The Role of Primary Factors and Households in the Transmission of Exchange Rate to Domestic Prices of Raw and Processed Food Products

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Introduction

A higher exchange rate leads to a higher price for imported goods. If imported goods are intermediate inputs used in the production of domestic goods, then production costs and, subsequently, domestic good prices will increase (Helmy et al., 2018). However, primary economic factors such as labor and capital can also play a role in this transmission. Because of the increased cost of imported and domestic goods due to an increased exchange rate, owners of primary factors, including households who are also consumers, face an increase in their living costs. Therefore, to cover their costs, households have to supply the primary economic factors at a higher price, which again increases the price of domestic goods. Now, the question is: what part of the transmission of an increased exchange rate is carried by intermediate factors, and what part is carried by primary economic factors through households? The answer to this question is important for policymakers regarding the price of food products, especially in countries such as Iran that experience a continuous increase in the exchange rate. Economic policies that control the price of food products would support food security.

Objectives

The present study aims to calculate the effect of an increase in the exchange rate on food prices, with and without consideration of the role of institutions in transmitting these effects. Comparing the results makes it possible to identify the institutions' roles, which have not previously been reported.

Model

In estimating the effect of an increase in the exchange rate on the price of goods only through the increase in the price of imported intermediate inputs, it is necessary to consider the relationships between the production sectors. The input-output (I-O) model shows these relationships well. Based on this model, the effect of an increase in the exchange rate on the price of domestic goods is calculated through equation (1) (Hoang & Kiyotaka, 2016):

$$dP^d = (I - A'^d)^{-1}(de\, A^m) \qquad (1)$$

dP^d = Change of domestic prices index
$(I - A'^d)^{-1}$ = Matrix of multiplier coefficients for domestic commodities
A'^d & A^m = Technical coefficients matrices of domestic and imported intermediate commodities
de = Change in the exchange rate

To examine the role of primary economic factors in the transmission of exchange rates on commodity prices, it is necessary to examine the relationship of these factors with production sectors. A social accounting matrix (SAM) price model builds on the I-O price model presented by Hoang & Kiyotaka (2016). The SAM price-based model is used in the form of equation (2):

$$dP^d = (I - A^{d\prime})^{-1} \begin{bmatrix} A_{ij}^{m\prime}\, de \\ 0 \\ A_{ih}^{m\prime}\, de \end{bmatrix} \qquad (2)$$

$A_{ij}^{m\prime}$ & $A_{ih}^{m\prime}$ = Coefficient matrix of the average expenditure of activities and households on imported goods.

Results & Discussion

Comparing the results of the I-O model and SAM model shows that the coefficients obtained using the SAM model are between 1.5 and more than three times the coefficients of the I-O model (Table 1). For example, the price of crop farming products, in response to a 100% increase in the exchange rate, increases by 6% without considering the role of primary production factors and households, and increases by 18.5% in the case of considering these roles. These results emphasize the importance of the role of primary economic factors in exchange rate transmission. Moreover, the greatest difference between the coefficients of the SAM and I-O models is related to horticulture products, crop farming products, and fish & other fishing products. The reason is that the role of households and primary economic factors in the transmission of an increased exchange rate to the price of these products is significant. Whereas for processed food products, livestock & poultry products, and beverages, the transmission of the exchange rate is mainly carried through intermediate inputs.

Table 1-Comparing the effects (%) of the exchange rate increase based on the I-O model and the SAM model

Row	Commodity name	Effect (I-O)	Effect (SAM)	Effect (SAM)/ Effect (I-O)
1	Crop farming products	6.0	18.5	3.08
2	Horticulture products	4.5	16.0	3.55
3	Livestock & poultry products	21.0	31.0	1.47
4	Fish & other fishing products	7.6	18.1	2.39
5	Processed food products	14.9	25.3	1.70
6	Beverages	19.1	28.2	1.48

Conclusions

This study shows that, by not considering the role of households and the primary factors supplied by them in the I-O model, there was an underestimation of the effect of an exchange rate increase. As a result, it is better not to rely solely on I-O results which have been favored by Prakash & Sharma (2009), Sharify & Larimi (2015), Hoang & Kiyotaka (2016), and Aydogus et al. (2018). Therefore, we suggest that researchers analyze the effects of an exchange rate increase by using SAM-based models. Moreover, policy makers should consider both the path of the primary inputs and the path of intermediary inputs to prevent the increase in food prices due to an increased exchange rate.

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