

The Role Of Human Capital, Structural Change, Quality Institutions In Driving Economic Growth In Indonesia

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Abstract

The primary goal of this study is to determine how human capital, structural change, and institutional quality affect Indonesia's long-term economic growth. We examine the cointegration connection between variables for the time span 1990–2021 using the Autoregressive Distributed Lag (ARDL) limit testing technique applied to time series data. We found that Indonesia's human capital drives Indonesia's economic growth. Likewise, structural changes that support the industry drive Indonesia's economic growth, this demonstrates how shifting away from the primary sector and toward a more modern and sophisticated industrial base tends to promote economic growth. However, long-term economic growth in Indonesia is not influenced by institutional quality. A long-term development plan with industrialization and structural change at its heart merits consideration in order to support Indonesia's long-term economic growth. Human resources are the key to Indonesia's economic development which needs to be continuously improved. Research related to institutional quality needs to be studied further in future studies.

Keywords: Human Capital, Structural Change, Quality Institutions, Economic Growth.

INTRODUCTION

The pattern of productive specialization of an economy is a determining factor for its level of productivity and the possibility of its growth. Its importance, if possible, is even greater in the current context of growing international economic integration and intensification of technological change. The ability to undertake structural changes imposed by new circumstances is a key factor for economic success (Croes, Ridderstaat, Bak, & Zientara, 2021). The differences between Indonesia's sectoral structure and other more dynamic and advanced economies, such as the United States and some northern European countries, are stark and do not show a clear downward trend. Indonesia is characterized by a low presence of sectors more related to new technologies and a low number of workers specializing in ICT use. From

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its inception, economic theory has demonstrated the importance of people in achieving higher levels of production (Nong, Escobar, Britz, & Börner, 2020).

Classical economic theory, identifies the importance of training to achieve better results in the workplace. If the owner of the machine receives income for the capital invested in it. In the same way, the possessor of extraordinary knowledge or skills must receive income for the capital invested in the process of acquiring those extraordinary abilities and skills. In this perspective, activities which are useless or which do not serve to keep the productive means running and in the process of constant profit growth are indicated as meaningless or superfluous (Piwowar-Sulej, 2021). Production resulting from the acquisition of skills and knowledge as a consequence of the educational process, is not consumed by the producers, but is sold on the market as merchandise (Paço, Leal Filho, Ávila, & Dennis, 2021). Human capital is an important factor in the economy (Bawono, Sanusi, Supriadi., Triatmanto., Widarni, 2023).

Understanding economic growth and the factors that drive it is one of the main and oldest challenges of the discipline of economics. However, this is also a line of research in which progress and, above all, consensus is very difficult to achieve. In recent decades, research related to economic growth and its determinants has experienced significant growth, highlighting research analyzing historical data from hundreds of countries around the world (Calero & Turner, 2020). In the economic growth literature, various theories have been developed to identify the variables behind the disparities that exist between countries' growth rates (Fernandes, Veiga, Ferreira, & Hughes, 2021). The traditional factors in the literature are the accumulation of physical and human capital, total factor productivity, technological innovation and international integration or trade opening. However, given the nature of this branch of research, these theories do not fully describe the stylized facts and, therefore, there is no general consensus on which factors are most important. In this context, there is a search for other factors outside of traditional factors, one of which is "institutions" (Wang, Xu, & Ma, 2021).

In the classical tradition, the development process is closely related to the phenomenon of changes in the structure of the economy. The theory of Smith and Ricardo, more 'spinning' in the production process allows the achievement of increased returns to scale through greater specialization. A growing economy is an economy that becomes more complex and sophisticated over time in terms of new productive sectors and new, more knowledge-intensive enterprises (Cardinale & Scazzieri, 2019). Simultaneously, new institutions, capacities, human resources, and forms of learning are developed in society. This is what led Kuznets and Abramovitz to distinguish between 'immediate' and 'ultimate' causes of development (Andersson & Andersson, 2019). Higher levels of savings and investment are included in the first group of factors causing growth, while learning, institutional development,

and increased technological capabilities and production organization are included in the second group of factors. They are basic forces that many times we don't even know exactly how to measure, but that must be seen as the essence of the process of developing the productive forces of a society (Haraguchi, Martorano, & Sanfilippo, 2019).

Debates related to human capital, structural change, and quality institutions in driving economic growth are gaps that need to be further researched, especially in developing countries like Indonesia. The main objective of this research is to investigate human capital, structural change, and institutional quality in influencing Indonesia's economic growth in the long term.

LITERATURE REVIEW

Economic theory suggests that, in the long run, the fundamental determinants of economic growth are technological changes and transformations related to the productive structure. In this sense, while the traditional use of greater factors of production, such as capital and labor, may result in increased output in the short term, there is a need for increasingly efficient use of these factors, including changes in activity-oriented specialization patterns with higher technology (Wang, Umar, Akram, & Caglar, 2021). So that the growth is dynamic and sustainable from time to time. This is within the framework of the specific macroeconomic challenges faced by a developing country like Indonesia and how to overcome them (Fatimah, Govindan, Murniningsih, & Setiawan, 2020).

Structural change is a fundamental element of the dynamic process of economic growth and, therefore, productive development policies that support it must be the pivot of an adequate development strategy (Zilberman, Reardon, Silver, Lu, & Heiman, 2022). That is, the dynamic efficiency of the economic structure, understood as its ability to encourage new waves of innovative activity, must be prioritized. This concept contrasts with static efficiency, the theoretical cornerstone of traditional microeconomics and international trade. In addition, dynamic efficiency requires a level of state intervention that is unacceptable to traditional proponents of static efficiency (Pla-Barber, Villar, & Narula, 2021).

Changes in the global regime of public policy and the process of globalization of the world economy have given rise to the phenomenon of transformation of productive structures that we still know relatively little about (Lockwood, 2021). The framework of industrial organization of the various productive sectors forms of subcontracting, the degree of vertical integration of factories, the supply of parts and products between local or international and sectoral competition regimes barriers to entry of new producers, the breadth of the product mix offered to the market, the price formation mechanism gradually changes, until recently we lived in an economy whose operating rules we knew only very imperfectly (Del Prete & Rungi, 2020).

Foreign ownership of the productive apparatus has increased, external supply of technology has also done so, and domestic efforts to produce technology have not made great strides, to the extent that it is still feasible to speak today of a fragmented and underfunded national innovative system and clearly marginal in terms of providing technology to the domestic productive apparatus (Medeiros, 2019). New forms of interaction are emerging some governed by market rules and others not between companies, and between these and other societal organizations, such as regulatory bodies domestic and foreign universities, municipal authorities, trade unions and many others (Vargo, Akaka, & Wieland, 2020). The phenomenon of endogenous learning and the gradual accumulation of institutional and technological capacity in society is generated (Gao & Liu, 2020). However, it is this plot, and its gradual evolutionary development over time, that is the essence of the process of the development of society. It involves the phenomenon of long-term maturation of the productive forces which can only be understood at the microeconomic and sectoral levels, because they are practically ignored in the aggregate analysis of growth, not because they are unimportant, but because the instruments used do not allow them to be captured (Shi, Han, Yang, & Gao, 2019).

Structural transformation oriented towards knowledge-intensive activities creates special challenges in countries with high dependence on natural resources, such as Indonesia (Cassini, 2023). Indeed, specific activities in natural resources need to generate complementarities with other sectors of production, in such a way as to foster a wave of innovation (Stern & Valero, 2021). At the same time, adequate policies are needed to adequately manage the extraordinary revenues derived from natural resources and promote the diversification and sophistication of other sectors, especially the tradable sector, which tends to boom in terms of trade (Zhang & Dilanchiev, 2022). Based on the results of previous research, we develop hypothesis 1 as follows:

H₁: The process of structural change drives Indonesia's long-term economic growth

The term "human capital" refers to the ability of people to produce goods and services in an economy. Despite the fact that the idea is somewhat recent, it is still used in economics (Janshanlo, Nurgaliyeva, Oralbaeva, Dzhakisheva, & Aktureeva, 2020). Theodor Schultz and Gary Becker were the first to use it regularly in the early 1960s when they applied the idea of capital to people as producers (Chirat & Le Chapelain, 2020). Human capital is the stock of knowledge and productive abilities that everyone possesses and that is also a component of the former since capital is a stock that has value as a source of current and future flows of production and revenue (Eker & Ilmola-Sheppard, 2020).

Since only those with the knowledge can own human capital after slavery was abolished and because a person cannot sell any of his or her human capital, quantitative analysis is restricted to taking into

account income streams or other rewards from the individual as a value equivalent to the rental of that knowledge (Jones, 2019), which is where the main difference between physical capital and human capital basically lies. To put it another way, while classical economics made a clear distinction between the three factors of production—land, capital, and labor—the distinction is less rigid today because the theory of capital can be applied to all three because their supply can be increased and increased through investment at a certain cost. To do this, one must use the theory of capital's foundational principle, which is to compare an investment's potential future returns to its potential present-day costs (Fischer, Martin, & Straubhaar, 2021).

Adam Smith discussed the connection between human capital and growth in "The Wealth of Nations." According to him, raising labor skill levels is a key driver of economic growth and prosperity (Astigarraga, Menudo, & Usoz, 2021). The most valuable capital is invested in people, Alfred Marshall underlined in his book "Principles of Economics" (Teixeira, 2020).

The latest of these three separate periods of the development of economic growth theory is the most recent (Sokhanvar, 2019). According to traditional growth theory, per capita product evolves over time, meaning that growth will largely remain stationary as long as firms experience diminishing marginal returns to productivity and population growth is constant (Popoola, Ajayi, & Abiodun, 2022). This is the alleged "stationary state" of Smith, Ricardo, and Malthus's seminal work (Hollander, 2023). According to these academics, the only way to end this stagnation is to either slow population increase or boost product growth through overseas trade (Stanojevi, 2020). Because of this, Malthus was concerned about population expansion, Smith attacked mercantilism, and Ricardo criticized the Corn Laws. According to the neoclassical growth model, there are two production factors, labor and capital, which have constant returns to scale, meaning that production doubles as capital increases and as labor decreases, and a third component, technological development, which affects the first two (Solo, 2021). Thus, long-term growth is the result of the addition of three factors: the working population's growth, the capital stock's desired growth, and the final exogenous factor, known as scientific knowledge or technical progress, which raises labor and capital productivity. Two significant implications result from this concept. If all nations are able to keep the same amount of capital and have access to the same degree of scientific knowledge, long-term increase in per capita income will typically be evenly distributed among all nations (Tadele & Sirany, 2021).

Exogenous advances in science and technology are the only way to continue growth; otherwise, per capita income will tend to stabilize at a constant level without increase (Thach, 2020). Scientific advancement is a product of competitive activity, which arises from increased investment in human capital (i.e., education, training, research, and development), not the global economy (Litvinenko, 2020). Return to

scale, or the rate of investment and return on capital, may rise as the capital stock rises rather than stay the same or fall (Covarrubias, Gutiérrez, & Philippon, 2020). Particularly, scientific theoretical knowledge that tends to demonstrate an improvement in marginal productivity and provides externalities from which other production variables gain (Huang, Sheng, & Sun, 2022). Because scientific and technical information is not acquired by all nations equally or in the same amounts, the many nations of the globe do not cooperate towards the same "steady state" or position of stability. As the rate of return on human capital rises, nations with low levels of beginning human capital may never catch up to less developed nations (Indrawati & Kuncoro, 2021). Based on the results of previous research, we develop hypothesis 2 as follows:

H₂: Increasing human capital drives Indonesia's economics

Resource economic theory assumes that a country's wealth can be increased by accumulating the factors of production, namely labor, physical and human capital, and technology (Hamrouni, 2022). From this perspective, if a country wants to grow, it must save, which supports investment which translates into increased capital and production, which follows the Solow model. In this approach, it is argued that in order to obtain high levels of investment and growth, high rates of saving must be encouraged, and if domestic savings are insufficient, a country can use foreign debt or facilitate investment to expand savings. However, many developing countries, despite increasing domestic saving rates and obtaining international loans (Mose, 2023).

Resource economic theory assumes that a country's wealth can be increased by accumulating the factors of production, namely labor, physical and human capital, and technology (Cvetanović, Mitrović, & Jurakić, 2019). From this perspective, if a country wants to grow, it must save, which supports investment which translates into increased capital and production, which follows the Solow model. In this approach, it is argued that in order to obtain high levels of investment and growth, high rates of saving must be encouraged, and if domestic savings are insufficient, a country can use foreign debt or facilitate investment to expand savings. However, many developing countries, despite increasing domestic saving rates and obtaining international loans (Goczek, Witkowska, & Witkowski, 2021).

Institutionalist theory, it is necessary to show that increased property rights or the rule of law and other institutional aspects are independent explanatory variables for income and not vice versa, i.e. institutions are a consequence of high incomes (Hartwell & Urban, 2021). The sole positive and substantial factor of income levels is institutional quality, as determined by a multi-element index that incorporates the protection provided to property rights and the rule of law. The integration factors' direct impact on income is lost when institutions are regulated. Long-term economic development also requires building institutions to maintain the momentum of

development and thereby facilitate socially acceptable distributions that sustain it. Institutions guarantee long-term economic growth (Adzimatinur & Manalu, 2021). Based on the results of previous research, we develop hypothesis 3 as follows:

H₃: High quality institutions tend to drive Indonesia's long-term economic growth.

METHOD

The primary goal of this study is to determine how human capital, structural change, and institutional quality affect Indonesia's long-term economic growth. We examine the cointegration connection between variables for the time span 1990–2021 using the Autoregressive Distributed Lag (ARDL) limit testing technique applied to time series data. The following is an ARDL from the model used in this study:

$$\Delta Y_t = \alpha_0 + \sum_{p,i=1} \beta_{1i} \cdot \Delta Y_{t-i} + \sum_{q,i=0} \beta_{2i} \cdot \Delta HC_{t-i} + \sum_{r,i=0} \beta_{3i} \cdot \Delta SC_{t-i} + \sum_{s,i=0} \beta_{4i} \cdot \Delta IQ_{t-i} + \sigma_1 \cdot Y_{t-1} + \sigma_2 \cdot HC_{t-1} + \sigma_3 \cdot SC_{t-1} + \sigma_4 \cdot IQ_{t-1} + \gamma \cdot D_t + \mu_t$$

where t is for time, Δ for the first difference operator, D stands for the structural break dummies, μ for the white noise error term, and p , q , r , and s stand for the lag lengths. Each variable's long-term coefficient is represented by σ , while the short-term dynamic parameter is represented by β . The variables Y_t , HC_t , SC_t , and IQ_t are all in logarithmic form and represent the GDP per capita, human capital, structural change, and institutional quality, respectively. Variable descriptions are presented in Table 1.

Table 1. Variable Descriptions

Variable	Description	Unit of Analysis	Source
Y	gross domestic product growth per capita	logarithm	World Development Indicators (WDI)
SC	Structural Change	logarithm	https://www.rug.nl/ggdc/structural-change/
HC	Human capital index	logarithm	World Development Indicators (WDI)
IQ	Institutional Quality	logarithm	World Development Indicators (WDI)

RESULT AND DISCUSSION

We present a statistical description in table 2 below:

Table2. Statistical Description

Variables	Mean	Minimum	Maximum	Standard Deviation
Y	2317.113	412.314	3716.213	1121.121
SC	2212.817	210.001	3221.118	786.213
HC	22.198	2.121	35.213	11.178
IQ	4.219	1.213	8.912	1.098

Table 2 shows that statistical description of each variable. Table 3 presents the findings of Unit Root Tests Of The Series Under Study.

Table 3. Unit Root Test result

Variables	ADF test	PP test
Level		
Y	-1.161 (0.731)	-1.133 (0.899)
SC	-1.221 (0.791)	-2.119*** (0.461)
HC	-1.069 (0.716)	-1.014 (0.711)
IQ	-2.789 (0.049)*	-3.011** (0.115)
First Difference (Δ)		
Y	-8.112*** (0.000)	-11.788 *** (0.000)
SC	-3.459*** (0.000)	-3.921 *** (0.000)
HC	-7.112*** (0.000)	-9.211 *** (0.000)
IQ	-7.321*** (0.000)	-10.419 *** (0.000)

Stationary IQ and SC. However, in the first difference, all variables are stationary. Table 4 presents the VIF values for each variable in each panel.

Table 4. Long and Short-Run Analysis

Dependent variable: ΔY_t			
Variables	Coef.	Std. error	t-stat.
Long-run			
Constant	14.169***	1.089	11.17
SC	3.014***	0.491	4.81
HC	0.419***	0.069	4.77
IQ	-0.049	0.139	-0.29
Short-run			
ΔSC	0.111	0.039	2.14
ΔHC	-0.399	0.141	-3.11
ΔIQ	-0.001	0.004	-0.29
ECMt-1	-0.049	0.014	-2.75

At the 1% level of significance, Table 4 demonstrates a positive association between structural change and economic growth as well as between human capital. These findings demonstrate that a yearly increase in capital tends to boost economic growth in Indonesia by 0.419% on average, while a long-term rise in structural change of 1% would boost growth by 3.014%. The findings also show that institutional quality did not statistically significantly affect Indonesia's economic development during the analyzed period.

ECMt-1, represents the rate of transition from the short-term equilibrium route to the long-term equilibrium path. The ECMt-1 coefficient is statistically significant at the 1% level, as seen at the bottom of Table 4, and its negative sign confirms a long-run relationship between the variables, even though its value (-0.049) reflects a very slow rate of transition from a state of short-term disequilibrium to a long-run equilibrium. For alternative proxies for institutional quality and structural change, these findings are strong. Our findings support the notion that structural reform is crucial for Indonesia's economy to flourish. Our prediction supports H1. The long-term economic growth of Indonesia is driven by the structural transformation process. The outcomes show that human capital has a

favorable effect on Indonesia's long-term economic growth. This supports H2. Long-term economic progress in Indonesia is fueled by increasing human capital. The results of our estimation do not find sufficient evidence to validate H3. High quality institutions tend to drive Indonesia's long-term economic growth. This contradicts contemporary scholarship that examines the function of institutions in Indonesia's economic development. It is crucial to note, however, that our findings on institutional quality do not immediately correspond to those outlined in the body of research on this topic.

CONCLUSION

Indonesia's human capital drives Indonesia's economic growth. Likewise, structural changes that support the industry drive Indonesia's economic growth, this demonstrates how shifting away from the primary sector and toward a more modern and sophisticated industrial base tends to promote economic growth. However, long-term economic growth in Indonesia is not influenced by institutional quality.

This research has significant limitations, despite its recent contribution. Despite our careful selection of the variables, a continuous time series was not accessible. This required us to use linear interpolation and backward and forward extrapolation to fill in some of the missing data from various sources. An approach like this could result in size distortion but has no effect on the long-term property being investigated. The study's proxies for human capital, the 'Human Capital Index', is aggregate data so that it will be more thorough when examined with primary data from each sub-district in Indonesia. Third, due to Indonesia's long-standing and pervasive corruption issue, it is possible to influence the estimation results regarding the quality of institutions and create biased results that might be examined in future research.

A long-term development plan with industrialization and structural change at its heart merits consideration in order to support Indonesia's long-term economic growth. Human resources are the key to Indonesia's economic development which needs to be continuously improved. Research related to institutional quality needs to be studied further in future studies.

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