# Human Capital as the Main Determinant of Regional Economic Growth

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*Abstract*

*The new growth theory has explained that economic growth was from technology changes as the accumulation of human capital. The accumulation of human capital leads to the efficiency, effectiveness and productivity which encourage the competitiveness. The objective of the study is to explain the new growth theory through the empirical data on regional economy. It analyzes the regional economy empirically in Central Java and Yogyakarta, Indonesia. The study results confirm that human capital can give the main and dominant contribution to encourage the regional micro and macro-economic growths. It means that the accumulated impacts of regional economic growth in human capital are able to give positive energy to increase the regional economic growth and the competitiveness.*

*Keywords: Human Capital, Social Capital, Productivity, Economic Growth, Competitiveness*

## 1. Introduction

Human capital stock directly related to the technology advancement (Ganeva, 2010). Theoretically; human capital should give positive effect on economic growth. However; empirically; the relationship is often not proven for many reasons (Ali, 2018). Theoretically, the role of human capital on economic growth can be measured with direct and indirect effects (Prasetyo, 2008, 2019; Ganeva, 2010). The direct effect related to the human resources' productivity, and the indirect effect through the total productivity change which consequently gives effect on economic growth and the competitiveness (Ganeva, 2010; Prasetyo, 2019). The theoretical study is to create the mathematical model of the effects human capital on the growth. Then, the novelty of the study is the starting point of empirical study explaining the roles of human capital on regional growth in Indonesia. Moreover; the focus of the Indonesian development strategy in 2020 is human capital which is in line with European Union's strategy focusing on three fields of growth; smart, sustainable and inclusive. Those goals cannot be reached without the main contribution of skills, knowledge and human values called human capital, (Pelinescu, 2015).

The dominant latest literature studies support the statement that human capital had effect on the economic growth (Rangongo & Ngwakwe, 2019; Osiobe, 2019; Ali, 2018). The study result of Rangongo, (2019); using the secondary data and panel model; confirms that there was a positive relationship between human capital investment and the economic growth. Osiobe (2019) also studied on the relationship between human capital investment and the economic growth. Using the previous dataset research, Osiobe (2019) summarized the roles of human capital in; (1) the framework of the economic growth theory, (2) the neo-classic growth model, (3) the production function of Solow's Growth theory, (4) The new endogenous theory, and (5) the empirical evidence of the effect-cause relationship between human capital and the economic growth. Then, Ali (2018) did a research with the data of 132 countries for 15 years; theoretically, it was stated that human capital had positive and significant effect on the economic growth. Furthermore; empirically, human capital had positive effect on GDB (Gross Domestic Bruto) growth per capita but it happened when there was good business opportunities and high-qualified

legal institutions. Ali (2018) also found that empirically; it was unconvincing that there was a role of human capital on the economic growth.

The objective of the study is to give the empirical evidence of human capital's central roles on regional economic growth. The importance of the study is to explain and to give the real evidence that human capital has the positive effect and the main determinant of regional economic growth. The main point of the article is how human capital encourages the regional economic growth. The article is to discuss the relationship of human capital and the regional economic growth. Then, the article also shows the empirical evidence of Solow's model "the new growth theory" is valid empirically at the economic cases at the local regions. The basic concept of human capital structure can be seen from the individual perspective focusing on human capital at the certain local regions. Human capital means the total number of human capital from the perspective of all economic social development in the certain regional population. It means that the structure of human capital at the article is both statically and dynamically.

## 2. Literature Review

The neo-classic economic theory acknowledges the importance of technology sourcing from human capital accumulation and physical capital to encourage the economic growth. The human capital theory assumes that education determines the marginal productivity of labors and their incomes (Marginson, 2017). Human capital, physical capital and technology had the direct effect on the economic growth and the other factors should be analyzed too (Acemoglu, 2009).

Acemoglu (2014) has reviewed the relationship among institution, human capital accumulation, and long-term economic growth. Acemoglu (2014) found that if the focus of difference determined historically, then the effects of human capital and the long term growth institution were strong; meanwhile if the there was less human capital; it led to the less consistent assumption. Then, Acemoglu (2014) recommended for further researches focusing on other more credible variables which the interactions were more complex and exciting at the local regions or other countries to understand the contribution of human capital on economic and social growths and on the interacted institutions.

Human capital and technology are the important determinants of growth in Nigeria (Chindo, 2015). The difference of technology is the vital key to understand the regional and national economic growth and development. Furthermore; the difference of its institutional policy implications can be seen from the total investment at human capital and technology.

The research model of Pelinescu (2015) revealed there was a positive and significant relationship among GDB (Gross Domestic Bruto) per capita and human capital innovative capacity (proven with the total patents) and employee qualifications (middle level education) as expected by the previous economic theory. Previously; the research result of Acemoglu (1996) explained that the return level of individual human capital went up on the employee human capital average although all production functions were constant, no technology externality and all labors competed at the same jobs.

The importance of regional entrepreneurship has been recognized by many parties or stakeholders but the directions and the impacts were still debated (Audretsch, 2002; Lee, 2004; Szerb, 2019). Entrepreneurship was often applied as the valid mechanism to improve the regional economic performance (Acs, 2018; Szerb, 2019; Stough, 2016). Acs (2018) has analyzed conceptually and empirically the relationship among the economic growth, input factors, institutions and entrepreneurship. Acs (2018) found that the entrepreneurial ecosystem supported the economic growth. Szerb (2019), analyzed 121 European Union's regions in 2012-2014, and found five important points; (1) there was a positive relationship between entrepreneurial ecosystem quality and regional performance, (2) Kirznerian's entrepreneurship had a negative effect on the regional performance, (3) Schumpeterian's entrepreneurship

had a positive effect on the regional performance, (4) Entrepreneurial ecosystem moderating the negative effect between Kirznerian's entrepreneurship and the regional performance, and (5) Entrepreneurial ecosystem moderating the positive effect between Schumpeterian's entrepreneurship and the regional performance. The more interesting part of the article was that quantity entrepreneurship (Kirznerian) had a negative effect on the regional performance but there was positive effect on the quality.

## 3. Research Methods

The roles of human capital and entrepreneurship on the economic growth have been analyzed by many researchers. The study was designed by the experimental model involving many variables and then the selected variables were chosen based on the experimental results. The primary sources of the study were microeconomic and macroeconomic fundamental primary data.

The data were collected by distributing surveys on the Small and Medium Enterprises (SMEs) at two regions/ provinces; Central Java and Yogyakarta. Cluster random sampling was used to select the samples based on the special local wisdom ownership. Since the research goals were to explain the related variables so the explanatory research was used based on the main regional economic growth and the sustainable competitiveness variables.

Path model analysis in the form of recursive system correlation was used as the analysis approach. The correlation of *Karl Pearson Product Moment* was used as the correlation model. Gini ratio, the popular dimension was used as the dimensions of the variable. The analysis objective was to explain and describe the central roles of human capital and entrepreneurship opportunity on encouraging the regional economic growth and the industry competitiveness in Indonesia. For easier understanding, here it is the structural equation model which can be seen at the formula and figure 1 below:

$$REG = \alpha_0 + \alpha_1 HC + \alpha_2 SC + \alpha_2 PDt + \varepsilon_1 \dots\dots\dots\dots (1)$$
$$EBC = \beta_0 + \beta_1 HC + \beta_2 SC + \beta_3 PDt + \beta_3 REG + \varepsilon_2 \dots\dots (2)$$
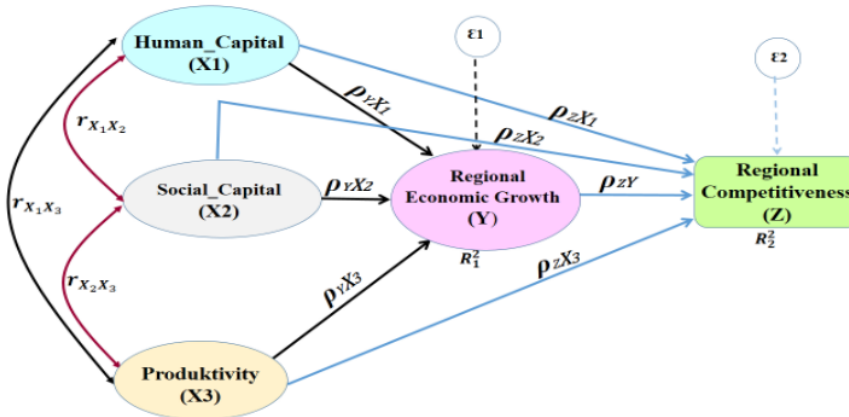


Figure 1. The Multiple Path Analysis with Correlational Recursive Model

## 4. Results and Discussion

To understand the path analysis; it suggests to understand the output result of regression coefficient as presented at table-1. Based on the output result of regression analysis at table-1, especially on model-1, it can be seen that the contribution of human capital factor can give the biggest value of beta coefficient standardized for 0.556 on the regional economic growth. The contribution of human capital on the regional economic growth is positive and significant at the confidence level above 99 percent. It is an empirical evidence that human capital factor gives dominant effect on economic growth. It means that the study result supports the the new growth theory from R.M. Solow and also supports study results from Osiobe (2019) and also supports Ali's study (2018) since Ali (2018) found the empirical study that there was only low effect of human capital on economic growth.

Basically, productivity is the key of the competitiveness (Prasetyo, 2008, 20019). It is true productivity is the key of competitiveness only when the productivity formed from human capital and social capital (Prasetyo, 2019). However; productivity factor is in line with human capital and social capital factors as the independent variables to influence economic growth, thus, the contribution of productivity factor goes down although it is positive and significant. At model-2, it can be seen that the contribution of human capital on the competitiveness is decreasing. On the other hand, the contribution of social capital factor on the competitiveness goes up. The study result supports the previous researches done by Prasetyo (2020) which shows the strong contribution of social capital to encourage the competitiveness at entrepreneurial SMEs industry. It also happens on productivity factor which also increases the competitiveness.

Table 1-1: The Regression Output of Path Analysis Model

| Model | Unstandardized Coefficients | | Standardized Coefficients | t-Stc | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant) | .037 | .032 | | 1.171 | .244 |
| 1 Human_Capital ($X_1$) | .574 | .070 | .556 | 8.219 | .000 |
| Social_Capital ($X_2$) | .246 | .084 | .218 | 2.941 | .004 |
| Produktivity ($X_3$) | .136 | .069 | .156 | 1.971 | .051 |
| (Constant) | .004 | .027 | | .143 | .887 |
| Human_Capital (X1) | .197 | .075 | .198 | 2.634 | .010 |
| 2 Social_Capital (X2) | .257 | .075 | .235 | 3.449 | .001 |
| Produktivity (X3) | .149 | .060 | .176 | 2.471 | .015 |
| Regional Economic_Growth (Y) | .371 | .078 | .384 | 4.744 | .000 |

Source: The processed primary data

Based on the data research as shown at table 1 in model 2, it can be seen that economic growth has effect dominantly on the competitiveness. However; economic growth is not the first important factor because it depends on human capital factor as the first and main factor to encourage economic growth. Although the biggest direct factor to encourage the competitiveness is urged from economic growth and social capital factors but the most vital factor on economic growth is human capital factor. It means without human capital, there will not be any good economic growth and the strong competitiveness. A good human capital factor urges economic growth and the competitiveness.

The previous study results showed that regional economic growth was encouraged positively by entrepreneurship (Prasetyo, 2019, 2020). Based on the entrepreneurship industry data in Central Java and Yogyakarta, the study found the capacity absorption of entrepreneurial strategic opportunities as the main power based on human capital, social capital, technology and also cultural variety of local wisdom could create the dynamic regional entrepreneurial ecosystem which led to the regional economic growth and the sustainable competitiveness.

It was already stated that the entrepreneurial growth is a way to build and maintain the rural and urban economy (Willis, 2020; Edmiston, 2007; Henderson, 2002). Thus; the study could give the implications on public policy to encourage the economic growth through creating new jobs urged by human capital capacity and increasing new enterprises at each region.

If the study result at table-1 related with diagram-2 and table-2, it can be seen the direct effect of human capital is consistent and more significant on the regional economic growth. Meanwhile, the effect of human capital on the competitiveness goes down. On the other hand, the effect of social capital goes up on the competitiveness. Although there is not any significant different effect between human capital and social capital on the competitiveness but the contribution of social capital is bigger than human capital on the competitiveness. Thus; the study result is consistent supporting the previous research which stated that human capital gave more dominant on economic growth; and social capital gave bigger effect to encourage the competitiveness (Prasetyo, 2019, 2020).
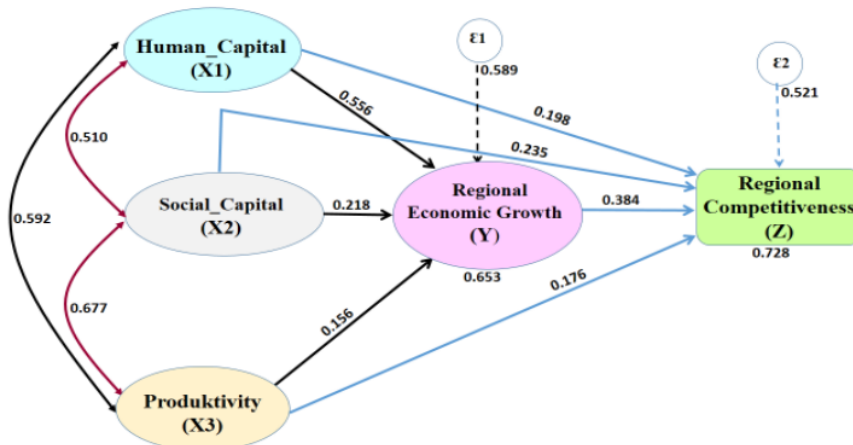


Source: The Processed Primary Data
Figure-2: The Multiple Path Analysis Result with Correlational Recrussive Path Model

It is more interesting to be analyzed seen at table-1, diagram-2 and table-2 that productivity factor is not the main factor of the competitiveness at a region. It is different result from the previous research that productivity is the main factor to increase the enterprises competitiveness (Prasetyo, 2019). Furthermore; if it is analyzed in details, the difference is located in the basic concept of the first structural equation.

If the productivity is developed from human capital and social capital factors influencing economic growth and the competitiveness, so the productivity can be the main key to increase the competitiveness. However; the study result shows that if productivity as the independent variable influences economic growth and the competitiveness; its effect goes down.  It is normal since the main factor of

productivity is human capital so if human capital does not influence the productivity so the productivity goes down and it cannot be the main key of the competitiveness improvement.

**Table-2**: The Direct and Indirect Effects of Path Analysis

| Variables | Direct Effects | Indirect Effects | | | | | Total effect |
|---|---|---|---|---|---|---|---|
| | | Human Capital | Social Capital | Productivity | Regional Economic_Growth | Indirect total | |
| Human_Capital | 0.039 | | 0.024 | 0.021 | 0.042 | 0.087 | 0.126 |
| Social_Capital | 0.055 | 0.024 | | 0.028 | 0.020 | 0.072 | 0.127 |
| Productivity | 0.031 | 0.021 | 0.028 | | 0.011 | 0.060 | 0.091 |
| Regional Economi_Growth | 0.147 | 0.042 | 0.020 | 0.011 | | 0.073 | 0.220 |
| Total | **0.272** | | | | | **0.292** | **0.564** |

Source: The processed primary data

It means that empirically; human capital has effect on productivity; it supports the grand theory from R.M Solow on the new growth theory. The theory explained that human capital investment through education and trainings are able to increase productivity and economic growth. The theory is consistent with the study result that human capital is the main determinant in increasing the regional economic growth.

It means that the regional economic growth and development in Indonesia depend on human capital and infrastructure. The relationship between capacity building of human capital and infrastructure development has been implemented by the Indonesian government. It might be complex and difficult to build the infrastructure but it can be useless if it is not followed by the capacity building of human capital sustainably.

## 5. Conclusion and Recommendation

The article is to explain empirically the contribution of human capital on regional economic growth and the competitiveness qualitatively and quantitatively. The empirical research focuses on the micro fundamental dataset to interpret the macro variables of economic growth. By using the path analysis, the study shows that human capital as a measure of human resources can be the driver of regional economic development.

The variation of structural equation model can explain the role of human capital in driving economic growth which in turn encourages competitiveness. The increasing development of human resources will further encourage the ability of infrastructure to improve the regional and national economic growth. Therefore, it is recommended that current and future economic development in Indonesia should focus on building capacity of human resources and also infrastructure to encourage good and quality economic growth to support the economic development outcomes and sustainable development since human capital and infrastructure are the keys of sustainable development.

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