



Effective Factors on Exports with Emphasis on Human Capital in Selected Developing Countries

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Abstract: Development of products exports causes the markets to get closer to competitive situation and domestic producers to be able to use their production capacity as much as possible. For this purpose, innovations, inventions and creativities of the labor force will be useful during the production and export process. In fact, investing in human capital causes its abilities to be developed so that the more educated and skilled they are, the easier and more accurate it will be for them to learn sophisticated things and it increases the level of their skill and abilities. Therefore, using skills and professions of skilled and creative manpower during the exports of different products process, not only results more productive use of domestic sources, attraction of foreign advanced technology and creation of technology for producing new products, but also it creates new ways to use production factors or raw material and by that, it can cause increase of exports and achieving economic growth in countries. Considering this, the purpose of this study is to analyse the factors affecting exports emphasising on human capital in 20 selected developing countries in period of 1995 to 2014 using panel data model. The results of the estimation show that human capital has positive and meaningful effect on exports of the studied countries in the considered period. Also variables of active population, capital formation and healthcare costs also have had positive and meaningful effect on exports.

Keywords: Human Development, Exports, Panel Data.

1. Introduction

Human capital or in other words, the quality of manpower and the knowledge institutionalized in individuals, causes increase of production and economic growth of countries. In recent forty years, this theory has been publicized that education costs must be considered a kind of investment. Nowadays, familiarity with the fact that education has caused activation of manpower and the belief that lack of skilled and professional manpower has been one of the obstacles of economic growth and development in developing countries has been so important that has resulted vast researches in this field (Miladifar, 2015). Human capital includes abilities, skills and knowledge of special employees. This important factor is the result of accumulation of knowledge, skill and experience in individuals. The qualitative factor affecting the production process is human capital which is not explainable by the labor factor and it does not seem to have a source other than education. Human capital includes obvious sources that employers access from their employees (Teixeira and Fortuna, 2004). The importance of understanding human capital in creating long-term economic development of countries can not be ignored. It is expected that macroeconomic policies of all countries be focused on economic and human development. Human capital is the spinal cord of economic and human development among all nations (Lucas, 2015). This important factor has entered economic discussions as one of new sources of wealth generation since 1950s (Ronning and Kearney, 1998). The obvious thing in the flow of industrial development of societies is the role of improvement of mankind's knowledge and development of human capital in production and services. More production is done based on two major capital sources (physical capital and human capital), although physical capital itself is also the result of mankind's previous works but from perspective of the role of education in development, cooperation of human sources in the process of production and exports and services is vital compared to material resources (Pourebadelahan et al., 2012). In general it can be

said that efficient manpower makes it possible to increase production and value added and ignoring this factor can be one of reasons of undevelopment in some developing countries. Investing in human capital and increasing its share of all investments in the country, results better benefit of physical capital and it is considered an important factor in economic growth and development process (Barghandan *et al.*, 2010). Knowing this, the present study attempts to study factors affecting exports in selected developing countries based on human capital in period of 1995 to 2014.

2. Theoretical Basis and Previous Studies

In economic theories of neoclassic economists, mankind is considered one of the factors of production in cycle of production and services, and physical capital was known as the maker of wealth for the country. But the critics of neoclassic theories introduce mankind as the source of development; new theories of growth are based on mankind. This means that investing on mankind is known as the most prestigious term for moving towards optimal economic development and they emphasis that development will not be achieved unless the inequalities and deprivations are reduced. Solow, Jones and Schumpeter believed so (Hickman and Olney, 2011). Neoclassic growth models were based on topics of economic growth until the late 80s, but since the late times of this decade, several researches were done in field of growth patterns which led to creation of new patterns called endogenous growth patterns. The base of neoclassical theories is to emphasis on capital compilation and existence of technology, while the endogenous growth patterns believe that capital and technology factors beside initial foundations of an economy (such as education, a decent level of knowledge and skill, research, etc.) play a role in economic growth. According to this theory, economic growth happens as a result of a complex of foundations in which, factors other than the primary factors of production function are included. One of the most influential factors is the factor of human capital. Human capital is a complex of merits, knowledge, social and personal features such as creativity, visualization in ability for doing something in order to produce economic value. This important factor is in fact a general economic perspective of an active individual in economy (Farhadi and Bastani, 2005).

Nowadays, human capital is one of the undeniable factors of growth and development of the countries and since human capital is the prerequisite of development, the rate of development depends on quality and quantity of the efficient force (Barghandan *et al.*, 2010). The concept of human capital is pretty vital in surplus working countries. Due to high birth rate under certain climate conditions, these countries usually have access to a great deal of labor force. The surplus workers of this country (manpower) the present human resource is more than the accessible and sensible amount (Jones, 2014). This human resource can be turned into human capital with effective inputs of education, health and moral values. Turning serial human resources into very lucrative human resources with these inputs, is the process of transformation of human capital. The phenomenon of lack of sensible capital in the surplus working countries can be solved internationally by quickening the rate of human capital formation through public and private investment in education and healthcare sectors. Sensible financial capital is an effective tool in improvement of economic growth of countries. Insensible human capital on the other side, is a tool for growth of nations development, because human capital is directly related to human development, when there is human development, quantitative and qualitative advancement of societies is undeniable (Jung and Mercenier, 2008). Human capital is for massive growth in long-term. The growth of financial sensible capital is not always linear due to shocks of the business cycle. During the success period, financial capital grows in a partly higher rate, while during economic crisis and setback there is reduction of rate of financial capital. On the other side, human capital has equal rate of growth in a long period of time, because the base of this human capital is educational inputs and healthcare (Jones, 2014). The quality of the present generation has been developed by effective inputs of education and healthcare. The future generation is in advantage due to more developed research in field of education and healthcare by the present generation. Furthermore, educational and healthcare inputs have useful influences in the future generation and the future generation is spectating the present generation. In addition to that, the amount of human capital formation in the future generation is more than formation of human capital in the present generation. This is the growth of amount of human capital formed by the spectating quality of the successful generation compared to the former ones (Lucas, 2015).

2.1. The Relation Between Human Capital and Exports

Since exports is one of the important parts of national production in macroeconomic discussions, the phenomenon of union of the two economic growth and exports growth variables in estimations of the

growth model is undeniable. In other words, the growth of national production equals the addition of weights of domestic demands growth and exports rates (Bernard and Bradford 1997).

On the other side, with increasing the level of skill of the labor force and level of technology, productivity of the labor force increases and this results reduction of the final costs of any unit of goods and ultimately it results increase of exports (Banerjee and Esther, 2005). In new discussions of trading and also in export products dependent on research and development and computer activities, production factors and specially the labor force have a key role. These products are based on productivity of the labor force and investment and the advantage of this type of exports of products is the relative changes of productivity in different institutes which itself is also dependent on human capital and technical skill in productivity. Presence of skilled and highly educated, motivated labor force with positive thinking of growth and development of the country results increase of efficiency of the labor force and as a result, it causes increase of competitiveness of institutes. Professional factors such as labor force, are considered as the basic advantage of a stable competition, the training of which is difficult and requires continuous investments on them. In other words, in case the institutes want to increase their competitiveness, they have to create professional labor force by continuous investments (Porter, 1990). Human capital is introduced as one of the most important advantages of competitiveness internationally and companies and corporations plan to manage and develop it, so that companies active in international trading emphasize on human capital for management of their own exports and directions (Rodwell and Teo, 2003).

Levin and Raut (1997), discussing human capital, believe that the exports sector can use human capital with more productivity compared to other economic sectors, because educated workers and labor force are able to attract sophisticated technologies quickly and can quickly react to required technology changes and adapt themselves with new technology and so, be more capable in competition in international markets (Levin and Raut, 1997). Heckscher-Ohlin in their theory, have pointed out the relation between human capital and exports indirectly. They consider the production provider side in their theory and the relative abundance of production factors is considered the primary factor in relative advantage. According to this theory, any production factor which is abundant in a country, that country will export the productions of that producing factor (Van, 2002).

With the help of Heckscher-Ohlin logic, it can be said that countries with abundant natural sources can produce and export industrial products in case the level of skill of labor force is high in that country, because if it is low, the exports of these kinds of countries will only be focused on primary products (Zhu and Chun, 2005).

In the Product Cycle theory, human capital is vital in the level of creation of the product, so the countries that have access to technical and educated labor force, are in competitive advantage of production and exports, compared to developing countries which depend on limited natural resources. After the product reaches maturity level and its market expands, the innovative institute creates new ideas and products with higher technology with the help of its skilled and educated labor force (human capital) in order not to lose its competitive advantage (Van, 2002). A country or an institute in the field of human resources and human skills causes loss of relative advantages in technology products. A part of the explanation of these changes in leadership of knowledge industry is compatible with Heckscher-Ohlin theory. Leadership of knowledge industry that belonged to the United States since the second half of 20th century, moved to Japan in the recent quarter century and nowadays Japan is also facing competitive threats from the newbies. So factors such as research and development and human capital that make field for increasing the productivity of manpower, can result increase of quality of industrial production and growth sectors.

2.2. Previous Studies

Blanchard and Olney (2017) studied the effect of globalization of investment in human capital and exports using panel data method in 102 selected countries. The results show that investing in human power sector has positive and meaningful effect on exports of the studied countries.

Che and Zhang (2017) studied the effect of human capital and acceptance of technology on the function of the company. The results of the studies show that professional and committed human capital has positive effects on function of companies and can be considered as an important factor in development of companies and institutes.

Cinnirella and Sterb (2017) studied the effect of human capital and innovation in economic development of Prouis region. They extracted individual information about valuable patents in Prouis in late 19th century with education level, marketing, average education and tax income data, in order to study the relation between different kinds of human capital, innovation and income. The results showed that the

second industrial revolution can be considered as a time passing period which caused the creation of human capital. As in the early times of the first industrial revolution, Useful Knowledge was accessible for hand-used industries and inventors, in 20th century too, primary education quality was in relation with productivity of workers and research and development processes. The final stage of those showed that the level of education has negative effect on fertility rate, which increases with increase of innovation. In total, their results showed that accumulation of human capital is a base for passing to modern economic growth.

Rebello and Silva (2017) studied the relation between variety of exports and taking advantage of technology and economic function of Portugal using coexistence method in period of 1967 to 2010. The results show that variety of exports and taking advantage of technology have positive relation with economic function and it can be said that this causes sensible increase in economic growth of Portugal.

Feqh *et al.* (2015) have studied the effect of human capital and foreign trade on economic growth in Asian countries in period of 1990 to 2013 using the fixed effects method and GMM in 42 Asian countries. The results show that foreign trade and human capital have positive and meaningful effect on economic growth of Asian countries in the studied period. The combined variable of foreign trade and human capital also has positive and meaningful effect on economic growth. Also the variable of population has had negative and meaningful effect on economic growth of these countries.

Ketabforoush *et al.* (2015) studied the effects of taking advantage of human development and R&D on exports of Iran using the OLS (ordinary least squares) method in period of 1975 to 2012. The results show that human development and R&D have positive and meaningful effect on exports of Iran in the studied period.

Salmani B. M. and Ashkan (2014) studied the effect of industrial products on economic growth of Iran using the least squares method in period of 1975 to 2010. The results show that there is a positive and meaningful relation between industrial products exports and economic growth of Iran.

Kundu (2013) has studied and analyzed the relation between exports and economic growth in 7 countries including India, Bangladesh, Sri Lanka, Pakistan, Nepal, Butane and Maldives. Using panel data analysis about the relation between exports and economic growth he concluded that there is no meaningful relation between gross domestic production and exports in these countries.

Bezhani (2013) has studied the economic effect of agriculture products in exports of Albania. The results show that improving the conditions of agriculture products and increasing the amount of agriculture products amount has positive effects on exports of Albania.

Mucavele (2013) has analyzed the real share of agriculture in economic growth and poverty reduction in 3 countries including Malawi, Mozambique and Zambia in a study. The results show that in all 3 countries agriculture has a vital role in economic growth and poverty reduction.

3. Introducing Data and Estimation Model

3.1. Data and Research Model

The statistical population of this study is 20 selected developing countries including Azerbaijan, Iran, Indonesia, Mali, Libya, Albania, Afghanistan, Turkey, Turkmenistan, Tajikistan, Algeria, Bahrain, Bangladesh, Qatar, Pakistan, Kazakhstan, Albania, Nigeria, Niger and Egypt. Data analysis method is using panel data method with the help of EViews software. Time series information from these countries has been collected from WDI (2016), with the target period from 1995 to 2014. In the current study, the model is based on a part of Blanchard and Olney (2017) and Salmani B. and Abdi (2014), which is modified as follows:

$$LEXP_{it} = \beta_0 + \beta_1 LEDU_{it} + \beta_2 LEMP_{it} + \beta_3 LGFC_{it} + \beta_4 HEA_{it} + U_i$$

LEXP: logarithm of exports of goods and services as a percentage of GDP

LEDU: Logarithm of human capital is achieved from the multiplication of the rate of enrollment in education at an adult literacy rate.

LEMP: Logarithmic Total Percentage of Active Population to Total Population

LGFC: The logarithm Legarithm gross fixed capital formation country i as a percentage of GDP

LHEA: The logarithm of health expenditure as a percentage of GDP

3.2. Panel Data Method

The econometrical model used in this study is based on panel data method. In panel data model, the data are serial and sectional which means the data are calculated during time between the sections. According to econometrical principals, the mentioned model is estimated using the Ordinary Least Squares method (OLS) and the β ratios are acquired. This method provides more awareness information, more variation of changeability, Less collinearity between the variables and more freedom and performance rates, while the series of time have collinearity. In panel data, considering the fact that they are a combination of time and section series, the sectional dimension causes adding changeability or much variation having which we can do more reliable estimations (Ashrafzadeh and Mehrgan, 2010).

4. Estimation of the Model

In this section, the studied model is estimated. For this purpose, first the stationary of the variables is considered and then the studied model will be determined using F, Lymer and Housman tests.

4.1. Studying the Stationary of the Variables

One of the ways to avoid fake regression is to make sure of stationary of variables For studying the stationarity of the variables there are different tests like Levin, Lin and Chu (LLC), generalized Fisher-Dickey Fuller (ADF), Philips-Perron (PP), etc. In this study, Levine, Lin and Chu (LLC) test has been used, which is one of the most important tests of unit root in panel data. The results of this test are in table 1 below:

Table 1: The results of the model variables using LLC test

Variables	T Statistics	Prob
EXP	-6.3763	0.0000
EDU	-7.5236	0.0000
EMP	-6.3423	0.0000
GFC	-10.013	0.0000
HEA	-8.4368	0.0000

Reference: Research findings

According to the results of table 1, for the group of selected developing countries in Levine, Lin and Chu (LLC) all the variables are in a stable level.

4.2. Estimation of the Model

The estimation of the introduced model of the study is done using panel data method. For this purpose, it is required that the method of estimation be determined for special type of cross-sectional data. In panel data estimation method two general conditions are seen. The first type is that width from the origin is equal for all sections in which it will be pool data model. The second type is that width from the origin is different for all sections which is called panel data. For distinguishing the two mentioned types, test called F-Lymer is used. So the F-Lymer test is used to choose between pool data regression methods and fixed effects regression. And the Housman test is used to choose between the two methods fixed and random effects. The results are shown in table below:

Table 2: The results of F-Limmer and Housman tests

Test type	T Statistic	Prob
F-Lymer	102.0231	0.0000
Housman	46.3214	0.0000

Reference: Research findings

As it is clear in table 2, the results of F-Lymer and Housman tests suggest the fixed effects method as the decent estimation method. So, regression method with fixed effects will be used for model estimation. For this purpose, the results of model estimation based on panel data using fixed effects method for period of 1995 to 2014 is shown in table 3.

Table 3: Results of the estimation of model using fixed effects method

Variables	Coefficient	T statistic	Prob
LEDU	0.7325	3.5121	0.0005
LEMP	0.8146	5.4196	0.0000
LGFC	0.4469	7.8478	0.0000
LHEA	1.2365	2.9356	0.0036
$R^2=0.8907$	$R^{2bar}=0.8793$		DW= 1.96

Reference: Research findings

As the results show, the estimated ratio for human capital variable is 0.73 which shows that by 1 percent increase (or decrease) of human capital, exports increase (or decrease) by 0.73 percent. So it can be said that with improvement of human capital condition, there will be an increase in exports in the studied countries. Professional improvement of human capital can have a positive effect on production because it motivates the society to work and this results increase of production and exports in different economic sectors. Using skilled and professional manpower can reduce production costs and create new ideas for production of different products in different sectors, this itself will result improvement of quality and variety of products and that results increase of production. With increase of production, the motivation to invest in different economic sectors increases and this is a beginning for economic growth.

During time, mankind has always been looking forward to usefully and efficiently use his abilities, facilities and accessible resources. And nowadays this fact has been more focused on than ever. Limitation of accessible resources, population growth and simultaneously, growth demands and needs of mankind has caused the administrators of economic, political, management activities, corporations and organizations in all countries especially in industrial societies, to make improvement of productivity their first priority. Considering the fact that natural resources, human resources, capital and technology are among the effective factors of economic growth and most of economic pundits believe what finally determines the feature and progress of economic and social development, is the human resources of a country. Therefore, comprehensive development will not be possible without efficient usage of manpower in the present world. On the other side, the rate of development of countries in economic dimension, depends on their optimal utilization of existent facilities in order to achieve their economic goals. Also policies and strategies which result improvement of human capital indexes, will cause economic growth and improvement of welfare and living standards.

The estimated ratio for active population is 0.81 . Active population is one of the most important sections of production in the process of exports improvement and economic growth and development. As it is observed, due to economic and production foundation in the studied countries which are mostly considered developing countries, active population and manpower in these countries can cause more exports development and economic growth. So it can be said that existence of active population can have positive effect on products exports and services of the studied countries. It is also to be mentioned that the more active population and employment increases in the studied countries, the amount of products and production services of different economic sectors will also increase.

The ratio of gross fixed capital formation variable was also estimated 0.44 and positive. This shows that with 1 percent increase (or decrease) gross fixed capital formation, exports increase (or decrease) by 0.44 percent. Most of economists emphasize on gross fixed capital formation and human capital as the primary factors of determination of economic growth and development. One of the most basic factors of production in economic growth models is the existence of physical capital. If the capital ratio to manpower (skilled or professional) increases, it results increase of domestic production capacity and economic growth. So one of the ways of increasing economic growth is to facilitate manpower by more investment in machineries and physical tools which is done by domestic or foreign investment. With the primary purpose of financial providing of projects, foreign investment contains other additional purposes such as increasing efficiency, improving the skill of manpower inside the country, development of trade and technology transfer. This is while investment itself required decent backgrounds and situation. For instance, foreign investors are motivated to invest by gaining profit and productivity. Now there are some conditions required for gaining profit and productivity, the most important of which are providing political stability and economic security. In case of lack of political stability in a country, in spite of existence of financial motivators for investment, because of high political and economic risk, this will not be possible. In case the borders of investment is clear for domestic and foreign investors and there be clearness in the atmosphere of investment, the risk of investing decreases and tendency to that will increase. It is clear that with increase of risk of investment atmosphere, tendency to investment will decrease. The economic situation of the host country must guarantee achievement of purposes of the

investor. For example taxes of investors be in a way that will not have negative effects on investment. Also the matching of financial and banking system of the host country with valid international banking system and development of monetary and credit services and ease of cash transfer have an important role in capital attraction. Of other conditions required for investment includes law foundations and laws of the host country, which means required solutions for supporting private property be thought of, besides different political situations. In total, increase of investment (foreign or domestic) is in the path of increasing physical capital stock is one of the most important engines of increasing exports.

The estimated ratio for healthcare variable is 1.23 which shows that with 1 percent increase (or decrease) of the index of healthcare expenditure, exports will increase (or decrease) by 1.23 percent. Sanitation is used as a product for both consumption and investment. From consumptive perspective, individuals are looking to have health, because in that case, the enjoy life more due to improvement of life quality. From investment perspective, the relation between time and health is so that if the health situation of an individual is good, he will have shorter illness period and will have more days to work and get more income and rest and have fun.

The estimated ratio for the studied model is 0.89 which shows that independent variables of the model have been able to explain the dependent variables well. It is to be mentioned that the results have the same approach with studies of Feqh *et al.* (2015), Salmani B. and Abdi (2014), Pourebadelahan *et al.* (2012), Blanchard and Olney (2017), Ketabforoush *et al.* (2015), Irfan *et al.* (2012).

5. Conclusion

Development of products exports causes the markets to get closet to competitive situation and the domestic producers to be able to use their production capacity as much as possible. In fact, by competition, inefficiency in the market is stabilized and production of goods with lower quality and higher costs decreases. So considering the limitation of production factors, domestic producers put more effort in improving and upgrading their level of technology for keeping and increasing their competition ability in domestic and foreign markets. Innovations, inventions and creativities of manpower will be useful in the production process. In fact, investing in manpower will result development of its abilities. The more educated and skilled individuals are, the easier it will be to learn sophisticated technical matters and their leve of skills and capabilities will increase. So taking use of skills and professions of skilled and creative manpower in exports of different products, will not only cause more efficient use of domestic resources, attraction of advanced foreign technology and creation of technology for making new products, but also it will reveal new ways to use production or raw materials factors and by that, it can result extension of exports and achieving economic growth. The present study tried to study the effects of developing human capital on exports of 20 selected developing countries in period of 1995 to 2014 using panel data model. For data compilation for the studied variables, the data bank of WDI was used. The selected countries of this study includes Azerbaijan, Iran, Indonesia, Mali, Libya, Albania, Afghanistan, Turkey, Turkmenistan, Tajikistan, Algeria, Bahrain, Bangladesh, Qatar, Pakistan, Kazakhstan, Albania, Nigeria, Niger and Egypt. The estimated ratio for human development variable was positive. This showed that there was a positive relation between human development and exports in the studied countries. The estimated ratio for the active population was positive. This showed that there is a positive relation between active population and exports in the studied countries. The estimated ratio for the gross fixed capital formation was positive. This showed that there was a positive relation between gross fixed capital formation and exports of the studied countries. The estimated variable ratio for the health expenditure was also positive.

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