**Applied Economics Studies, Iran (AESI)** 55

Volume 7, Number 27, Fall 2018

# The Impact of Import and Export of Low Technology Industries on Iran Economic Growth

Ahmadvand, N.[1], Fotros, M. H.[2*]

## Abstract

In the process of economic globalization, one of the important factors is transfer and technology overflow from the channel of trade. Absorbing foreign technology by the channel of imports of industrial products and using the latent technology in those products creates export development, increase the quality and quantity of manufactured goods with low costs, and modify management, technology improvements and production of goods with high added value that this makes optimal allocation of resources, efficiency and economic growth in various economic sectors. Therefore, in developing countries, after passing through the agricultural sector, the technology has been absorbed into the low-tech industries to reach a stage of development and to create the appropriate substrates for producing higher value added industries. On the other hand, export of these industries is important by creating competitive advantage, improving management practices, making cost savings and valuing. In this study, using Romer's endogenous growth model, the impact of import and export of low technology industries have been studied on economic growth of Iran for the period 2002-2012. In this regard, seasonal data were used in an autoregressive distributed lag (ARDL) model to examine the relationship between variables. The separation of low technology industries has been made according to the OECD classification. The results showed a positive and significant impact of import and export of low technology industries on Iran's economic growth. Also other variables i.e. capital stock, employment and research and development expenditures have had a positive and significant effects on Iran economic growth.

**Keywords:** Technology transfer, Industries with low technology, Romer endogenous growth model, Autoregressive distributed lag method.

**JEL Classification:** F14, F43, O14.

## 1. Introduction

Based on the experiences of most developed countries, the evolution of the economy is evolving, with the development of agriculture, industry and services, respectively. Countries in the early stages of their development, after passing

1. Master of Science (Economics), Bu-Ali Sina University **Email:** narges.ahmadvand.4630@gmail.com

2. Professor, Department of Economics, Bu-Ali Sina University **Email:** fotros@basu.ac.ir

through the agricultural sector, are making low-tech products and, after reaching a stage of development, are pushing for the production of technology-intensive industries. Ultimately, knowledge based products are the basis of the growth of the industry and economy. Therefore, developing countries need to achieve a level of development, in order to reach the level of development, first, the import of low technology industries and localization of this field to achieve this level of development and import of high technology industries (Chuang, 1998; 697-721).

Therefor, industries import with low technology have indirect role in the production of medium and high tech industries, and the direct role in creating added value, replacing old ones, increasing the quality level of this group The products are very important for the economies of developing countries.

Export development strategy or the policy of economic outreach, which is based on encouraging the export of industrial goods, through the development and diversification of exports, the improvement of the quality of manufactured goods, the improvement of management and technology improvement, the reduction of costs and production on a large scale and the growing number of foreign exchange earnings will result in the optimal allocation of resources and the growth of the entire economy.

In Iran, surveys show that the share of exports of low technology industries decreased from 24.1% in 2004 to 11.6% in 2014. On the other hand, the technological mix of imports also suggests that the share of low-tech industrial imports increased from 9.8% in 2004 to 17.3% in 2014 (Institute for Trade Studies and Research, 2015; 3). These statistics point out the lack of policies in this regard.

## 2. Background

The first wave of endogenous growth models is AK. These models are Y = AK in the form, and in that A, the main feature of the technology. K represents physical and human capital (Jones, 1995: 495-525).

The second wave of endogenous growth models is based on R & D models. Which emphasizes the endogenous role of technology for long-term growth. This model presents how to combine the physical and labor resource storage for product production using knowledge-based capital, and instead of following the assumption of the neoclassical theory and the effect of the exogenous nature of technological change, it has the advantage of describing forces Effective and technological changes are trying. In growth models based on R & D activities for a given technology level, the returns to the scale for Ly and k are constant, and with a certain amount of inputs, the production level is greater. Technological innovation in the human capital and research and development sectors affects scientific resources and knowledge production, and scientific reserves are used in the production of final goods and can lead to an increase in the growth rate of production (Haji Mohammadi and Arsalan Bad, 2014; 5).

In this research, the export and import of low technology industries as a channel for the transfer of technology and scientific resources and the cost of R & D as knowledge-based capital are ways to increase productivity, in the A component, the function of Romer Lies hidden.

$$Y = K^{\alpha}\ (AL_y)\ \alpha - 1$$
$$\frac{A^0}{A} = \partial L_A \qquad (1)$$

In the above relations, Y is the production, profitability, or knowledge of capital. The labor force in both activities is used both in product production (Ly) and in innovation efforts (LA). As $L_A + L_y = L$, total labor force in the economy.

## 3. Materials and Methods

In the present study, using the Roemer's endogenous growth models, the impact of industries imports and exports with low-tech on Iran's economic growth for the years 2002-2012 has been investigated. For this purpose and in order to investigate the relationship between variables, seasonal data has been used in the form of a Distributed Distress Layer (ARDL) model.

The analysis in this model is based on three short-run, long-term, and error correction equations. In the present study, the first short-run equation for the models is estimated, and then the long-term coefficients are estimated and the error correction model associated with their long-run equation is estimated.
According to the estimation method, the ARDL form for the present study is:

$$LGDP = \alpha_0 + \sum_{i=0}^{n} \alpha_i LGDP_{t-i} + \sum_{j=0}^{n} \beta_{1j} LK_{t-j} + \sum_{j=0}^{n} \beta_{2j} LL_{t-j} + \sum_{j=0}^{n} \beta_{3j}\, LR\&D_{t-j} + \sum_{j=0}^{n} \beta_{4j} LLTI_{t-j} + \sum_{j=0}^{n} \beta_{5j} LLTE_{t-j} + u_t \qquad (2)$$

Where GDP, K, L, R&D, LTI, LTE are, gross domestic product, capital stock, labor force, research and development costs, import of low technology industries and export of low technology industries respectively.

## 4. Discussion and Conclusion

Results of the Estimation of Iran's Long Term Economic Growth Equation

| Statistics t | Standard deviation | Coefficients | Variables |
|---|---|---|---|
| 14/802017 | 0/043461 | 0/643314*** | LK |
| 2/722849 | 0/143024 | 0/389433** | LL |
| 5/230522 | 0/021006 | 0/109874*** | LR&D |
| 2/177786 | 0/006361 | 0/013852** | LLTI(-3) |
| 2/871254 | 0/010600 | 0/030435*** | LLTE |

Source: Research calculations

The results show that capital stock variables have most impact on Iran's economic growth compared to other variables, so that an increase in one percentage point of capital stock would increase GDP 0.64%. After capital stock, lobar force in the industrial sector has a huge impact on growth, with a one-percent increase in lobar force, GDP increase to 0.38%. Research and development costs, despite all the efforts made in recent years to expand it, lead to an increase 10% in GDP. Import and export of low technology industries have a positive and significant impact on Iran's economic growth. As can be seen, a one percent increase in imports and exports of low technology industries will increase GDP 0.013% and 0.30%, respectively. The greater the export stroke and the significance of it at a level of 99% confidence shows that in Iran, low-tech industrial exports have more efficiencies than imports. Which can be attributed to the development and diversification of exports, the increase in the quality of manufactured goods, the improvement of management and technology improvement, the reduction of costs and production on a large scale, and the growing earning of foreign exchange.

Also, importing these industries in order to upgrade and improve the quality of existing products and facilities and the need to take advantage of the modern technologies of the country to create new production methods, and have a positive effect on growth.

Therefore, one of the most important channels for increasing economic growth is, absorb the needed technology and then localize it and use it in the production cycle to create diversification in production and increase the quality of production and, consequently, increase exports. In this case, the country's competitiveness and export development, based on technical and industrial progress, will be realized.

## References

Chuang, Y. C. (1998). “Learning by Doing, the Technology Gap and Growth”, *International Economic Review*, 39(3): 697-721.

Haji Mohammadi, F. & Arsalan Bod, M. (2015). *The Relation between Higher Education and Higher Education Expenditure with Economic Growth of Iran in Recent Half a Century*. The Fourth Conference on Islamic Growth Pattern of Iran (in Persian). National Library of the Islamic Republic of Iran.

Institute for Trade Studies and Research in Iran. (2015). *Analysis of the performance of Iran's non-oil trade over the past decade*. Trade Promotion Organization in Iran.

Jones, C.I. (1995). “Time series Tests of Endogenous Growth Models”. *The quarterly Journal of Economics*, 110(2): 495-525.