The Strategy of Export Diversification and Economic Growth in Selected Developing Economies
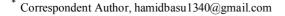
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Abstract
Today export diversification has become one of the most important economic objectives of development strategies in the developing countries. For various reasons, such as preventing instability in export prices of primary products in global markets, 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 selected developing countries over the period of 2000-2010. Accordingly, the relationship among GDP, physical capital stock, labor force, and export diversification index was studied using the generalized method of moments (GMM). The results showed that reducing export specialization and increasing export diversification have significantly positive effect on the rate of economic growth of these countries.

Keywords: Export Diversification, Economic Growth, Developing Countries, GMM
JEL classican: F10, O40

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1. Introduction

In recent years, many policymakers have been interested in the issue of export diversification in economic literature that means increasing the variety number of export goods and decreasing the concentration on a single source of income. However, different studies have proposed different definitions. Alwang and Seigel (1994) and Ferrantino et al. (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 concentrating the export portfolio in a limited number of export goods. Therefore, the larger the number of export goods in an export portfolio is, the more diverse the exports of a country would be. Economic development is a process synchronous 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 concerns competitiveness of the 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 2000-2010 will be analyzed. And, finally, the sixth and seventh sections will include conclusions and suggestions respectively.

2. Theoretical Background

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. Findings of an econometric exercise in the study of Seetanah et al. (2014), revealed a positive relationship between export diversification and economic growth in Mauritius both in the short run and long run. Nevertheless, the coefficients of the short run estimates were smaller than the long run ones, implying that it takes time for the absolute effect of export diversification to be experienced. Moreover, domestic investment, trade openness, human capital and FDI were also seen to contribute to economic growth in the long run. In addition, a bi-causal relationship between diversification and growth in the country was confirmed with openness, human capital and FDI also having been identified as the short run determinants of exports diversification. Diversification is observed to work indirectly through openness, FDI and GDFCF in influencing economic performance. 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 workforce, and improvement of managerial skills due to the intense competition that exporters face in global markets (Grossman and Helpman, 1991). 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 structuralism economists, developing countries in order to achieve a stable economic growth should move from exporting primary products towards exporting industrial goods (Syrquin, 1989). Furthermore, according to the Prebisch-Singer theory, export diversification can prevent weakening of exchange relationships in the developing countries.

In the light of the experience of successful exporting countries, there is a growing consensus in economic literature that outward-oriented policies combined with selective market friendly interventions can help countries grow more, and reap the benefits of trade liberalization. There is also a growing consensus that patterns of economic development is associated with structural change in exports and increased export diversification. In virtually all regions of the world, the patterns of trade have changed from primary exports to manufactured exports of labor intensive types and subsequently to more resource intensive manufactures (Samen, 2010). In this regard, Aditya and Acharyya (2013) investigated the export-growth relationship at the country level and at the level of exports, focusing on the diversification and the composition of exports of a sample of 65 countries for the period 1965–2005. The dynamic panel estimation revealed that both diversification and composition of exports are important determinants of economic growth after controlling for the impacts of other variables like lagged income, investment, and infrastructure. There is a critical level of export concentration beyond which increasing export specialization leads to higher growth. Below this critical level, diversification of exports matters for gross domestic product (GDP) growth. Growth of high technology exports also contributes to the output growth; the relationship becomes stronger for countries that have share of manufacturing exports in their total exports greater than the world average. These results are robust even when the dataset is classified in four sub-panels based on the export-economic growth relationship.

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 investments and rapid economic growth. In addition, exchange rate in the countries that are considerably dependent on limited number of products experiences less fluctuation 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 workforce 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 (Amin Guitierrez de Pineresn and Ferrantino, 2000).

One of the researchers investigating the effect of export diversification on economic growth is Affendy 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, RCA_i indicates the relative advantage of export goods, and $\overline{RCA}$ indicates the mean of RCA index for N goods from the sample. In fact, this method uses the standard deviation of RCA index as the export diversification index. The Equation (2) shows the mathematical relations of RCA index. Based on the equation, 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 (□)

declines 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.

$$RCA_i^j = \frac{\{X_i^j\}\big/\{X_t^j\}}{\{X_i^w\}\big/\{X_i^w\}} \quad (2)$$

In Equation 2, RCA is the relative advantage index, X_i^j represents the goods i exported by the country j, X_t^j indicates the total exports of the country j, X_i^w represents the total goods iexported in the world, and finally X_i^w represents the total exports in the world.

3. Literature Review

Since few researches have been conducted in Iran concerning the role of export diversification on economic growth, our review of experimental studies is mostly limited to foreign studies. Agosin (2007) examined the hypothesis of export diversification and economic growth in Mauritius, Thailand, China, Chile, Taiwan, and Korea during 1980-2003 odd; using the experimental model of growth and pooled data method. He stated that, in these countries, export diversification as well as other control variables such as investment and workforce has a positive and statistically significant effect on the growth of per capita income. Hesse (2008) in his article "Export Diversification and Economic Growth" for some developing countries concluded that export diversification plays an important role in the process of economic development of developing countries; Using Solow growth model and pooled data method. He suggested that export specialization has a negative effect on the economic growth in these countries due to reduction in exchange relationships between the countries, especially those exporting primary products.

Using learning-by-exporting hypothesis and ARDL method, Ferreira (2009) studied the long-term relationship between export diversification and economic growth in

Costa Rica during 1965-2006. Nicet-Chenaf and Rougier (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. Herédia and Veiga (2010) studied the political and economic factors that determine successful export diversification and export sophistication strategies in the Sub-Saharan African (SSA) countries and also the way in which successful export diversification and sophistication strategies contribute to explain the improving in some of the millennium development goals (MDG). Using separate regressions and disaggregated data (1960 to 2005) of the 48 SSA countries, for the determinants of export sophistication and export diversification, the results suggest that better governance is an important determinant for the success of diversification and sophistication strategies in SSA. In particular, the level of corruption, transparency and accountability are important factors in limiting or promoting the scope of diversification and the level of sophistication of the exports. The results also suggest that increases in human capital in SSA countries promote both export diversification and export sophistication, showing that the level of education of the workforce is positively related with export sophistication and export diversification, with higher levels of education (tertiary) playing a more important role in explaining export sophistication, while lower levels of education (primary) being more important as determinants of export diversification. Their study also suggests that the Sub-Saharan

countries that were more successful in achieving export diversification and export sophistication tend to be more successful in improving the living conditions of their population.

Affendy et al. (2010) studied the long-term relationship between export diversification and economic growth during 1980-2007 in Malaysia; Using time series techniques and Granger causality in their research. The results showed that export diversification has a remarkable role in the economic growth of Malaysia. Furthermore, the suggested that Malaysia has to diversify its exports in order to reach a sustainable economic growth. Using time series data and AEG model, Naude 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 resulted 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 a panel of 30 selected sub-Saharan African countries over the period 1995-2008, Songwe and Winkler (2012) estimated the impact of exports and export diversification on value added, labor productivity, and conditional and unconditional labor demand. The results indicated on one hand that, exports have a positive impact on value added, labor productivity and labor demand. On the other hand, they found that export diversification of products and markets increase value added and labor productivity, but not labor demand. Moreover, controlling for the export market share to the U.S., EU-25, China and sub-Saharan Africa, the results

show that the export destination matters for growth and employment.

In their study, Olaleye et al. (2013) used a thirty years dataset of Oil, manufacturing and agricultural share of total exports of Nigeria as independent variables and per capita income as the dependent variable, which is important at a time the government of Nigeria is focusing on diversifying the economy. The result estimation showed that there is a uni-directional relationship between per capita income and all the variables except Agricultural share of export which exhibits bi-directional causal effects. This confirms the need for the country to look into diversifying the economy with a view to deepen the impacts of other sector on socio-economic development of the people. The study actually confirmed the assertion of relationship between export diversification and economic growth in Nigeria, using the Granger Casualty test which is the first time this method is adopted in the study of the impact of export diversification of the economy of the country, which has added to the empirical evidence.

4. The Model

Generally, one may 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. 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.

In this research, attempts are made to estimate a dynamic panel data model with special references to generalized method of moments (GMM), which exploits all the linear moment restrictions that follow from the assumption of no serial correlation in the errors, in an equation which contains individual effects, lagged dependent variables and no strictly exogenous variables. The general model of regression for cross-border growth is depicted as Equation 3.

$$Lny_{it} = \alpha Lny_{i,t-1} + \beta' LnX_{it} + \varepsilon_{it} \qquad (3)$$

Where y_{it} is real GDP, $y_{i,t-1}$: lagged real GDP, X_{it}: matrix of explanatory variables and ε_{it}: 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 (1991) 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 is used to examine the effect of export diversification on their economic growth (Equation 4).

$$LnGDP_{it} = \alpha + LnGDP_{it-1} + \beta_1 LnK_{it} + \beta_2 LnL_{it} + \beta_3 LnED_{it} \qquad (4)$$

Where, the dependent variable, $LnGDP_{it}$, is the natural log of the GDP for each country. The independent variables in the core model include $LnGDP_{it-1}$, LnK_{it}, and $LnED_{it}$, representing the natural log of total physical capital, labor force, and export diversification index respectively. In equations 3 and 4, i and t indicate the relevant sections and time respectively. Each of these variables is significant and robust. The required data for annual model estimation for the selected countries during

2000-2010 is as follows:

GDP: GDP at the fixed price of 2005, WDI (2012)

K: gross fixed capital formation at the fixed price of 2005, WDI (2012)

L: active labor force, WDI (2012)

ED: export diversification index (DSD), UNECTAD (2012)

5. Empirical Results

Figure 1 shows the process of export specialization (export diversification) in the selected countries. As it is shown, export specialization index for selected countries has been in decline during 2000 to 2013. 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 (Figure 1).

Figure 1: The process of export specialization (export diversification) in selected countries
Source: World development indicators (2014). Available at: http://data.worldbank.org

Although we have studied export concentration (diversification) for 23 countries in this study, but Table 1, illustrates the exports concentration (exports diversification) index of Iran and other 7 neighboring countries, whose economies are similar to the Iranian economy in the region, including Malaysia, Turkey, Egypt, Saudi Arabia, Algeria and Pakistan during the years 2002 and 2013.

The results in table 1 indicates that during the years of the study, the export concentration index had a diminishing rate and on the contrary, the export diversification had increasing rate, while the rate was not the same for all countries. For instance, one may observe the rate of Export diversification was higher in the case of Malaysia and Turkey.

Table 1: Export Concentration (diversification) in Iran and regional countries (2002-2013)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Iran	0.80	0.80	0.78	0.76	0.75	0.75	0.75	0.76	0.71	0.73	0.73	0.73
Malaysia	0.51	0.50	0.47	0.47	0.45	0.46	0.44	0.47	0.47	0.47	0.46	0.45
Turkey	0.55	0.54	0.51	0.53	0.47	0.46	0.47	0.51	0.46	0.48	0.44	0.48
Egypt	0.65	0.64	0.63	0.62	0.60	0.60	0.55	0.55	0.57	0.55	0.54	0.52
Saudi Arabia	0.82	0.83	0.81	0.81	0.79	0.77	0.77	0.78	0.77	0.77	0.76	0.76
Algeria	0.84	0.82	0.83	0.81	0.80	0.80	0.76	0.79	0.78	0.72	0.72	0.74
Pakistan	0.79	0.78	0.78	0.77	0.74	0.72	0.72	0.71	0.72	0.70	0.72	0.72

Source: World development indicators (2014). Available at: http://data.worldbank.org

Further, the Equation 4 has been estimated and the results are illustrated in Table 2. 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($_i$). 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 2. From Table 2, it can be inferred that in this study, the Real GDP of selected countries increases by 0.67 percent in response to a one percentage increase in GDP of previous year. A one-percent increase in the share of human source of production results in a 0.29 average percent increase in GDP. This indicates that labor productivity plays an important role in economic growth measured by GDP. That means, any further

growth in the labor force would substantially contribute to economic growth as much as other factors of production. According to the estimates, the contribution of capital to GDP is also significant one-percent increase in the share of capital formation results in a 0.12 average percent increase in GDP. A further reason for capital stock growth to be important for GDP growth is that the structural base of developing countries may be characterized by capital shortage and labor abundance. A one-percent increase in the share of export specification index, results in a -0.10 average percent decrease in GDP, in other words, one-percent increase in the share of export diversification, results in a 0.10 average percent increase in GDP This indicates that (horizontal and vertical) export diversification plays an important role in economic growth. This feature is in line with economic theory and suggests the opening to trade and the elimination of distortions increase the average quality of capital and improve the allocation of capital towards sectors with higher marginal productivity.

Table 2- Model estimation; fixed effects method results

Dependent variable: Real GDP			
variable	coefficient	t-statistic	probability
$L_n GDP_{(t-1)}$	0.67	10.73	0.00
LnL	0.29	2.54	0.01
LnK	0.12	8.17	0.00
LnED	-0.10	-2.03	0.04
R^2		0.89	

Source: Authors

As shown in Table 2, all the variables in the model are statistically significant and the coefficients are consistent with the economic theories. According to the results of Wald test that involves χ^2 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 χ^2 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 0.10 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 0.10 %. This is consistent with the studies of Hesse (2008) on about 80 developing countries and Nicet-Chenaf and Rougier (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, 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 economic growth increase rate of through increasing export diversification and decreasing the fluctuations of export incomes.

5. Conclusions

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, 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.

Therefore, 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.

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