Relationship between Export Diversification and Economic Growth

Mohammad Hassan Fotros[1], Morteza Nemati[2*], Hadi Darabi[3]

[1]Associate professor, Faculty of Economy and Social Sciences, Bu-Ali Sina University, Hamedan, Iran
[2]PhD student, Faculty of Economics and Social science, Bu-Ali Sina University, Hamedan, Iran
[3]M.A, Faculty of Economics and Social science, Bu-Ali Sina University, Hamedan, Iran

Corresponding author E-mail: M.Nemati92@basu.ac.ir

Abstract

Nowadays, export diversification has become one of the most important economic objectives of development strategies in developing countries. For various reasons, such as prevent instability in export price of primary products in world markets and thus reduce the fluctuations in the terms of trade of them in compared with industrial goods, dynamic benefits from exports of various goods and increased productivity of production factors, economic growth will increase. The main purpose of this study is investigation role of export diversification on economic growth in selected developing countries during the period 2000 to 2009. Therefore, we investigate the relationship between per capita gross domestic product, physical capital stock, labor force, export diversification index. The results show that export diversification has significant positive impact on economic growth.

Keywords: Export diversification, Economic growth, Developing countries, GMM JEL classification: F10, O40.

Introduction

In recent years, the issue of export diversification in the economic literature has been considered by many policymakers that meant to increase exported products and reduce dependence on a source of income. However, different studies have proposed different definitions Alwang and Siegel (1994), Ferrantino and Gutierres (1997) have described diversify as progress in composition of a country's exports of primary products to industrial products. In the other group studies, such as Love (1979) and Hirsch and Lev (1971), diversify is expressed as decentralization of the country's export composition in a limited number of exported products. Thus, whatever the composition of a country's exported more be done in more export products, it is said that the country's exports are more diversified. The economic development process is a process consistent with the structure change in those countries that causes production of primary commodities move towards manufacturing and export of industrial goods. The main reason for this transfer is high elasticity income demand for exports of industrial products in world markets. Many developing countries that depend on primary commodity exports or have little exports suffer from uncertainty in their exports. So export diversification is a way to reduce these certain constraints. Another important problem is the competitiveness of countries exports in world markets and the increasing cross-border trade which exporting countries will be exposed to international competition. This paper investigates the role of export diversification on economic growth in selected developing countries.

Recent studies in the literature of international trade focused on the role of business to accelerate of innovation and facilitate the transfer of knowledge and technology. The new growth theory emphasizes to advantages of a dynamic export sector based on the principle of increasing returns to scale and externalities effects of the export sector to other sectors. These externalities effects is showed in form of the diffusion of more advanced techniques, skilled labor force and enhance management skills due to the intense competition are faced by exporters in the world market.

Theoretically, there are many ways through which export diversification can increase the economic growth. Herzer and Lehmann (2006), argue that export diversification can have a positive impact on economic growth with the reduce dependence on the limited number of primary commodities. This theory holds true in the case of developing countries which rely heavily on exports of agricultural and primary commodities. Based on constructionist theories, developing countries to achieve sustainable economic growth should propel their exports of primary commodities to manufactured goods exports (Syrquin, 1989). Also, according to Prebish-singer, export diversification can prevent the decline in terms of trade in developing countries. Potentially, there are two main channels in relation to the influence of export diversification on economic growth. The first channel is by preventing of instability

in export revenues which is known portfolio. This view states that exporting countries of primary commodities often suffer from price instability of their export commodities. Instability in the prices of primary commodities will lead to volatility in export revenues of these commodity exporters. In addition, it may lead to increase the uncertainty in the macroeconomic variables and is harmful for economic growth in long-run. Thus, a higher degree of export diversification with greater stability in export revenues is lead to lower volatility in these revenues and provides the background of increase the purchasing power of these countries. Increased purchasing power has also led to higher investment and economic growth will increase in this way. Moreover, the exchange rate will have more volatility in countries that export are significantly dependent on a limited number of commodities compared to countries with diverse economic structures. This fluctuating will be prevented to investment in tradable goods and services (Ghosh & Ostry, 1994). Also Agosin (2007) states that economic growth in countries which provide limited and low export basket will be faced with volatile due to fluctuations in export revenues. This also leads to lower economic growth in these countries. He argues that during the recession, labor force and capacities in the economy will be unemployed somehow during the economic boom cannot easily return to equilibrium.

Another channel of this influence is related to the dynamic benefits of export diversification. Export diversification strategy in terms of favorable impact on resource allocation is possible not only lead to definite improvement in the allocation in accordance with countries comparative advantage in international trade, but also it will lead to realizing the benefits of dynamic. While the reallocation of resources according to comparative advantage increases income, dynamic benefits of export diversification increases speed income growth. Increase using the capacity of factories, the realization of economies of scale, creating jobs through exporting labor intensive commodities creates an increasingly effect and increases the demand for intermediate inputs and consumer demand and is realized growth in total factor productivity.

Naude and Rossouw (2010) investigated the relationship between export diversification and economic performance of countries Brazil, China, India and South Africa during the period 1962-2000 by using time series data and models (AEG). They concluded that a U-shaped relationship is established between focus of exports and per capita income growth in China and South Africa. The results of Granger Causality method show that there is a causal relationship between export diversification and per capita income in Brazil, China and sub-Saharan Africa. Furthermore, the results of AEG model indicate that export diversification has positive effect on economic growth during the period under review in South Africa.

Hesse (2008) by using the Solow growth model and the panel data in selected developing countries concludes that export diversification plays an important role in the economic development process in developing countries. He argues that the focus on exports by reducing trade between countries, particularly the primary commodity exporting countries, has a negative impact on economic growth in this country. Ferreira (2009) examined the long-run relationship between export diversification and economic growth by using the theory of learning by exporting in Costa Rica and the method of ARDL in period 1965-2006. He concludes that export diversification has no long-run impact on economic growth in this country. Affendy et al (2010) investigated the long-run relationship between the export diversification and economic growth in Malaysia during the period 1980-2007 by using the time-series techniques of co-integration and Granger causality. The results indicate that export diversification plays a significant role in economic growth in Malaysia. They also suggest that in order to achieve sustainable economic growth, Malaysia needs to diversify its export. In addition, the export diversification strategy, in the long run will lead to stability in the country export revenues.

Nicet-Chenaf and Rougier (2008), in a study for the MENA countries expressed that export diversification has become the major target for development strategies in countries of the Middle East and North Africa. In addition, foreign direct investment (FDI) can also play a key role in the economic development process as a complement the export diversification. They used of the panel data model and generalized method of moment (GMM) and finally show that FDI and export diversification have positive and significant effect on economic growth in these countries. Agosin (2007) by using an empirical growth model and method of panel data has examined the hypothesis of export diversification and economic growth in the countries of Mauritius, Thailand, China, Chile, Taiwan and Korea during the 1980-2003 years. He stated that export diversification in these countries beside of others control variables like investment and labor force have a positive and significant effect on per capita income growth.

Methodology

A study that examines the impact of export diversification on economic growth is the study of Affendy et al (2010). He uses of the (DSD) index as the export diversification index in Malaysia. DSD index presented by Balassa (1989) and is calculated according to equation (1):

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

(1)

So that N is the number of commodities, RCA_i represents a comparative advantage in export commodities and $\overline{RCA}$ represents the average RCA index in N desired commodities in the sample. In fact, this method uses the standard deviation of RCA index as an indicator of export diversification. Equation (2) indicates the mathematical relation of RCA index. According to equation (1), it is clear that whatever the value of the standard deviation (σ) in this relation is lower, indicating a higher degree of export diversification. While higher value of the standard deviation in equation (1) indicates a higher degree of export diversification.

In other words, in a period of time, if the export diversification index (DSD) decreases, that country will experience the higher degree of export diversification during the desired period and vice versa.

$$RCA_i^{\,j} = \frac{\{X_i^{\,j}\}/X_t^{\,j}}{\{X_i^{\,W}\}/X^{\,W}}$$ (2)

In equation (2), RCA represents a comparative advantage index, $X_i^{\,j}$ represents i commodity exports by country j, $X_t^{\,j}$ is total exports of country j, $X_t^{\,W}$ represents the export of i commodity in the world, X^W is total exports in the world. Figure (1), the mean concentration of exports (export diversification) shows in selected countries. As can be seen, between 2002 and 2008, the export concentration index has been declining in these countries, regularly. This indicates that in recent years, developing countries seriously have followed policies of export diversification and have been tried to expand and diversify their export basket.
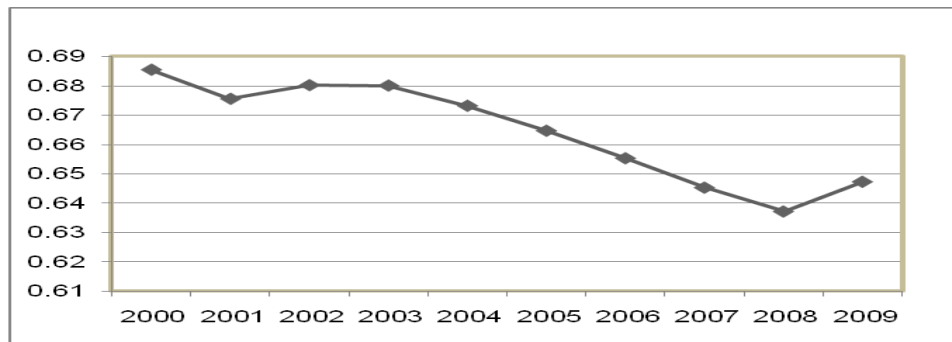

Figure 1. The export concentration index (diversity) in selected countries.

Generally, in order to examine the effects of trade policies on economic growth can be used of three methods. Using of observations of cross-country or panel, time series and general equilibrium models that in the present study uses panel data methods. In this study we assess the impact of export diversification on economic growth in developing countries using data from 23 countries which have homogeneity and economic conditions of closer together and more and better statistics compared to other developing countries. On the other hand, in recent years export diversification has been on the agenda in these countries, seriously. Selected countries in the study 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.

This study for assess the relationship between the economic growth and export diversification uses of generalized method of moments (GMM) that is an estimator for dynamic panel method. In this way, two types of time-series and cross-section data are used. Generally the cross-country growth regression model is as follows:

$$Lny_{it} = aLny_{i,t-1} + B'LnX_{it} + \varepsilon_{it}$$ (3)

y_{it} : Real GDP per capita
$y_{i,t-1}$: The lag of real GDP per capita
X_{it} : The matrix of explanatory variables
ε_{it}: The regression stock astics

We use Arellano and Bond (1991), to estimation of model and eliminate the fixed effects and to eliminate the correlation of variable with lag and other explanatory variables, we use the instruments matrix. In this method, Arellano and Bond offer the two-stage GMM estimators. Different variables are used for the X vector in empirical studies, such as physical capital, human capital, population, labor force, government expenditure, foreign direct investment, exchange rate and etc. Which considering to special circumstances of these countries, and the available information is used in the following model to examine the effect of export diversification on economic growth in these countries?.

$$LnGDPP_{it} = a + LnGDPP_{i,t-1} + B_1LnK_{it} + B_2LnL_{it} + B_3LnED_{it}$$ (4)

Where, GDPP, K, L and ED are respectively representing the GDP per capita, physical capital, labor force and export diversification index. In this regard, i and t are respectively showing the desired sections and time. The data needed to model estimation annually from 2000 to 2009 for selected countries are as follows:

GDPP: GDP per capita in constant prices of 2000, WDI (2010)
K: Gross fixed capital formation in constant prices of 2000, WDI (2010)
L: Active labor force, WDI (2010)
ED: Export diversification index (DSD), UNECTAD (2011*).*

Data analysis

In this section we estimate equation (4) and offer the obtained results, but the main problem that we face in estimating these models is that the lag of dependent variable in right side of model are related to specific cross effects of each countries (η_i).This model is caused to estimating model using panel data method (fixed effects or random effects) is biased and inconsistent.

Therefore, we have used of the generalized method of moments (GMM) that have been developed for dynamic panel models. Furthermore, in this method lag of dependent variable is used as instrument in GMM estimator for the elimination of correlations the dependent variable and the error term. The results of estimation with GMM method is presented in table 1.

Table 1. Results of estimating equation 4 in selected countries using fixed effects.

Dependent variable: real GDP per capita			
Variable	Coefficients	t	Sig.
$LnGDPP(-1)$	0.21	14.68	0.000
LnL	0.54	27.57	0.000
LnK	0.15	28.49	0.000
$LnED$	-0.27	-9.61	0.000
j- statistic		0.292	
Wald Test		215.64	

As can be seen, all the variables used in the model were statistically significant at a high level and the signs of the coefficients are consistent with economic theory. According to the Wald test, Null hypothesis that all coefficients are zero in one percentage level is rejected and confirms the validity of the estimated coefficients. Sargan test statistic also being rejected the null hypothesis based correlated of residuals with instrumental variables. Based on the results of this tests instrumental variables used in the model are valid. So, validity of the results is confirmed for interpretation.

Coefficient of export diversification index equals to 0.27 and is significant at the 99% level which indicates that export diversification has a positive impact on growth in developing countries. Given that the model is estimated using the logarithmic form, variables coefficient represent elasticity of that variable than economic growth. According to the coefficient of estimation the export diversification index, if export diversification is reduced by one percent in developing countries, economic growth increases amounted to 0.27 percent in these countries. This result is consistent with the study results of Hesse (2008) for more than 80 developing countries and studies of Nicet-Chenaf and Rougier (2008) for the Middle East and North Africa and many other studies conducted in developing countries. So that in some studies, the estimated coefficient of export diversification index by using the panel data and the logarithmic has been always ranged between 0.16 to 0.30 and increase in export diversification has been significant and positive impact on economic growth in these countries. Moreover, the impacts of variables as GDP per capita with lag, labor force and physical capital on economic growth was positive and statistically significant in these countries.

Thus, according to the obtained results can be expressed that the effect of export diversification on economic growth is positive in the countries surveyed and with increase the export diversification and export promotion based on comparative advantages and reduce the share of primary commodities in total export basket of the country in long run can increase economic growth through increased export diversification and reduce volatility in export revenue.

Conclusion

In recent years, the issue of export diversification in the economic literature has been considered by many policymakers that meant to increase exported products and reduce dependence on a source of income. Export diversification is considered by policy makers, especially in developing countries for various reasons such as volatility of export prices of primary products in world markets, resulting in large fluctuations in the terms of trade for primary products compared to industrial goods. The purpose of this paper is examination of the role of export diversification on economic growth in selected developing countries.

Based on research done in this field, there is not a consensus on how the impact of exports diversification on economic growth in different countries. This means that some groups are believed to positive relationship and some groups are believed to negative relationship between these two variables. In this study, we examined the relationship between GDP per capita, physical capital, labor and export diversification index for the 23 developing countries with use the generalized method of moments (GMM). The results showed that the effect of export diversification on the economic growth of selected countries is positive and significant.

In fact, the increase in export diversification and export promotion based on comparative advantage and reduce the share of primary commodities in total export basket of the country, and also reduce the fluctuations in export revenues, will lead to increased economic growth. It is expected that if a country be able to encourage the correct composition and diverse of export, all or

part of the price volatility is compensate in a subset of export goods. Accordingly, export goods diversification is often recommended as solution to ridding the country of the decline in export product price and volatility in foreign exchange revenues.

References

Affendy M, Sim L, Bakari A, 2010. Export diversification and economic growth in malaysia. Munich personal RePEc Archive (MPRA) Paper No. 20588.

Agosin M, 2007. Export diversification and growth in emerging economies. Working paper, Universidad de Chile: Department de Economia, Universidad de Chile.

Alwang J, Siegel PB, 1994. Portfolio models and planning for export diversification: Malawi, Tanzania and Zimbabwe. Journal of Development Study. 30(2): 405-422.

Arellano M, Bond SR, 1991. Some tests of specification for panel data: monte carlo evidence and an application to employment equations. Review of Economic Studies. 58(2): 277-297.

Balassa B, (Ed.), (1989). Trade Liberalization and 'Revealed' Comparative Advantage. Hertfordshire: Harvester Wheatsheaf.

Ferrantino M, Gutierres SA, 1997. Export diversification and structural dynamics in the growth process, the case of Chile. Journal of Development Economics. 52: 375-391.

Ferreira G, 2009. Export diversification and economic growth in Costa Rica. Louisiana State University, Department of agricultural economics and agribusiness. Annual meeting, Atalanta, Georgia, 31 January 3 February 2009.

Ghosh AR, Ostry J, 1994. Export instability and the external balance in developing countries. IMF Staff Papers. 41: 214-35.

Herzer D, Lehmann N, 2006. What does export diversification do for a growth?. An econometric analysis. Applied Economic. 38(15): 1825-1838.

Hesse H, 2008. Export diversification and economic growth. Working paper, Commission on growth and development, The World Bank, Washington, DC.

Hirsch S, Lev B, 1971. Sales stabilization through export diversification. Review of Economics and Statistics. 53: 270-277.

Love J, 1979. A model of trade diversification based on the Markowitz model of portfolio analysis. Journal of Development Studies. 15: 233-241.

Naude W, Rossouw R, 2010. Export diversification and economic performance: evidence from Brazil, China, India and South Africa, Econ Change Restruct.

Nicet-Chenaf D, Rougier E, 2008. FDI, diversification and growth, an empirical assessment for MENA countries. IMF Staff Papers. 40: 151-172.

Syrquin M, 1989. Patterns of structural change. In: Chenery H, Srinavasan TN., (Edn.), Hanbook of Economic Development. Amsterdam: Elsevier Science Publishers.