



# Human capital development via education and economic growth in ASEAN economic community

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## Article Info

### Article history:

Received 7 May 2020

Revised 16 June 2020

Accepted 2 July 2020

Available online 31 July 2021

### Keywords:

AEC,  
Development,  
Economic Growth,  
Education,  
Human Capital

## Abstract

This research aims to analyze causal relation between human capital development via education and economics growth in ASEAN Economic Community (AEC). Several human capital development variables and key economic indicators at the regional level of 10 ASEAN countries during 1990–2018 are examined using the Pooled Bivariate Granger Causality Test. The results indicate that the FDI as well as education related indicators such as education index, average year of schooling, and pupil-teacher ratio can affect output growth in the region. Further evidence indicates that a rise in human capital can cause GDP growth and per capita GDP growth. The average year of schooling can attract Foreign Direct Investment (FDI). There is no direct evidence to support the idea that lower fertility rate in aging society will harm economic growth in this region.

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## Introduction

Human capital is the most important factor of production in the economy because it can serve as labor and entrepreneur in the production of goods and services. Improving the quality of human capital will affect productivity and create sustainable wealth of nations. Most nations aim to develop and reform their education system as national agenda in order to prepare human capital and to enhance knowledge capital. Such capitals consist of wisdom, knowledge, and necessary skills for the population required for various occupations used to create output necessary to fulfill the needs of society. The quality of

human capital starts from households and further develops in school. The education system is an important tool used to prepare and enhance the performance of human capital for economic productivity. For rapid social and economic changes, most countries in the ASEAN Economic Community (AEC) continuously develop and reform their education system in accordance with their national development plans. Most of the related researches focus on the specific needs to develop human capital for each country, but few studies mention the overall structural relationship of human capital development via education in AEC. To align and integrate human capital development via education in AEC for future benefits of labor mobility in the region, this research aimed to analyze the structural relationship between human capital development via education and economic growth in AEC. As such, this research can benefit education and economic policymakers as well as schools to solve structural problems. The current quality of education and its future improvement will

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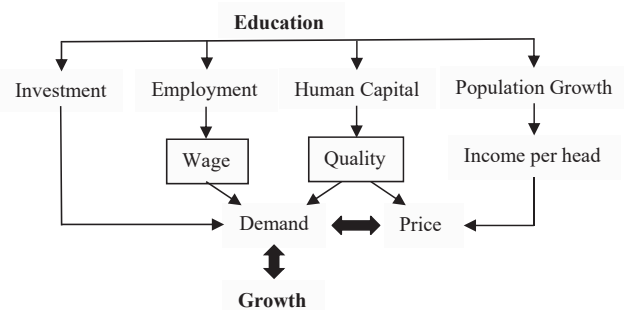


support. The problems arise from the measurements and only few researches having been done in developing nations. With proper measurement of skills and learning, cognitive skills and knowledge capital become the driving force for economic growth and development. Glewwe and Lambert (2010) pointed out that most research related to the education production function in developing countries focused on school enrollment, not cognitive skills and learning outcome. Hanushek, Jamison, Jamison, and Woessmann (2008) discovered that the level of cognitive skills is positively correlated to whether a nation's economy is open to outside trade and other external influences. Nevertheless, Hanushek (2005) found that most government made an effort to improve cognitive skills by focusing on schools. The evidence from many countries shows that insufficient attention has been paid to teacher quality, and the data show that good teachers in developed countries can move the achievement of a typical student up at least four percentiles. Typical studies find that quantity of schooling is highly related to economic growth rates, but the quantity of schooling is a very crude measure of the knowledge and cognitive skills of people. Hanushek and Woessmann (2015) mentioned that inclusive growth is possible through the achievement of basic skills. These skills have tremendous potential to reduce poverty, and foster new technologies needed to ensure sustainable growth in a competitive world economy. The most important step for the United Nations was to establish an explicit quality goal such as Level 1 in mathematics and reading for 15-year-olds on the Programme for International Student Assessment (PISA), or its equivalent.

Economists largely ignore the existence or potential of such international testing and assessments. The international investigations of the determinants of educational achievement have followed voluminous literature based on data for individual countries. Economists have pursued two separate lines of inquiry, each related to notions of human capital. The first subsection considers studies that take the cognitive skills measures from the international tests as direct measure of human capital. The second major line of inquiry has turned to cross-country investigations of the outcomes of human capital. More recent studies in the last decade have seen tremendous upsurge in research activity on cross-country issues. These researches tend to rely heavily on panel data sets that follow the achievement of students that can link to the growth characteristics. With these extensive data sets, identification of separate causal determinants of achievement is frequently much clearer than in the simple cross-sections of data supplied by the international assessments (Hanushek & Woessmann, 2012).

The importance of human capital is the value creation that is correlated to the value-added process in economics. Competency is highly correlated to intellectual capital. Both can uplift economic performance. The model used in this research is a growth model extension from the neoclassical endogenous growth model introduced by Romer (1986). The Romer model was developed from the Ramsey model. The Ramsey model can create Pareto optimum in both production and consumption. In contrast to the Ramsey model, the Romer model can obtain steady stage growth under technological progress, so it can fulfill sustained growth objective in AEC.

Arrow (1962) concluded that knowledge and productivity gains come from investment; however, there are various kinds of investment such as investment in physical capital and investment in human capital. Thus, sustainable economic growth can be started from human capital investment. This can lead to the change in productive technology. Wilson and Briscoe (2003) examined the effects of human capital on economic growth and concluded that the investment in human capital by increasing overall education level can positively affect economic growth at the multinational level. Saviottia, Pykac, and Junc (2016) summarized the linkages and transmission mechanism from education to economic growth passing through various economic and social factors as shown in Figure 1.



**Figure 1** The linkages from education to economic growth  
**Source:** Saviottia, Pykac, and Junc (2016)

Supply side assumptions are as following. Firm maximizes profit. There are spillovers from growth driving mechanism. Factors of production are physical capital ( $K$ ), labor ( $L$ ), and human capital ( $H$ ). Human capital includes education and skills which can create productivity. The change in human capital is independent from the amount of labor. The production function for firm  $i$  is shown in Equation (1):





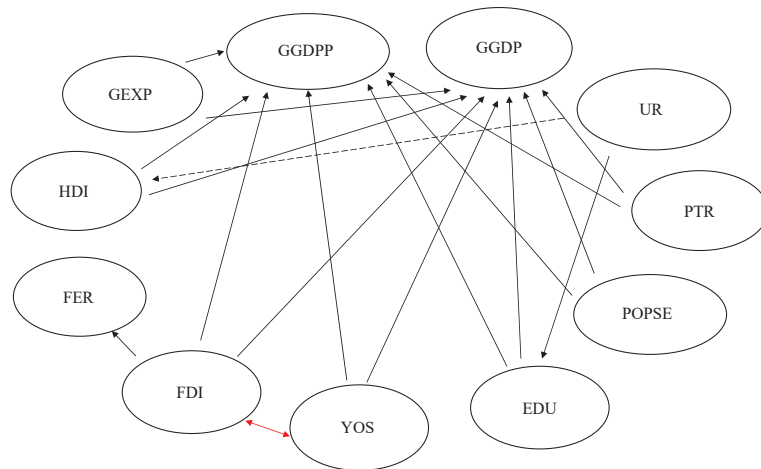
**Table 1** The Pooled data Bivariate Granger Causality Test for AEC

Null Hypothesis	Lags	Obs	F-Statistic	Prob.
EDU does not Granger Cause GGDPP	3	280	6.2986	.0004*
GGDPP does not Granger Cause EDU			0.4693	.7039
FDI does not Granger Cause GGDPP	3	214	6.0788	.0006*
GGDPP does not Granger Cause FDI			0.3509	.7885
FER does not Granger Cause GGDPP	3	280	1.8187	.1440
GGDPP does not Granger Cause FER			0.0276	.9938
GEXP does not Granger Cause GGDPP	3	280	2.9134	.0348*
GGDPP does not Granger Cause GEXP			0.5688	.6360
HDI does not Granger Cause GGDPP	3	280	7.3229	.0001*
GGDPP does not Granger Cause HDI			0.0347	.9913
POPSE does not Granger Cause GGDPP	3	280	4.0045	.0082*
GGDPP does not Granger Cause POPSE			0.5299	.6621
PTR does not Granger Cause GGDPP	3	280	5.8189	.0007*
GGDPP does not Granger Cause PTR			0.0058	.9994
UR does not Granger Cause GGDPP	3	280	1.4113	.2398
GGDPP does not Granger Cause UR			0.2035	.8939
YOS does not Granger Cause GGDPP	3	280	5.4157	.0012*
GGDPP does not Granger Cause YOS			0.4684	.7046
EDU does not Granger Cause GGDP	3	280	5.9575	.0006*
GGDP does not Granger Cause EDU			0.2093	.8899
FDI does not Granger Cause GGDP	3	214	5.3365	.0015*
GGDP does not Granger Cause FDI			0.1385	.9369
FER does not Granger Cause GGDP	3	280	1.8187	.1440
GGDP does not Granger Cause FER			0.0276	.9938
GEXP does not Granger Cause GGDP	3	280	2.7327	.0442*
GGDP does not Granger Cause GEXP			0.5339	.6594
HDI does not Granger Cause GGDP	3	280	7.0790	.0001*
GGDP does not Granger Cause HDI			0.0132	.9979
POPSE does not Granger Cause GGDP	3	280	3.6107	.0138*
GGDP does not Granger Cause POPSE			0.3129	.8160
PTR does not Granger Cause GGDP	3	280	6.4245	.0003*
GGDP does not Granger Cause PTR			0.0244	.9949
UR does not Granger Cause GGDP	3	280	1.0812	.3575
GGDP does not Granger Cause UR			0.1913	.9023
YOS does not Granger Cause GGDP	3	280	5.2484	.0016*
GGDP does not Granger Cause YOS			0.2101	.8894
FDI does not Granger Cause EDU	2	225	0.2733	.7611
EDU does not Granger Cause FDI			1.2370	.2923
FER does not Granger Cause EDU	2	288	0.0248	.9755
EDU does not Granger Cause FER			0.6816	.5067
GEXP does not Granger Cause EDU	2	288	0.0780	.9250
EDU does not Granger Cause GEXP			0.0216	.9786
HDI does not Granger Cause EDU	2	288	0.2082	.8122
EDU does not Granger Cause HDI			0.3624	.6963
POPSE does not Granger Cause EDU	2	288	0.8006	.4501
EDU does not Granger Cause POPSE			0.6549	.5203
PTR does not Granger Cause EDU	2	288	0.0009	.9992
EDU does not Granger Cause PTR			0.1969	.8214
UR does not Granger Cause EDU	2	288	4.8141	.0088*
EDU does not Granger Cause UR			0.5750	.5634

**Table 1** Continued

Null Hypothesis	Lags	Obs	F-Statistic	Prob.
YOS does not Granger Cause EDU	2	288	0.3302	.7191
EDU does not Granger Cause YOS			0.1695	.8442
FER does not Granger Cause FDI	3	225	0.7977	.4517
FDI does not Granger Cause FER			9.5760	.0001*
GEXP does not Granger Cause FDI	3	225	0.7764	.4613
FDI does not Granger Cause GEXP			0.2671	.7659
HDI does not Granger Cause FDI	3	225	1.1113	.3310
FDI does not Granger Cause HDI			0.7821	.4587
POPSE does not Granger Cause FDI	3	225	0.5556	.5746
FDI does not Granger Cause POPSE			0.1257	.8820
PTR does not Granger Cause FDI	3	225	0.2664	.7664
FDI does not Granger Cause PTR			0.8009	.4502
UR does not Granger Cause FDI	3	225	0.3536	.7025
FDI does not Granger Cause UR			0.1766	.8382
YOS does not Granger Cause FDI	3	215	7.0669	.0002*
FDI does not Granger Cause YOS			2.8053	.0408*
GEXP does not Granger Cause FER	4	286	0.2230	.9255
FER does not Granger Cause GEXP			0.1253	.9733
HDI does not Granger Cause FER	4	286	0.3346	.8546
FER does not Granger Cause HDI			0.0301	.9982
POPSE does not Granger Cause FER	4	286	0.3833	.8205
FER does not Granger Cause POPSE			0.1019	.9817
PTR does not Granger Cause FER	4	286	0.2801	.8907
FER does not Granger Cause PTR			0.2494	.9099
UR does not Granger Cause FER	4	286	1.6421	.1638
FER does not Granger Cause UR			0.8293	.5074
YOS does not Granger Cause FER	4	286	0.3246	.8614
FER does not Granger Cause YOS			0.0917	.9850
HDI does not Granger Cause GEXP	1	289	0.4386	.5083
GEXP does not Granger Cause HDI			0.1903	.6630
POPSE does not Granger Cause GEXP	1	289	0.0004	.9846
GEXP does not Granger Cause POPSE			0.6090	.4358
PTR does not Granger Cause GEXP	1	289	0.4434	.5060
GEXP does not Granger Cause PTR			0.4681	.4944
UR does not Granger Cause GEXP	1	289	1.2794	.2590
GEXP does not Granger Cause UR			2.3465	.1267
YOS does not Granger Cause GEXP	1	289	0.5739	.4493
GEXP does not Granger Cause YOS			0.2896	.5909
POPSE does not Granger Cause HDI	3	288	0.7994	.4506
HDI does not Granger Cause POPSE			0.9401	.3918
PTR does not Granger Cause HDI	3	288	0.0401	.9607
HDI does not Granger Cause PTR			0.0315	.9690
UR does not Granger Cause HDI	3	288	2.6231	.0743**
HDI does not Granger Cause UR			0.4091	.6646

Note: \*, \*\* denoted 95 and 90 percent confidence interval, respectively.



**Figure 2** The causal relation between human capital development via education and economic growth in AEC  
 Note: — and - - - - denoted 95 and 90 percent confidence interval, respectively. The arrow indicates the direction of causal relation

**Conclusion and Recommendation**

ASEAN Economic Community is one of the fastest growing markets in the world. There are approximately 600 million people or about 10 percent of the global population. Freer trade in both goods and services causes more intense competition in this region. During the period of economic expansion, labor productivity improvement is a critical issue. Economic integration in the region creates mutual agreement on trade in services including 12 sectors. Education service is one of them. Education in this region must be developed to meet international standards. Freer labor mobility, especially high skilled labor movement in the region, is subject to the Mutual Recognition Arrangement (MRAs).

Higher skilled labor, high skilled labor, and more quantity of skilled labor become the main driving force for regional economic growth. Although more robotic technology and artificial intelligence will be used in the production process of various industries in the region, problems related to the shortage of high skilled labor is worth mentioning. Unlike economic growth, unemployment will force human capital development, and the amount of labor force will no longer be the main driving force for economic growth in this region. The quality of education that helps to improve labor productivity will become the new challenge for economic growth in the region. The policy, which will uplift the education standard in the region, will increase the human capital development and future economic performance in AEC. Therefore, each country in the region should co-ordinate their educational policy for efficient use of education budget. The important findings suggest that increasing the ratio secondary school

enrollment to population will draw foreign direct investment, and the future research should focus on measuring the magnitude of these dynamic effects of these structural changes for precise policy implication.

**Conflict of Interest**

There is no conflict of interest.

**Acknowledgments**

This research is supported by the Department of Economics, Kasetsart University.

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