (2) is estimated without separation of the effects of positive and negative shocks on imports price index, and the estimation results are presented in Table 5.

Table 5.The Results of estimation of Model (2): FMOLS Method

Dependent Variable: LP_{IPI}			
Variables	Coefficient	t-values	PV
C	-3.2122^*	-7.8598	0.0000
LEX	0.1245^*	3.5314	0.0000
LGDP	0.2532^*	8.5641	0.0000
$LP_{IPI}(-1)$	0.8474^*	28.3476	0.0000
$R^2= 0.99$			

*Note: * denote statistically significant results at 1% level of significance.*

Considering the results of the Table 5 it can be observed that the foreign exchange rate has a positive effect on imports price index. In this regard, foreign exchange rate pass-through degree without considering the asymmetry is 0.12 that considering the research literature the foreign exchange rate pass-through degree is incomplete. In fact, increasing the foreign exchange rate (decreasing the value of national currency) compared to other currencies means that the price of foreign goods is increased in the country and instead the price of the domestic goods is increased in foreign countries. So, increasing the foreign exchange rate through increasing the price of imported goods results in decreasing the goods imports, while, decreasing the foreign exchange rate increase the imports. In addition, gross domestic product has positive effect on imports price index. In fact, by increasing the production and as a result increasing the income, the imports are increased, so, imports price index is increased. Furthermore, increasing the price index of one period can be also transferred to next periods; as a result, imports price index of the previous period can have positive effect on imports price index of the current period.

In order to investigate the asymmetry with regard to the direction of foreign exchange rate change, the fluctuations of the foreign exchange rate are analyzed

to positive and negative shocks and then the effect of positive and negative shocks of the foreign exchange rate on imported goods are investigated; the estimation results are presented in Table 6.

Table 6. The Results of Estimation of Model (3): FMOLS Method

Variables	Coefficient	t-values	PV
Dependent Variable: LP_{IPI}			
C	-0.5739*	-4.6972	0.0000
$A_t \Delta LEX$	0.3273*	10.9711	0.0000
$D_t \Delta LEX$	-0.8276*	-9.8355	0.0000
LGDP	0.0636*	5.3031	0.0000
$LP_{IPI}(-1)$	0.9723*	253.6855	0.0000
R^2= 0.99 D-W= 1.66			

*Note: *denote statistically significant results at 1% level of significance.*

Considering the results presented in Table 6 we can see that positive and negative shocks of the foreign exchange rate both have positive and negative effects on imports price index, and the effect of negative shocks of foreign exchange rate on imports price index is more than the effect of positive shocks[1]. Therefore, positive and negative shocks of the foreign exchange rate have asymmetric effects on imports price index. In fact, the results indicate that the foreign exchange rate pass-through degree is 0.32 for positive shocks and 0.82 for negative ones. Hence, it can be argued that foreign exchange rate pass-through degree to imports price in the condition of national currency reinforcement (decreasing the foreign exchange rate) is 0.5 (coefficient difference) more than the condition of weakening the national currency (increasing foreign exchange rate).

In addition, all estimated coefficients are statistically significant in 1% and have the expected sign. In order to investigate the strength of the obtained results, Wald test is used for investigation of the foreign exchange rate shocks effects symmetry; the results of the Wald test are presented in Table 7.

Table 7. The Results of the Wald Test to investigate of the Exchange Rate Shocks Effects Symmetry

$\beta_{1A} = \beta_{1D}$	
Statistic of Test	PV
1.1995	0.0000

The results of Table 7 indicate that in the significance level of 1%, the null hypothesis that is the equality of the positive and negative shocks coefficients cannot be accepted and the null hypothesis is rejected in favor of the alternative

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[1] Since the variable of the negative shocks includes negative numbers, so the opposite sign of the obtained coefficient indicates the effect direction of the negative shock.

hypothesis. In other words, the foreign exchange rate pass-through degree is not the same for increase and decrease of foreign exchange rate, and foreign exchange rate in the condition of enforcing the national currency is significantly more than foreign exchange rate pass-through degree in the condition of weakening the national currency. Not only positive and negative shocks of the foreign exchange rate are effective on the price of imported goods, but also the size of the foreign exchange rate shocks can have asymmetric effect on imports price. In order to test the asymmetry of foreign exchange rate pass-through degree on the imports price in the condition of little and big foreign exchange rate shocks, t is the threshold based on Chan's (1993) method; that the t threshold value is 1.2%.[1]

In Chan (1993) method, 15 % of the upper and lower observations of the threshold variable (change of exchange rate) are eliminated, and then the model is estimated for intermediate observations. The threshold is a value that minimizes the sum of squared errors or maximizes R^2 (Pedram et al., 2012).

The results of estimation of the size of changing the foreign exchange rate on imports price are presented in Table 8.

Table 8. The Results of estimation of Model (4): FMOLS Method

Dependent Variable: LP_{IPI}			
Variables	Coefficient	t-values	PV
C	-0.6122**	-2.5771	0.0118
$L\Delta LEX$	0.2471*	4.8226	0.0000
$S\Delta LEX$	2.4143**	2.0235	0.0463
LGDP	0.0655*	2.8176	0.0061
$LP_{IPI}(-1)$	0.9774*	132.7591	0.0000
	R^2= 0.99	D-W= 1.16	

Note:, ** denote statistically significant results at 1%, and 5% level of significance.*

Considering the results of the Table 8 it can be seen that big changes of the foreign exchange rate are effective with the coefficient of 0.24 and the little changes are effective with the coefficient of 2.41 on the imports prices, and big and little changes of the foreign exchange rate have asymmetric effects on imports price index. The foreign exchange rate pass-through degree has been significantly different in both big and small conditions of the foreign exchange rate; in a way that, the reaction of the imports price compared to one percent changes of the foreign exchange rate for smaller shocks is much more than bigger shocks, and this difference is statistically significant. In addition, all estimated coefficients are statistically significant and have the expected sign. To investigate the strength of the obtained results, the Wald test results are presented in Table 9 to examine the symmetry of the size of the foreign exchange rate shocks:

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[1] For further studies refer to Enders (2005).

Table 9. The Results of the Wald Test to investigate of the Exchange Rate Shocks Size Effects Symmetry

$\beta_{1L} = \beta_{1S}$	
Statistic of Test	PV
-2.1672	0.0726

The results of Table 9 indicate that in the significance level of 10 %, the null hypothesis that is the equality of coefficients of foreign exchange rate shock sizes cannot be accepted and the null hypothesis is rejected in favor of the alternative hypothesis; so, the effect of foreign exchange rate size on the imports price index is asymmetric.

In addition, to investigate the simultaneous effects of positive and negative shocks of foreign exchange rate and big and small changes of the foreign exchange rate on imports price index, Model (5) has been estimated and the estimation results are presented in Table 10.

Table 10. The Results of Model (5): FMOLS Method

Dependent Variable: LP_{IPI}			
Variables	Coefficient	t-values	PV
C	-0.2753^{***}	-1.7185	0.0896
$LA\Delta LEX$ [1]	0.3838^{*}	9.5635	0.0000
$LD\Delta LEX$ [2]	-0.8100^{*}	-6.9519	0.0000
$SA\Delta LEX$ [3]	1.90003^{**}	1.8685	0.0654
$SD\Delta LEX$ [4]	-2.5923	-1.5700	0.1204
LGDP	0.0322^{**}	2.0453	0.0442
$LP_{IPI}(-1)$	0.9844^{*}	193.4171	0.0000
	$R^2 = 0.99$ D-W= 1.47		

Note:, **, *** *denote statistically significant results at 1%, 5%, and 10% level of significance.*

Considering the results of the Table 10 the following results can be obtained:

- The effect of positive shocks with smaller sizes is more than that of the positive shocks with bigger sizes, and this is consistent with the findings of Model (4) (comparison of the coefficients of variables 1 & 3).
- The effect of negative shocks with smaller sizes is more than that of negative shocks with bigger sizes (comparison of the coefficients of variables 2 & 4) that is consistent with the findings of Model (5) which states that the effects of smaller shocks are bigger compared to bigger shocks.

- The effect of smaller positive shocks is less than the effect of negative ones (comparison of sum of coefficients of variables 1 & 3 with sum of coefficients of variables 2 & 4).
- The effect of bigger shocks is less than the effect of smaller ones (comparison of sum of coefficients of variables 1 & 2 with sum of coefficients of variables 3 & 4).

So, the results indicate that the simultaneous effects of positive and negative shocks of the foreign exchange rate and the effects of the size of foreign exchange rate shocks on the imports price index is also asymmetric. In addition, all estimated coefficients except for the effect of negative shocks of the foreign exchange rate with smaller size are statistically significant and have the expected signs. Furthermore, the results of Wald test to investigate the symmetry of simultaneous effects of positive and negative shocks of the foreign exchange rate and also the effects of the size of foreign exchange rate shocks on the imports price are presented in Table 11.

Table 11. The results of Wald test to investigate the simultaneous effects symmetry of the exchange rate positive and negative shocks and also the size effects of exchange rate shocks

$\beta_{1LD} = \beta_{1SD}$		$\beta_{1LA} = \beta_{1SA}$	
Statistic of Test	PV	Statistic of Test	PV
4.4927	0.0327	1.1939	0.0000

The results of Table 11 indicate that in significance level of 1 %, the equality of the coefficients of positive shocks with big and small sizes of the foreign exchange rate cannot be accepted and the null hypothesis is rejected in favor of the alternative hypothesis; that is, positive shocks with big and small sizes of the foreign exchange rate have asymmetric effect on imports price index. In addition, in the significance level of 5 %, the equality of negative shocks with big and small sizes of the foreign exchange rate cannot be accepted and the null hypothesis is rejected in favor of the alternative hypothesis; that is, negative shocks with big and small sizes of the foreign exchange rate have asymmetric effect on imports price index.

6. Conclusion and Recommendations

In this study the asymmetric effects of the exchange rate on the imports price index of Iran have been investigated using the quarterly time series data during 1990–2011 and the cointegration method of Johansen-Juselius and the FMOLS method .

In relation to the greater the exchange rate pass-through on the import price in the case of the decline in the exchange rate in comparison with the increase in the exchange rate, it can be argued that when the exchange rate rises, and the stability of other conditions are maintained, the price of imported goods is more expensive than domestic currency and as a result, it reduces the purchasing

power of domestic consumers, which may reduce the market share of the importer of consumer goods. In the conditions of competition between domestic and foreign goods, importers may transfer the effects of an increase in the exchange rate less to the price of imported goods in order to maintain their market share by reducing their margin of profit. While in the case of a decline in the exchange rate, importers in the domestic markets can reduce the price of imported goods proportionate to the decline in the exchange rate easily due to the improved competitive conditions. In other words, importers may be transferring the effects of a decrease in the exchange rate more to the price of imported goods .

In the case of imported intermediary and capital goods, it can be said that with the increasing exchange rate, manufacturing costs have increased and as a result, the producer (the exporter) may transfer the effects of the exchange rate less to the price of the imported goods in order to maintain its market share of domestic (foreign) trade by reducing their margin of profit. However, in the case of a decline in the exchange rate, importers of intermediary and capital goods can transfer the effects of a decrease in the exchange rate to the price of the imported goods easily and improve their market share. So, the degree of exchange rate pass-through on the price of imports in the case of a decrease in the exchange rate is greater than its increase .

Concerning the degree of the exchange rate pass-through on import prices in the case of smaller exchange shocks compared to larger exchange shocks (such as a significant increase in the exchange rate), it can be argued that when a larger currency shock occurs in economics, the import price is most affected and it reduces strongly the competitive power of imported goods and affects the cost of production and increases the price of intermediate and capital goods. As a result, the effect of the exchange rate pass-through on import prices will be less in order to maintain the market share and to prevent a sharp drop in the purchasing power of people for imported goods, as well as to prevent a sharp rise in the prices of manufactured goods .

However, in the event of smaller foreign exchange shocks (such as a slight increase in exchange rates), the enhancement in import prices and production costs will be negligible; importers can transfer easily the enhancement in the exchange rate to the price of imported goods. In other words, the import price response to the smaller increases is higher than the import price response to the sharp increase in the exchange rate and this is due to the higher degree of exchange rate pass-through on the import price in the case of smaller shocks compared to larger shocks[1].

So, the results obtained from the research and policy recommendations to policy makers and the planning of the country are as follows:

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[1] For the great currency shock, the increase in the exchange rate in 2012 and for the small currency shock, the increase in the exchange rate in 2016 is an example. The exchange rate pass-through on import price in 2016 is expected to be higher than in 2012.

- Positive and negative shocks of the foreign exchange rate both have positive and significant effects on the imports price index, in a way that the extent of the effect of negative shocks is more than positive shocks, and statistically, the asymmetry of the effects of positive and negative shocks of the foreign exchange rate on imports price is accepted. The political implication of this discussion is that the government must consider the difference in the effects of national currency (increase of the foreign exchange rate) as well as the effects of weakening the national currency (decreasing the foreign exchange rate) on imports price and inflation in its economic policy making; in a way that, according to the obtained results, decreasing the foreign exchange rate has been effective in controlling inflation and increasing the foreign exchange rate does not have a considerable effect on imports price and inflation. In other words, if the government decides to control inflation, due to the serious effects of decreasing the foreign exchange rate on imports price control, the foreign exchange rate control is emphasized. On the other hand, if the government pays close attention to increase of exports, the increase of the foreign exchange rate will not be that be worrying for inflation, because the effectiveness degree of increasing the foreign exchange rate is less on imports price and as a result there is less inflation.
- Big and small shocks of the foreign exchange rate have positive and significant effects on imports prices; however, the effect of small shocks of the foreign exchange rate is significantly more than the bigger shocks. Therefore, big and small shocks of the foreign exchange rate have asymmetric effects also on the imports price index. The policy implication is that in carrying out economic policies, especially controlling the imports price, the government should create smaller changes in the foreign exchange rate more frequently, because the effects of each percent of change in foreign exchange rate in smaller scale is more than its effects in small scale.
- The simultaneous effects of positive and negative shocks of the foreign exchange rate and big and small shocks of the foreign exchange rate on the imports price index are asymmetric also. In fact, big shocks with big and small sizes of the foreign exchange rate have a positive effect on imports price index, and the effect of small shocks is more than that of big shocks of the foreign exchange rate, and negative shocks with smaller sizes will not have a significant effect on the imports price index. Considering the analysis of the effects of big, small, positive and negative shocks simultaneously on the imports price, it can be argued that if the goal of the government is to control inflation, the best policy

is to implement currency policies of national currency enforcement on a small scale. However, if the goal of the government is to increase the foreign exchange rate in order to strengthen exports, in this condition it is suggested that the government should implement the currency policies on a wide scale.

- Variables of domestic gross product and the interrupted amount of the imports price index have also a positive effect on the imports price index.

- Therefore, with regard to the results obtained the government should pay attention also to the asymmetry of the effects of the foreign exchange rate on the imports price under the different conditions (positive, negative, small, and big shocks) in implementing the currency policies.

Therefore, according to the results, the government should pay attention to the asymmetric effects of the exchange rate on the import price under the different conditions (positive and negative shocks and small and large shocks) in the implementation of foreign exchange policies. However, it should be noted that along with the above policy recommendations, based on the theoretical framework and empirical studies, there are other factors in reducing and controlling import prices, including inflationary expectations, government economic policies, external shocks, openness of the economy, etc.

Therefore, keeping the exchange rate low in order to increase inflation, regardless of other factors, is not always honest, because keeping the exchange rate low, regardless of the state of affairs in the domestic economy and without coordination with the monetary policy, will reduce the competitiveness of domestic producers and increase its dependence on imports. Not only is this kind of dependency not to the benefit of the country, but with the smallest international tension, the domestic economy suffers from extreme fluctuations. Therefore, other factors affecting inflation should be considered.

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