The Impact of Comparative Advantage of Agricultural Triple Industries and Export Diversification on the Value-Added Industries in Iran

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Abstract

Developmental plans of the country emphasize on the exports-focused growth strategy, and export diversification is one of the most appropriate policies in this area. Export diversification moves from primary goods to industrial goods. Yet, export diversification, according to the principles of international trade, must be based on comparative advantage until to change value-added. Changes in the value-added of industrial activities can show manufacturing and export capabilities of a country and also production growth. Due to the importance and high value-added of the agricultural sector in developing countries, added value and influencing factors in triple industries of food, wood, and paper are studied. To this end, human capital and physical capital in agricultural triple industries is considered. The variable of weighted comparative advantage of agricultural triple industries and diversification in these industries are considered for the period of 1998 to 2013 by using panel data. The results of the model estimation indicated that, during the period under study, the wood and paper industries had the lack of comparative advantage in the production and export. This variable will have a negative effect on the growth of value-added. Exports diversification is only carried out in food industries; however, this variable had a positive impact on the growth of the value-added of agricultural sector industries. The human capital and physical capital have a high positive effect on value-added of the industries in the agricultural sector.

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INTRODUCTION

The need for economic development in developing countries is not hidden from anyone, where there exists a huge gap between these countries and the industrialized ones; therefore, developing countries should put the development planning at the top of their activities. The value-added of the industry and its contribution to gross domestic product is one of the criteria that can describe the developmental situation of the industries. In order to achieve industrial development and its continuation, in addition to the widespread use of traditional factors of production (labor and physical capital), attention to the country's comparative advantages in production and also increasing the production through diversification of goods production in terms of structure and number of goods is inevitable. Since the agriculture is the main activity in developing countries (including Iran), the importance of the agricultural sector in the process of economic growth and development is remarkable. Due to the growth of young population, lack of employment and providing food security, the existence of comparative advantages in the agricultural sector in Iran's economy is necessary (Shahabadi, 2009). Agricultural activities development are considered as basic indices in developing countriessuch as; Iran. Principle of comparative advantage is one of the important economic criteria forproduction planning, import and export (Karbasi, 2005). Given the importance of agriculture and the development of non-oil exports, triple the industry comparative advantage in agriculture is important and studied according to the classification of ISIC 3 Group industry includes foodstuffs, wood and paper industries.

Iran, despite having considerable resources in the agricultural sector, due to the several insufficiencies such as low productivity of factors, poor management, inefficiencies of the units, and application of traditional methods of production, has failed to achieve the optimal growth of development. The agricultural sector can play a major role in the development of the economy of our country; this importance is significant in terms of providing foods, creation of employment, providing foreign exchange and the needs of other economic sectors as well as the contribution, which it has in the gross domestic production of the country. The lack of competition between domestic producers and the same type of foreign producers, and consumers' tend to buy foreign products are of the factors that can influence on production, import and export in wood industry, which is one of the problems in this field (Yazdani, 1995).

Agricultural diversification implies increasing the variety of agricultural commodities produced at the farm level. From this point of view, Southeast Asia was remarkably successful in agricultural diversification in the nineteenth and early twentieth century's (Hayami, 1992) when in response to growing demand from the West for tropical products. Agricultural diversification in this narrow sense may also be the response of subsistence. Diversification can occur at the micro, regional, and macro level (see Taylor1994). At the micro level, the individual household diversifies in order to strengthen and broaden its sources of farm and non-farm income. That may involve both horizontal diversification toward new agricultural commodities or vertical diversification into non-farm activities such as marketing, storage, and processing.

Shayesteh and Ranjbar (2014) have investigated the impact of comparative advantage of the nine exports industries and export diversification on the value added of the industries in Iran in the period of 1997-2012. Findings of this research indicate that the value-added of the industries has a similar trend with exports and export diversification. The variables of labor and physical capital in the industry sub-sectors have a positive impact on the value-added of the industries, which shows the developmental effects of these two variables. The human capital variable also has a positive effect on the added value that could be due to the skill and the spillover of research and development. Export diversification in the nine industries leads to growth of value added of industries. Comparative advantage of industries has an increasing effect on the value added of the industries.

Kohansaland and Zamaninejad (2013) have

studied determination comparative advantage of main agricultural products in Fars and Mazandaran Provinces during 2006 to 2010. Using RCA index showed that Fars province in production agricultural products such as corn, wheat, and beans had comparative product advantage and Mazandaran Province in production agricultural products such as grain, and canola had comparative products advantage. So, development and agricultural improvement of cultivation these products will have positive results for national and regional economy.

Zamaninejad and Abdeshahi (2012) has studied determination of comparative advantage on the main agricultural products. In this study, the Revealed Comparative Advantage Index (RCA) has been used to determine the comparative advantage of production. Data are formed as time series between the years of 2003 to 2008 and are collected through the Agricultural Administration statistics. Using the RCA index showed that K & B province had production comparative advantage in producing the agricultural products such as wheat, grain and paddy during years of 2003 to 2008, grain corn in 2008, bean during 2004 to 2007 and Canola in 2007; while there was no production comparative advantage for tomato during 2003 to 2008. Therefore, development and well agriculture of these products would lead to positive results for the local and national economy.

Research results Belova et al. (2012) are consistent with the above conclusion that the export of the Czech food industry experienced a significant transformation after joining the EU, and that the only traditionally competitive sectors maintain a positive position.

In an article entitled "Orientation of comparative advantage of some newly industrialized countries of South East Asia and its comparison with Iran." Darvishi and Asgari (2007) have calculated the comparative advantage index of economic sectors of these countries by using panel data method in the period of 1984-2000. The results indicate that industry and creating a comparative advantage in this sector has been the main factor of economic growth in newly industrialized countries. Iran has no advantage changes in

line with these countries, but the advantages focus on agriculture sector, which has negative impact on economic growth based on research findings.

Vaez et al (2007) have studied the role of labor, capital and research and development expenditures in value added of high-tech industries in Iran in the period of 1988-2006. Based on their research, the variables including the role of labor, capital, and research and development expenditures play important roles in increasing added value of the industries in the studied period.

Accordingly, the purpose of this study was investigation of the impact of the traditional factors of the growth of the value added of the production, which include: university-educated labor force as human capital and physical capital, as well as the variables of comparative advantage in agricultural triple industries and diversification of production in order to increased growth of the value added of agricultural sector in line with the competitiveness of agricultural products in the international arena, development of export markets, increasing domestic production standard and moving toward market economy and providing food security. In other words, the case of the present study is investigation of the impact of comparative advantage of the agricultural triple industries and the diversification in these three industries as well as human capital and physical capital on the growth of value added in the agricultural sector of Iran's economy, and the hypothesis include:

1- The impact of the human capital in the agricultural triple industries on the growth of value added of this sector during the years of 1998 to 2013 is positive and significant.

2- The impact of the weighted comparative advantage of the agricultural triple industries on the growth of value added of this sector during the years of 1998 to 2013 is positive and significant.

3- The impact of the export diversification in the agricultural triple industries on the growth of value added of this sector during the years of 1998 to 2013 is positive and significant.

Accordingly, the second section of the paper deals with the expression of the theoretical dis-

cussions. The third section, overview of the empirical studies is done. The fourth section is devoted to specify the model and fifth section deals with the results of the estimation of the model.

MATERIALS AND METHODS

The main framework of the research is based on the theories of Grossman-Helpmn (1991). They believe that goods diversification regarding consumer demand and market trend along with other factors such as physical capital can have positive effects on economic growth. In addition, according to Ricardo's theory, each country should produce the goods that have a comparative advantage for that country. Therefore, to express the concepts of diversification, comparative advantage and value added of production, specifying the function will be investigated at first.

The neoclassic function is used in order to relate the production diversification, comparative advantage, and production:

$$Y_t = F_t\ (K_t,\ L_t,\ P_t) \qquad (1)$$

Yt is the product (gross domestic product) in the period under review; K_t and L_t are the inputs of capital and labor. The input of Pt is the general knowledge index in the period t. In the above equation, P_t is an exogenous variable. This exogenous variable consists of two major components according to Herzer and Lehman studies (2006): the export diversification and comparative advantage.

When firms increase their knowledge store, their production and exports will develop, so they can attend competitive international markets. Subsidiary benefits of knowledge will be seen in increasing production sectors.

This model is related to the production knowledge used in producing industrial goods. But how P_t is effective in production function by export sector? In production functions P_t is considered as given, but according to conducted studies, export diversification (increasing the export sectors and increasing the contribution

of industrial goods exports in total exports) can cause increasing if only it's based on comparative advantage.

The theoretical foundations of this issue returns to economic development theory of Smith and the international trade standard model of Heckscher-Ohlin-Samuelson in a neoclassic economy, which express the countries should be specialized in production and export of the goods with comparative advantage to achieve economic development.

Smith states that the static trade benefit comes from specialization of production based on comparative advantage and dynamisms of the production benefits can be achieved from division of labor and economies of scale. Therefore, comparative advantage, as a variable affecting export diversification, can be considered as a parameter affecting general knowledge.

Then the parameter of general knowledge is expressed as following.

In this equation, the vertical diversification variables ($VDIV_{it}$) and revealed comparative advantage of its industry (RCA_{it}) are used in factory industries (the triple agricultural industries).

$$Pt=\ Z(VDIV_{it},\ \Sigma RCA_{it}) \qquad (2)$$

Now, by considering the theoretical issuespresented and the effect of knowledge on production (the variable of human capital), equation (2) is used instead of Pt in equation (1).

The production function in the form of Cobb-Douglas production function is considered as following:

$$Y_{it}=\ f(L_{it},\ K_{it},\ HCit,\ RCAWit,\ VDIV_{it})=L_{it}{}^{\delta}\ K_{it}{}^{\beta}\ HC_{it}{}^{\gamma}VDIV_{it}{}^{\lambda}RCAW_{it}{}^{\delta} \qquad (3)$$

The following linear model is obtained by logarithm of both sides of the above equation:

$$LogY_{it}=\ C_{it}\ +\ \alpha LogL_{it}\ +\ \beta Log\ K_{it}+\ \gamma Log\ HC_{it}\ +\ \lambda\ LogRCAW_{it}\ +\delta\ LogVDIV_{it} \qquad (4)$$

i and t indices indicate each of the triple agricultural industries[1] and the year respectively,

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[1] *How to use the triple agricultural industries will be explained in the section of tools and methods (4-2).*

and the used variables are defined as following:

Y_{it}: value-added of the triple industrial activities in agriculture sector, based on two-digit ISIC classification of goods.

L_{it}: the number of total employed persons (except for skilled workers, technicians and engineers) in the nine industrial activities in workshops with ten or more workers.

K_{it}: Investment of the triple industrial activities.

HC_{it}: The sum of workers, with university education is in the triple industrial activities.

$RCAW_{it}$: weighted revealed comparative advantage of the agricultural triple industries.

$VDIV_{it}$: Export vertical diversification of the triple agricultural industries.

In this model, the instead of simultaneous use of two variables labor and human capital in three agricultural industries with similar statistics and avoid linear and errors in results, the ratio of the labor force with a college education to the total labor force working in triple industry used (HC_{it}).

Variables of the model

Value-added (Y), labor (L), capital (K), human capital (HC), comparative advantage (RCAW) and export diversification (VDIV) are model variables that areallcalculated in triple agricultural industries. According to the above definitions of the variables, the value added variables, labor, and human capital are calculated from the website of Statistical Center of Iran in the explained way. Comparative advantage and diversification variables are also calculated as follows:

Comparative advantage

The variable of revealed comparative advantage of the industry: That is the contribution of export goods of each country in the total exports of that country related to the contribution the country's export in total global exports.

In this study, among the existing indexes, the normalized form of the Balassa evolved index will be used to measure the comparative advantage, which is presented by Brasili et al. (2000) in equation 5 as follows:

$$RCA_a^i = \frac{(X_a^i / X_t^i)}{(X_a^w / X_t^w)} \tag{5}$$

In this Balassa evolved index, indices i indicates the country under evaluation, indices a represents the good under investigation (production or non-production) and w and t indices represents all traded goods and all countries in the world respectively. Therefore, the variables of Balassa evolved index can be defined as follows:

X_{ia}: the value of the export of the good a (production or non-production) in the country i

X_{it}: the value of the export of all exported goods of the country i

X_{wa}: the value of the export of the good a in the world level

X_{wt}: the value of the export of all exported goods in the world level

Therefore, Balassa evolved index calculates the contribution of export goods of each country in the total exports of that country related to the contribution the country's export in total global exports.

The index of the average of weighted comparative advantage

This index is calculated by using the revealed comparative advantage. Accordingly, first, this comparative advantage is calculated for three industries for each year, then the comparative advantage of each industry group is multiplied by the contribution of industrial exports (relative to the total export industries):

$$RCA_{wt} = RCA_{it} * (X_{it}/\Sigma X_{it}) \tag{6}$$

RCA_{wt}: the weighted comparative advantage of each industry group in the year t.

RCA_{it}: the comparative advantage of the ith industry in the year t.

X_{it}: the exports of its industry in the year t.

ΣX_{it}: the sum of the exports of nine industry groups in the year t.

That the sum of export contribution of the industries equals to one and finally the average of the weighted comparative advantage is obtained, which is the sum of comparative advantages of

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three industry groups divided by the sum of export contribution of the industries (one).

$$RCAW_{it} = \Sigma RCA_{wt} / 1 = \Sigma RCAw \qquad (7)$$

RCAW$_{it}$: the average of weighted comparative advantage of the industries in the year t.

Export diversification

Vertical export diversification (VDIV): it shows structural changes in the growth process. It means the production of the country changes-from traditional goods to industrial goods, which can be measured by increasing the contribution of industrial exports in total exports. This index was used in researches by Osakwe (2007):

$$VDIV= (TMX)/ (TX) \qquad (8)$$

VDIV is vertical export diversification, TMX is the value of total manufacturing exports and TX is the value of total exports.

The closer this index to one indicates that the combination of the country's exports is focused on the more numbers of goods and so diversification will be more.

Tools and data

In this study, the annual data of macroeconomic variables of Iran (K, L, HC, RCA, VDIV) in estimation of equation Y in the period of 1997-2013. The statistical population comprised manufacturing industries of the country. In the third edition of the good classification based on ISIC code (Table 1), industries have been divided into 23 industry groups according to the two-digit ISIC codes. Considering this change, the necessary calculations for the variables in the model have been performed by using Excel software and the model has been estimated.

Data collection method is documental and the data have been collected from the website of Statistical Centre of Iran, the UN Comrade and the World Bank in the form of librarian. Panel data technique has been used to analyze the hypothesis, and information analysis and model estimation also carried out by the software of Stata.

The estimation of the economic model

Before presenting the results of the estimated model over the period of1998-2013, diagnostic tests are used to determine the appropriate method ofestimating this economic model. The results of these tests are shown in Table 2.

Considering the results of the diagnostic tests, the model is panel data and according to the Hausman test, using the method of random effects is more efficient. Additionally, the model consists of the correlation between the cross-sections and the first order autocorrelation, and

Table 1
Classification Triple Agricultural Industries

ISIC	The nine groups' code	Sub-sector
31	Food, drink and smoking	Food and drink industries (15) + production from tobacco, tobacco (16)
33	Wood and its products	Production of wood and wood products (20)
34	Bookbinding and paper industries	Production of paper (21) + publishing and printing (22)

Table 2
The Results of Diagnostic Tests in the Pattern of Gross Domestic Product in Triple Agricultural Industries

Tests	Statistical test	Triple agricultural industries	
		Statistics	p-value
Limer Test	F	196.45**	0.000
Hausman Test	Chi^2	2.03	0.730
Test for GroupWise Heteroskedasticity	Chi^2	0.11	0.99
First Order Autocorrelation Test	F	135.88**	0.007
Test of Cross Sectional Independence	Pr	9.86*	0.02

**$p<0.01$, $p<0.05$

Table 3

The Results of Unit Root Test of Panel Data for the Variables under Study

Variable	Triple agricultural industries	
	Statistics	p-value
LnVA	-5.81	0.060
LnK	-4.76*	0.030
LnHC/L	-4.37**	0.001
LnVDIV	-4.85**	0.003
LnRCAW	-5.28**	0.001

**p<0.01, p<0.05

there is no heteroscedasticity; in this case, the best estimation approach is the GLS method (Hoechle 2007).

The reliability diagnostics test of the data

Before estimating the model, the time series stationarity issue of the model's variables is investigated. Like time series models, there exists the problem of spurious regression for the panel data models too. In this paper LLC test (Levin, Lin and Chu) will use to investigate the unit root of panel data. The null hypothesis of the test, states the non-stationarity of the variables. The summary of the results of the unit root tests of the studied variables are presented in Table 3. As shown in the table, it can be seen that all the coefficients of the variables used in the equation are at stationary level.

Therefore, considering the stationarity of the variables of the model and the results of the diagnostic tests, the economic value-added growth model of the triple agricultural industries in Iran is estimated. The results of the model estimation for the period of 1998-2013 are presented in Table 4.

In this study, panel-data approaches are used to investigate the effects of comparative advantage and export diversification in manufacturing in-dustries on the value added of the industry. Basically, the statistical data are divided into three categories including, time series data, cross-sectional data and panel data. In panel data, the same cross-sectional unit is studied during the time. Among the advantages of using this type of data, increasing the sample size, decreasing the linearity, increasing the efficiency, reducing the estimation bias, heteroscedasticity and fea-sibility of separating the economic effects can be mentioned. In panel data models, some of variables are changed between cross-sectional units or over the time period. The fixed effects and random effects models are used to consider these differences. In the first model, it is assumed that the difference between cross-sections can appear in the constant term. In the second model, it is assumed that the difference between cross-sections can appear as disturbance term (Greene, 2001).

The estimation results suggest that all coeffi-cients are in accordance with theoretical expec-tations in terms of significance and the sign, and the coefficient of the variable of export di-versification has a positive and significant effect on the value added of the industries; such that for every one percent change in the value of this index, the value added will be increased by

Table 4

The Results of the Estimation of Value-Added Growth Model of Triple Agricultural Industries in Iran

variables	Triple agricultural industries	
c	Coef.	Prob.
LnK	8.71**	0.000
LnHC/L	0.56**	0.000
lnRCAW	10.73**	0.000
lnVDIV	-0.11	0.239
R-squared	0.58*	0.001
	0.91	

**p<0.01, p<0.05

0.58%. Weighted comparative advantage index has been used to investigate the effect of comparative advantage of the triple agricultural industries on the value added of the industries. The negative effect of this index on the value added of the industry indicates that having a comparative advantage in the industry sector decreases the value added of this sector. In the other words, one percent increase in comparative advantage in the industrial sector leads to decrease the value added of the industry about 0.11 percent, But not statistically significant.

The logarithm of the variables, physical capital and human capital has had a positive and significant effect on the value added of the industries. Therefore one percent increase in physical capital and human capital leads to increase the value added of the industry about 0.56 and 10.73 percent respectively, which shows the importance of the developmental factor capital in this industry. Similarly, one percent increase in human capital will increase the value added of the industry about 10.73%, which can be due to the use of expert and trained labor force and increasing research and development research spillovers in the industry. This can also help the production diversity and changing comparative advantage towards the goods with potential competitive and comparative advantage.

In addition, the results suggest that adjusted coefficient of determination (R^2) for the estimated model is 0.91, which indicates the explanatory power of the model. The overall significance test of the regression shows the overall significance of the model at the significance level of one percent.

Evaluation of the trend of the growth of the value-added and the other variables indicates that food industry had a considerable growth in the investigated period. In this period, physical investment on this industry has been carrying out and it has been able to help the process of economic development in this industry. The process of these two variables was similar in the studied period. Human capital (the ratio of university-educated labor force to total labor force working in the desired industry) had a constant trend with slight changes during the

period.

This industry had a comparative advantage only for the years 2009 to 2013 and lack of comparative advantage for the other years.

Exports diversification was conducted only in the years 2009 to 2013 in this industry, and it had a relative stability during the other years.

Providing financial capital and growth of human capital in recent years of the study had a positive effect on comparative advantage and changing the production structure and exports in food industries and its products. It should be noted that the comparative advantage is not static and canchange inregard to the production and export conditions in the country and the world. For example, exporters' competitive power will be changed in the export markets due to fluctuations in the price of inputs and outputs in the country and the world. Therefore, comparative advantage will be different in various periods, therefore comparative advantage is dynamic.

The factors affecting the lack of comparative advantage in this industry include:

The raw material prices; lack of compliance with international standards and the lack of competitive ability in international markets, the high finished price and reducing the competitive power of exporters, lack of packaging industry and inadequate investment in this sector and inappropriateness of the transportation system and the lack of cold storage facilities and proper warehouses.

The trend of value added in the wood and paper industries has been relatively stable. Physical capital had fluctuations in both industries and human capital has not changed. In the period under review, both industries had the lack of comparative advantage. It can because of the lack of competition of domestic producers with the same foreign types and the tendency of industry owners to substitute products due to the high cost of wood and wood products. Also export diversification almost is not carried out in these two industries. In all three industries, comparative advantage and export diversification have moved in line with each other.

According to these trends, in investigation of

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the impact of these variables in the triple industries on the value added of agricultural sector, it can be seen that comparative advantage had a negative impact on the value added that was not statistically significant, however, this result is not unexpected according to the trend of comparative advantage in all three industry groups in the years studied. Factors affecting the comparative advantage include amount and the volume of trade, competition between goods and industries in international markets in terms of price and quality, which seems that more weakness can be seen in this context especially in the wood and paper industries than the food industry. If long-term investment in this sector was done, the export ability would be more powerful than the present time.

Export diversification has only been carried out in the food industry and there were no changes in two other industries, however, this variable could have a positive impact on value added of the agricultural sector. Therefore, changing the production structure from traditional to industrial that exists in food industries has been effective on the growth of the value added of the agricultural sector. Food industry is sensitive and risky in international trade and political relations (Shakeri, 2004), and in terms of global, it is considered in establishing food safety.

Providing physical capital had a positive and significant impact on the value added of the agricultural sector. This variable is an effective and well-known traditional factor on production growth. But among the triple industries, the growth of this variable has been observed in food industry, and providing capital was associated with fluctuations in two other industries and its growth rate is very low, but the positive role of this variable in the model has been found.

Investment is a solid foundation of export in the industry. This variable leads to appearing comparative advantage in the long term and can a suitable ground for creation of comparative advantage in future periods. Therefore, the increase in this variable leads to an increase in the comparative advantage. If the industrial ac-

tivity in the studied period, was able to increase the power and expansion of its activity, in this case, it will have a higher growth in value-added compared to other industries. Industries can increase their value-added through creation of comparative advantage. So it can be said that the added value can improve the comparative advantage and have a positive effect on it.

The human capital had a high impact on the growth of value-added. The ratio of people with university education (as the human capital) to the total labor force was high in all the three industries, which had a great impact on the growth of the variable under study in the model. The high rate of educated people in the employees of the agricultural triple industries and the existence of specialists in these industries help the cases like research and development in agricultural sector, targeted technology transfer to this sector and using and localization of technology in this sector. In general, it leads to progress of technology in this sector. This variable is highly considered by newly industrialized countries in East Asia.

CONCLUSIONS

Changes in the value-added of industrial activities due to the industrial-economic policies are an important index to determining the structure situation of industries. Value added reflects the economic abilities of the activities of a sector, and its higher proportion indicates the positive changes in the industrial structure.

For this purpose, given the importance of the industry sector in economic development plans, attempts have been made to evaluate the value-added of the triple agricultural industries by investigation of comparative advantage and export diversification of these industries in the economy and to study the trends of comparative advantage and export diversification in this industries by using the statistics of the export industries classified in ISIC system. Attempts have also been made to test the effects of these two variables on the industry along with the traditional factors of growth including labor and physical capital. The variable of human capital has also been used as a factor influencing the increase in re-

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search and development spillovers in production diversification in line with comparative advantage.

The findings of this research, which has been carried out for the triple industrial groups by using panel data and time period of (1998-2013), indicate that trend of the industries' value added of each of the three industrial activities in agricultural sector indicates that food and beverage industries and production of wood and wood products had a higher growth of value added in comparison to paper and paper products industries, and there exists a constant trend in the value-added of paper and paper product industries during the study period.

In the period under study, the wood and paper industries had lack of comparative advantage in the production and export, and food industries had comparative advantage only at the last one-third of the period. It is therefore clear that this variable will have a negative effect on the growth of value added. But according to the alignment of the trend of comparative advantage of the industries and export diversification, it seems that the government attempts should be towards the change and creation of comparative advantage in these industries.

Exports diversification, which is the result of change in the production structure from traditional production to industrial production, is only carried out in food industries, but this variable had a positive impact on the growth of the value added of agricultural sector.

Considering the positive impact of human capital on the value added of the industries and growth production, more investment in human resources and training of skilled workers and specialist should be carried out in order to increase the exports of manufactured and industrial goods to compete in the international economy.

Therefore, according to the results of the model estimation, among the three hypotheses presented in the article, two hypotheses based on the positive and significant effect of human capital and export diversification on the growth of the value added of agricultural triple industries will be accepted. The hypothesis related to the comparative advantage is rejected because this variable has a statistically insignificant and negative impact on the model.

The following are some suggestions given based on the results of the present study:

1. Decreasing production cost is an important factor in increasing comparative advantage. Investment as Production factor of workforce Complementary is effective in increasing comparative advantage.

2. In context of export or offering, decreasing packing costs, transport, insurance, marketing, advertisement, and cause comparative advantage.

3- Investment, leads to appearing comparative advantage in the long term and increase the power and expansion of its activity, Therefore, it will have a higher growth in value-added compared to other industries.

4- Changes in factors such as the elimination of competitor industries in market, productivity of production factors, the level of technology and production methods and the intensity of domestic and foreign demand for industrial products lead to changes in the structure and level of industrial activity and eventually production and exports diversification and therefore, changes in the value added.

5- Regarding the human capital and education, in addition to the creation of productivity and innovation in production by increasing research and development (R & D), lead to expand the pulp and paper industries and influence on the growth of the value added of this industries.

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