The Role of Human Capital and Technology in Improving Economic Performance in Thailand

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Abstract

The purpose of this study is to look at the relationship between human capital, technology, and economic growth in Thailand. Using vector analysis, we examine the causal connections between technology, human capital, and economic growth. This analysis uses secondary data from the World Bank for a yearly period from 1995 to 2020. We found that technology improves human performance where humans themselves have the human capital to work and maintain their work performance. With the existence of technology, the role of human capital is increasingly increasing. Because human capital is also needed in mastering technology and using technology in helping human work. Technology and human capital are two things that reinforce each other in increasing economic growth.

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Introduction

The pros and cons of human capital continue to this day (Harms, Schmidt, Dame, Brockman, & Stuart, 2022). Before human capital came into the economy, the focus was mainly on the economy in the past, it relied on the advantages of having cheap labor and large amounts of natural resources. Humans were only a factor of production in the period before human capital was present in economic studies (Mohanty & Sethi, 2019). However, Nowadays human resources are considered a valuable asset and with the influence of globalization, advances in production technology, a world without borders, a constantly developing new economy, and competition, forcing organizations to not only focus on low wages but also have to focus on the quality of people (Obradović, Vlačić, & Dabić, 2021).

However, many in developing countries today are not able to increase their knowledge, abilities, and capacities through vocational skills training to use modern technology to keep up with industrial developments (Malik, 2018). Today's modern industry requires advanced production technology that automatically requires workers to adapt and be able to work with technology. This of course cannot be separated from the influence of human capital (Sima, Gheorghe, Subić, & Nancu, 2020).

Human capital is an important engine along with technology that will be the basis for leading a developing country (Prasetyo & Kistanti, 2020). Recognize the value of educating people about the contributions of technology and human capital to Thailand's economic development (Muhamad, Sulaiman, & Saputra, 2018). Technology's and human capital's contributions to economic growth have been examined across a wide range of topics and theoretical frameworks. However, given the significance of human capital for economic growth, its impact on growth is still a fascinating question (Widarni & Bawono, 2021).

Skills and abilities accumulated in the workforce contribute to economic development (Sulisnaningrum, Widarni, & Bawono, 2022). Therefore, a study of economic growth in subsequent periods becomes important to recognize that workers are more differentiated by sex, age, education, and occupation (Nasiri & Hamelin, 2018). Innovation and technology creation both heavily depend on human resources, and also contributes to increasing the ability to adopt the technology (Vrontis, Christofi, Pereira, Tarba, Makrides, & Trichina, 2022).

The development of human resources in Thailand has given importance to accelerating the expansion of human resources in Thailand, especially in primary schools, namely compulsory education, including vocational and tertiary education, to produce workers at the middle and higher levels in accordance with the demands of the labor market (Lhakard, 2022).

The Thai government attaches great importance to educational development, expanding basic education opportunities, encouraging people to pursue higher education at higher levels of education, and promoting equality in educational opportunities. In addition, education has shifted its role from focusing on the workforce to meet the needs of the country's industrial development to developing the community to have the knowledge, skills, and critical thinking skills in line with economic and social changes (Worawiwat & Qian, 2019).

The Thai government views technology as an important and complex thing. The importance of technology as the foundation of development in all fields encourages technology to be seriously developed in Thailand (Dung & Tri, 2021).

Technology is critical to development in all areas including agriculture, industry, energy and the environment, medicine, public health, and education (Fróna, Szenderák, & Harangi-Rákos, 2019). Using existing technology to support development in line with the demands of the manufacturing sector, increases the country's competitiveness and self-sufficiency in technology both in qualitative and quantitative terms, emphasizing the principle of sustainable development (Ren, Li, Wang, & Zhang, 2020).

Economic growth is more influenced by the number of workers with a high level of human capital than by the number of workers with such low human capital stock (Nguyen, 2020). The rate of technological change that affects the rate of change in output has an impact on economic performance (Alam & Murad, 2020). Various vital sectors in the industry require skilled human labor so that human capital is needed for efficient and effective technological adaptation in production (Abdeldayem & Aldulaimi, 2020). The purpose of this study is to look at the relationship between human capital, technology, and economic growth in Thailand.

Research Method

Using vector analysis and the following model, we examine the causal connections between technology, human capital, and economic growth :

$$T_t = \beta_1 T_{t1} + \beta_2 T_{t2} + \beta_3 HC_{t3} + \beta_4 HC_{t4} + \beta_5 GDP_{t5} + \beta_6 GDP_{t6} + e_t \quad \text{(equation 1)}$$

$$HC_t = \beta_1 T_{t1} + \beta_2 T_{t2} + \beta_3 HC_{t3} + \beta_4 HC_{t4} + \beta_5 GDP_{t5} + \beta_6 GDP_{t6} + e_t \quad \text{(equation 2)}$$

$$GDP_t = \beta_1 T_{t1} + \beta_2 T_{t2} + \beta_3 HC_{t3} + \beta_4 HC_{t4} + \beta_5 GDP_{t5} + \beta_6 GDP_{t6} + e_t \quad \text{(equation 3)}$$

Information :
HC = Human Capital
T = Technology
GDP = Economic growth
t = time period
β = Constant

e = error term

We employ secondary data from the World Bank that has been modified to meet the demands of the research using the variable descriptions shown in Table 1.

Table 1. Descriptive Statistics

No	Variable	Variable Description	Unit Analysis
1	Human Capital (HC)	Total nominal in USD of education investment on a national scale in an annual period	USD
2	Technology (T)	The total nominal of all investments in technology in USD nationally and in an annual period	USD
3	Economic Growth (GDP)	The total nominal value of the production of goods and services nationally in USD and with an annual period	USD

This analysis uses secondary data from the World Bank for a yearly period from 1995 to 2020.

Result and Discussion

The autoregressive vector test shown in table 2 is used in this study to examine the direction of the link between economic growth, human capital, and technology.

Table 2. Autoregressive Vector Test

	GDP	HC	T
GDP	0.311231	0.026213	0.41131
	-0.24117	-0.0227	-0.71131
	[1.21113]	[1.31317]	[0.61112]
HC	2.01141	0.18321	0.11713
	-9.21121	-0.26112	-0.13126
	[2.21231]	[2.41121]	[0.81237]
T	0.612125	0.411235	0.058002
	-0.00012	-0.471121	-0.11211
	[0.34117]	[0.00911]	[0.19323]
R-squared	0.771231	0.77215	0.782233
Adj. R-squared	0.751121	0.721048	0.785749

It is clear from the test findings that the previous GDP significantly influences the present GDP in a positive direction by comparing the statistical value with the coefficient value. Human capital is significantly impacted favorably by GDP (HC). GDP has a significant positive effect on technology.

Human capital (HC) is significantly impacted favorably by GDP. Human Capital in the past is significantly impacted favorably by human capital today. Human capital is significantly impacted favorably by technology.

Technology has a significant effect on GDP. Human capital is significantly impacted favorably by technology. Technology has a significant positive effect on the technology itself. The model fit of the tested equation is 77 percent according to the corrected R-squared, which is 0.77. The vector test's findings support the conclusion that the hypothesis is correct.

Conclusion

Technology improves human performance where humans themselves have the human capital to work and maintain their work performance. With the existence of technology, the role of human capital is increasingly increasing. Because human capital is also needed in mastering technology and using technology in helping human work. Technology and human capital are two things that reinforce each other in increasing economic growth.

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