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Budiman Muhammad Akbar, Master Student, Faculty of Economics, Sriwijaya University, Indonesia

ORCID ID: 0000-0002-0174-0962
e-mail: 17akbarmuhammad@gmail.com

Rohima Siti, Doctor (Economics), Lecturer at the Faculty of Economy, Sriwijaya University, Palembang, Indonesia

ORCID ID: 0000-0002-9196-7924
e-mail: annayulia@unsri.ac.id

Yulianita Anna, Doctor (Economics), Lecturer at the Faculty of Economy, Sriwijaya University, Palembang, Indonesia

ORCID ID: 0000-0001-8744-3274
e-mail: annayulia@unsri.ac.id

Human Capital, Labour Force, And Economic Growth: Case Study of Across Regions in Indonesia

Abstract. Introduction*. Human development in education, health, and decent living increases, the accumulated human capital increases. The increase in production factors in the form of human development as a whole will increase output. In aggregate, an increase in the accumulation of human capital will impact the use of production factors as a source that replaces accumulated physical capital with human capital. Based on endogenous growth theory, human capital accumulation will create knowledge that will produce higher knowledge output. This research focuses on analyzing economic growth in Indonesia regarding endogenous factors, including the Government Expenditure Ratio for Education and Health, Human Development Index, and Labor Force Participation Rate by all provinces in Indonesia. The data used in this study are secondary for the period 2011-2020 and cross-sectional from 34 provinces in Indonesia. The analysis technique uses quantitative with Panel Data regression analysis tool.*

Purpose. *This study analyzes the effect of the Government Expenditure Ratio on Education and Health, Human Development Index, and Labor Force Participation Rate on Economic Growth in Indonesia.*

Results. *Education and Health Expenditure Ratio, HDI, and TPAK have a positive effect on Economic Growth. This condition means that every increase in Education and Health Expenditures, the human development index, and the Labor Force Participation Rate (TPAK) will increase economic growth. Overall economic growth is mostly determined by the Labor Force Participation Rate (TPAK).*

Conclusions. *. Increasing the Proportion of Education and Health Expenditure Ratio, improving the quality of HDI, and increasing LFPR will impact increasing Economic Growth in Indonesia. Thus, to further increase spending on education and health, the availability of employment opportunities will result in the accumulation of human capital, which will increase economic growth in the long term.*

Keywords: *government expenditure; human development index; labor force participation rate; economic growth*
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Будіман М. А., магістрант економічного факультету Університету Шрівія, Індонезія.

Рохіма С., доктор економічних наук, викладач економічного факультету Університету Шрівія, Палембанг, Індонезія

Юліаніта А., доктор економічних наук, викладач економічного факультету Університету Шрівія, Палембанг, Індонезія

Людська столиця, робоча сила і економічний зріст: дослідження в регіонах Індонезії

У статті зосереджено вагу на аналізі економічного зростання в Індонезії щодо ендогенних факторів, включаючи коефіцієнт державних видатків на освіту та охорону здоров'я, індекс людського розвитку та рівень участі робочої сили в усіх провінціях Індонезії. Дані, використані в цьому дослідженні, є вторинними для періоду 2011-2020 років. Методика аналізу включає кількісну з інструментом аналізу регресії панельних даних. З'ясовано, що загальне економічне зростання в основному визначається коефіцієнтом участі робочої сили (ТРАК). Доведено, що збільшення частки видатків на освіту та охорону здоров'я, покращення якості ІРЧП та збільшення LFPR вплинуть на зростання економічного зростання в Індонезії. Таким чином, для подальшого збільшення видатків на освіту та охорону здоров'я наявність робочих місць призведе до накопичення людського капіталу, що в довгостроковій перспективі збільшить економічне зростання.

Ключові слова*: державні витрати; Індекс людського розвитку; рівень участі робочої сили; економічне зростання.*

Formulation of the problem. Study of economic growth related to human capital as the engine of economic growth Cooray et al., [8]; Islam and Muneer [19]; Mustafa et al. [28]; Qadri and Waheed [31]. Solow growth explains that productivity or technological development is considered as given. However, in the

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framework of the new growth theory (New growth theory), technological innovation and the formation of human capital are the primary sources of productivity. Productivity growth will, in turn, become the engine of economic growth. The potential positive effect of labor productivity from investment in human capital makes it a very relevant issue for development policy in a country. The progress of human development is an essential achievement of a country; human development also needs to be supported by efforts to improve the quality of human resources. This increase in productivity is influenced by the application of technology and the improved quality of human resources. The more significant the efficiency and productivity of human resources, the growth relatively increased Curea and Ciora [9]; Dissou et al. [11]; Teixeira and Queirós [37]. However, the concept of human capital is complex and multidimensional. Schultz [33] and Becker [14] define human capital as a set of knowledge, skills, competencies, and abilities embodied in an individual and that an individual acquires over time through training, education, work experience, medical care, and migration. Thus, human capital can be divided into three main components: health, education, and training. Therefore, it needs to be supported by better education, higher health status, and new learning. An indicator that is often used to see human resources development capable of bringing about successful development conditions is the Human Development Index Becker [14]; Iskandar [18]; Schultz [33]. This is in line with empirical studies conducted Chikalipah & Makina [5]; Fosu [13]; Mercan & Sezer [25] that there is a positive and significant effect between economic growth and human development. The role of human resources as development implementers directly or indirectly determines the steps, characteristics, and success of development itself. One of the indicators used in employee development success is the Labor Force Participation Rate Mirah et al. [26]. Improved economic growth must still be supported by the availability of labor Lind [24] . Empirical studies also find that labor force participation positively and significantly affects economic development Clark et al. [6]; Dogan [12]; Ul Haque et al. [38]; Wijaya et al. [39]. Therefore, human development does not only pay attention to the quality of human resources itself but also needs to be supported by the availability of labor. In addition to the role of human development factors in increasing economic growth, the theory of economic growth is also influenced by an increase in government spending. Theoretically, Musgrave and Peacock [27] found a high correlation between public expenditure and per capita income. It is empirically proven that government spending on health and education increases labor productivity and infrastructure development, thereby increasing economic growth Curea and Ciora [9]; Kundu [21]; Odhiambo [29]; Ogundari and Awokuse [30]; Teixeira and Queirós [37]. Government spending on education is an investment in economic growth. According to Dissou et al. [11], countries that devote much attention to public education (as seen from the percentage of GDP on education) have a low level of income inequality. In other empirical studies, government spending on education is related to economic growth, but government spending on health is also related to economic growth. This is in line with empirical studies conducted Ogundari and Awokuse [30] . We also find that the contribution of government spending on health to economic growth is relatively more significant than the impact of government spending on education. Most of the empirical studies discussing the relationship of economic growth focus solely on one relationship. The relationship between government spending on education and economic growth on the one hand, and the relationship between government spending on health and economic growth on the other Bloom et al. [3]; Soni and Jariwala [35] observed that many previous studies had the variable bias removed since both education and health were considered to be equally important in investing in long-term economic growth. Therefore, to achieve economic growth and development, the quality of human resources in the economy is needed to be improved significantly. Other than that, the government must pay attention to promote long-term economic development and devote much attention to government spending on education and health.

Analysis of recent research and publications. Several studies discuss human capital investment, particularly concerning government spending on education and health. Most of the empirical studies discussing the relationship of economic growth only focus on one relationship. There is a relationship between government spending on education and economic growth on the one hand and the relationship between government spending on health and economic growth on the other Soni and Jariwala [35]. Studies that discuss the effect of both government spending on education and health on economic growth Aka Bedia and Dumont Christophe Jean [1]; Gyimah-Brempong and Wilson [16]; Li and Huang [23] find a positive and significant effect of government spending on education and health on economic growth. However, most studies only focus on one relationship between government spending on education and economic growth Hanushek and Kimko [17]; Svitlana Maksymenko and Mahbub Rabbani [36] they find that government spending on education has a positive and significant effect on economic growth.

Furthermore, a study conducted by Colantonio et al. [7]; Gyimah-Brempong and Wilson [16] only discussed the indicators of government spending on health on economic growth; they found that government spending on health had a positive and significant effect. However, empirical studies were conducted by Chandra Shekhar Kumar [4]; Davood Behbudi et al. [10]; Jude Eggoh et al. [20] states that public spending on education and health has a negative impact on economic growth because public investment in education and health must be jointly

increased. Its efficiency is expected to have a positive impact on human capital on economic growth.

An increase in government spending, especially in the fields of education and health, will have an impact on the formation of human capital, which is the primary source of productivity, and productivity growth will, in turn, become the engine of economic growth. Therefore, it needs to be supported by availability through better quality education, higher health status, and new learning. Studies conducted by Laisina et al. [22]; Sihite [34] found that the increase in the productivity of human capital, in this case, seen from the human development index, has a positive and significant effect as an engine driving economic growth. The availability of jobs must also support the success of improving the quality of human resources. Studies conducted by Amir et al. [2]; Wijaya et al. [39] discuss total labor force participation in economic growth. They found a positive and significant effect between the level of labor force participation and economic growth.

In summary, empirical studies on the effects of economic growth on education and health are pretty diverse, and the results of the literature depend not only on the one variable relationship used between education and economic growth or the relationship between health and economic growth, but also on both education and health variables, and the quality of human capital supported by the availability of jobs. Therefore, this paper aims to compare the relative impact of human capital indicators and their interactions with economic growth in Indonesia.

Formulation of research goals. According to all provinces in Indonesia, this study focuses on analyzing economic growth in Indonesia in terms of endogenous factors, including the Government Expenditure Ratio in Education and Health, Human Development Index, and Labor Force Participation Rate. The data used in this study are secondary, time-series data for the period 2011-2020, and data, cross-sectional, 34 provinces in Indonesia obtained from the Indonesian statistical center agency and the Indonesian Ministry of Finance. The analytical tool used in Panel Data Regression with the following model:

〖LNGDP〗_it=β_0+β_1 〖GE〗_it+β_2 〖IPM〗_it+β_3 〖TPAK〗_it+ ε_it (1)

Where: LNGDP = GRDP per capita, GE = Ratio of Government Expenditures on Education and Health, HDI = Human Development Index, LFPR = Labor Force Participation Rate _0 = Constant, _1-β_2 = Indenpent Variable Regression Coefficient, = error of term.

The panel data estimation are used to analyze the effect of the Government Expenditure Ratio on Health and Education, HDI, and TPAK on economic growth in Indonesia. The model analysis chosen are the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model. The comparison between models is presented in Table 1:

Table 1. **Estimation Results of Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model**

Variable	Common		Fixed		Random	
	Coefficient	Prob.	coefficient	Prob.	coefficient	Prob.
C	6,094153	0,0000	98,39920	0,0000	5,805527	0,0000
GE?	0,001766	0,1023	6,042518	0,0000	6,87E-05	0,7454
IPM?	-5,78E-06	0,0000	2,248926	0,0253	4,40E-07	0,7364
TPAK?	0,061116	0,0000	78,96105	0,0000	0,065744	0,0000

Source: The results of the 2021 data processing

Table 1 above shows that statistically, the best model comparison is the Fixed Effect Model. The model can be categorized as the best model because all variables, including Health and Education Expenditure Ratio, which have Health and Education Expenditure Ratio, HDI, and LFPR have a probability value smaller than the significance level. The model selection was based on several tests, namely the Chow test, Hausman test, and Langgrange multiplier test. The results of testing of models that can be seen in Table 2

Table 2. **Testing Results Model**

No.	Testing	Statistical	Probability
1	TestChow	1895,37	0,0000
2	TestHausman	0,0000	1,0000
3	TEST LM	25 378	0,0000

Source: Processed Data, 2021

Table 2 shows that statistically, the best model based on the three tests is the Fixed Effect Model. Thus, the model that will be interpreted is the Fixed effect. Based on the estimation results using the Fixed Effect Model, it shows that in the direction of the variable coefficient of the Health and Education Expenditure Ratio, which has a Health and Education Expenditure Ratio, HDI and LFPR have a positive slope. In detail, the estimation results will be explained based on Table 3

Table 3. **Estimation Results of Panel Data Regression**

Dependent Variable: LNGDP?				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5,677404	0,057698	98,39920	0,0000
GE?	0,000665	0,000110	6,042518	0,0000
HDI?	1,02E-06	4,55E-07	2,248926	0,0253
TPAK?	0,067406	0,000854	78,96105	0,0000
Statistics Weighted				
R-squared	0,997105	Mean dependent var		23,22038
Adjusted R-squared	0,996714	SD dependent var		15,20735
SE of regression	0,048231	Akaike information criterion		-4,231862
Sum squared resid	0,621114	Schwarz criterion		-3,779461
Log likelihood	680,2431	criter Hannan-Quinn.		-4,050891
F-statistic	2554,227	Durbin-Watson stat		0,809076
Prob(F-statistic)	0,000000			
Unweighted Statistics				
R-squared	0,993613	Mean dependent var		10,35350
Sum squared resid	0,621159	Durbin-Watson stat		0,406851

Source: Processed Data,2021

Table 3 shows that all variables are declared significant, namely Health and Education Expenditure Ratio, HDI, and LFPR. However, before carrying out further analysis stages, statistical tests include F test, t-test, and coefficient of determination. The results of the F-statistical test show that the F-statistical probability value is smaller than the 5% significance level (0.0000 < 0.05), so that simultaneously the variables of the Health and Education Expenditure Ratio, HDI, and LFPR significantly influence economic growth. Meanwhile, to analyze the effect partially, the t-test was used. The probability value of the Health and Education Expenditure Ratio variable is smaller than the 5% significance level (0.0009 < 0.05) so that partially the Health and Education Expenditure Ratio has a significant effect on economic growth. The probability of the HDI variable is smaller than the 5% significance level (0.0253 < 0.05), so that partially HDI has a significant effect on economic growth. The LFPR variable has a probability value smaller than the 5% significance level (0.0053 < 0.05), so that partially, HDI significantly affects economic growth. The next test is to test the coefficient of determination to determine how much variation the variables of Health and Education Expenditure Ratio, HDI, and TPAK vary in determining the variation of the economic growth variable with the R2 result of 0.997 or 99.7% the variation of the variable determines the variation of economic growth. The rest, 0.3 percent, is influenced by variables outside the research model.

For further discussion, it will be analyzed the influence of each variable of Health and Education Expenditure Ratio, HDI, and TPAK on economic growth with the following equation model:

LNGDP = 5.677 + 0.0065 GE + 0.0000012 HDI+0.00674 TPAK (2)

The result shows that constant value (β0) = 5.677 can be interpreted if the Health and Education Expenditure, HDI and LFPR, are considered constant or zero, then the economic growth is 5.67 percent. Economic growth without the Health and Education Expenditure Ratio variable, HDI and LFPR are 5.67 percent. The coefficient value (β1) = 0.0065 can be interpreted if the Health and Education Expenditure Ratio variable positively affects economic growth; if there is an increase in the health spending ratio of 1%, it will increase economic growth by 0.0065 percent. The coefficient value (β2) = 0.0000012 can be interpreted that the HDI variable has a positive effect on economic growth, if there is an increase in HDI by 1% it will increase economic growth by 0.0000012 percent. The coefficient value (β3) = 0.00674 can be interpreted that the LFPR variable has a positive and significant effect on economic growth, if there is an increase in LFPR by 1% it will increase economic growth by 0.00674 percent.

Based on the estimation results show that the proportion of the ratio of government spending on education and health has a positive and significant effect. This condition means that every increase in the proportion of government spending on education and health will increase GDP. It is theoretically an advanced stage of economic development described by Rostow that when government activity increases in this case the provision of special economic infrastructure, education, and health service programs will have an impact on overall economic development. Increased economic development in terms of education and health will have a positive impact on increasing economic growth. This is in line with the empirical study conducted by Gisore et al., [15] that spending on health and education has a positive and statistically significant effect on economic growth.

Based on the study results, it was explained that the human development index had a positive and significant effect. This can be interpreted that the increase in the human development index will increase GDP. This theory explains that the human development index indicators in terms of education, health, and decent living increase, then the accumulated human capital increases. So that the increased human development as a whole will increase output. This is in line with the empirical study conducted by Dissou et al., [11] that there is a positive relationship between the accumulation of human capital and economic development so that the accumulation of human capital will create knowledge that will produce higher output.

The estimation results show that the level of labor force participation has a positive and significant effect. This can be interpreted that increasing the level of labor force participation will increase GDP. This theory explains that if the increase in production factors, in this case, is explained as an accumulation of labor-capital that is used effectively, it will increase labor productivity, where every increase in labor productivity will produce output per worker. This will have an impact on economic development. This is in line with an empirical study conducted by Ul Haque et al., [38] that there is a positive relationship between the level of labor force participation and economic development. An increase in output per worker will impact economic development.

Conclusion. The study results showed that the ratio of education and health spending, HDI, and TPAK had a positive effect on economic growth. This condition means that every increase in Education and Health Expenditures, the human development index, and the Labor Force Participation Rate (TPAK) will increase economic growth. Overall economic growth is most determined by the Labor Force Participation Rate (TPAK). Thus, it is recommended to increase spending on education and health further, the availability of employment opportunities to become an accumulation of human capital which will ultimately increase economic growth in the long term.

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