

## An Investigation of the Impact of Non- Oil Exports on Economic Growth– Case of Iran

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### **Abstract**

Growth and economic development are the primary goals of all economies and proper trade policy is one of the essential tools to achieve this goal. Economic analysts emphasize on promoting Non - Oil Exports as a successful strategy to achieve high economic growth rates. For this reason, in economic development plans, increasing of exports is emphasized as one of the basic instruments to achieve growth and economic development.

Positive effects of exports on economic growth in developed and developing countries are proved in empirical studies and it is argued that countries who have adopted export orientation have enjoyed efficient resource allocation and higher growth.

In this research using Iranian statistical data for the period 1959-2003 and applying a production function model, we try to examine the impact of non - oil exports on economic growth.

Estimating econometric models in the case of Iran resulted in conclusions which are rooted in inherent facts of society and economy, and reveals considerable facts of Iranian economy. Results show too weak impact on gross domestic product growth of non - oil exports and also low factor productivity in export sector relative to non - export sector . It seems that small share of non oil exports in GDP and inept combination of non - oil exports and high portion of traditional and agricultural products in total exports are the main reasons. High dependency on oil and lack of basic and reasonable planning toward non - oil exports promotion is among the other problems that non - oil export sector is facing.

**Keywords:** Economic Growth, Import Substitution strategy, Export Promotion strategy, Non– Oil Exports, Productivity, Externalities.

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## **1- Introduction**

Economic Development is one of the main goals of every society and economic growth is fundamental to economic development. The relationship between exports, economic growth and development has long been a subject of much interest in development literature. Theoretical consensus on export – led growth emerged among neoclassical economists in the 1970s and 1980s after the successful story of newly industrialized countries (NICs). They suggested that exports expansion contributes to economic growth by increasing the rate of capital formation and enhancing the growth of factor productivity. There are usually four reasons for the support of this hypothesis: a) fostering specialization help to benefit from the comparative advantage ; b) utilizing the full capacity of the plant size , where domestic demand is less than the full capacity production ;c) getting benefits of the greater economies of scale due to large market ; and d) increasing the rate of investment and technological changes .

In addition, competition in the world market also help producer to reduce inefficiencies. Neoclassical economists emphasize on outward – looking policies and believe that export promotion is the proper policy to achieve economic development in developing countries.

In contrast, there are some concerns about trade, especially between the primary and industrial goods exporting countries where the terms of trade are deteriorated against the poorer countries. The income elasticity of demand for primary products and the real prices for these goods have fallen overtime .Because of reasons mentioned above, some economists (including Singer, Perbish ...) emphasize on inward – looking policies and believe that import substitution is the proper policy to achieve economic development in developing countries.

This paper investigates the relationship between non-oil exports and Iranian economic growth. The objective of the paper is to examine whether a) the marginal factor productivities in the export and non- export sectors are different and b) there are strong externality effects of high growth in the export sector on the non- export sector. The model used in this study is Feder's (1982), in which externality effects and marginal productivity differential effects are isolated. The paper is organized as follows: section 2 presents Import Substitution and Export Promotion strategies, section3 reviews Iranian non –oil exports, section 4

contains a review of previous studies about relationship between exports and economic growth. The analytical framework of the study is presented in section 5. Section 6 presents the results of the empirical investigation. Finally, conclusions will be presented in section 7.

## **2- Trade Strategies**

Different countries have opted various economic policies to achieve economic growth and development. A branch of these policies are trade strategies. Import Substitution and Export Promotion are the important trade strategies that some countries have applied to achieve economic development. We survey these strategies.

### **2-1- Import substitution strategy**

An Import substitution strategy (IS) is a policy that is directed towards reduction of imports and substituting domestic products. Recently, economists prefer to use the term "inward-oriented" to refer to policies which promote domestic products vis-à-vis import of commodities. During 1950s and 1960s, most developing countries opted import substitution strategy to industrialize and achieve economic development. Initially, Latin American countries applied this strategy. "Great Depression" in 1930s and deterioration of terms of trade against the poor countries were the main reasons. Therefore, exporting primary agricultural products from developing countries to industrial economies in order to import manufactured goods was an ordinary issue. Continuous changes of term of trade in favor of manufactured goods and against agricultural goods led to doubts in the validity of the hypothesis that exports of these commodities induce economic growth. Other important reasons to adopt IS strategy were, on one hand, the decline in global demand for basic goods and raw materials and, on the other hand, the belief in the importance of the policy for industrialization mainly emphasized by international organizations such as World Bank through long term aids. Moreover, many of the new developing countries gained political independence just after World War II and therefore, were pessimist about colonialist states and tended to be self-sufficient.

An IS strategy is associated with advantages and disadvantages:

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Some economists believe that IS strategy has several main advantages: 1) the existence of market for the industrial products, so that risks are reduced in setting up an industry to replace imports; 2) the ability of developing countries to protect their domestic products against foreign competition; 3) the correcting of the BOP problems; 4) the increase in government revenues; 5) the decline in terms of trade; and 6) the protection of infant industries.

Hirshman argues that war, economic deprivation and balance of payment problems are the main reasons for countries to opt the IS strategy.

In spite of these advantages, there are disadvantages: 1) domestic industries have no incentive to become more efficient because they are accustomed to protection from foreign competition; 2) the smallness of domestic market in developing countries can lead to inefficient industries that can not take the advantage of economies of scale; and 3) high prices for domestic consumers due to limited market.

In general, some economists believe that the IS has led to inefficient domestic industries because of the very high rate of protection during 1950s, 1960s and 1970s. Heavy protections and high subsidies induced excessive capital intensity and relatively little labor absorption.

### **2.2- Export Promotion strategy**

Export promotion strategy (EP) is often emphasized by neoclassical economists and conservatives who theoretically believe in free trade system, automatic demand and supply mechanism and oppose government intervention in the economy. Export Promotion strategy is a market oriented policy and focuses on pricing incentives rather than on quantitative controls. The essence of EP strategy is its link to the international markets and the aim of that is to realize economies of scale through establishing plants of optimal size in an industry. EP strategy is also associated with advantages and disadvantages. Advantages include the following: 1) it overcomes the smallness of the domestic market and allows developing countries to exploit economies of scale; 2) the benefits of the expansion of exports are not limited to the growth of domestic market; 3) production of manufactured goods for exports stimulates efficiency throughout the economy. This is important when the output of an industry is used as an input of another domestic industry ; and 4) based on this strategy , free trade leads to the optimal allocation of resources, thereby the

country will produce and export the goods of its comparative advantage and will import the goods in which it does not have comparative advantage. EP strategy seeks to exploit country's international comparative advantages and therefore achieve efficient use of resources.

On the other hand, there are some disadvantages associated with the strategy: 1) it may be very difficult for developing countries to set up an efficient export industry to be able to compete with more established and efficient industries in developed countries; and 2) there is a high level of effective protection in developed countries for their labor-intensive products in which developing countries have comparative advantages.

### **3- A review of Iranian Non-oil Exports**

Available official statistics indicate that the Iranian Economy has heavily been dependent on oil export revenues. Oil export revenues had been of basic importance in provision of required resources in other sectors. In other words, other sectors are, either directly or indirectly, dependent on crude oil and its export revenues. Heavy reliance on oil revenues has hindered finding remedies to increase the volume of non-oil exports and to diversify the combination of these exports.

#### **3.1- Influential factors on exports**

In a broad classification, influential factors on exports can be divided into economic, scientific- technical, social- cultural and legal – political categories.

##### **3.1.1- Economic factors**

The most important economic factors that affect Iranian exports are as follows:

- a) Inflation,
- b) Economic policy,
- c) Exchange rate,
- d) Level and distribution pattern of consumer's income,
- e) Country's economic growth.

##### **3.1.2- Scientific- Technical Factors**

- a) Among most important factors of this category are:

- b) Production technology,
- c) Skilled labor and expert managers,
- d) Advanced production and packing equipments,
- e) Equipped facilities for transportation of products.

### **3.1.3- Social - Cultural Factors**

Social and cultural factors play increasingly effective roles in shaping international trade. Most important factors are:

- a) Consumption pattern,
- b) Population growth rate,
- c) Cultural and religious values,
- d) Common and public culture.

### **3.1.4- Legal - Political Factors**

Political stability of countries, foreign policies of exporting and importing countries and administrative systems especially those responsible to foreign trade are among the most important political determinants of exports. Legal factors include a wide range of factors. Most important of these factors are:

- a) Legal framework of countries,
- b) National regulations and laws,
- c) International commitments of countries.

After exploring influential factors on exports, it is necessary to identify all problems of Iranian export sector. Non –oil exports problems, although various and numerous, can be categorized into domestic and foreign dimensions.

## **3.2. Domestic dimensions of non –oil exports**

- a) Reliance on oil revenues

Heavy reliance of national economy on export revenues of oil has negatively affected other economic sectors. Severe oil price fluctuations affect state revenues and thereby planning based on these revenues. Oil price shocks result in import decrease especially of intermediate goods which are needed in manufacturing sector and also cause reductions in investment expenditures and thereby affect national growth and development trend. In addition to that, oil

revenues underpin government's dominance on the economy and contribute to government enlargement and limitation of private sector.

b) Production weakness ( especially in industrial sector )

A successful export sector in the global trade is depended upon a strong industrial foundation. In our country, in addition to low share of industrial sector in GDP, investment in this sector is in low levels. On the other hand, mobilizing investments to fast-payback and trade-based activities, has caused serious shortage of financial resources in productive sectors of economy and thereby has limited their access to new equipments and modern technologies. As a result their products suffer from high protection costs and are not competitive in global markets.

c) Continuous changes in laws and regulations

d) Continuous changes in regulations cause uncertainty about future and this, in turn, affects long term contracting and commercial negotiations with other countries and, through creating lags in export, causes losses in market share and also in resources devoted to marketing.

e) Different and numerous institutions deciding about import and export regulations

f) Existence of numerous foreign trade related institutions not only in decision stage but also in practice has contributed to severe disharmony of regulations and policies. Wide bureaucracy has emerged in export area due to different decision making institutions as well. As a result, exporter has to pass several steps in order to acquire export licenses, thereby wasting time and energy.

g) Simplistic attitude toward export

Simplistic attitude toward export (i.e. just emphasizing on government protections) and neglecting the role of production factors, exporting stages, demand changes, domestic consumption patterns and similar issues have harshly harmed non-oil exports.

h) Exporter Groups Composition

Small and Medium size firms constitute a large portion of exporter bodies. Large and powerful firms which are internationally active and enjoy strong bargaining and competition powers in international markets are very scant in Iranian exporting firms. Small and traditional exporters who lack academic training in areas such as negotiation techniques, regulations, etc. are exposed to

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destructive competition practices (including dumping) and inconsistent policies and are convict to exit. Competition of Iranian exporters in German carpet market and in Persian Gulf countries' fruits and vegetables markets are examples of such problems.

##### **i) Trade and commodity concentration in non –oil exports**

Trade concentration causes bargaining power decline in global markets, export demand elasticity drop- off thereby creating monopsony conditions. On the other hand, according to the sensitivity of international trade pattern any kind of challenge and conflict in political relations with trade partners cause market loss in export markets. In addition, examining composition of exporting goods indicate that carpet, pistachio, skin, copper and plum which are mainly consumer and intermediate goods, constitute a portion of non-oil exports in Iran and manufactured goods share in exported goods is very small. Other problems in this area are:

- High inflation and exchange rate stabilizing policies,
- Small share of technology in exported goods,
- Inability of production units in packing, tailoring, and making products attractive for market participants,
- Inconsistency between export quality and market requirements,
- Weakness of proper transportation equipment for on time and healthy delivery of products,
- Weakness of export organizations and misuse of free trade zones in persuasion of export goals,
- Dominance of business- oriented attitudes and weakness of production oriented attitudes.

### **3.3- Foreign dimensions of non-oil exports**

#### **a) Non – Tariff Obstacles**

Most important of these obstacles are economic sanctions on goods transited through Iran and application of restricting measures by European community to enjoy advantages of preferential tariffs.

#### **b) Negligence of market requirements of exported goods**

Since consumer preferences play a determining role in shaping global demand, knowing consumers' needs, preferences and taste and also provision of

products in consistency with their needs and taste play an important role in export promotion.

c) Weakness of relations with major international organizations and poor exploitation of regional cooperations

Regional and international agreements are one of effective factors on foreign trade sector of each country. Membership in international organizations like WTO and regional organizations or treaties facilitates enjoying tariff and non-tariff advantages associated with such treaties and organizations as much as possible.

d) Insufficient information about evolution of markets and weakness of information system

Nowadays information plays a strategic role in international trade. In many advanced countries, in addition to extensive access of exporters to communication technologies and marketing experts, they enjoy widespread information facilities by government institutions. In our country, despite its neighborhood with central Asia and Caucasus region, exporters, and even government authorities have not sufficient information about regional markets, customs regulations and business activities of foreigners. So is our exporter's information about other global markets.

#### **4- Empirical studies**

Several empirical studies have been conducted to assess the role of exports in the economic growth of developing and developed countries from various aspects. Most of the studies have concluded beneficial effects of export performance on economic growth such as:

increasing specialization and the spillover effects of exports sector's growth, b) greater capacity utilization ,c) the externality effects of exports in the diffusion of modern technology across other sectors and industries ,and d) the increasing effects of economies of scale , industrialization and import of capital goods.

Balassa (1978) studied the effect of exports on economic growth in a group of developing countries and reached the conclusion that exports have positive effects on economic growth in these countries.

Feder (1982) investigated the sources of economic growth in the period 1964-1973 for a group of semi- industrialized less developed countries .The

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results showed the positive effects of exports on economic growth. Furthermore, results showed that there are substantial differences in factor productivities between export and non-export sectors in favor of export sector.

Kavoussi (1984) evaluated the relationship between exports expansion and economic growth in a sample of seventy – three developing countries for the period 1960-1978. The empirical results showed that in both of low and middle-income countries, export expansion is associated with better economic performance and an important cause of this association is the favorable impact of exports on total factor productivity.

Yosif kalifa al – Yousif (1997) investigated the relationship between exports and economic growth of the Arab countries, namely, Saudi Arabia, Kuwait, UAE, and Oman for the period 1973-93 using a general production function framework and a two sector model that exports enter as additional input in the production process. The empirical results indicated that the exports have a positive and significant effect on economic growth in these countries.

Shamshad Begum and Abul F.M Shamsuddin (1997) evaluated the effect of exports on economic growth in Bangladesh, based on a two- sector model for the period 1961-92. The results suggest that exports growth has significantly increased economic growth through its positive impact on total factor productivity in the economy.

Jani Beko (2003) examined the nature of Granger causality between exports (in aggregate and sectoral level), and output growth in Slovenia for the period 1992-99. The empirical results indicated that capacity creation and export promotion should be seen as complementary policies for promoting economic progress.

Balaguer and Cantavella- Jorda (2004) investigated the structural change in exports and economic growth for Spain (1961-2000). For this purpose they had taken both export expansion and the progress of "traditional" exports with respect to the manufactured and semi- manufactured exports into consideration. Empirical results indicated a feedback between exports and economic growth. Also results showed that the structural transformation in export composition have positive effect on economic growth.

To date, several empirical studies have been undertaken to investigate the relationship between exports and economic growth in case of Iran.

Motavaseli (1999) investigated the relationship between exports growth and GDP growth using Granger's causality definition and annual real data for the period 1959-1995. The results indicated that exports cause GDP growth and that there are casual relationship between GDP and exports. However, this study showed that the impact of GDP on exports was rather weaker and less important. Tavakoli and Karimi (1997) investigated the impact of services and goods exports on GDP growth for the period 1959-1996, using a production function. The empirical results indicated the positive effect of exports on GDP growth. The results of Azimi's study (2000) showed that the non-oil exports don't have positive effect on economic growth. This study used Esfahani's model and Iranian information for the period 1967-1976.

Akbari and karimi Hesnigeh (2000) evaluated the impact of exports on economic growth and capital formation for the period 1959-1999 using SUR<sup>1</sup> model. The results indicated the positive effect of oil exports and negative effect of non-oil exports on economic growth. They also showed that the impact of industrial exports on value-added in industrial sector is higher than the impact of agricultural exports on value-added in this sector.

Alaeifar (2004) examined the relationship between oil exports and economic growth in Iranian economy for the period 1955-99. The empirical results showed that there is unilateral relationship from petroleum exports to economic growth in Iranian economy.

In this paper we use Feder's model, which can isolate externality and marginal productivity differential effects.

## **5- Specification and Estimation of model**

This section presents the analytical framework of the study. In modeling the effect of exports on economic growth, this paper focuses on the supply side of the economy. There are two channels that the exports affect economic growth.

- a) Externality effect of export sector on non-export sector.
- b) Productivity differential effect

The export sector operates in a highly comparative environment and to succeed in global competition it invests in advanced production techniques,

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1- Seemingly Unrelated Regression.

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workers' training and infrastructure. The non – export sector receives indirect benefits from the export sector in two ways: the demonstration effect and the public good characteristics of some export activities. The non- export sector can replicate the management practices, improve production techniques and marketing strategies of the export sector and it may get access to public infrastructure (transport and communication facilities) developed for the export sector.

Factor productivity in the export sector may differ from that in the non-export sector for several reasons. First, export industries use improved technology and skilled workers. Second, factors of production are not perfectly mobile between two sectors due to institutional constraints as well as differential skill requirements across sectors. In the absence of perfect mobility of factors, the value of marginal product of each input in the export sector is likely to be higher than that of the non – export sector. The productivity gap would be larger if the skill composition of the work force differed between sectors.

It is assumed that the allocation of resources between the export and non-export sectors is non- optimal due to the presence of non-priced externalities and imperfect mobility of factors of production.

The model used in this study is based on Feder's model, with some modification. Since these studies focus on the potential non – optimality of resource allocation between export and non-export sectors, the economy is viewed as if it consists of two sectors: one producing export goods, and the other producing for the domestic market .Instead of an aggregate national function, each of two sectors' output is a function of the factors allocated to the sector. In addition , the output of the non – export sector is dependent on the volume of exports produced .This formulation represents the beneficial effects of exports on other sectors; such as the development of efficient and internationally competitive management , the introduction of improved production techniques , training of higher quality labor , steadier flow of imported inputs etc. These effects are referred to as externalities, since they are not reflected in market price.

The overall output is composed of goods and services produced by two sectors. Adapting Feder's theoretical framework, the supply side of the economy can be expressed as:

$$Y = N + X \quad (1)$$

$$N = f(K_n, L_n, X) \quad (2)$$

$$X = g(K_x, L_x) \quad (3)$$

Equation (1) states that the gross domestic product (Y) is the sum of the non-export sector output (N) and the export sector output (X).

$K_x$ ,  $K_n$  are sector-specific capital stock, and  $L_n$  and  $L_x$  are sector-specific labor employment. Also, the production function for the non-export sector is augmented by inclusion of  $X$ , the export sector output.

Suppose that the ratio of the respective marginal factor productivities in two sectors deviate from unity by a factor  $\delta$  so that:

$$\frac{g_k}{f_k} = \frac{g_l}{f_l} = 1 + \delta \quad (4)$$

where the subscription denote partial derivatives and  $g_l$ ,  $f_l$  are the marginal productivities of labor in the export and non-export sector respectively and  $g_k$ ,  $f_k$  are the respective marginal productivities of capital.  $\delta$  Measures difference in productivity in favor of exports.

In the absence of externalities, and for a given set of prices, a situation where  $\delta=0$ , would reflect an allocation of resources which maximizes national output. In other words if  $\delta = 0$ , marginal productivities are equalized across the two sectors. However due to a number of reasons, marginal factor productivities are likely to be lower in the non-export sector. (i.e  $\delta > 0$ ).

One important reason is the more competitive environment in which export-oriented firms operate. Competition induces innovation, adaptability, efficient management of firm's resources, etc. Another reason for deviations between sectoral marginal factor productivities is various regulations and constraints such as credit and foreign exchange rationing (Feder 1982).

Taking the total differential of equation (2) and equation (3), we get:

$$dN = f_k dK_n + f_l dL_n + f_x dX \quad (5)$$

$$dX = g_k dK_x + g_l dL_x \quad (6)$$

Where  $dL_n$  and  $dL_x$  are sectoral change in labor force,  $dK_n$  and  $dK_x$  are sectoral change in capital stock and  $f_x$  describes the marginal externality effects of exports (X) on the output of non- exports (N).

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Defining total capital as the sum of capital in two sectors and total labor force as the sum of labor force in two sectors:

$$L = L_x + L_n \quad (7)$$

$$K = K_x + K_n \quad (8)$$

Taking a total differential of equations (7) and (8) and rewriting those yields;

$$dL = dL_x + dL_n \quad \Rightarrow \quad dL_n = dL - dL_x \quad (9)$$

$$dK = dK_x + dK_n \quad \Rightarrow \quad dK_n = dK - dk_x \quad (10)$$

Using equations (9) and (10) in equation (5) yields;

$$dN = f_l dL - f_l dL_x + f_k dK - f_k dk_x + f_x dx \quad (11)$$

Equation (4) can be written as:

$$f_k = \frac{g_k}{1 + \delta} \quad , \quad f_l = \frac{g_l}{1 + \delta} \quad (12)$$

Using these results in equation (11) finally yields;

$$dN = f_l dL + f_k dK - \left(\frac{1}{1 + \delta}\right)(g_l dL_x + g_k dK_x) + f_x dX \quad (13)$$

The term  $(g_k dK_x + g_l dL_x)$  in equation (13) is equal to total differential of X.

Equation (13) can be written as:

$$dN = f_l dL + f_k dK - \left(\frac{1}{1 + \delta}\right)dX + f_x dX \quad (14)$$

As already mentioned gross domestic product (Y) is the sum of the non-export sector output (N) and the export sector output (X)[equation (1) above];

Taking the total differential of equation (1) and using equations (6) and (14) in equation (1) yields;

$$dY = f_l dL + f_k dK - \left(\frac{1}{1+\delta}\right) dX + f_x dX + dX \quad (15)$$

After some manipulation of equation (15):

$$dY = f_l dL + f_k dK + \left(\frac{\delta}{1+\delta} + f_x\right) dX \quad (16)$$

Equation (16) states that the change in GDP is dependent on the changes in capital stock, labor force and exports. The effect of change in exports on the change in GDP is the sum of factor productivity differential  $\left(\frac{\delta}{1+\delta}\right)$  and externality effects ( $f_x$ ). In this equation  $f_k$ ,  $f_l$  are respectively the marginal productivities of capital and labor in the non – export sector and  $\left(\frac{\delta}{1+\delta} + f_x\right)$  is the sum of the productivity differential and externality effects.

Suppose that the linear relationship exists between the marginal productivity of labor in the non- export sector and average output per labor in the economy ( $f_l = \beta\left(\frac{Y}{L}\right)$ ). Also suppose that  $f_k = \alpha$  and

$$dK = I \Rightarrow I = I_x + I_n.$$

$$dY = \beta\left(\frac{Y}{L}\right) dL + \alpha I + \left(\frac{\delta}{1+\delta} + f_x\right) dX \quad (17)$$

Then dividing equation (17) by Y yields;

$$\frac{dY}{Y} = \beta\left(\frac{dL}{L}\right) + \alpha \frac{I}{Y} + \left(\frac{\delta}{1+\delta} + f_x\right) \frac{dX}{X} \cdot \frac{X}{Y} \quad (18)$$

Note that if marginal productivities are equalized across sectors ( $\delta = 0$ ) and if there are no inter- sectoral externalities ( $f_x = 0$ ), equation (18) reduces to the familiar neo- classical formulation of the sources –of- growth model. In the more general case, the term  $\left(\frac{\delta}{1+\delta} + f_x\right)$  is likely to be non-zero. In this equation, the parameter  $\alpha$  should be interpreted as the marginal productivity of capital in the non – export sector, rather than as the marginal productivity of capital in the economy as whole. In this model, we are able to decompose the term  $\left(\frac{\delta}{1+\delta} + f_x\right)$  into its components. One can identify the specific inter-

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sectoral externality effect by adapting a plausible specification for the term  $f_x$ . Assuming that exports affect the production function of non –export sector with constant elasticity, i.e.,

$$N=f(K_n,L_n,X) = X^\theta \varphi(K_n, L_n) \quad (19)$$

In this equation  $\theta$  is a parameter. One can show;

$$\frac{d(N)}{d(X)} = f_x = \theta \cdot \left(\frac{N}{X}\right) \quad (20)$$

Equation (18) can now be rewritten as:

$$\frac{dY}{Y} = \beta \left(\frac{dL}{L}\right) + \alpha \frac{I}{Y} + \left(\frac{\delta}{1+\delta} + \theta \left(\frac{N}{X}\right)\right) \left(\frac{dX}{X} \cdot \frac{X}{Y}\right) \quad (21)$$

The term  $\theta \left(\frac{N}{X}\right) \left(\frac{dX}{X} \cdot \frac{X}{Y}\right)$  can be simplified as:

$$\theta \left(\frac{N}{X}\right) \left(\frac{dX}{X} \cdot \frac{X}{Y}\right) = \theta \left(\frac{N}{X}\right) \frac{dX}{Y} = \theta \left(\frac{Y}{X} \cdot \frac{dX}{Y}\right) - \theta \frac{dX}{Y} \quad (22)$$

Using this result in equation (21) yields;

$$\frac{dY}{Y} = \beta \left(\frac{dL}{L}\right) + \alpha \frac{I}{Y} + \left(\frac{\delta}{1+\delta} - \theta\right) \left(\frac{dX}{X} \cdot \frac{X}{Y}\right) + \theta \frac{dX}{X} \quad (23)$$

Note that if we assume  $\frac{\delta}{1+\delta} = \theta$ , the model reduces to:

$$\frac{dY}{Y} = \beta \left(\frac{dL}{L}\right) + \alpha \frac{I}{Y} + \theta \frac{dX}{X} \quad (24)$$

Equation (24) states that the annual growth rate of GDP is linearly dependent on the annual growth rate of labor force, the annual investment –GDP ratio and the annual growth rate of exports.

Adding stochastic term to equation (23) yields;

$$\frac{dY}{Y} = \beta \left(\frac{dL}{L}\right) + \alpha \frac{I}{Y} + \left(\frac{\delta}{1+\delta} - \theta\right) \left(\frac{dX}{X} \cdot \frac{X}{Y}\right) + \theta \frac{dX}{X} + \varepsilon \quad (25)$$

where  $\frac{dY}{Y}$  is the annual growth rate of GDP,  $\frac{I}{Y}$  is the annual investment-GDP ratio,  $\frac{dL}{L}$  is the annual growth rate of labor force,  $\frac{dX}{X}$  is the annual growth rate of exports and  $\frac{dX}{X} \cdot \frac{X}{Y}$  is the annual growth rate of weighted exports, that is the exports growth rate weighted by the share of exports in GDP.

### 5.1- Data description

For the purpose of this paper we used annual data for the period 1959-2003. Aggregate data for Non-Oil GDP, Non-Oil Exports and Investment in Non-Oil sectors were taken from Central bank of the Islamic Republic of Iran. Data for Employment in Non-Oil sectors obtained from Central bank of the Islamic Republic of Iran and Management and Planning Organization of Iran. All data are in constant 1997 rails.

Before estimating the model, in order to avoid spurious regression, it's necessary to discern the stationary of variables. By doing so, the validity of usual test statistics (t-and f-statistics, and  $R^2$ ) will be insured. We used Dickey-Fuller (DF) test to check the stationary of the variables. The results of DF test indicates that all variables are stationary. Therefore the results of regression and test statistics are reliable.

### 5.2- Estimation of model

In this section, we estimate the equation (25) for the investigation of the impact of non-oil exports on economic growth using Iranian statistical data for the period 1959-2003. The results of estimation are;

$$\begin{aligned}
 RGDP = & 0.457 \frac{I}{GDP} + 1.74 RL - \\
 1.18 \left( \frac{dNX}{NX} \cdot \frac{NX}{GDP} \right) & + 0.057 RNX - 0.003 D \\
 t: & \\
 (4.69) & \quad (6.29) \quad (-1.75) \quad (1.73) \quad (-2.24)
 \end{aligned}$$

$$R^{\nu} = 0.62 \qquad D - W = 1.44 \qquad F = 15.91$$

where  $RGDP$  is the annual growth rate of non- oil GDP,  $\frac{I}{GDP}$  is the share of investment in non-oil sectors in non- oil GDP ,  $RL$  is the annual growth rate of labor force in non-oil sectors ,  $RNX$  is the annual growth rate of non –oil exports ,  $(\frac{dNX}{NX} \cdot \frac{NX}{GDP})$  is the weighted non –oil exports growth , that is ,  $(\frac{dNX}{NX})$  is the annual growth rate of non –oil exports and  $(\frac{NX}{GDP})$  is the share of non-oil exports in non- oil GDP and  $D$  is dummy variable that indicates the impact of imposed war on economic growth. The marginal productivity differential (parameter  $\delta$  ) can be calculated by using the given estimation of  $\theta$  and the parameter which is associated with  $(\frac{dNX}{NX} \cdot \frac{NX}{GDP})$ . The results indicate that the parameter  $\delta$  is 0.052 and significantly different from zero (at the 10% significance level),i.e.

$$(\frac{\delta}{1 + \delta} - \theta) = -1.18$$

$$\Rightarrow \delta = -0.052$$

$$\theta = 0.057$$

$\delta = -0.052$  , implies that the factor productivity in export sector is lower relative to non- export sector.

## **6- Empirical results**

In this paper we applied the OLS estimator to estimate the equation (25). Investment and labor force growth exhibited positive effects on Non – oil GDP growth. The coefficient of the investment- GDP ratio is 0.457 .This coefficient measures the marginal productivity of capital in the non-export sector and is significantly different from zero .Also the results indicate that the labor force growth has significant positive effect on non-oil GDP. The labor force growth obtains a coefficient of 1.74 with a t- statistic of 6.29 .The weighted non –oil exports growth has a negative effect on non –oil GDP growth .The non-oil exports has a positive effect on non –oil GDP growth. The coefficient of the

non-oil exports is 0.057 and statistically significant at the 10% level. The coefficient of dummy variable is negative with a t-statistic of -2.24. The coefficient of dummy variable indicates that the imposed war had the negative and deterrence effect on Iranian economic growth. The model used in this study can isolate the productivity differential effects  $\left(\frac{\delta}{1+\delta}\right)$  from the external effects ( $f_x$ ). The results indicate that the marginal productivities differential (parameter  $\delta$ ) is 0.052 and the parameter  $\theta$  that presents the external effects of export sector on non-export sector is 0.057. The parameter  $\delta$  indicates that the factor productivity in export sector is lower than that of non-export sector. In general, results of estimated equation showed too weak impact of non-oil exports on non-oil GDP and also low factor productivity in export sector relative to non-export sector. It seems that the small share of non-oil exports in GDP and high portion of traditional and agricultural products in total exports are the main reasons. The portion of non-oil exports in GDP was very low over the period 1959-2003. In 1979, the portion of non-oil exports in non-oil GDP was 3%. This portion was 1% due to drastic decrease in non-oil exports over the period 1981-85. Afterwards, the share of non-oil exports in non-oil GDP increased to 3% in 1994. After that non-oil exports devoted the share of 5% of GDP. Another point about Iranian economy is that "empirically" whenever economic growth has entered into a negative trend as a result of oil revenues decline, government's policy making agendas has favor non-oil exports promotion and again after rebooming oil revenues the policies have neglected or at best lost their priority.

The analysis of exports indicates inept combination of non-oil exports. The portion of traditional and agricultural products in non-oil exports is very high over the period 1959-2003. In the early post-revolution, the portion of traditional and agricultural products in non-oil exports was about 90%. Afterwards this portion decreased to 67% in 1994. After that traditional and agricultural products devoted the share of 40% of non-oil exports. Recently, the portion of industrial and petrochemical products in non-oil exports were shown to be 60% while the portion of high-tech goods in non-oil exports is very low. Traditional and agricultural products including carpet, pistachio, caviar, etc. are accounted as a large portion of non-oil exports having no positive effect on economic growth. Naturally, these products have weaker external and productivity effects than manufactured products.

In studies executed in other countries, stronger effect of manufacturing sector exports on economic growth is emphasized. Kavoussi(1984) believes that

the impact of export on economic growth is a function of manufactured exports share in total export and suggests external and productivity effects of export are not constant and increase in the same direction with manufactured exports. He suggests that when manufactured exports increase it is expected that external economies of export and also the gap between factor productivity in export and non-export sectors increase. Dudaro (1990) also assumes manufactured exports as an economic growth factor and shows that manufactured exports increase growth more than other exports do. In our country, where manufactured exports have a small share in total exports, we can not expect expansion of the gap of factor productivity between export and non-export sectors.

## **7- Summary and conclusions**

This paper has presented an empirical study into the impact of non-oil exports on Iran's domestic gross product growth. Using the Feder's model, this study investigated the effects of non-oil exports growth, (changes in non-oil exports as a share of GDP), investment as a share of GDP and labor force growth on GDP growth rate. This study put forward two basic questions; a) is the factor productivity in export sector greater than that of the non-export sector? And, b) Dose the export sector generate positive externalities for the non-export sector? If the productivity differential and externality effects be positive, then any marginal reallocation of resources from the non-export sector to export sector will increase economic growth.

The major findings are:

- 1- The labor force growth has a significant positive effect on economic growth.
- 2- The investment –GDP ratio has a positive effect on economic growth. The coefficient of the investment – GDP ratio that measures the marginal productivity of capital in the non –export sector is significantly different from zero.
- 3- Although Non-Oil Exports have a positive effect on GDP, this effect is too weak .The coefficient of non-oil exports is statistically significant at the 10% - level.
- 4- The factor productivity in export sector is lower than that of the non-export sector.

It seems that small share of non-oil exports in GDP and high portion of traditional and agricultural products in total exports are the main reasons for the obtained results. As it was already mentioned "empirically" in Iranian economy whenever economic growth has entered into a negative trend as a result of oil revenues decline, government policy has been directed to the promotion of non-oil exports and again after the return of oil revenues the policies have neglected the priority of this sector. It's important to bear in mind that the above mentioned results do not suggest that non-oil exports do not have any positive effect on economic growth. The paper's results are based on non-oil exports structure in the past which in turn have been based on the traditional structure of the economy and the low non-oil exports share of GDP. Therefore the reasonable conclusion would be that in the absence of fundamental changes in exports composition, it seems that there is low, or no, potential for positive effect of non-oil exports on economic growth through external economies and productivity increase.

## References

- 1- Akbari, M. and Karimi H. H., (2000), "The Impact of Export Growth on Economic Growth and Capital Formation", *journal of planning and budgeting*, No. 52&53, pp.63-84.
- 2- Akavi, A., (1994), *International Trade, Trade Strategy and Economic Development: A study of theories, Application and Experiences*, Institute for trade studies and Researches, Tehran, Trading publications co.
- 3- Alaeifar, M., (2004), "The Relationship between Export and Economic Growth: assessing the evidence from Iran (1959-1999)", Institute for International Energy Studies, (I.I.E.S), [www.saeec.ch](http://www.saeec.ch) /saeec 2004.
- 4- Azimi, R., (2000), "Examining the Effects of Non-Oil Exports on Economic Growth", *journal of planning and budgeting*, No.56& 57, pp.27-50.
- 5- Balaguer, J. and Cantavella- Jorda, M., (2004), "Structural change in exports and economic growth: cointegration and causality analysis for Spain (1961-2000)", *Applied Economics*, Vol.36, pp.473-477.
- 6- Ballassa, B., (1978), "Exports and Economic Growth: Further Evidence", *journal of Development Economic*, vol.5, pp.181-189.

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7- Begum, S. and Shmsuddin, A. F.M., (1988), "Exports and Economic Growth in Bangladesh", *journal of Development Studies*, vol.35, no.1pp.89-114.

8- Beko, J., (2003), "Causality Analysis of Exports and Economic Growth, Aggregate and Sectoral Results fore Slovenia", *Eastern European Economics*, vol.41, No.6, pp.70-92.

9- Central Bank of Islamic Republic of Iran., "Economic Report and Balance Sheet", *various years*.

10- Feder,G .,(1982),"On Exports and Economic Growth", *journal of Development Economic*, vol.12 , pp.59-73.

11- Gujarati, D. N., (2004), *Basic Econometrics*, vol.2, translated by Hamid Abrishami, Tehran, University of Tehran press.

12- Gylfason, T., (1999), "Exports, Inflation and Growth", *journal of world Development*, Vol.26, No.6, pp.1031-1057.

13- Jalali, N.A. and Rezazadah, E.M., (1996), "Exports and Economic Growth", *Iranian journal of Trade Studies*, No.1, pp.7-35.

14- Kavoussi, R. M., (1984), "Export Expansion and Economic Growth: further Empirical Evidence", *journal of Development Economic*, vol.14, pp.241-250.

15- Love, J. and Chandra, R., (2004), "Testing export led growth in Bangladesh in a multivariate VAR framework ", *journal of Asian Economics*, vol.15, issue 6.pp.1155-1168.

16- Matin, N.,(2001),"Exports of Non –Oil Products and 50 years Economic Planning", *Economic Research Review*, Second Book,pp.41-63.

17- Motavaseli, M., (1999),"A Survey of relationship between exports growth and economic growth based on Granger cause Test", *journal of planning and budgeting*, No.46& 47, pp.41-73.

18- Noferesti, M., (1999),"Unit Root and Co-integration in econometrics", Tehran, Rasa press.

19- Pakdaman,R.,(1998)," Legal restraining and limiting factors of Iranian export " ,*The first annual commercial policies and international trade , papers and proceeding* , Institute for trade studies and Researches, pp.147-164.

20- Pirasteh,H.and Karimi,F.,(2002).,"Evaluating the Goal of Second and Third Development Plans in Non-Oil Exports Sector , Considering

Production Capacities of Economics Sectors", *journal of planning and budgeting*, No.9& 10, pp.33-51.

21- Rahman , M. and Mustafa , M .,(1997) ,"Dynamics of Real Exports and Real Economic Growths in 13 selected Asian Countries", *journal of Economic Development* ,vol.22, number2 , pp.81-95.

22- Sepehri, K, Ghasavi, H. and polimi, R., (2000), "Structural requirements of Export Promotion", *journal of Economic Researches and Policies*, Vol.46, No.1.pp.33-45.

23- Tavakkoli, A. and Karimi, F., (1997), "The Impact of Growth of Services and Goods Exports on Gross National Product (GDP) Growth", *journal of Economic Researches and Policies*, five years, No.1, pp.84-92.

24- Yousif Khalifa, Al- Y., (1997),"Exports and Economic Growth: some empirical evidence from the Arab Gulf Countries ", *Applied Economics*, vol. 29, pp.693-697.