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The Impact of Exchange Rate Devaluation on Price Indices of Exported Goods in Iran

Nooraddin Sharify*[1],
Vahid Taghinezhad Omran[2],
Tahereh Valinejad Ahangaree[3]

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Abstract

Exchange rate is an important factor influencing price indices of exported goods of a country in different ways. Imported intermediate commodity is one of the important ways by which the change in exchange rate affects price indices of the exported goods. Using the input-output table of Iran for the year 2001, this paper investigates the impact of exchange rate devaluation on price indices of exported goods in Iran. The results of the research indicate that, when all agents do not adjust their earnings exactly with respect to price indices of products, the exchange rate pass-through is partial; therefore the increment in the level of exported prices is less than that of exchange rate variation. In contrast, when all agents adjust their earnings with respect to price indices, the price indices of all products will increase as much as exchange rate variation, hence, the pass-through is complete, and as a result, the current devaluation policy is neutral.

Keywords: Devaluation, Price Indices, Exported Goods, Exchange Rate Pass-Through, Input-Output Analysis.
JEL Classification: C67, E58, F47.

1. Introduction

The exchange rate of Iran has decreased for different reasons in recent years. This reduction has affected the domestic price of products through imported goods and services. However, the Exchange Rate Pass-Through (ERPT) on prices of imported goods varies in different situations.

In addition, although it is expected that the price indices of exported goods will rise due to reduction in the value of domestic

1. Associate Professor, Department of Economics, University of Mazandaran, Babolsar, Iran (Corresponding Author: nsharify@umz.ac.ir).
2. Assistant Professor, Department of Economics, University of Mazandaran, Babolsar, Iran (taghizadeh@gau.ac.ir).
3. University of Mazandaran, Babolsar, Iran (valinejad59@yahoo.com).

currency, the level of the increment is also dependent on reaction of primary factor holders of the economy. Labour forces and capital owners are two groups among those who may adjust their earnings because of price increments. These adjustments will intensify the effect of an initial shock to exchange rate.

This paper attempts to investigate the effects of change in the value of exchange rate in Iran in different scenarios. To this end, the effects of 10% devaluation in the value of domestic currency on the size of price indices of exported goods are investigated. In contrast to most previous studies in Iran that were based on a time series method, this research examines the relationship between exchange rate and Exported Goods' Price Index (EGPI) through applying the input-output table of Iran for the year 2001.

The following sections of this paper have been organized as follows: Section 2 concerns a theoretical study of the research. Previous studies are reviewed in section 3. The model and data resources are introduced in section 4. Section 5 discusses the empirical findings. Finally, section 6 concludes the study.

2. A Theoretical Study

2.1 A Macroeconomic Analysis

Exchange rate pass-through (ERPT) is commonly defined as the extent to which exchange rate changes are eventually reflected in traded goods' prices. The degree and speed of ERPT play an important role in the choice of optimal monetary policies and exchange rate regimes. In the literature, two issues are of particular importance; one relates to whether the pass-through is complete or incomplete, and the other to whether incomplete pass-through is likely to be more than just a short-run phenomenon (Brissimis & Kosma, 2007).

Trade price is influenced by a number of variables, such as exchange rate, production cost and market power. Although there is a broad consensus on the existence of the effect of cost and market structure on the price of imports and exports, previous studies have provided inconsistent findings on the degree of the effect of exchange rate. (Brissimis & Kosma, 2007). Dornbusch (1987) justifies incomplete pass-through as arising from firms that operate in a market characterized by imperfect competition and adjusts their mark-up (and not only prices) in response to an exchange rate shock.

One of the stylized facts in the literature is that the degree of ERPT is time-varying and more specifically is declining substantially over the last decades (Ozkan & Erden, 2015). Several complementary explanations have tried to account for the decline in the ERPT and cross-country differences over time. Among the main ones there are macro factors, suggested by Taylor (2000) who links the degree of ERPT to the inflation environment and more specifically to the presence of inflation targeting. After the adoption of an IT framework, countries tend to experience a lower pass-through (Caselli & Roitman, 2016). Another important macro factor is the nature of the factor exchange rate regime. Some authors justify that a more stable exchange rate regime is indeed likely to induce more local currency pricing and a pass-through decrease for import prices. Finally, further potential reasons for the decline in the ERPT could be microeconomic factors, such as shifts in the composition of the import bundle from high pass-through goods such as energy and raw materials, to lower pass-through items such as manufactured goods, an increase in trade integration or an increasing share of imports denominated in the home currency (María-Dolores, 2010).

2.2 The ERPT Trace in an I-O Model

A devaluation of exchange rate influences the prices of domestic products through imported goods. Irrespective of the ERPT to imported goods prices in domestic currency, a part of this shock influences the total expenditure of products through the value of imported intermediate inputs in domestic currency. This is the direct impact of the initial shock on the total expenditure of products.

The increment in the level of total expenditure of products leads to an increment in the price of these products. Since a part of these products is consumed as intermediate input of some products, considering the new price of products leads to a new increment in total inputs and consequently the prices of the related products indirectly. However, since only a part of the products is consumed as intermediate input, it is expected that the size of the future shock will tend toward zero. Hence, the process of adjustment will continue until the effects of the shock are ignorable.

Another part of imported products is consumed as final demand.

The increment in the value of imported goods affects the price of imported final goods. As a result, this part of the increment will not directly affect the prices of domestic products through intermediate input.

In addition, value added components are other factors which may affect the total input of products. On the other hand, the primary factors' owners may adjust their earnings with respect to price increments to constant their welfare. To this end, the labour forces may ask to adjust their wages with respect to the Consumer Price Index (CPI). The capital holders may adjust their receipts with respect to some indices like the Producer Price Index (PPI). Hence, these primary factors, as well as the net indirect tax, may intensify the price indices' increments due to exchange rate devaluation.

3. Literature Review

There are numerous studies examining the extent of ERPT on prices of exported goods. The phenomenon of incomplete ERPT on trade prices has been largely seen in the context of high-income countries. With global integration and trade reforms, this can also be feasible in developing countries markets.

Generally speaking, almost all studies have been carried out using different techniques of the econometrics approach. Thus, this paper fails to find any document concerning the application of an input-output model in this area. For instance, an Autoregressive Distributed Lag (ARDL) model was employed in some researches such as Torkemani & Trazkar (2005) on the short-term and long-term effect of exchange rate variation on the EGPI of pistachio products. In a similar method, the pass-through of exchange rate volatility on the price of non-oil exported goods of Iran was investigated by Asghar-Pour et al. (2011).

The Vector Error Correction Model (VECM) is another technique of the econometric approach used in a number of studies. According to our investigation, VECM was employed by Bashar-Abadi et al. (2010) to investigate the exchange rate pass-through on EGPI in Iran. In addition, a 3 Stage Least Square (3SLS) method was implemented by Ohno (1989) to search exchange rate pass-through on EGPI in Japan and the US.

Moreover, a regression method was used in a number of researches.

The effect of exchange rate on exporters' pricing policies in Japan, the UK, Germany and the US was investigated by Knetter (1993). Parsons and Sato (2007) have also employed a regression method to specify the effect of exchange rate on exported products' prices of Japan to the US, Europe and Eastern Asian countries. A regression method was used by Cegloski (2009) on pass-through EGPI increments in Japan.

Furthermore, a panel data method was used in some studies as well. Using this method, the reaction of EGPI to exchange rate was studied in Mallick & Marques (2008).

And finally, a Vector Auto-Regression (VAR) method has been implemented in some studies as well. Using the VAR approach, McCarthy (1999) finds that ERPT on domestic prices is partial in industrial economies. Aziz et al. (2013) has employed a Recursive VAR method to estimate the exchange rate pass-through on the EGPI of Bangladesh. The VAR and regression methods were implemented to specify the exchange rate pass-through on EGPI in the US by Choudhri & Hakura (2012).

4. The Model and Data Sources

4.1 The Model

Our study started with a case in which the imported commodities are classified into intermediate imported input and final goods consumed by households or used for other purposes. The effects of exchange rate shock in intermediate imported inputs are considered similar to those of value added components, whereas the imports of final goods are considered similar to those of other final commodities (Table 1).

Table 1: The Schematic of I-O Table

Intermediate transaction	Households consumption	Other final demand	Total output	Imported final goods	Total supply
Value added components					
Intermediate imports					
Total inputs					

To measure the effect of exchange rate variation on the price indices of commodities through intermediate imported inputs, a modified version of the Table Adjustment Price (TAP) model proposed by Sharify and Sancho (2011) is employed. This model runs

based on the I-O table adjustment due to an initial shock in value added components through several iterations.

It is assumed that I_j^1 stands for the price index of product *j* due to the direct effect of exchange rate variation. It is equal to the ratio of the size of total inputs' value of the j^{th} products after initial shock in exchange rate to the corresponding value before the initial shock. By multiplying this ratio by the corresponding row of the I-O table, the change in the price of the product is considered in the value of this product in different sections. This change, which can be strengthened by value added components, causes a new shock in the value of total inputs for products.

Similarly, I_j^2 is obtained by the ratio of the new value of total inputs for product *j* to the corresponding value after the initial shock. By considering the new shock through multiplying I_j^2 by the value of products in the corresponding row of the table, like the initial shock, the second shock is also considered in the table. This process will continue until I_j^t becomes close enough to one, so that the result of the shock adjustment leads to an ignorable number.

To generalise the adjustment from one product to all others, a matrix form is required. To this end, the adjustment process of the table is shown as equation (1):

$$T^k = I^k \times T^{k-1} = \begin{bmatrix} I_1^k & 0 & \cdots & 0 & 0 & 0 \\ 0 & I_2^k & \cdots & 0 & 0 & 0 \\ \vdots & \vdots & & \vdots & & \vdots \\ 0 & 0 & \cdots & I_n^k & 0 & 0 \\ 0 & 0 & & 0 & A^k & 0 \\ 0 & 0 & \cdots & 0 & 0 & B^k \end{bmatrix} \times \begin{bmatrix} T_{11}^{k-1} & T_{12}^{k-1} & \cdots & T_{1n}^{k-1} & \cdots & T_{1m}^{k-1} \\ T_{21}^{k-1} & T_{22}^{k-1} & \cdots & T_{2n}^{k-1} & \cdots & T_{2m}^{k-1} \\ \vdots & \vdots & & \vdots & & \vdots \\ T_{n1}^{k-1} & T_{n2}^{k-1} & \cdots & T_{nn}^{k-1} & \cdots & T_{nm}^{k-1} \\ W_1^{k-1} & W_2^{k-1} & & W_n^{k-1} & 0 & 0 \\ S_1^{k-1} & S_2^{k-1} & \cdots & S_n^{k-1} & 0 & 0 \end{bmatrix}$$

$$= \begin{bmatrix} T_{11}^k & T_{12}^k & \cdots & T_{1n}^k & \cdots & T_{1m}^k \\ T_{21}^k & T_{22}^k & \cdots & T_{2n}^k & \cdots & T_{2m}^k \\ \vdots & \vdots & & & & \vdots \\ T_{n1}^k & T_{n2}^k & \cdots & T_{nn}^k & \cdots & T_{nm}^k \\ W_1^k & W_2^k & & W_n^k & 0 & 0 \\ S_1^k & S_2^k & \cdots & S_n^k & 0 & 0 \end{bmatrix} \qquad (1)$$

where T^{k-1} and T^k refer to partitioned matrices of I-O in the *k-1*th and k^{th} iteration of the adjustment process, respectively. They include the intermediate demand, final demand, and value added items as equation (2).

T^{k-1} or

$$T^k = \begin{bmatrix} Intermediate\ Input & Households\ Consumption & Other\ Final\ Demand \\ Value\ Added\ Items & 0 & 0 \end{bmatrix} \quad (2)$$

I^k concerns a diagonal matrix of the k^{th} iteration of the adjustment in which its elements I_j^ks are associated with the j^{th} product intermediate input adjustment. A^k and B^k are two additional adjustment coefficients related to *W*, wages, and *S*, operating surplus, the value added items of products, respectively.

For instance, in the case in which wages are adjusted with respect to Consumer Price Index (*CPI*), A^k, the adjustment coefficient for the k^{th} iteration of adjustment, is calculated through the Laspeyres price index:

$$g = \frac{\sum_{i=1}^{n} Q_i^{c^0} \times P_i}{\sum_{i=1}^{n} Q_i^{c^0} \times P_i^0 + \sum_{i=1}^{n} M_i^{c^0} \times P_i^f} \quad (3)$$

$$CPI = g \times \frac{\sum_{i=1}^{n} Q_i^{c^0} \times P_i}{\sum_{i=1}^{n} Q_i^{c^0} \times P_i^0} + (1-g)\frac{\sum_{i=1}^{n} M_i^{c^0} \times P_i^f \times e}{\sum_{i=1}^{n} M_i^{c^0} \times P_i^f} = g \times \frac{\sum_{i=1}^{n} C_i}{\sum_{i=1}^{n} C_i^0} + e(1-g) \times \frac{\sum_{i=1}^{n} C_i^m}{\sum_{i=1}^{n} C_i^{m^0}}$$

g and (1-*g*) denote the share of households' consumption expenditure in domestic and imported products before exchange rate shock, respectively. $Q_i^{c^0}$ refers to the quantity of domestic product *i* in households' consumption. P_i and P_i^0 indicate the price of product *i* after and before exchange rate shock, respectively. P_i^f shows the world price index for the i^{th} imported final goods expressed in the foreign currency. $M_i^{c^0}$ denotes the quantity of imported final goods *i* in households consumption. C_i and C_i^0 refer to the households expenditures on domestic products *i* after and before exchange rate

shock, respectively. C_i^m and $C_i^{m^0}$ indicate the households expenditures on imported products *i* after and before exchange rate shock, respectively.

B^k, the adjustment coefficients of operating surplus, can be replaced by the Producer Price Index (*PPI*). To this end, the Laspeyres price index to measure *PPI* is as follows:

$$PPI = \frac{\sum_{i=1}^{n} Q_i^0 \times P_i}{\sum_{i=1}^{n} Q_i^0 \times P_i^0} = \frac{\sum_{i=1}^{n} Z_i}{\sum_{i=1}^{n} Z_i^0} \qquad (4)$$

Q_i^0 and Z_i^0 refer to the quantity and level of total products value for the i^{th} products, prior to any exchange rate shock, respectively. Z_i denotes the total value of the i^{th} products after the exchange rate shock took place.

$C,^k$ the adjustment coefficient for indirect tax, is calculated to meet the ad-valorem tax policy.

$$Ta_j^k = \frac{\sum_{i=1}^{n} T_{ij}^k + W_j^k + S_j^k + M_j^k - Su_j^k}{\sum_{i=1}^{n} T_{ij}^{k-1} + W_j^{k-1} + S_j^{k-1} + M_j^{k-1} - Su_j^{k-1}} . Ta_j^{k-1} = C^k . Ta_j^{k-1} \qquad (5)$$

here Ta_j^k, Su_j^k, M_j^k, S_j^k, W_j^k and $\sum_{i=1}^{n} T_j^k$ denote indirect taxes, subsidy, intermediate imported input, operating surplus, wages and total domestic intermediate input for products *j* in the k^{th} iteration of the table adjustment process, respectively. Ta_j^{k-1}, Su_j^{k-1}, M_j^{k-1}, S_j^{k-1}, W_j^{k-1} and $\sum_{i=1}^{n} T_j^{k-1}$ refer to the same items for products *j* in the $(k-1)^{th}$ iteration of the table adjustment process, respectively.

However, in the case where one or more value added items are not adjusted with respect to price shock, the related adjustment coefficient would be equal to one. It is notable that considering one for C_j^k, leads the model to be fit for a unitary tax policy for the related product.

The result of the adjustment process of the table leads to T^t the adjusted I-O table with respect to price exchange rate shock in equation (6).

$$T^t = I^1 \times I^2 \times I^3 \times \cdots \times I^t \times T^0 \quad (6)$$

T^0 refers to the initial I-O table, I^1 to I^t the diagonal matrix of adjustment coefficient of products and value added components in the 1st to t^{th} iteration of the adjustment, respectively. However, due to differences in the size of C_j^k for different products, it would be multiplied by the net indirect taxes of related products during the table adjustment process, separately.

The values of the price index of products, *CPI* and *PPI*, change as a result of any variation in exchange rate. These indexes are computed through multiplying the size of these components by corresponding coefficients in different iterations of adjustment. For instance, the price index for the j^{th} product, I_j, yields through equation (7).

$$I_j = \prod_{k=1}^{t} I_j^k = I_j^1 \times I_j^2 \times I_j^3 \times \cdots \times I_j^t \quad (7)$$

Hence, the *EGPI* can be calculated as follows:

$$EP = \frac{\sum_{i=1}^{n} X_i^0 \times P_i}{\sum_{i=1}^{n} X_i^0 \times P_i^0} = \frac{\sum_{i=1}^{n} E_i}{\sum_{i=1}^{n} E_i^0} \quad (8)$$

X_i^0 refers to the size of exported goods or services, and E_i^0 and E_i refer to the value of exports before and after exchange price shock, respectively.

Finally, the model is also capable of being used for the case in which the imported commodities, for any reason, are classified as intermediate input only. To do so, by putting zero instead of $M_i^{c^0}$ in equation (3), the model would be suitable for this purpose. This capability is one of the advantages of this model.

4.2 Data Sources

The supply and use tables of the year 2001 that are the last survey-based tables are employed as database of the research (Iranian Census Bureau, 2006). These tables that are based on producer prices were used to provide the commodity by commodity table with the sector technology. The table has been balanced with respect to economic relationships.

The imports of the country have been divided into the intermediate

and final groups of goods. For convenience in this paper, the results of the tables have been aggregated into 27 products.

5. Empirical Findings

Using the TAP approach, this study analyzes ERPT on EGPI. The model is estimated for three scenarios. It is assumed that a regulated price policy is dominant in the exchange market. On the other hand, the exchange rate is fixed after an initial shock. With respect to an ad-valorem tax policy, the net indirect tax is calculated based on the value of products including intermediate goods and segments of value added such as wages and operating surplus.

The first scenario concerns the case in which wages and operating surplus are constant. The second scenario meets the case in which it is supposed that the labour forces adjust their earnings based on the CPI index. And finally, wages and operating surplus are supposed to be adjusted based on CPI and PPI indexes, respectively in the third scenario.

Table 2: The Effect of 10% Changes in Exchange Rate on the Exported Products Price Index in Different Scenarios

	Scenario 1	Scenario 2	Scenario 3
Exported Products Price Index	0.34	0.41	10

Resources: Authors

With respect to equation (8), the exported products price indexes are calculated by dividing the value of exports in the final stage of adjustment by their value in the initial stage. In the first scenario, in which segments of value added don't adjust, 10 percent of devaluation in exchange rate raises the EGPI by 0.34 percent (Table 2). This indicates that the degree of exchange rate pass-through is low and incomplete.

To see the factor's influence in the price indexes of goods, the correlation coefficients of these indexes with the share of intermediate and primary inputs in total inputs of products are displayed in Table 3. According to the results, the share of domestic and specially imported inputs in total inputs of products implies that they have a strong relationship with the price indexes of products. On the other hand, the price indexes of products using higher domestic or specially imported

intermediate inputs will be affected more due to exchange rate variation in this case. In contrast, products with higher value added segments will confront less change in price index variation.

In the second scenario in which wages are adjusted with respect to CPI, in addition to intermediate inputs, the EGPI rises 0.41 percent, which is less than the exchange rate increment (table 2). Hence the ERPT is partial. Compared with the first scenario, the correlation coefficient of price indices of products with the share of wages in total inputs has increased.

In a further investigation, Table 3 demonstrates two results: 1) The sizes of price indices of all products in the second scenario are a little greater than those of the first scenario. This is due to adjustment of wages of labour forces with respect to CPI index along with the intermediate inputs' components that intensify the size of price indices increments. 2) Construction/, textiles, clothing and leather products/ and chemical products have the highest price indices in both scenarios, respectively. In contrast, crude oil and natural gas/, financial/ and private business services have the least price indices, in the first and second scenarios, respectively. Thus, the correlation coefficient of the price indices of products of these scenarios is estimated at about 0.98. On the other hand, in these scenarios, the effects of exchange rate on price indices of products are similar to each other to some extent.

To examine the effects of different factors on price indices of products and EGPI, the correlation coefficients of these factors with price indexes of products are calculated. As it is shown in Table 3, the correlation coefficients of the share of domestic and imported intermediate inputs out of total inputs of products with price indices of these products are relatively high and positive. However, due to the role of wage adjustment, the sizes of these coefficients in the second scenario are smaller than those of the first one. In contrast, the size of the correlation coefficient of wages' share in total inputs of products with their price indices is -0.04, which is negative but very low. It seems that there are a number of reasons for this phenomenon. Since a part of households' consumptions is imported, it is not adjusted except in the initial shock. Hence, the wages of labour forces are not adjusted exactly with respect to price indices of products. Another reason of

this phenomenon concerns the small share of wages in total products that is about 12 percent.

Table 3: The Effect of 10% Exchange Rate Devaluation on Price Indices of Products in Different Scenarios

Goods and service	Scenarios		
	1	2	3
Farming products	100.46	100.51	110.13
Livestock products	100.86	100.93	110.13
Wood and wood products	100.24	100.53	110.15
Fishery	100.58	100.75	110.14
Crude oil and natural gas	100.03	100.06	110.14
mining	100.39	100.56	110.14
Electricity, gas and water	100.24	100.46	110.15
Foods, beverages and tobacco	101.42	101.52	110.12
Textiles, clothing and leather products	102.01	102.22	110.12
Petroleum refinery pro.	100.63	100.72	110.13
Chemical products	101.86	102.00	110.12
Metallic mineral products	100.78	101.01	110.14
Other industries	101.63	101.79	110.12
Machinery and equipment	101.61	101.80	110.12
Construction	102.80	102.94	110.11
Wholesaling and retailing services	100.77	101.04	110.14
Restaurant and hotel	100.17	100.26	110.14
Transportation	100.67	100.86	110.14
Post, telephone and telegraph	100.56	100.72	110.14
Financial intermediary service	100.13	100.41	110.15
Residential service and imputed rent	100.17	100.64	110.16
Private business services	100.13	100.17	110.14
Public administration	100.67	100.86	110.14
Education	100.78	101.26	110.15
Health	100.21	100.83	110.17
Other services	100.64	100.96	110.15
Correl. Coe.* Imports share	0.99	0.97	-0.76
Correl. Coe. Intermediate Inputs share	0.63	0.59	-0.59
Correl. Coe. Wages share	-0.24	-0.04	0.79
Correl. Coe. Operating Surplus share	-0.57	-0.68	0.06

*: Correlation Coefficients

Resources: Authors

Finally, as shown in table 3, in the third scenario, in which all segments of value added are adjusted with respect to price indices to protect the real value of their earnings, the price indices of products and subsequently the EGPI will change as much as the initial shock in the exchange rate. Thus, the size of EGPI will rise as much as exchange rate devaluation, i.e., ERPT is complete. On the other hand,

in the case in which all components of primary inputs are adjusted with respect to price shock along with the intermediate inputs, an exchange rate devaluation policy leads to an equivalent inflation in exported goods' prices that neuter the effect of this policy.

To display the role of different factors on price indices of products, the correlation coefficients of these factors with price indices of goods and services are calculated. According to the results of the research, the correlation coefficients of the share of intermediate inputs and imports in total inputs of these products with the price indices of products are negative, whereas the correlation coefficients of the share of wages and operating surplus with the price indices of products are positive. In other words, the increments in the prices indices of products have contrary relationships with the share of intermediate inputs and imports in total inputs of these products, whereas the increments in the prices indices of products have similar relationships with the share of wages and operating surplus of these products in their total inputs. A comparison among the price indices of products in scenario 3 with scenarios 1 and 2, indicates that this is due to the role of the adjustment of these factors as well as the adjustment of domestic and imported inputs of these products that leads the price indices of products to increase by about 10%.

6. Conclusions

The effect of exchange rate devaluation policy on the price of exported products and the EGPI is dependent on the situation of economies. In the case in which one or some of the primary factors' owners do not adjust their earnings as much as increments in price indices, the pass-through is partial. Hence, the exchange rate devaluation policy will lead to a decrease in the real price of exported goods' prices. Consequently, the exchange rate devaluation can expand the level of exports.

In contrast, in the case in which the exchange rate devaluation is exactly intensified by economic agents through adjusting their earning with respect to price indices' increment to prevent their welfare, using this policy will have no benefits for real exported goods' prices and the level of exports in this case. On the other hand, the effects of this policy are neutered by inflation. Hence, due to a complete pass-

through of exchange rate devaluation, using this policy leads to an increase in EGPI without any benefits to exported products' prices.

In our case study of Iran, the ERPT of 10% devaluation in exchange rate in cases where all agents will not adjust their earnings exactly with respect to price indices, are quite inconsiderable. The level of increment in price indices of products is to some extent dependent on the share of imported and domestic intermediate inputs in total inputs of products, respectively. In contrast, the price indices of products and the ERPT of 10% devaluation in exchange rate in the case in which all actors adjust their earnings exactly with respect to price indices of products are equal to 10%. Thus, due to a complete pass-through, this policy is neutral and has no decrement in the level of real prices of products.

References

Aziz, M. N., Rahman, M. S., Majumder, M. A., & Sen. S. (2013). Exchange Rate Pass-Through to External and Internal Prices: A Developing Country Perspective. *Journal of Applied Business and Economics, 15*(3), 128-143.

Banik, N., & Biswas, B. (2007). Exchange Rate Pass-Through in the US Automobile Market: A Cointegration Approach. *International Review of Economics and Finance, 16*(2), 223-236.

Brissimis, S. N., & Kosma, T. S. (2007). Market Power and Exchange Rate Pass-Through. *International Review of Economics & Finance, 16*(2), 202–222.

Caselli, F. G., & Roitman, A. (2016). Non-Linear Exchange Rate Pass-Through in Emerging Markets. *IMF Working Paper, WP/16/1*, Retrieved from https://www.imf.org/external/pubs/ft/wp/2016/wp1601.pdf.

Dornbusch, R. (1987). Exchange Rates and Prices. *American Economic Review, 77*(1), 93–106.

Gagnon, J., & Knetter, M. M. (1995). Markup Adjustment and Exchange Rate Fluctuations: Evidence from Panel Data on Automobile Exports. *Journal of International Money and Finance, 14*(2), 289–310.

Mallik, S., & Marques, H. (2008). Exchange Rate Transmission to Industry-Level Export Prices: A Tale of Two Policy Regimes in India. *IMF Staff Papers, 55*(1), 93-108.

María-Dolores, R. (2010). Exchange Rate Pass-Through in New Member States and Candidate Countries of the EU. *International Review of Economics and Finance*, *19*(1), 23–35.

Mishkin, F. S. (2008). Exchange Rate Pass-Through and Monetary Policy. *NBER, Working Paper, 13889,* Retrieved from http://www.nber.org/papers/w13889.pdf.

Ozkan, I., & Erden, L. (2015). Time-Varying Nature and Macroeconomic Determinants of Exchange Rate Pass-Through. *International Review of Economics and Finance*, *38*(1), 56–66.

Taylor, J. B. (2000). Low Inflation, Pass-Through, and the Pricing Power of Firms. *European Economic Review*, *44*(7), 1389-1408.

Sinha, R. S., & Pyne, P. K. (2011). Exchange Rate Pass-Through and India's Export Prices. *Trade and Development Review, 4*(1), 41-63.

Vigfusson, R. J., Sheets, N., & Gagnon, J. (2007). Exchange Rate Pass-Through to Export Prices: Assessing Some Cross-Country Evidence. *Discussion Papers, 902, Board of Governors of the Federal Reserve System International Finance*, Retrieved from http://www.federalreserve.gov/Pubs/ifdp/2007/902/ifdp902.pdf.

Wang, K. L., & Wang, C. S. (1999). Exchange Rate Pass-Through and Industry Characteristics: The Case of Taiwan's Exports of Midstream Petrochemical Products. In Ito, T., & Krueger, A. O. (Eds.), *Changes in Exchange Rates in Rapidly Developing Countries: Theory, Practice, and Policy Issues* (211-234). Chicago: The University of Chicago Press.

Zorzi, M. C., Hahn, E., & Sanchez, M. (2007). Exchange Rate Pass-Through in Emerging Markets. *Working Paper Series, 739,* Retrieved from
https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp739.pdf.