Export diversification and economic growth in some selected developing countries

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Nowadays, export diversification has become one of the most important economic objectives of development strategies in the developing countries. For various reasons, such as preventing instability in export prices of primary products in global markets and consequently, reducing fluctuations in exchanges of them compared with industrial goods, producing dynamic benefits resulted from exporting various goods and increasing productivity of production factors may increase the rate of economic growth. The main purpose of this study is to investigate the role of export diversification in the economic growth of some selected developing countries over the period of 2000-2009. Accordingly, the relationship among GDP per capita, physical capital stock, labour force, and export diversification index was studied using the generalized method of moments (GMM). The results showed that reducing export specialization and, consequently, increasing export diversification have significantly positive effect on the rate of economic growth of these countries.

Key words: Export diversification, economic growth, developing countries, GMM.

INTRODUCTION

In recent years, many policy makers have been interested in the issue of export diversification in economic literature, which means increasing the number of export goods and decreasing the dependence on a single source of income. However, different studies have proposed different definitions. Alwang and Seigel (1994) and Amin Gutierrez de Pineres and Ferrantino (1997) have defined diversification as development of export portfolio of a country from primary products to industrial goods. In another group of studies such as Love (1983) and Hirsch and Lev (1971), diversification is expressed as not specializing the export portfolio in a limited number of export goods. Therefore, the larger the number of export goods in an export portfolio, the more diverse the exports of a country would be.

Economic development is a synchronous process with transformation of structural form in which the countries move from the production of primary products towards the export of industrial goods. The most important reason for this change is the income elasticity of demand for the exports of industrial goods in global markets. Many developing countries, which are dependent on primary products or offer limited range of export portfolio, often suffer from uncertainty of their exports. Therefore, export diversification is a way to reduce these kinds of limits.

Another important issue is the competitiveness of the

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countries’ exports in global markets and increasing growth of foreign trade exposing their exports to international competition. The purpose of this article is to investigate the role of export diversification in the economic growth of some selected developing countries. In the first and second sections, export diversification and its relation to economic growth will be studied theoretically and experimentally. In the third section, export diversification index will be defined and the procedure of this variable will be analyzed. The fourth section will discuss the model and classification of data. In the fifth section, the economic model of the developing countries over the period of 2000-2009 will be analyzed. And, finally, the sixth and seventh sections will include conclusions and suggestions respectively.

THEORETICAL BASIS

Recent studies in the literature of international trade have emphasized the role of trade in speeding up innovation and facilitating transmission of knowledge and technology. New theories of growth focus on advantages of a dynamic export sector based on increasing returns to scale and external effects of export sector on the other sectors. These external effects mainly include expansion of advanced techniques, employment of highly-skilled work force, and improvement of managerial skills due to the intense competition that exporters face in global markets (Romer, 1990; Barro, 1991; Sachs and Warner, 1995). Theoretically, there are various ways by which export diversification may lead to increase in economic growth. Herzer and Lehman (2006) believe that export diversification may have positive effect on economic growth by reducing dependence on the limited number of primary products. This theory may prove right about the developing countries that are heavily dependent on the exports of primary products and farming sector. Based on theories of the structuralist economists, developing countries in order to achieve a stable economic growth should move from exporting primary products towards exporting industrial goods (Chenery, 1979; Syrquin, 1988). Furthermore, according to the Prebisch-Singer theory, export diversification can prevent weakening of exchange relationships in the developing countries.

Potentially, there are two main channels concerning the effect of export diversification on economic growth. The first channel involves preventing the instability of export incomes known as portfolio effect. This view suggests that the developing countries exporting primary products often suffer from price instability of export goods. Price instability of export goods makes the exporters of these goods face fluctuations in their export incomes. Moreover, these fluctuations may lead to rise in uncertainty of macroeconomics variables and can be harmful for long-term economic growth.

Therefore, higher degree of export diversification will lead to fewer fluctuations through creating higher stability of the export incomes and will increase purchasing power in these countries. In turn, the increase purchasing power will result in larger investment and, consequently, rapid economic growth. In addition, exchange rate in the countries that are considerably dependent on limited number of products experiences fewer fluctuations than it does in the countries with diverse economic structure. These fluctuations may be an obstacle to investment in exchangeable goods and services (Ghosh and Ostry, 1994; Bleaney and Greenaway, 2001). Also, Agosin (2007) points out that the countries offering limited range of export portfolio, due to frequent fluctuations in export incomes, would face a variety of fluctuations which, in turn, would lead to low rate of economic growth in these countries. He argues that during economic depression the work force and available capacities would go through unemployment to such an extent that they may not easily return to the state of equilibrium in the period of economic prosperity.

The other channel of effect is associated with dynamic advantages of export diversification. Strategy of export diversification in terms of desirable effect on resource allocation not only may result in assured improvement in the allocation based on countries’ relative advantage in international trade but, more important than that, would lead to realization of dynamic profits. While resource reallocation based on relative advantage raises the income level, the dynamic profits of export diversification play an important role in increasing the rate of income growth. Increasing use of the factories’ capacities, realization of economies of scale, and job creation through exporting labor-intensive products have caused a multiplier effect that increases the demands for intermediate inputs and the consumer demands as well as leading to growth in the total factor productivity. The marginal factor productivity in export-oriented industries is significantly higher than that of other industries. This difference seems to be partly due to beneficial side effects of the section developed by export sector (Barmaki, 1378: 940).

A review of experimental studies

We found no research in Iran concerning the role of export diversification on the economic growth. Thus our review of experimental studies is limited to foreign studies. Using time series data and AEG model, Naudé and Rossouw (2011) investigated the relationship between export diversification and economic performance in Brazil, China, India, and South Africa during that period of 1962-2000. They concluded that there is a U relationship between export specialization and the growth of per capita income in China and South Africa. The findings from Granger causality method showed that there is a causal relationship between export diversification and per capita income in Brazil, China, and the Saharan countries.
in Africa. Furthermore, the findings resulted from AEG model showed that in South Africa export diversification has a positive and very significant effect on economic growth of these countries during the period.

Using time series techniques and Granger causality in their research, Arip et al. (2010) studied the long-term relationship between export diversification and economic growth during 1980-2007 in Malaysia. The results showed that export diversification has a remarkable role in the economic growth of Malaysia. Furthermore, they suggested that Malaysia has to diversify its exports in order to reach a sustainable economic growth.

Dalila and Eric (2008), in a research about MENA group (the countries of Middle East and North Africa), pointed out that export diversification has become the most important goal of development strategies in Middle Eastern and North African countries. In addition, direct foreign investments can play a key role as a complementary factor for export diversification in the process of economic development. Using pooled data method and GMM model, they showed that direct foreign investment and export diversification have a positive and significant effect on economic growth of this group of countries.

**Export diversification index**

Some of the researchers investigating the effect of export diversification on economic growth are Arip et al. (2010). They used DSD (degree of specialization and diversification) as their export diversification index for Malaysia. DSD index was introduced by Balassa (1989) and is calculated as:

\[
\sigma = \sqrt{\frac{1}{N} \sum_{i=1}^{N} (RCA_i - \overline{RCA})^2} \quad (1)
\]

Where N represents the number of goods, indicates the relative advantage of export goods, and indicates the mean of index for N goods from the sample. In fact, this method uses the standard deviation of index as the export diversification index. The equation (2) shows the mathematical relations of index. Based on the equation (1), it is evident that a lower standard deviation in this equation indicates a higher degree of export diversification. However, a higher standard deviation in the equation indicates a higher degree of export specialization. In other words, if the export diversification index reduces during a period, then it will mean that the country in question has experienced a higher degree of export diversification during that period and vice versa.

\[
\text{RCA}_i = \frac{\left(\frac{X_i}{X_i^l}\right) / \left(\frac{RCA}{X_i^l}\right)}{N}
\]

In equation (2), is the relative advantage index, represents the goods exported by the country, indicates the total exports of the country, represents the total goods exported in the world, and finally represents the total exports in the world.

Figure 1 shows the process of export specialization (export diversification) in the selected countries. As it is shown, export specialization index for these countries has been in decline from 2002 to 2008. This indicates that, in recent years, the developing countries have keenly been pursuing the policy of export diversification and trying to develop and diversify their export portfolio.

**DATA DEFINITION**

Generally, we can apply three methods to study the effects of trade policies on economic growth; that is, panel observations, time series, and general equilibrium models. The method of panel data was used in this research.

**Data collection**

To study the effect of export diversification on economic growth, the data from 23 developing countries with more similar economic conditions and more suitable data were used. Furthermore, the issue of export diversification has been high on the agenda. The selected countries included Argentina, Algeria, Ecuador, Indonesia, Iran, Brazil, Bangladesh, Bolivia, Pakistan, Turkey, Tunisia, Peru, Chile, Saudi Arabia, Colombia, Philippines, Malaysia, Morocco, Egypt, Mexico, Nigeria, India, and Venezuela.

**Determining the variables**

In this research, generalized method of moments (GMM) was used as an estimation method for dynamic data panel in which cross-sectional data and time series data are employed.

The general model of regression for cross-border growth is:

\[
\text{Lny}_i = \alpha \text{Ln} \text{y}_{i-1} + \beta' \text{LnX}_i + \epsilon_i
\]

Where is real GDP per capita, is lagged real GDP per capita, is a matrix of explanatory variables, and is error term of the regression. We apply the Arellano-Bond approach (Arellano and Bond, 1991) to estimate model and remove fixed effects and we use instruments matrix to remove the correlation of the lagged variable with the other explanatory variables. In this approach, Arellano and Bond propose a two-stage GMM estimator. In experimental studies, various variables are used for X vector, such as physical investment, human capital, population, labor, government expenditures, foreign direct investment, exchange rate, etc. Regarding particular conditions of the selected countries and the available data, the following model may be used to examine the effect of export diversification on their economic growth:

\[
\text{LnGDPP}_i = \alpha + \text{LnGDPP}_{i-1} + \beta_1 \text{LnK}_i + \beta_2 \text{LnL}_i + \beta_3 \text{LnED}_i
\]

Where GDPP, K, L, and ED represent GDP per capita, total physical capital, labor force, and export diversification index respectively. In this equation, i and t indicate the relevant sections and time respectively.

The required data for annual model estimation for the selected countries during 2000-2009 are as follows:

GDPP: GDP per capita at the fixed price of 2000, WDI (2010)
The process of export specialization (export diversification) in the selected countries. Source: calculated using sample data.

Table 1. Equation (4) estimation, fixed effects.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>T-Statistic</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>LnGDPP(-1)</td>
<td>0.21</td>
<td>14.68</td>
<td>0.00</td>
</tr>
<tr>
<td>LnL</td>
<td>0.54</td>
<td>27.57</td>
<td>0.00</td>
</tr>
<tr>
<td>LnK</td>
<td>0.15</td>
<td>28.49</td>
<td>0.00</td>
</tr>
<tr>
<td>LnED</td>
<td>-0.27</td>
<td>-9.61</td>
<td>0.00</td>
</tr>
</tbody>
</table>

J – Statistic  0.292
Wald Test      215.64

Source: calculated using sample data method results.

K: gross fixed capital formation at the fixed price of 2000, WDI (2010)
L: active labor force, WDI (2010)
ED: export diversification index (DSD), UNECTAD (2011)

Model estimation and coefficient interpretation

In this section, we estimate equation (4) and present the results. However, the main problem in estimating the models is that the lag of dependent variable on the right side of the equation is related to the country-specific cross-sectional effects. This model makes the estimation by means of pooled data (fixed effects or random effects) biased and inconsistent. Therefore, in order to estimate the models, we used the generalized method of moments (GMM) which is developed for dynamic panel models. Moreover, the variable lag as an instrument in the GMM estimator is used to remove the correlation of the lagged dependent variable with the error term. The results of estimation after various tests are shown in Table 1.

As shown in Table 1, all the variables in the model are statistically very significant and the coefficients are consistent with the economic theories. According to the results of Wald test that involves distribution with degrees of freedom equal to the number of explanatory variables minus the fixed component, the null hypothesis that all the coefficients are zero at the significant level of 1% is refuted and, consequently, the validity of the estimated coefficients is confirmed. Also, the Sargan test statistic, which involves distribution with degrees of freedom equal to the number of over-identifying restrictions, refutes the null hypothesis that the residuals are correlated with the instrumental variables? According to the results of this test, the instrumental variables applied for model estimation are valid enough. Thus, the validity of results to be interpreted is confirmed.

The coefficient of export specification (diversification) index is 0.27 and statistically significant at the level of 99% indicating that export diversification has positive effect on the developing countries’ economic growth. As the model is estimated in logarithmic form, the variable’s coefficient indicates its elasticity to economic growth. Regarding the estimated coefficient of export specification (diversification) index, if the export specification reduces by 1% in the developing countries, the economic growth will increase by 0.27%. This is consistent with the studies of Heiko (2008) on about 80 developing countries and Dalila and Eric (2008) about the countries of Middle East and North Africa and many other studies carried out in developing countries. The coefficient of export specification index estimated by pooled data and logarithmic method has always varied from 0.16 to 0.30 and increase in export diversification has had statistically positive effect on the rate of these countries’ economic growth. Furthermore, the variables of lagged GDP per capita, labor force, and physical capital have had positive and statistically very significant effect on the rate of economic growth of these countries.

Therefore, regarding the findings, it may be suggested that the effect of export diversification on economic growth of the countries in question is positive and increasing export diversification and export development based on the relative advantages and reducing the portion of primary products in export portfolio may lead to increase in the rate of economic growth through increasing export diversification and decreasing the fluctuations of export incomes.

Conclusion

In recent years, many policymakers have been interested in the issue of export diversification in economic literature that involves increasing the number of export goods and decreasing the dependence on a single source of income. For various reasons, such as instability in export prices of primary products in global markets and, consequently, high fluctuations in exchanges of them compared to industrial goods, this issue has also attracted many policymakers in the developing countries.

The main purpose of this research is to investigate the
relationship between export diversification and economic growth of some selected developing countries. Concerning the findings of the researches carried out, there is no consensus about the way in which export diversification influences the economic growth in different countries; that is, some confirm positive effect and some other confirm the negative effect.

In this research, the relationship among GDP per capita, physical capital stock, labor force, and export diversification index in 23 developing countries was studied using the GMM method. The findings showed that the effect of export diversification on these countries' economic growth is positive and significant. In fact, increasing export diversification and export development based on the relative advantages and reducing the portion of primary products in export portfolio as well as decreasing the fluctuations of export incomes will lead to increase in the rate of economic growth in the long term.

Policy recommendations

We can expect that if a country can encourage a proper and diverse mixture of export portfolio, then all or remarkable portion of the fluctuations in a subset of export goods may be evened out. Therefore, diversification of export goods is recommended as a solution to get rid of drops in export prices and export earnings instability.

Conflict of Interests

The authors have not declared any conflict of interests.

REFERENCES


