

The impact of monetary and fiscal policies on balance of payments in order to fulfill the objectives of the Fifth Development Plan

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Abstract: International balance of payments is the broadest criterion of measuring the flow of trade exchanges and capital transfer in an open economy. For developing countries, the balance of payments and current account are of the most important macroeconomic variables and macroeconomic strategic constraints. On the other hand, monetary and fiscal policies are the most important political instruments of each country which influence macroeconomic variables. In this study, the impact of monetary and fiscal policies on trade balance of Iran has been investigated in the period of 1979-2012 using autoregressive technique, and using vector error correction method (VECM), the model convergence has been studied. Based on the obtained results, monetary and fiscal policies have had a negative impact on balance of payments in long term. Also, the results of vector error correction model estimation indicate the model convergence and error correction factor equals to -0.82.

Key words: Monetary and fiscal policies; Balance of payments; Autoregressive technique; Vector error correction method

1. Introduction

Since the industrial revolution and even before that, foreign trade has been always an important topic in the economy of advanced countries of the world and it has also become an urgent need for continuing the progress and industrial development. Unlike the theory that believes, the world market is the origin of economic shocks on the domestic markets of small developing countries, domestic markets can solve the domestic imbalances through compliance with the global market. The importance of the balance of payments, in the meantime, as one of the most basic issues of international trade and factors affecting that comes more explicit. Generally, the main goal of the economy of every country is sustainable development in the sense of internal balance (moderate level of unemployment) and external balance (balance of payments), which can be seen as an important factor in the economic sector of Fifth Development Plan. Thus, taking into account the interplay between internal and external sector of the economy, any economic policy should be adopted due to the interaction. Thus, considering the interaction between internal and external sector of the economy, any economy policy should be adopted due to the interaction. Monetary and fiscal policies are of the most important macroeconomic tools and being aware of how the variables affect is an important step in planning and national development. In general, two important macroeconomic tools include monetary and fiscal policies. In the economic literature of developed

countries, the role of fiscal and monetary policies is along with softening the economic cycles. Achieve economic growth has a special place in the list of economic policies objectives, and the main objective of economic policies is in fact, the growth and development. This study aims to investigate the impact of monetary and fiscal policies on the balance of payments.

2. Theoretical foundations of the study

Examining the relationship between trade balance and other variables affecting it has been always one of the major and notable topics in the basics of countries' international trade, among which the two approaches below are the most important comments available:

Marshall Lerner condition approach and J-Curve approach.

3. Marshall Lerner condition

Currency depreciation policy is applied with the aim of improving the balance of trade status or compensating the balance of payments deficit by increasing export and reducing import. Practical studies show that the implementation of policy to reduce the value of money is followed by different effects on the balance of payments of developing countries. The impact of currency depreciation on trade balance depends on the establishment of Marshall Lerner condition and fiscal and monetary policies implemented during the implementation of this policy. Marshall Lerner condition relying on market stability condition states that if the sum of

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the absolute value of import and export demand elasticity towards the exchange rate is greater than one ($|E_x + E_m| > 1$, where E_x is the elasticity of export towards the exchange rate and E_m is the elasticity of import towards the exchange rate) the foreign exchange market will be stable and currency depreciation will lead to an improved trade balance.

If the total of import and export elasticity towards the exchange rate is greater than one, Marshall Lerner relation will be established and currency depreciation will improve balance of payments; otherwise currency depreciation of the national currency will make balance of payments deficit worse. In fact, if the total of elasticity is greater than one, the effect of increasing the volume of exports and reduction of imports on the balance of payments would be larger than the effect of price on it and therefore the current balance will be improved. In this case, Marshall Lerner condition is established and there is successful currency depreciation.

4. Curve

According to many studies conducted in the literature of J-curve, researchers believe that Marshall Lerner condition is no longer able explaining the exact response a country's trade balance towards the exchange rate changes. Therefore, in the majority of studies conducted in the last two decades the J-curve has been the application basis of the correct attitude towards factors affecting trade balance.

In fact, what has led to the emergence of the J-curve phenomenon in history of international trade was the occurrence of contradictions in America's trade balance response to the dollar depreciation in 1970. In this year, America's trade balance had a surplus of 2.2 billion dollars which turned to a deficit of 2.7 billion dollars in 1971 followed by some policies. In the same year and followed by the deficit, the country's government officials decided to reduce the value of the dollar for rectifying the situation, based on what was found in the literature on international trade and thus to improve trade balance of the country. But the implementation of this policy only led to a worsening trade balance deficit in this country for more than 8.6 billion dollars (Ratha, 2004). Followed by the occurrence of paradoxical reaction, researchers began extensive studies seeking to find the answer to that.

Maggie was the first person who dealt with interpreting this phenomenon in 1973. The following diagram is a plot of the J-Curve phenomenon. As it can be seen in the diagram, if the policy of national currency devaluation is implemented at time t, first the response of trade balance to this change is negative, but as it can be seen in the figure, with the passage of time the negative effect will be reduced and we would see trade balance improvement in response to this foreign exchange policy in the long term. Thus, trade balance response to the change in the exchange rate (exchange rate appreciation or

depreciation of the national currency) in the long term could be drawn as J-shaped curve.

After Maggie, Jones and Romberg in the same year (1973) began to complement the findings presented by Maggie. After the two studies, two other researchers named as Laffer and Salant in 1976 separated from one another, studied the phenomenon of J-curve as well. But in 1979, Mills with a study on the subject, proposed three criticisms on previous studies:

1. The permanent or temporary effects of exchange rate changes on the balance of trade are not known;
2. No comparison between the calculated levels before and after the currency devaluation has been done;
3. They have not investigated the effects of this change on other variables such as government monetary or fiscal policies.

Therefore, he, correcting the defects of previous studies, presented the following equation to analyze the effects of currency devaluation on trade balance:

$$(TB/Y)_i = c_0 + c_1 (G_i - G_R) + c_2 (M_i - M_R) + c_3 (C_i - C_R) + c_4 ER_i \quad (1)$$

Where the variables are as the following:

TB: Trade balance of country i; Y: the income level of country i, G_i and G_R : government spending in country i and government spending in other countries in the world, respectively; G_i and G_R : the income growth rates in country i and the income growth rates in the world, respectively; M_i and M_R : the average ration of the amount of high-powered money to the production in country i and the average ration of the amount of high-powered money to the production of other countries in the world, respectively; and ER_i : rate of change of the exchange rate in country i.

Using the above equation, he concluded that the devaluation of national currency has not led to the improvement of trade balance status; however, it has improved the status of balance of payments through capital account channel.

Himarius in a study conducted in this field, made criticisms over Mill's analysis:

1. The results obtained from Mill's analyses are sensitive to the variables unit of measurement;
2. Internal and external variables cannot have the same effect on trade balance;
3. The real exchange rate is more effective than the nominal exchange rate on trade flow of a country;
4. Values with an exchange rate pause play an important role in this effect;
5. Determination of the average of currency devaluation effect on trade balance of a country against determination of currency devaluation effect on trade balance of that country are two different concepts. Modifying the defects of previous model and changing its analytical approach, he designed the following equation:

$$E_t = F(Y_t, Y_t, M_t, M_t, C_t, C_t, G_t, G_{t-1}, G_{t-2}, \dots) \quad (2)$$

Where: B_t is trade balance; Y is domestic (foreign) country income; M is domestic (foreign) country money; G is government expenditure of domestic (foreign) country; q is the real exchange rate and r is the opportunity cost of money.

5. Research model and variables

$$NX_t = A + \beta_1 INF_{t-1} + \beta_2 LI_{t-1} + \beta_3 EX_{t-1} + \beta_4 G_{t-1} + \beta_5 GDP_{t-1} + \epsilon_t \quad (3)$$

Where: NX represents the balance of payments; INF is inflation rate, EX is exchange rate, GDP is gross

domestic product, LI is liquidity (monetary policy) and G is government spending or expenditure (fiscal policy).

5.1. Investigating variables stationary

In time series method, the first step is to investigate variables stationary. According to the results obtained in Table 1, all variables were at the level of non-stationary, and they became stationary with a first order difference. Since the residuals are at the level of stationary, so there is no concern for spurious regression.

Table 1: Dickey-Fuller test (ADF)

Variable	With a first order difference		At the level of variables	
	Statistic	Probability	Statistic	Probability
NX	-3.81	0.006	-0.18	0.931
EX	-4.26	0.002	-0.65	0.844
INF	-3.76	0.007	-0.61	0.853
G	-3.96	0.004	0.10	0.960
LI	-3.97	0.005	0.36	0.987
GDP	-4.69	0.001	0.54	0.985

5.2. Determining the cointegration vector

Due to the Engel-Granger cointegration test a cointegrated vector is assumed, it has a fundamental weakness because there may more than one cointegration vector in a model. So to solve the difficulties in Engel-Granger method, Johansson

method is used. Both maximum eigenvalue test and trace test are used to implement Johansson cointegration method. In this study based on the third pattern and maximum eigenvalue statistics, there are two cointegration that the result of normalized vector is shown in Table 2.

Table 2: Cointegration vector

Variable	Gross Domestic Product (GDP)	Liquidity	Inflation rate	Government spending
Long Run relationship coefficient	35.55	-8.33	11.11	-14.44

Based on the results, fiscal and monetary policies (liquidity and government spending), have a negative effect on the country's balance of payments in the long term. Also, price index and gross domestic product (GDP) positively affect this variable.

5.3. Estimating vector error correction model

In this research, at last using the vector error correction model, the way of imbalances influencing in the model has been studied. Error correction model is considered as a feedback and therefore, dependent variable is adjusted towards the imbalance of system ensuring the long term relationship achievement.

Vector error correction model using selective cointegration vector that actually indicates a long term relationship between the variables, estimates their short-term relationship, and represents Error Correction Term (ECT), as well as convergence of model and variables available. In the error correction models, convergence condition is that error correction term is statistically significant, the

absolute value should be between zero and one, and it's negative in terms of the sign.

In this paper, according to the estimation of vector error correction model, on the effect of monetary and fiscal policies on the balance of payments, error correction term (ECT), is -0.82 and the estimated size of t statistic for it is the -2.01, indicating the significance of it. As it can be seen the coefficient has the desired sign which is between zero and one. The value of coefficient obtained show that in each period, 0.82 differences due to the shock are disappeared and the variables return to their long-run trend.

5.4. Investigating instantaneous response functions

Fig. 1 shows trade balance response to an impulse as a standard deviation to the variables of government spending and liquidity that are representatives of fiscal and monetary policies. First, these impulses have a negative effect on trade balance and secondly, the impulses are discharged during the second and third periods.

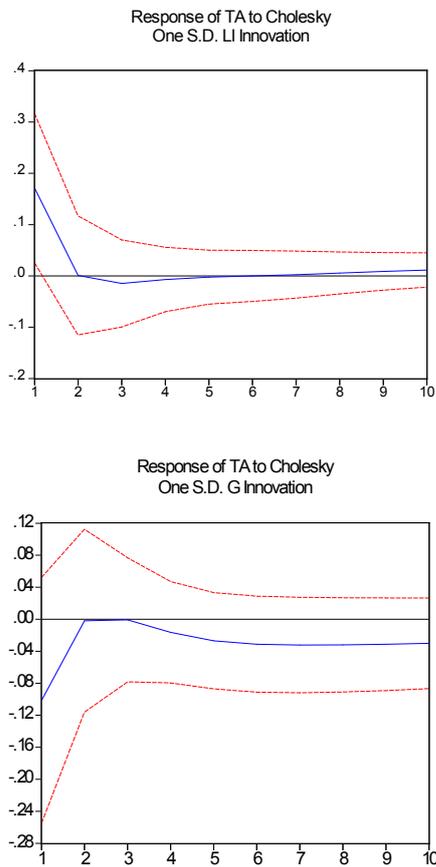


Fig. 1: The functions of excitation reaction

6. Conclusion

The results obtained indicate that the variables of trade balance, liquidity and government spending in turn affect trade balance, and the impact of trade balance itself is more than other variables. In the medium term, we'll face with increasing share of other variables. At the beginning of the period, liquidity is the most influential factor. And then, government spending and trade variables are most effective. In the long run, as the medium-term, liquidity is the most influential and then, government spending and variable of trade balance itself have the greatest impact. Also, trade balance in the long term has a negative and relationship with government spending and liquidity as well as a positive correlation with inflation and GDP.

In the long term, gross domestic product (GDP) has the greatest impact on trade balance. Monetary and fiscal policies also have a negative effect on trade balance in the long run.

Based on the results obtained, it can be interpreted that government spending as fiscal policy, has a positive effect on imports of goods. This means that government spending import through the import channels will lead to the worsening of the trade account balance. Therefore, an increase in government spending is considered as an increase in effective demand a part of which led to imports of goods from the abroad. Also, about the negative impact of liquidity, similar interpretation can be

found, so that liquidity injected move toward import, leading the trade balance to be more negative.

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