HUMAN CAPITAL COMPETITIVENESS OF INDONESIAN

by Hery Winoto

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Human Capital Competitiveness of Indonesian Human Resources in Facing ASEAN Economic Community of 2015

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Abstract

In entering the ASEAN Economic Community (AEC) by 2015, the competition between ASEAN countries in the field of goods and services will increase sharply due to the possibility that an ASEAN country is able to sell its goods and services production to other countries around ASEAN freely. In regard to Indonesia, AEC is able to create opportunities and challenges for Indonesia's readiness in facing AEC which is marked by Indonesia's competitiveness against countries in ASEAN region. In the report of the competitiveness between countries within the World Economic Forum (2014), Indonesia's position in ASEAN region fell behind Singapore, Malaysia, Brunei Darussalam, and Thailand. One of the determinants of a country's competitiveness is its human resources. The model of neo-classical economic growth has provided empirical evidence that human resources determine the economic growth of a country.

The Neo-classical approach of economic growth focuses on the production. As the quality and quantity of investment in human capital particularly in terms of education, health, and research improve, the economic growth and competitiveness of a country will increase. The accumulation of sciences providing essential innovations and benefits for economic growth will be stimulated through education. Meanwhile, education will also contribute to science and knowledge through research and development (R&D) which is highly needed for economic growth. Science and R & D is also the key to compete and win the competition.

By using descriptive cross-section data of 2014 taken from various sources, this paper will investigate the transmission mechanisms of human capital investment within Indonesia's competitiveness against AEC. Based on the observation of the variable data distribution of human capital and the country's competitiveness in AEC, it can be seen that the increasing growth of investment in human capital is positively correlated with the increase in the competitiveness of a country.

Keywords: Human capital, new growth theory, competitiveness. MEA

Introduction

The Central Statistics Agency (BPS) in early 2014 released a "report" on Indonesia's economic performance in 2013 which it was encouraging. While in the midst of the world economic recovery which was still not out of the global economic crisis, BPS (2004) reported that the Indonesian economy in 2013 had grown by 5.87 percent; also, Bank Indonesia (BI) noted that inflation rate in 2013 amounted to 8.38%. Although the achievements of the inflation rate were still higher than expected, the rate remained low (BI, 2014).

Regardless of the economic growth rate and high inflation rate in 2013, the Indonesian economy is still facing classical and serious problem such as poverty and unemployment. The number of poor people in Indonesia in September 2013 reached 28.55 million people, or about 11.47 percent of the Indonesian population (BPS, 2014). When compared with numbers of poor people in March 2013, which amounted to 28.07 million, the period from March to September 2013 poor people increased by 0.48 million, and this poverty population increase occurred in both rural and urban areas. The poverty line used to classify the population into poor and not poor is the monthly average expenditure of Rp 308, 826 in urban areas and of Rp 275,779 in rural areas (BPS, 2014).

While the open unemployment rate (TPT) in Indonesia in August 2013 reached 6.25% or 7.39 million people, there was an increase if compared to TPT of February 2013 at 5.92% or 7.17 million people (BPS, 2013). The unemployment rate became worse when the figures of underemployed and part-time people, which reached 36.81 million in 2003 were included. In the level of education, 72.48% of the unemployed people had education from elementary to junior high school levels. To overcome the poverty and unemployment, the economy must grow in an adequate growth rate. If 1% of the economic growth is able to absorb new labor force of 300,000 people, the economic growth should reach approximately 21% to be able to eliminate the unemployment of 2013. This economic growth rate was impossible to be achieved, because in 2013 the Indonesian economy was only able to grow by 5.87%. Thus, it can be ascertained that the accumulation rates of unemployment and poverty will increase from year to year if the rate of

economic growth is not able to offset the rate of the unemployment and poverty. In the adherents of neoclassical economic thought, economic growth is determined by the physical capital, human capital, and technology (Baro, 1992). This capital is not only in terms of quantity but also in the sense of quality. The empirical evidence shows that Korea and Ghana in 1976 had the same per capita income levels and economic growth, but within 30 years, Korea has grown far beyond Ghana (WDR, 1998). Korean growth is due to the rapid development of technology that goes far beyond Ghana. Technology is a product of knowledge (science), and knowledge derives from education. Pack and Nelson (1997) provided empirical evidence of how the economy has grown fantastically referred to Asian Miracle in the late 1990s in which Taiwan, Korea, China, Singapore and Hong Kong have been able to transform technology well over 35 years and are able to improve their economy 4-fold. In this paper, I would like to see the relationship between education and economic growth by using the neo-classical growth theory thinking. By using the method of cross-country data descriptive (cross section) in 2013 from various sources, I will analyze the transmission mechanism from human capital investment to economic growth.

Neo Classical growth theory

The idea of classical economic growth was built in the 1950s and 1960s (Barro, 2000) based on the ideas of Robert Sollow (1956) in his paper entitled "A Contribution to the Theory of Economic Growth", published in the Quarterly Journal of economic, February 1956, and from this hard work, Sollow was awarded the Nobel Prize in Economics in 1987. Sollow's monumental contributing ideas include growth factor technology as the driver of economic growth in the classical growth model, and these ideas that incorporate elements of technology as the determining factor have brought a great revolution in the theory of economic growth. Solow's model of $y = k^{\alpha} A l^{1-\alpha}$ recognizes that the growth of technology (A) is the triggering factor of economic growth, (y) is the growth of capital per worker (k) and (l) is the growth of output per worker. The Neo-classical model of thinking is based on the production side, assuming constant return to scale, growth (k) and (l) will run linearly with the output growth. This means that if (k) and (l) are doubled, then output will also be doubled. The question that remains is whether the technology also grows linearly with the output growth (Wahyoedi, 2000).

To search for these answers, David Roomer (1996) combined the ideas of Paul Roomer (1990), Grossman and Helpman (1991), and Aghion and Howitt (1992) which elaborate technological factors as the economic growth driver called *the New Growth Theory*. Based on the adherents of this theory, the economic growth is supported by growth in the research and development and growth of human capital investment. The technology that is part of the creation of knowledge has been believed by Tapscott (1997) as one form of the New Economy. One characteristic of the new economy is the economy relying on knowledge (science). According to Tapscott (1997), people will work use his brain more often than using hands. The annual study of the World Bank in 1998/1999 also raised the topic of education and knowledge entitled Knowledge for Development as the development of the world's annual report year 1998/19999. From the World Bank study (1998/1999), there is apparently a strong and positive correlation between the growth of knowledge and the economic growth of a country.

Increasingly, the international trade is influenced by conditions affecting trades in goods requiring knowledge/technology greater than trades of primary goods. In 1976, the composition of world trade on primary goods and technology items were 34% and 54%, but then in 1996 the composition had changed into 13% and 72% (WDR, 1998: 28).

Research and Development Model

One of the investment in human capital is in the form of research and development (R & D). It is undeniable that the development of research and development plays an important role in human life. Aghion and Howitt (1992: 349) says "Growth exclusively results from technological progress which turns from competitions amongst research firms that generate innovations, and each innovation consists of new intermediate goods that can be used to produce the final output more efficiently than before."

The innovations developed through R & D have been believed to be the cause of the rapid economic growth. Countries that grow rapidly such as South Korea and other new industrial countries state that cost of R & D is very large. Meanwhile, developing countries with R & D spending which is still very low has not been able to grow rapidly. To discuss more about this R & D model, I will begin by looking at the basic assumptions of this model i.e. (1) labor, capital

and technology together will result in knowledge production function; (2) R & D production function (which produces knowledge) and the production of goods and services which follow the Cobb-Douglass; (3) the part of the output that is saved and part of the labor force and capital stock used for R & D sector are assumed to be constant and exogeneous.

Like the Neo Classical model, this model is based on four variables: labor (L) Capital (K), technology (A), and output (Y). Furthermore, this model presumably contains two sectors i.e. the goods producing sector that produces goods and services and R & D sector that produces knowledge (science). The aL is part of workforce that is used in R & D while the 1-aL is work force that is used the production of goods and services. The aK is the stock of capital employment of R & D, and 1-aK of the capital employment is the production of goods and services.

Because there are sectors of production output and R & D production, then the quantity of output produced in terms of time t is: $Y(t) = [(1-a_k)K(t)]^{\alpha} [A(t)(1-a_L)L(t)]^{1-\alpha}$, $0<\alpha<1$….(1) Except 1-ak and 1-aL which are parts of the K and L are used in the output sector, then this model is typical of the Solow model with a constant return to scale of K and L, meaning the technology is considered not to change, and when the addition of K and L is doubled, output will be doubled as well. While the production of new ideas depends on the quantity of K and L are used in R&D as follows: $A(t) = G(a_kK(t), a_LL(t), A(t))$…(2) assuming a Cobb-Douglas production function, the function becomes: $A(t) = B[a_kK(t)]^{\beta} [a_LL(t)]^{\gamma} A(t)^{\theta}$, $B>0$, $\beta\geq0$, $\theta\geq0$….(3). Assuming the value of the parameter B, β, θ, then this function becomes non constant return to scale anymore. In the model also assumes that the saving rate is constant exogeneous and namely: $K(t) = sY(t)$…. (4) And the rate of population growth is also considered exogeneous: $L(t) = nL(t)$, where $n \geq 0$… (5). By not involve an element of capital, then the model (1) becomes: $Y(t) = A(t)(1-aL)L(t)$ ….(6) And the production function of new knowledge are:
$A(t) = B[a_LL(t)]^{\gamma} A(t)^{\theta}$…(7). The equation (6) implies that output per worker is proportional to A, thus the growth rate of output per worker is proportional to A, and the growth rate of output per worker is equal to the level of growth A. While the dynamics of A is described by equation (7), and the growth rate of A expressed in gA, namely: $g_A(t) = Ba_L^{\gamma} L(t)^{\gamma} A(t)^{\theta-1}$…(8). The growth rate of gA are: $gA(t) = [\gamma n + (\theta-1)\, gA(t)]\, gA(t)$…(9). Knowledge production function in

equation (7) implies that it is always positive. Thus gA increase if γn + (θ-1) gA positive, and decreases when n + (θ-1) gA negative, and constant when zero. Thus gA will be constant if:

$$g_A = \frac{yn}{1-\theta} = g_A^* \quad ...(10)$$

Knowledge and Capital Dynamics Model.

By entering the variable capital, the equation (1) and equation (4) will be:

$$\mathbf{K(t) = s(1 - a_K)^{\alpha}\ (1 - a_L)^{1-\alpha}\ K(t)^{\alpha}\ A(t)^{1-\alpha}\ L(t)^{1-\alpha}} \quad ...(11)$$

By dividing both sides by K (t) and define $\mathbf{cK = s(1 - a_K)^{\alpha}\ (1-a_L)^{1-\alpha}}$, then

$$g_K(t) = \frac{K(t)}{K(t)} = cK\left[\frac{A(t)L(t)}{K(t)}\right]^{1-\alpha} \quad ....(12)$$

Thus if g_K increase, decrease, or horizontally, depending on the behavior of AL / K. Its growth rate is determined by gA + n - g_K. Thus the g_K will be ascending when gA + n - g_K positive, decreases as negative, and a constant when zero. By dividing equation (3) with A (t) produced by expression of the growth rate of A as follows: $\mathbf{g_A(t) = c_A\ K(t)^{\beta}\ L(t)^{\gamma}\ A(t)^{\theta-1}}$ ...(13) where cA = $Ba_K^{\beta}\ a_L^{\gamma}$. Equation (13) indicates that gA behavior depends on the $\beta g_K + \gamma n + (\theta - 1)\, g_A$. gA will increase if the expression is positive and decreases if negative, as well as constant if it is equal to zero.

Growth of new knowledge is then determined by $\beta + \theta$. The rate of return to scale of the increase in the K and A in the production of knowledge is $\beta + \theta$. The increase in the K and A by X, will raise A by X ($\beta + \theta$). Thus the determinant of economic growth is how it compares $\beta + \theta$ to 1 (the original models are θ compared with 1). When the smaller one, there will be decreasing returns to scale, the larger one will happen increasing returns to scale, and is equal to 1 constant returns to scale (the same as the model without capital).

Model of Human Capital

A study on the income received by a scholar in the United States in (Acemoglu, 1998) shows that in 1970 an undergraduate (S1) received an average income 55 percent higher than high school

graduates. Meanwhile in 1995 a scholar receives income 62 percent higher than high school. Thus the role of education (both formal and informal) are essential to increase revenue. Efforts to improve education is inherent in the human capital model. Human capital is different from knowledge, because human capital involves the ability, expertise, and knowledge of a particular job. Besides, another difference is the human capital excludeable and rivals. This means that if someone is doing a job, then the work can not be done by other people, and other people do not get the job. The assumptions underlying this model is:

output is the function of: $\mathbf{Y(t) = K(t)^{\alpha} H(t)^{\beta} [(A(t)L(t))]^{1-\alpha-\beta}}$, $\alpha > 0$, $\beta > 0$, $\alpha + \beta < 1$ ...(14)

Where H is the stock of human capital, L the number of workers. Equation (14) indicates that the output is determined by capital, labor and human capital per worker. K, H, and L is assumed constant returns to scale. The second assumption is the dynamics of K and L as follows: $\mathbf{K(t) = s_K Y(t)}$ ....(15) and $\mathbf{L(t) = nL(t)}$....(16).

s_K is the accumulation of physical capital, and assumed no depreciation. Furthermore, the growth of technology is constant and exogeneous: $A(t) = gA(t)$... (17) While the accumulation of human capital is modeled together with physical capital accumulation as follows: $\mathbf{H(t) = s_H Y(t)}$... (18) Furthermore, k = K/AL, h = H/AL, and y = Y/AL, thus: $\mathbf{Y(t) = k(t)^{\alpha} h(t)^{\beta}}$ ...(19)

By looking at the k first, the definition of the equations involving k and K, L, and A implies: $\mathbf{k(t) = s_K k(t)^{\alpha} h(t)^{\beta} - (n + g)k(t)}$...(20) or $\mathbf{k = [s_K /(n + g)]^{1/(1-\alpha)} h^{\beta/(1-\alpha)}}$

Thus k is equal to zero when $s_K k^{\alpha} h^{\beta} = (n + g)k$.. The increase of k is equal to increase of h. When $\beta < 1 - \alpha$ then k will be negative, and if $\beta < 1 - \alpha$ then k will be positive.

Investigating the dynamics of h. Such as the equation (20), then:

$\mathbf{h(t) = s_H k(t)^{\alpha} h(t)^{\beta} - (n + g) h(t)}$ ...(21)

h will be equal to zero when $\mathbf{s_H k^{\alpha} h^{\beta} = (n + g)h}$ atau $k = [(n + g)/s_H]^{1/\alpha} h^{(1-\beta)/\alpha}$. If $1 - \beta > \alpha$ then h will be positive and negative when $1 - \beta < \alpha$. By completing the magnitude y in balanced growth that y * will be obtained the effect of changes in s and n. Suppose k * and h * is the value of k and h on balanced growth and k = h = 0, then: $\mathbf{s_K k^{*\alpha} h^{*\beta} = (n + g)k^*}$... (22)

this equation can be solved becomes:

In y* = $\frac{\alpha}{1-\alpha-\beta} InS_k + \frac{\beta}{1-\alpha-\beta} InS_h - \frac{\alpha+\beta}{1-\alpha-\beta} In(n+g)$

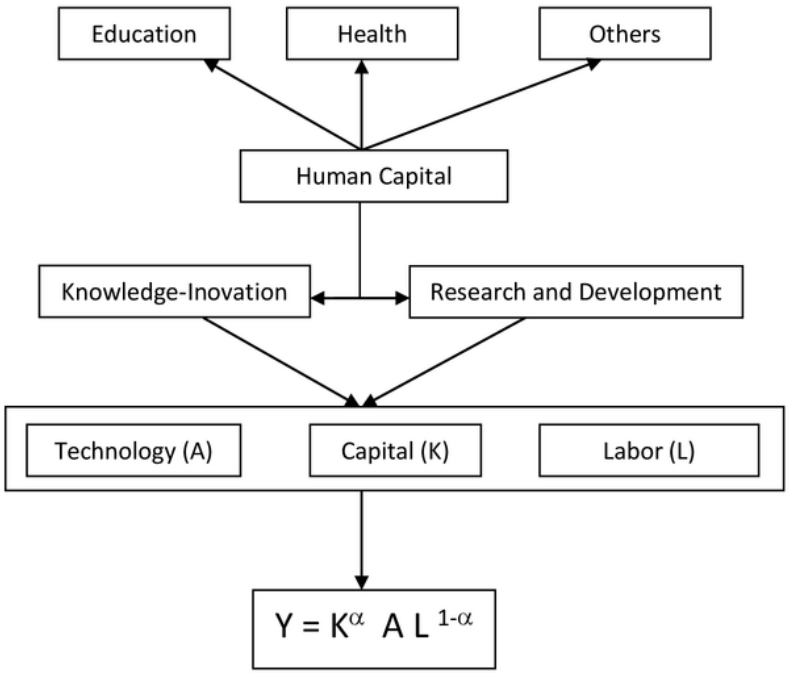
To explain the differences in output growth across countries, suppose there are two countries with the production function and the same technology, a assumed equal to 0.35 and b = 0.4. s_K and s_H is 2 times greater in the second than the first country, and n + g is 20% smaller, then:

$$Iny_2^* - Iny_1^* = \frac{\alpha}{1-\alpha-\beta}(InS_{k2} - InS_{k1}) + \frac{\beta}{1-\alpha-\beta}(InS_{H2} - InS_{H1}) - \frac{\alpha+\beta}{1-\alpha-\beta}\left[In(n_2+g) - In(n_1+g)\right]$$
$$= 1.4(In2) + 1.6(In2) - (3In0.8) \approx 2.75$$

Because $e^{2,75}$ approaching 15, 6 thus output per worker is nearly 16 times greater in the second state.

Implications of The Model

In brief, the transmission mechanism of human capital to economic growth can be summarized as follows: human capital namely health, education and so forth (Becker, 1992) will bring increased to knowledge by creating innovation, hereinafter jointly contribute to the research and development (R & D). Knowledge and R & D will provide an increase in quality of technology (A), capital (K) and labor (L), which in turn will boost the economy (Y) as shown in the diagram below.



By using the latest data from several publications of national institutions (BI and BPS) and international (World Economic Forum, World Bank, UNDP), it can be seen the relationship between human capital growth through the economics of cross-country analysis (cross section). As samples are 10 states that have a ranking 1-10 on the Global Competitiveness Report from 2013 to 2014 and member countries of ASEAN. Selection of sample from ASEAN countries due in 2015 ASEAN will enter the era of the ASEAN Economic Community (ASEAN Economic Community).

Countries sample and competitiveness

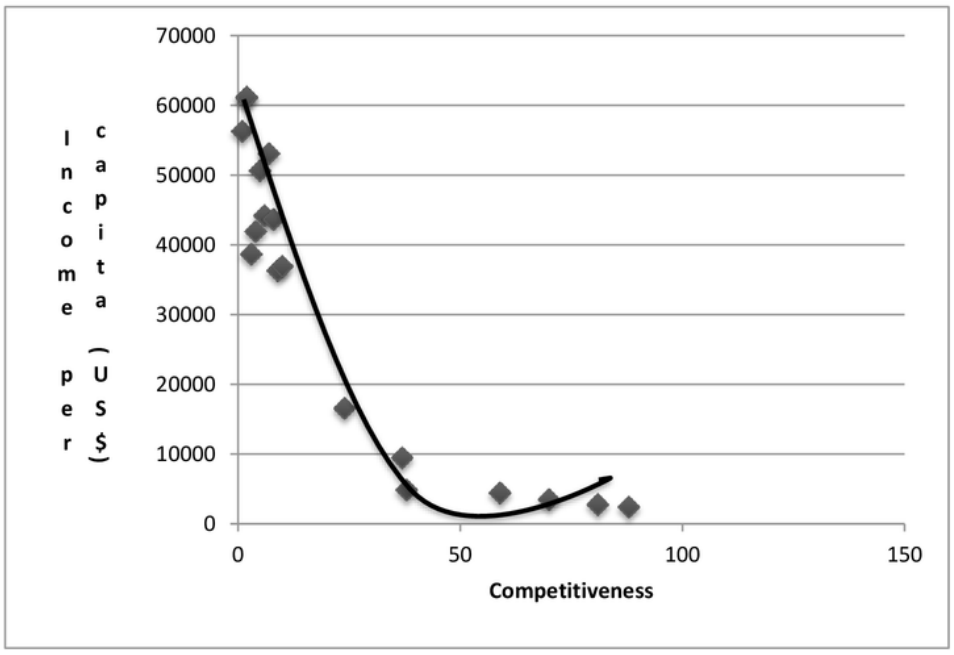
No.	Country	Ranking 2013/2014
1.	Switzerland	1
2.	Singapore	2
3.	Finlandia	3
4.	Germany	4
5.	United States	5
6.	Sweden	6
7.	Hongkong	7
8.	Netherland	8
9.	Japan	9
10.	United Kingdom	10
11.	Malaysia	24
12.	Brunei Darussalam	26
13.	Thailand	37
14.	Indonesia	38
15.	Philippine	59
16.	Vietnam	70
17.	Lao PD	81
18.	Cambodia	88
19.	Myanmar	139

Source: World Economic Forum 2013

From 148 countries which is counted their competitiveness then given its competitiveness ranking by the World Economic Forum (WER) in 2013, was issued global competitiveness of countries such as the table above.

Competitiveness and Income per Capita

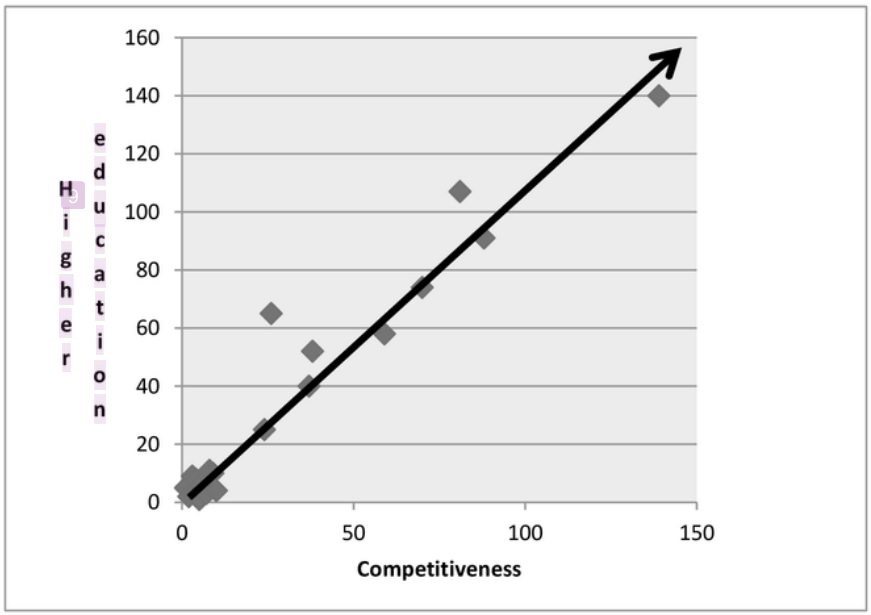
Economic Growth Model Neo Classical mentioned above implies that through the quality and quantity of technology, capital, and labor and human capital will affect the competitiveness of which is owned by a country. The relationship between competitiveness and economic growth can be seen in diagram below.



From the diagram above shows that the smaller the ranking of competitiveness (better competitiveness), the higher the per capita income of the country. From the diagram above also shows that the relationship scatter diagram as an exponential relationship (steep slope is not linear) for countries with small rank (high competitiveness), and linear tends to be flat for a country with low competitiveness (rank 30 and over). This means that for countries with good rankings, the rise in ranking would boost per capita income faster than the ranking of countries with less well.

Competitiveness and Quality of Higher Education

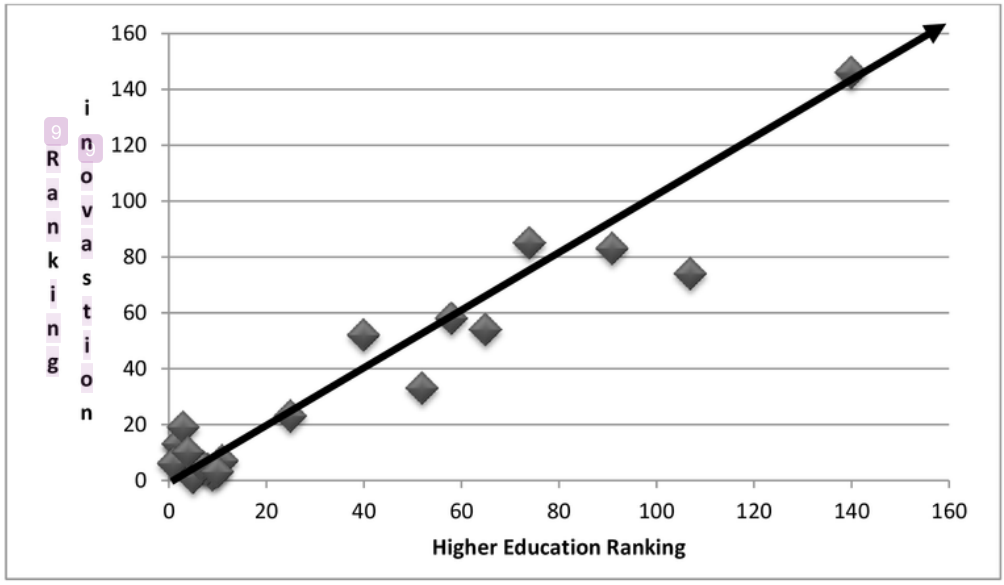
Countries with high competitiveness that is able to increase the per capita income is due because of the support of the quality of higher education of these countries as shown in the diagram below.



From the picture above it can be seen that there is an existence of a direct relationship (positive) between ranking the quality of higher education in a country with the global competitiveness of the country. The higher the rank the quality of higher education of a country's, competitiveness ranking will also increase, and in turn the income per capita of the country's will increase.

Higher Education and Innovation

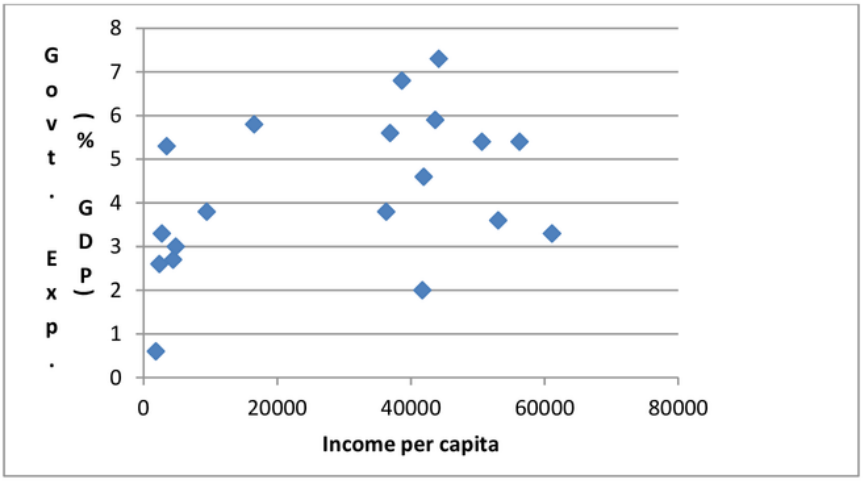
Education as one part of the human capital is believed to be able to increase the knowledge which in turn will increase the innovation needed for economic growth of a country. The relationship between higher education and innovation can be seen in the diagram below.



Of the scatter diagram above shows that there is a tendency of positive linear relationship. That is, the better the ranking quality of a country, the higher education will improve also innovations in the country. These findings support the thesis of Aghion and Howitt (1992: 349) who said that innovation is a product of knowledge through education.

Income per capita public spending on education

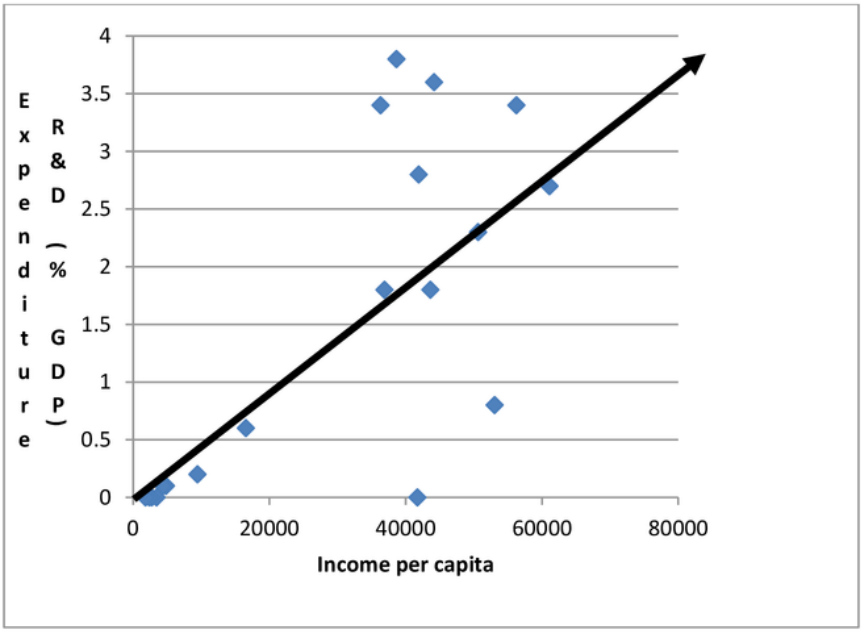
It has been realized that education can improve economic growth approached through a per capita income. Steedman (2001) said that if education is not able to improve economic growth, education is failing. To the need for government intervention in the form of government expenditure aimed at improving the quality of education. Increasing government spending for education is expected to increase per capita income. The relationship between government expenditure in education primarily to earnings per capita can be seen in the diagram below.



Although from the scatter diagram above shows that there is no clear pattern between government expenditure for education with per capita income, but it can be seen the two (2) cluster the cluster of ASEAN countries (with per capita income is low) which collects diagram scatter in the left and the second cluster of countries that gathered the top ten rankings in the right. Two clusters shows that the increase in government spending on education looks more meaningful (increase income per capita) in the second compared to the first cluster.

The income per capita and expenditures on Research and Development (R & D)

Education that enhances knowledge which then produce new innovations also resulted from research and development activities (R & D). The role of R & D is located in the economic growth of a country. Through R & D can produce new products of high added value that could increase per capita income. Therefore, the government must take responsibility to fund R & D activities. Relationship between spending on R & D per capita income can be seen in the diagram below.



From the diagram above shows the distribution pattern of positive. This suggests that higher government spending on research and development (R & D) will further improve the income per capita of a country.

Conclusion

Neo-classical growth theory emphasizes the role of human capital as a driver of economic growth. This is because of the neo-classical approach of economic growth in terms of production. With the improvement in the quality and quantity of factors of production owned by a country, the more it will improve the economy. Special emphasis is given to investment in human capital, especially education. Education will be created the accumulation of knowledge that gives important innovations for the benefit of economic growth. Meanwhile education will also contribute knowledge through research and development (R & D) is needed for economic growth. Considering education and R & D is an important variable for economic growth, then the allocation of government spending on these two variables must be given in large quantities. However, as shown in the table in the appendix that government spending for education in Indonesia only amounted to 3% of GDP is much lower than Malaysia amounted to 5.8% of GDP. Government expenditure on R & D fund is also very low at only 0.1% of GDP which is far

behind from Finland amounted to 3.8% of GDP. In the absence of a significant improvement in government spending on education and R & D, then it is difficult for Indonesia to escape from the classic problems of poverty and unemployment.

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Human Deveelopment Report 2013

Badan Pusat Statistic Publication, several edition

Bank Indonesia Publication, several edition

Appendix

Country	Rank high.edu	Rank inovation	y/pop (US$)	Pub-spen-edu(%GDP)	exp R&D (% GDP)
Singapore	2	13	61100	3.3	2.7
Malaysia	25	23	16530	5.8	0.6
Brunei Drssalam	65	54	41703	2	0
Thailand	40	52	9430	3.8	0.2
Indonesia	52	33	4810	3	0.1
Philippines	58	58	4400	2.7	0.1
Vietnam	74	85	3440	5.3	0
Lao PDR	107	74	2730	3.3	0
Cambodia	91	83	2360	2.6	0
Myanamar	140	146	1817	0.6	0
Switzerland	5	1	56240	5.4	3.4
Singapore	2	13	61100	3.3	2.7
Finlandia	9	2	38630	6.8	3.8
Germany	8	4	41890	4.6	2.8
USA	1	6	50610	5.4	2.3
Sweden	7	5	44150	7.3	3.6
Hong Kong	3	19	53050	3.6	0.8
Netherland	11	7	43620	5.9	1.8
Japan	10	3	36290	3.8	3.4
United Kingdom	4	10	36880	5.6	1.8

Compile from World Development Report 2014, World Economic Forum 2013-2014, Human Development Report 2013

HUMAN CAPITAL COMPETITIVENESS OF INDONESIAN

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