Investigating the Marshall-Lerner's Condition Regarding the Intermediate Goods Importing in Iran's Economy

Shaban Mostafaee[1, *], Hasan Aama[2], Parvaneh Kamali Dehkordi[1]

[1]Department of Economy, Payame Noor University, Tehran, Iran

[2]Department of Economy, Payame Noor University, Kashmar, Iran

Email address:
sh.chaos@gmil.com (S. Mostafaee), hasanaama@gmail.com (H. Aama), parvanehkamali@gmail.com (P. K. Dehkordi)
[*]Corresponding author

Abstract: The Marshal-Lerner's condition is an answer to this question: Can a devaluation of the currency improve the balance of payments (net export value) in the country's interest? This condition is with some hypotheses that one of them is the independence of exports from imports. Concerning the statistical evidences of Iran's economy based on the statistics of the Central Bank, it is specified that more than 80 percent of Iran's imported goods are the intermediate goods (investing and intermediate). Therefore, in this research, we have examined the mentioned condition by considering exports as a function of imports. Firstly, regarding the exports as the function of imports, the Augmented Marshal-Lerner's condition has been extracted, then for investigating the Marshal-Lerner's condition in Iran using the Auto-Regression Distributed Lag (ARDL) during the 1961-2020, we have estimated the demand functions of import and export. The scientific results of the study show that by violating the condition of independence of exports and imports, an amount equal to the elasticity of imports relative to the real exchange rate in the elasticity of exports relative to imports is added to the Marshal-Lerner's condition. The experimental results of the research, based on the estimation of the extractive model of the scientific sector, do not confirm the establishment of the Augmented Marshall-Lerner condition in the Iranian economy. Therefore, the devaluation policy cannot help improve the trade balance.

Keywords: Marshall-Lerner's Condition, Balance of Payments, Intermediate Goods, Real Exchange Rate, ARDL Approach

1. Introduction

The importance and the role of foreign trade and its topic are not covered for anyone in international economy. Undoubtedly, the international trade is one of the most important economic discussions. In this field, the balance of payments is an important criterion for measuring and evaluating the trade exchanges flow and Marshall the capital transferring in an open economy. The important components of balance of payments, current account (the difference between the imports and exports of goods and services), and the capital account. For the developing countries, the balance of payments and the status of the current account are the most important variables and are considered as the strategic limitations of macro economy,

because the imbalance of the foreign trading pattern has undesirable effects on the domestic economy (production, inflation, budget, government, etc.). Answering the question that if decreasing the value of money can improve the net value of export (the current account's balance) for the country is done through the investigation of Marshall-Lerner's condition in Iran's economy. The investigation of Iran's economy shows that during the investigation period the proportion of the intermediate goods (including the capital goods and raw materials) is more than 80 percent. Accordingly, for calculating the Marshall-Lerner's condition considering the intermediate goods is important.

Table 1. *The proportion of importing components from the whole imports during 1961 to 2020.*

Import Goods	1961-1977	1978-1982	1983-1989	1990-2003	2004-2020
Intermediate Goods	85.56	76.13	83.12	86.78	87.21
Consumption Goods	15.43	23.86	16.87	13.21	12.78

Source: [30].

Regarding the remarkable proportion of the intermediate goods from the whole imports the Marshall-Lerner's condition is being investigated with reversing one of the mentioned conditions, which is the independency of exports and imports. In this study, firstly the theoretical bases including the discussion of Marshall-Lerner's condition and the hypotheses, which are based on this condition, are being investigated. Then, the Marshall-Lerner's condition will be approved considering this matter that the exports are a function of imports. Following this, the research methodology and the results of the study are being explained and finally, the results are interpreted.

2. Review of the Literature

2.1. Theoretical Bases

The most famous analysis on the policy of decreasing the value of national currency is the view of elasticity is which analyzes the reaction of import and exports of the country to this policy. This view flourished for the first time by Bickerdick and Marshall, and after that in the 1940s by the studies of Robinson and Metzler [13].

The primary goal of increasing the currency nominal rate is to encourage the exports and limit the imports. In fact, the policy of decreasing the values of currency causes the increasing price of foreign exchange, which is followed by domestic increasing of imports and foreign decreasing of the exports (the domestic price of the foreign imports of the country). The response of the imports content of both countries to the domestic prices depends on their elasticity. If the intended elasticity is big, the decrease of imports and exports will be remarkable which leads to the improvement of the balance of payments. Generally, if the two cases of elasticity is more than one, the policy of nominal increasing currency rate leads to the improvement of the balance of payments, which is known as Marshall-Lerner's condition. Thus, in case that the Marshall-Lerner's condition is established

the policy of decreasing the value of national currency has positive effect on the balance of the payments [15].

If η_x is the exports demand's elasticity and η_M the imports demand's elasticity the equation of $\eta x + \eta M > 1$ is known as the Marshall-Lerner's condition and expresses this matter that if the sum of sensitivities of the exports and imports' demand is more than one, then the balance of payments reacts normally to the currency changes.

The hypotheses, which the Marshall-Lerner's condition is based on:

1) The exports and imports' supply and demand is the main factor for determining the currency rate and its fluctuations [7].
2) Supplying the exports and demanding the exports depend only on the national prices, which are measured based on the domestic currency [10].
3) The level of prices is not affected by the nominal rate increasing of currency [17].
4) Exports are independent from the imports. In other words, the content and combination of the imports do not affect the country's exports [23].
5) In this view, no attention is paid to the income effects and the production capacity and also the monetary conditions (the interest rate) for analyzing the effects of money value decreasing [21].

In this view, no attention is paid to the income effects and the production capacity and also the monetary conditions (the interest rate) for analyzing the effects of money value decreasing [21].

To prove the Marshall-Lerner's condition reversing the hypothesis of exports' independency from the imports it is assumed that export is a function of import. Thus, the fourth hypothesis from the above hypotheses is reversed. In this case we have:

$$X = f(\varepsilon, M(\varepsilon)), M = f(M(\varepsilon))$$

Regarding the definition of trade balance in form of $\frac{x}{m}$ we have:

$$\frac{X}{M} > 1, Log\left(\frac{X}{M}\right) > 0$$

$$Log\left(\frac{X}{\varepsilon M}\right) = [(\varepsilon, M(\varepsilon))] - \log\varepsilon - \log[M(\varepsilon)]$$

To investigate the Marshall-Lerner's condition the trade balance to the real currency rate is differentiated which is a following:

$$\frac{\partial \log\left(\frac{X}{\varepsilon M}\right)}{\partial \varepsilon} = \frac{1}{X}\frac{\partial X}{\partial \varepsilon} + \frac{1}{X}\frac{\partial X}{\partial M}\frac{dM}{d\varepsilon} - \frac{1}{\varepsilon} - \frac{1}{M}\frac{1}{\varepsilon}\left[\frac{\varepsilon}{M}\frac{dM}{d\varepsilon}\frac{M}{X}\frac{\partial X}{\partial M} + \frac{\varepsilon}{X}\frac{\partial X}{\partial \varepsilon} - \frac{\partial}{M}\frac{dM}{d\varepsilon} - 1\right]$$

$$\frac{1}{\varepsilon}[E_M E_{XM} + E_X - E_M - 1] > 0$$

Is the above equation is written based on the absolute value, for the balanced Marshall-Lerner's condition based on reversing the independency of exports and imports we will have:

$$|E_X| + |E_M| > 1 + |E_M E_{XM}|$$

E_x and E_M are respectively the elasticity of exports and imports towards the real currency rate and E_{xM} the elasticity

of exports to the imports. From the above equations, it is concluded that if the export is a function of import, then the absolute value of the import and export elasticity should be more than one to establish the Marshall-Lerner's condition. In other words, the amount of exports elasticity than imports multiplied by the import elasticity is added to the mentioned condition.

2.2. Background Research

A great deal of studies has been done inside and outside of the country to see if the decrease of currency value improves the balance of payments or not. What that is concluded from all of the studies is the lack of a consensus relevant to the proposed subject. In this way that some of the performed studies came to completely different conclusions. For better familiarity with the empirical literature environment, the relation of the currency rate and trade balance, consequently investigation of Marshall-Lerner's condition regarding the great content of the studies, a number of domestic and foreign studies that are diverse both in the way of theoretical attitude and in the way of the selected samples are presented.

2.2.1. Domestic Studies

Shakibaye (1992) in a study "the effect of decreasing the value of currency on imports" has estimated the imports elasticity towards the import goods' price to the domestic goods as -1.52. Thus, based on the imports elasticity only and without noticing the exports elasticity the execution of decreasing the currency rate policy by limiting the imports improves the balance of payments, which means the establishment of Marshall-Lerner's condition in Iran's economy [25].

Rahimi Brooujerdi (1993) in a study with title of "investigating the effect of decreasing the value of currency on the balance of payments of IRI: estimation the generalized Marshall-Lerner's condition", the Marshall-Lerner's condition and its generalized condition have been estimated for three periods of 1966-1988, 1974-1988, and 1976-1988. He has investigated the generalized condition of the above-mentioned condition by multiplying the non-petroleum exports share of the whole exports (β) by the exports elasticity and with the sum of the import elasticity. The obtained results are estimated as following. The obtained results for the Marshall-Lerner's condition indicate that this condition is correct for three periods [22].

Jowhari (1994) in some studies, "the effect of decreasing the value of real on imports" and "the effect of decreasing the value of real on the import of capital and intermediate goods of the mining and industry part", he has investigated the effect of decreasing the value of currency on the imports and the Marshall-Lerner's condition in Iran's economy. He assumed that the exports do not react to the changes in currency value. So, for Marshall-Lerner's condition to be correct it is necessary that the import price elasticity be more than one. Therefore, the results of his study with the export elasticity of zero and the import elasticity of -1.56 indicate that the mentioned condition is confirmed for Iran's economy [11].

Zebaiye Farymany (1997) in a study, "investigating the effects of decreasing the value of national currency on the foreign trade", he obtained the imports elasticity towards the real exchange rate as -and the exports elasticity as 1.3 which means the establishing of Marshall-Lerner's condition [29].

Mohammedi Aghdam (2002) in a study with the title of "the effect of decreasing the value of currency on the trade balance (without petroleum) in Iran's economy during 1979-1999, he has investigated the Marshall-Lerner's condition for Iran's economy. Firstly, for investigation this condition, he estimated some econometric models appropriate for both parts of non-petroleum exports and imports of Iran in which he has obtained the export elasticity as -0.36, import elasticity as -0.17, and it has been concluded that with decreasing the value of national currency during 1979-1999 the trade balance is getting worse; accordingly, the Marshall-Lerner's condition is not confirmed for Iran's economy [18].

Kavand (2001) in an article, "the effect of decreasing the currency value on a dozen of the trade balance developing countries and Iran through the elasticity", he has investigated the effect of decreasing the value of currency on the trade balance in twelve developing countries. The results of his study show that the Marshall-Lerner's condition is established for the investigated countries in long-term condition. In addition, the countries, which experience the condition in short term, have experience the improvement of payments balance [12].

Dezhpasand and Gudarzi (2009) in a paper, "investigating the effect of decreasing the currency value on Iran's payments balance (realization of Marshall-Lerner's condition in Iran)", they did not confirm the significant relationship between the exchange rate and the amount of exports and imports in estimation the exports and imports' equations using the time series and integrated data. As a result, the establishment of the Marshall-Lerner's condition was not confirmed in Iran both in long term and in short term [5].

2.2.2. Foreign Studies

Bhagwat and Onitsuka (1974) in a paper, "the response of exports and imports to the decreasing currency value policies in non-industrial countries in the 1960s", they have investigated the effect of currency value decreasing policy on exports and imports. The results of his study shows that countries that applied the policy of decreasing the currency value to correct and balance the payments balance have had increasing incomes of exporting. Counties that have had the fixed exchanging rates regimes and have locked their currency value in French Frank or England's Sterling Pound did not show an identical reaction against the decreasing currency value policy. That is, the income of some groups has increased and of others has remained fixed [3].

Khan (1974) in another study, "the exporting and importing demand in developing countries", he has studied the effect of currency value decreasing on the developing countries' export and import. In this study, it is assumed that the market forces determine the demand for the developing countries import and the global demand for export; accordingly, these goods of

trading by these countries are not sensitive to the exchanging price. His main goal has been the estimation of the demand function for export and import of fifteen developing countries and testing the effect of decreasing currency value on the content of these countries' exports and imports. Khan's results showed that the Marshall-Lerner's condition for most of the countries under the investigation such as Argentina, Brazil, Colombia, Costa Rica, Ecuador, India, Morocco, Pakistan, Peru, Philippines, Sri Lanka, Turkey, and Uruguay in 1951-1969 is confirmed and only Chile and Ghana are excluded from this condition [14].

Edwards (1985) in a study, "the exchange rate changes in developing countries, analytic and empirical evidences", he showed that the currency decreasing policy has failed in most of the developing countries and only in a few of these countries has been successful. In addition, he concluded that those countries that have been unsuccessful in executing the decreasing currency value policy have applied the financial and monetary expansive policies parallel with this policy. Accordingly, in the absence of coordinated financial and monetary the imposing of decreasing the national currency policy may not be followed by desirable results, i.e. the exporting incomes of a group have been increased and remained without any changes for another one. In the case that the countries who have applied the adaptable demand management policies with decreasing the currency value to control the domestic value and decreased the deficit, have been remarkably successful in decreasing the real currency value and the balance of payments [8].

Bahmani-Oskooee and Niromand (1998) in an article, "long and short term price elasticity and reviewing the Marshall-Lerner's condition", using data during 1962-1992 estimated the trade elasticity to investigate the Marshall-Lerner's condition for about 30 countries. The results of their estimation show that the Marshall-Lerner's condition is confirmed in long term in most of the investigated countries. Thus, in these countries decreasing the currency value has improved the trade balance [2].

Fun *et al* (2004) in a study, "is the Marshall-Lerner's condition established in China? The empirical analysis based on Social Accounting Matrix (SAM) in 2000 China", investigated the establishment of the mentioned condition from the empirical analysis analyzing based on the general balance view. This studying group investigated the mentioned condition without considering the social accounting matrix firstly which by calculating the export elasticity as -0.85 and importing elasticity as -1.077 and the summation absolute value of 1.93, the establishment of the Marshall-Lerner's condition was confirmed for China. However, with considering the social accounting matrix they did not confirmed the above condition for China's economy [9].

Wu Ying (2010) in a paper, "reviewing the Marshall-Lerner's condition under the investigation of empirical-trade evidences in China", have investigated the Marshall-Lerner's condition based on the real exchange rate of the Chinese money compared with Dollar. The results of his findings show that the mentioned condition is established for China's

economy, i.e. increasing the real exchange rate has improved the trade balance [28].

Dong (2017) in a paper, " is the testing the Marshall-Lerner condition between the U.S. and other G7 member countries", examined the Marshall-Lerner condition for the six bilateral trade balances between the U.S. and Canada, France, Germany, Italy, Japan, and the U.K. from 1985 to 2016. The main contribution of this paper is that it tests for and incorporates nonlinearity into the balance of trade equation of Boyd, Caporale, and Smith (2001). Their results indicate that price elasticities for exports and imports hardly satisfy the Marshall-Lerner condition in either of the two regimes. This means that higher real exchange rate depreciation may not necessarily improve the U.S. bilateral trade balance with all of the other G7 member countries [4].

Adams and Metwally (2020) in a study examined the extent to which evidence can be found for the Marshall-Lerner (ML) condition on Egypt's trade balance. For this purpose, the theoretical foundations of ML are presented and then tested using Egyptian trade data from 1965 to 2017. The results show that the export model strongly suggests that real exports of Egyptian goods and services are elastic with respect to changes in the real effective exchange rate (REER), with a coefficient weight of -1.64 and is significant at 1%. However, for the import model the coefficient weight of the REER -1.17 and is significant at 1%. This result contradicts ML theory, where an increase in the REER makes imports cheaper and thus causes them to increase [1].

3. Research Methodology

In this research, the unit root of Augment Dicky-Fuller for investigating the variables stationary and for investigating the long-term relation (integrated) demand functions of exports and imports for investigating the Marshall-Lerner's condition reversing the precondition of independency of exports from imports the method of ARDL is used. The main advantage of ARDL method is that, the variables with the different conversion degrees can be used [6, 20]. Another advantage of this method is that, this model can cover enough lapses for the process of data production in a modeling framework of general-to-specific. In addition, this method avoids the problems resulted from the transiency of time series data [16]. In other integrated methods including Johansen and Johansen-Juselius, all of the variables should be I (1) (Convergent and first order). If the variables have a degree of convergence, these methods are not appropriate methods. However, the ARDL pattern is the best option for investigating the integration in this condition [24, 26].

3.1. Research Variables and Statistics

The required variables for estimating the research models based on the time series data during 1961-2008 were collected from the Central Bank of Iran and the World Bank as following [31]:

LIMP: logarithm of the country's imports with the fixed prices of 2005 in million dollars.

LEXP: logarithm of the country's exports with the fixed prices of 2005 in million dollars.

LGDP: logarithm of gross domestic price in base price with the fixed prices of 1997 in Billion Rials.

LGDPW: logarithm of global gross domestic with the fixed prices of 2000.

$$LRER = Log(EP_w/P_D): \text{ real exchange rate.}$$

E: the nominal rate of exchange in one Dollar and Rial units.

P_W: the index of the whole produced and consumed global goods in the base year of 2005.

P_D: the index of produced and consumed produced goods inside the country based on the base year of 1997.

3.2. Model Introduction and Specification

Based on the theoretical bases and the empirical studies, the pattern of exports and imports demand to estimate the Marshall-Lerner's condition reversing the precondition of independency of exports and imports is used as following:

$$\text{Import demand function } M^d = F(Y, RER,)$$

$$\text{Export demand function } X^d = F(YW, RER, IMP)$$

In the above model, Y and YW indicate the national and global income, respectively and their relationship with the import demand is a direct relationship in a way that the increase of national income causes the increase of imports and the increase of global income causes the increase of exports. RER is the real exchange rate (the multiplying of nominal exchange rate by the foreign prices divided by domestic prices), it is expected that the real exchange rate's relationship with exports and imports is reverse and direct, respectively. IMP indicates the whole imports of the country. Because of the dependency of exports to imports, with increasing the imports the rate of exports is increased too.

For the model's specification the logarithm pattern for elasticity is used.

$$LIMP = \alpha_1 LGDP + \alpha_2 LRER + \alpha_3 D + U_t$$

$$LEXP = \alpha_1 LGDPW + \alpha_2 LRER + \alpha_3 LIMP + \alpha_4 D + U_t$$

The first equation indicates the imports pattern and the second equation indicates the exports pattern.

3.3. The Obtained Results from the Models' Estimation

3.3.1. The Results of Unit Root Test of Augment Dicky-Fuller (ADF)

For assurance of the model's estimating coefficients the stationary tests should confirm the variables' stationary. In the present investigation, common Augment Dicky-Fuller (ADF) does the model variables' stationary test. To this aim, for each of the variables first the unit root of augment Dicky-Fuller at the variable's level is done with the existence of exogenous variables of intercept and time process.

In the current study, the maximum length of applied lapse

to determine the length of the optimized lapse and the criterion to determine the length of lapse is the Schwarz's Bayesian criterion. In the next stage, the reliability test for the difference amounts of the time series variables is accomplished. The related results to this test at the first order level and difference for all of the model's variables are provided in table 2.

Table 2. The results of unit root test of Augment Dicky-Fuller (ADF).

variable	Statistic of unit root of Augment Dicky-Fuller		result
	intercept	Trend and intercept	
LIMP	ADF(1)=-1.61 -2.54[1]	ADF(1)=-2.90 -3.53	Non-stationary
LEXP	ADF(1)=-1.99 -2.94	ADF(1)=-1.69 -3.53	Non-stationary
LGDP	ADF(1)=-1.74 -2.93	ADF(1)=-2.84 -3.51	Non-stationary
LGDPW	ADF(0)=-2.03 -2.94	ADF(1)=-3.40 -3.54	Non-stationary
DLIMP	ADF(0)=-3.68 -2.94	ADF(0)=-3.69 -3.53	stationary
DLEXP	ADF(0)=-4.42 -2.94	ADF(0)=-4.62 -3.53	stationary
DLGDP	ADF(0)=-3.71 -2.93	ADF(0)=-3.64 -3.51	stationary
DLGDPW	ADF(1)=-4.77 -2.94	ADF(1)=-4.71 -3.54	stationary

Source: Research Findings.

3.3.2. Investigating the Existence of Long-run Relationship with Pesaran Test

In this method for selecting the numbers of variables optimized lapse the Schwarz's Bayesian method has been used. For deducting and analyzing in this method three equations of dynamic, long run and correcting error were used. To investigate the integration equation between the pattern's variables the critical amounts which presented by [19] were used and regarding the fact that this data is annually the maximum lapse of two was used. Since the amount of calculating F for both functions of exports and imports go beyond the critical amount high range the H_0, concerning the lack of long-term relationship can be rejected. The results are mentioned in table 3.

Table 3. Pesaran test.

function	F - statistic	Surface 90%		Surface 95%	
		I(0)	I(1)	I(0)	I(1)
import	6.79	2.71	3.81	3.21	4.37
export	16.77	3.06	4.08	3.53	4.67

Source: Research Findings.

3.3.3. Investigating the Short-run Relationship of Export and Import Models, and Diagnostic Tests

After being sure of the existence of the integrated relationship between the pattern's variables, the dynamic relation is estimated. The results of this estimation for both functions of exports and imports are provided in table 4:

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[1] 3-amount of critical in surface 5%

Table 4. *The estimate of the short-run relationship models by ARDL Approach.*

Function	variable	Coefficient	Std.Error	t-statistic	P-value
Import Model ARDL(2,0,0)	LIMP(-1)	1.23	0.15	8.16	0.000
	LIMP(-2)	-0.45	0.14	-3.22	0.003
	LGDP	0.23	0.06	3.69	0.001
	LRER	-0.14	0.04	-3.00	0.005
	DW1	-0.2	0.11	-1.74	0.092
	R^2	0.93932			
Export Model ARDL(1,0,0,0)	LEXP(-1)	0.731	0.930	7.8	0.000
	LGDPW	0.951	0.268	3.53	0.001
	LRER	0.057	0.519	2.89	0.007
	LIMP	0.253	0.587	2.35	0.026
	C	-3.0006	8.7	-3.44	0.002
	R^2	0.82550			

Source: Research Findings.

These results are Diagnostic Tests in table 5.

Table 5. *Diagnostic Tests for export and import Equations.*

Function	statistic Tests	Statistic LM	F-Statistic
Import Model	Serial correlation	0.226 (0.605)	0.22 (0.640)
	Function form	0.110 (0.750)	0.08 (0.774)
	Normality	0.195 (0.911)	-
	Heteroscedasticity	2.016 (0.151)	2.07 (0.160)
Export Model	Serial correlation	1.4357 (0.231)	1.259 (0.274)
	Function form	0.298 (0.604)	0.2251 (0.639)
	Normality	3.021 (0.228)	-
	Heteroscedasticity	1.91 (0.167)	1.916 (0.177)

Source: research findings.

3.3.4. Stability Tests

The integration returning residual statistics (CUSUM) and the square of integration returning residual (CUSUMQ) for the exports and imports functions. In these tests, the H_0 tests the parameters' stability in the significance level of 5%. The certainty distance in these, two tests are two direct lines, which show the certainty level of 95%. If the tests statistical place between these two lines the H_0 showing the coefficients' stability cannot be rejected. Thus, the parameters' stability is confirmed [27].

3.3.5. Estimating the Model's Long-run Coefficients

After estimating the short-term equations using the ARDL method, the long-term coefficients are estimated. The results of the long run equations of both models of exports and imports are provided in table 6.

Table 6. *Estimating the model's long run.*

Function	variable	Coefficient	Std.Error	t-statistic	P-value
Import Model ARDL(2,0,0)	LGDP	1.07	0.07	14.96	0.000
	LRER	-0.14	0.04	-3.00	0.005
	DW1	-0.94	0.47	-1.98	0.056
Export Model ARDL(1,0,0,0)	LGDPW	3.52	1.29	2.71	0.011
	LRER	0.21	0.704	2.25	0.032
	LIMP	0.778	0.34	2.25	0.013
	C	-111.32	42.02	-2.63	0.013

Source: Research Findings.

The long-term model for each of the equations is as following:
Imports' function:

$$LIMG = b_1 LGDP + b_2 LRER + b_3 DW1$$

Where the obtained coefficients are as following:

$$LIMP = 1.07 LGDP - .66 LRER - .94 DW1$$

Exports' function:

$$LEXP = b_1 LGDPW + b_2 LRER + b_3 LIMG + b_4 C$$

where by the obtained long term coefficients is turned into the following one:

$$LEXP = 3.52LGDPW + 0.21LRER + 0.778LIMG - 111.32C$$

From the table 6 for the import function, it can be concluded that in long-term condition the national gross production variables and the real exchange rate respectively have positive and negative effects on the real imports, which this influence is significant at the level of 95%.

From the long-term equations and based on the research findings it is observed that the imports' elasticity towards the real exchange rate is obtained as -0.66. From the imports' elasticity towards the real exchange rate, it can be concluded that one percent of increase in real exchange rate decreases the real imports in 66%. In addition, it can be concluded that with the price increase of the domestic currency in opposite to the foreign currencies, the foreign goods are expensive inside the country and the demand rate of real imports is decreased.

In addition, from the table 6 for the exports' function it is concluded that regarding the significance of all coefficients of the exports' demand equation the exports elasticity towards the real exchange rate and imports is respectively 0.21 and 0.778. In other words, one percent increasing in the real exchange rate increases the real exports with the rate of 0.21. In addition, one percent increasing in imports rate, increases the real exports with rate of 0.778.

3.3.6. The Estimation of the Error Correction Models

The error correction pattern indicates the short-term relationship between the pattern's independent and independent variables. The relevant coefficient are estimated in the exports demand model (-0.26) and in the imports demand model (-0.22) which indicate the balanced speed of the imbalance process towards the balance in long-term condition. The results are provided in table 7.

Table 7. *The Estimation of the Error Correction Models.*

Function	variable	Coefficient	Std.Error	t-statistic	P-value
Import Model	ECM(-1)	-0.218	0.061	-3.585	0.001
Export Model	ECM(-1)	-0.269	0.093	-2.880	0.007

Source: Research Findings.

4. Conclusion

To answer the question: Can the devaluation of money improve the balance of payments (net export value) in favor of the country? The Marshal-Lerner's condition is used. Given the presuppositions in the construction of this condition, for an accurate answer according to the economic facts, it is necessary to examine the assumptions of this condition. One of these assumptions is the independence of exports from imports. According to the statistical evidence of Iran's economy, it turns out that more than 80% of our imported goods are intermediate goods. Therefore, by violating the assumption of export independence from

imports, the Marshal-Lerner's condition has been theoretically re-examined and we have reached a new equation for this condition.

Regarding the obtained equation for the balanced Marshal-Lerner's condition by reversing the independency of exports and imports and the results obtained from estimating the functions of exports and imports demand we have:

Balanced Marshall-Lerner's condition

$$|E_X| + |E_M| > 1 + |E_M E_{XM}|$$

$$|0.21| + |-0.66| > 1 + |0.778 * 0.66| \Rightarrow 0.87 < 1.51$$

From the above equation it can be concluded that firstly, the reversing exports and imports independency cause the 0.5 increasing of the Marshall-Lerner's condition amount and secondly, estimating the demand exports and imports functions show that the balanced Marshall-Lerner's condition is not confirmed in Iran. Since in this paper the precondition of exports and imports independency has been reversed, in reapproving the Marshall-Lerner's condition regarding the exports as a function of imports an amount to exports elasticity towards the imports multiplied by the imports elasticity towards the real exchange rate has been added to the mentioned condition. This added amount has been calculated in estimating the exports and imports demand using the ARDL method with the amount of 0.50.

5. Discussion

Given the lack of the Marshal-Lerner's condition in the Iranian economy, it can be said that an increase in the exchange rate will not improve the trade balance. A total conclusion which is obtained from this condition is that the increasing exchange rate policy (decreasing the national currency rate) in Iran's economy regarding the estimations and hypothesis test of establishing the balanced Marshal-Lerner's condition cannot improve the trade balance. Accordingly, with respect to the little proportion of non-petroleum exports from the whole exports of the country and regarding the high level of imports of the country increasing the exchange rate threats the domestic production. Thus, it is suggested that for improving the trade balance policies other than increasing the exchange rate should be applied.

For a more detailed examination, other hypotheses of this condition should be examined empirically and their truthfulness in economic conditions in order to reach a more consistent formula. On the other hand, it should be seen that the increase in the exchange rate was due to economic policy or non-political pressures were involved in its increase, and the side effects of the increase in the exchange rate should be considered along with trade effects.

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