HUMAN CAPITAL IS THE KEY TO THE SUCCESSFUL COMPETITIVENESS OF COUNTRIES IN THE ASEAN

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ABSTRACT

Objective: This research aims to look at competitiveness in the ASEAN region. Knowing the factors driving competitiveness then mapping the strength of competitiveness based on the driving factors for each country in ASEAN. So you will know which countries with high competitiveness are influenced by what factors. The results will be an illustration for other countries in ASEAN to improve these factors with the aim of increasing competitiveness.

Method: The method used to determine the factors driving competitiveness is to use panel data regression with the Stata application. Then group them using main factor analysis with SPSS so that country categories are found based on the factors driving their competitiveness. The data used are 12 indicators forming independent and dependent variables. Obtained from various relevant sources. In a period of 10 years, namely 2010 to 2019.

Results: The results of multivariate linear regression showed that both simultaneously and partially Human Capital Development (HCD), Human Capital - High Education (HCH), Research and Technology Development (RTD), and Social Capital - Unemployment (SCU) had a significant influence on Competitiveness. HCD has the greatest influence on competitiveness. This research can provide an illustration for each country in ASEAN that the driving factors of competitiveness needed to achieve high competitiveness are HCD and HCH because of their large influence in the regression model. Countries with very strong competitiveness also have very strong HCD and HCH factors and vice versa. This can be a consideration for each country in making policies related to increasing national competitiveness. Because high competitiveness indicates a high level of population welfare.

Keywords: competitiveness, human capital, social capital, research and technology development.

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O CAPITAL HUMANO É A CHAVE PARA O ÉXITO DA COMPETITIVIDADE DOS PAÍSES DA ASEAN

 RESUMO

Objetivo: Esta pesquisa visa olhar para a competitividade na região da ASEAN. Conhecer os fatores que impulsionam a competitividade, em seguida, mapear a força da competitividade com base nos fatores impulsionadores para cada país na ASEAN. Por isso, saberão quais os países com elevada competitividade que são influenciados por quais fatores. Os resultados servirão de exemplo para outros países da ASEAN melhorarem estes fatores com o objetivo de aumentar a competitividade.

Método: O método usado para determinar os fatores que impulsionam a competitividade é usar a regressão de dados do painel com a aplicação Stata. Em seguida, agrupe-os usando a análise fatorial principal com SPSS para que as categorias de países sejam encontradas com base nos fatores que impulsionam sua competitividade. Os dados utilizados são 12 indicadores que formam variáveis independentes e dependentes. Obtidos a partir de várias fontes relevantes. Num período de 10 anos, ou seja, de 2010 a 2019.

Resultados: Os resultados da regressão linear multivariada mostraram que, simultaneamente e parcialmente, o Desenvolvimento do Capital Humano (HCD), o Capital Humano - Ensino Superior (HCH), a Pesquisa e Desenvolvimento Tecnológico (RTD) e o Capital Social - Desemprego (SCU) tiveram influência significativa na Competitividade. A HCD tem a maior influência na competitividade. Esta investigação pode fornecer uma ilustração para cada país da ASEAN de que os fatores determinantes da competitividade necessária para alcançar uma elevada competitividade são o HCD e o HCH devido à sua grande influência no modelo de regressão. Os países com uma competitividade muito forte também têm fatores de HCD e HCH muito fortes e vice-versa. Isto pode ser uma consideração para cada país na elaboração de políticas relacionadas com o aumento da competitividade nacional. Porque a alta competitividade indica um elevado nível de bem-estar da população.

Palavras-chave: competitividade, capital humano, capital social, pesquisa e desenvolvimento tecnológico.

1 INTRODUCTION

Competitiveness is one measure of prosperity in a sustainable regional development approach. Porter (1990) once conveyed the concept of competitiveness where a country can innovate to gain profits through its economic sector where the sector has advantages over other countries. Implicitly, Porter's thinking related to competitiveness is how a country increases labor productivity in that country. Reis and Thomas (2012) say that the strength of a country in the export market illustrates the strength of its competitiveness. Countries with high competitiveness at the world level are usually also able to excel in their domestic market. Camagni and Capello (2010) state that productivity itself is influenced by human and natural resources and the availability of capital. The productivity of a country affects the sustainability of the country's standard of living. In the 2008 Europe Committee report, it is stated: “Competitiveness can be
understood as the continuous improvement of the standard of living by a country or region and a shallow “open unemployment rate”.

Asean has the most stable economic dynamics compared to other regions. When several regions were trying to get out of the economic crisis a few years ago, Asean had 5% economic growth and was the most dynamic. If we think of Asean as a country, economists think that this country will become a world giant. There are several reasons put forward by economists, namely: First, the population in Asean is large enough and more than enough to dominate the labor market and human resource development goals. Asean's total population in 2021 has touched 666.86 million people or about 8.51% compared to the world's population. This number makes Asean the third most populous region in the world after China and India (World Bank, 2021). Second, Asean has a fairly large gross domestic product (GDP) capacity and is the sixth largest in the world. Asean's total GDP in 2020 reached USD 3.06 trillion and only lost to the United States (US), China, Japan, Germany and the UK. The contribution of Asean GDP to the total world GDP currently reaches 3.53% (World Bank, 2020). Third, the trade capacity of goods in Asean is the fourth highest in the world. The Asean Secretariat (2020) noted that the total trade transactions in Asean reached USD 2.096 trillion and were only lost to China, the US and Germany. The contribution of Asean trade to total world trade is in the range of 4.02%. Fourth, Asean succeeded in absorbing total foreign direct investment (FDI) of up to USD 174 billion. Asean FDI is in fourth place in the world after the United States, Hong Kong, and China with FDI contribution reaching 5.29% of total world FDI (UNCTAD, 2021). However, this advantage has not been able to make all countries in Asean have high competitiveness. There is a sharp disparity in the competitiveness of Asean countries.

Based on the 2018 Human Development Index released by UNDP, only Singapore, Brunei Darussalam, and Malaysia are performing at a very high level of human development, while Indonesia, and Thailand are at a high level of human development. Meanwhile, Laos, Cambodia, and Myanmar still have low levels of human development. Inequality is caused by differences in economic efficiency between countries, especially in terms of infrastructure quality. Measured based on the 2018 Logistic Performance Index (LPI), Singapore is the highest compared to other Asean countries where infrastructure competitiveness is ranked seventh globally. Thailand is ranked 32, Vietnam is ranked 39, Malaysia is ranked 41, Indonesia is ranked 46, the
Philippines is ranked 60, Brunei Darussalam is ranked 80, Laos is ranked 82, Cambodia is ranked 98, and Myanmar is ranked 137. Every country in the world that has an open economy, of course, must try to increase its competitiveness at the global level. This is done to show existence and attract investment into the country.

2 THEORETICAL FRAMEWORK

2.1 REGIONS’S REVEALED COMPETITIVENESS

GRDP per capita, productivity, and export value are indicators that can reveal the competitiveness of a region. These three indicators cannot be examined separately but must be tested together (Lengyel and Rechnitzer 2013). High competitiveness if the Revealed Competitiveness value is more than zero. On the other hand, if the Revealed Competitiveness value is below zero, then the competitiveness is considered weak. According to Lengyel (2004) indicators to measure Revealed Competitiveness that can be used are: GRDP per capita of a region; labor productivity in the regions; and regional economic openness (exports and imports). In the initial stage, competitiveness speaks of a company's resilience in market dynamics. In the next phase, the development of competitiveness leads to competition between countries. In general, the notion of competitiveness is the superiority of industry in certain aspects and shows the existence of superiority and better productivity than other industries. So the factor that must be considered in competition is excellence.

Heckscher-Ohlin (1990) provides information that land, labor, and capital are still unable to demonstrate a competitive advantage strategy for each industry. Heckscher and Ohlin then classify the above factors into human resources, natural resources, capital, knowledge, and infrastructure. The competitive advantage of the factors depends on how the efficiency and effectiveness of the factors are spread out. Not only how, but where these factors developed in an economy is very important, because technological sophistication and human resources have expertise that can be used in various industries. In other words, this theory emphasizes that different endowment factors (abundant resource factors) can explain why countries have advantages in different commodities.
2.2 REVEALED COMPETITIVENESS (RC) INDICATORS

2.2.1 GDP Per capita

According to Tarigan (2007) income per capita is the total income of an area divided by the total population in the area in the same year. Jhingan (2007) argues that per capita income is obtained by dividing the country's (constant) income by the total population in the country. Per capita income according to Sukirno (2006) is the average income of the population in a country. Per capita income is obtained from the division of a country's national income in a given year by the total population of that country in that year. The benefits of calculating per capita income include the following (Alam, 2007): 1) To see the level of comparison of the welfare of the people of a country from year to year; 2) As a comparison of the level of welfare of a country with other countries; 3) As a comparison of the standard of living of a country with other countries; and 4) As data for policy making in the economic sector. As explained in the previous chapter, the measure of competitiveness is the welfare of the people in a country. Then GDP per capita is one measure that shows the welfare of a person in a country which ultimately describes the competitiveness of a country.

2.2.2 Worker’s Productivity

An important role in the economic development process is held by the workforce along with infrastructure and governance which are key factors in encouraging and accelerating the ups and downs of an economy's competitiveness (APO, 2020). Uzik and Vokorokosova (2007) show that there is a fairly strong relationship between economic competitiveness and labor competitiveness in a country. The concept is that increasing the competitiveness of a country cannot be separated from the development of human resources in that country (World Bank, 2010). Let’s look at examples such as South Korea and China, the main agenda in their development is to build human resources to increase the competitiveness of their countries. Financial and political support with the issuance of several policies is something that the two countries have done to prioritize the agenda of developing human resources in the country. This is what makes South Korea and China currently able to create a highly competitive workforce even though they are faced with a long process and strict mechanisms (Maskymenko and Rabbani, 2011).

How the level of output can be produced to the maximum extent possible with the available inputs, both physical inputs such as capital and labor as well as the quality of
new and advanced technology inputs in the production process in the region. According to Porter, higher labor productivity in a country indicates better competitiveness in that country. Productivity is not only closely related to the quality of life but is also closely related to the skills and competitiveness of the nation. (Krugman, 1997) states that a country's ability to raise its standard of living over time depends almost entirely on its ability to increase its output per worker. The increase in output per capita will ultimately show how capable a country is of improving the welfare of its country. This condition makes productivity in the long term the most important thing and everything for a country.

2.2.3 Export Value

International trade occurs because of differences in tastes or consumption patterns between countries, and international trade arises mainly because one country can produce certain goods more efficiently than another country. The idea that exports and trade in general can promote economic growth has been held by several researchers for a long time. The ability to exploit advantages in trade is a basic theoretical concept, which leads to exploiting one's comparative advantage through higher productivity. Many researchers have found a close relationship between a country's economic openness and an increase in a country's welfare (Baldwin and Winters, 2003), and as a medium of knowledge transfer and increased productivity are things that need to be highlighted in the role of international trade. (Alcala and Ciccone, 2004). Porter (1998) redeveloped the competitiveness framework in which other alternatives can assess the relationship between competitiveness and exports. At the heart of Porter's framework is that productivity has a critical role to play in driving sustainable prosperity. Although it does not have a fundamental role in promoting competitiveness, export-oriented policies have proven to be better than other policies.

2.3 DRIVING FACTOR OF REVEALED COMPETITIVENESS

2.3.1 Human Capital Development (HCD)

Humans play a role as the person in charge of all processes of economic activity, be it the production process, consumption process, or transaction process. As for expanding choices for humans themselves, it is necessary to develop human capital (UNDP, 2020). According to UNDP, the concept of human development is a refinement of the previous concept which discussed human resources based on GDP per capita.
Human resources in an area cannot be clearly defined only through the average income. The trigger is the high gap between high and low-income groups so if only the concept of per capita income is used, the poor will be included and considered prosperous. Increasing the size of human development using the premise, namely: 1) The center of attention in development is the population; 2) Not only increasing income but also choices for the community, meaning that not only economic aspects are considered; 3) Optimizing the use of human capabilities is the goal of human development in addition to efforts to increase human capabilities themselves; 4) Productivity, equity, sustainability, and empowerment as pillars of human development; 5) Determining development goals and what steps can be used are important in human development.

2.3.2 Human Capital - High Education (HCH)

Romer (1999) states that the fundamental source of a country's productivity is the country's human capital. Frank & Bemanke (2007) added that an effort to increase productivity can be made through investment in human capital. Human capital is a combination of experience, education, training, habits, health, energy skills, and workforce initiatives. This combination will result in different productivity between countries. Schultz (1961) said in his research that increasing the productivity of the country's economy is an important factor to consider in human capital. The concept of human capital itself was introduced in 1776 through classical economic concepts (Fitzsimons, 2015). This concept states that two ways can be done to achieve high human capital, namely the use of human capital based on the number where the more workers, the more productivity will also increase. Furthermore, the second investment in the form of education, training, and others is a way to increase the ability and expertise of the workforce which will ultimately increase productivity.

At the empirical level, as quoted by Chacholiades (1990) found a paradox, namely, America exports commodities that are relatively more labor-intensive than capital-intensive commodities. Likewise, American imports are more dominated by commodities that are relatively capital-intensive than labor-intensive. This paradox occurs because America's human resources are "superior" compared to other countries. The superiority of American human resources who are more trained than other countries, causes America to produce commodities that are produced from trained labor with high intensity. After paying attention to several theories and concepts above, human resources
with higher education in this case higher abilities and expertise can encourage increased competitiveness of a region.

2.3.3 Research, Technology and Development (RTD)

In the new growth theory, human resources contribute significantly to economic growth through the creation of innovation and new knowledge. At the micro-level, technological advances are used to change the industrial structure and global competition (Radhi, 2010). At the macro level, technology is used to promote economic development and contribute to economic growth (Subramanian, 1987). To win the competition in the global market, every business and company is required to pay more attention to and manage technology better in creating a competitive advantage that is highly dependent on the development of research and technology itself. In the development of technology, almost every country and business is faced with two choices. First, developing technology through the process of invention and innovation. Second, developing technology through a technology transfer process. No country and no business can meet all the types of technology required in the process of manufacturing and selling products. With these shortcomings, each country or business can apply a technology strategy or method to develop new technology through R&D and purchase several development strategies or methods that are implemented through the technology transfer process (Radhi, 2010).

2.3.4 Social Capital – Unemployment (SCU)

Sukirno (2007) explains that unemployment is a condition of workers who want to work but have not been able to get it. The lack of aggregate expenditure is the main factor in the occurrence of unemployment. If demand decreases, production will decrease and there will be less labor needed and unemployment will occur. So it is necessary to increase the production of goods and services so that there is also an increase in the number of workers used in the production process (Mankiw, 2000). Low incomes and people's productivity due to unemployment have always been a big problem for a country, especially developing countries which on average have limited employment opportunities while the labor force is abundant. This limited job opportunity is caused by the scarcity of investment capital, excess labor, and problems in the world of domestic politics. Unemployment cannot be allowed because it can trigger the creation of poverty and other social problems in life (Ningrum, 2008). Unemployment is also related to social capital
inherent in cross-sectoral personal relationships, which are very useful for individual development in organizational social communities (Tsai and Ghoshal, 2007). This social network will create beneficial social capital for entrepreneurs. Social capital according to the entrepreneurial view can provide a network to create business opportunities, the process of identifying and gathering scarce resources, and their allocation (Prasetyo and Harjanti, 2013). So, it can be said that social capital is a contribution to the business world because a high level of social capital can reduce the costs that may occur due to transactions between sectors, as well as the costs of gathering information, and the costs of bargaining and the costs of decisions incurred in making them. In the informal industrial sector, social capital is increasingly needed, considering the characteristics of labor absorption in this sector override a person's ability to be able to work in the formal sector.

3 METHODOLOGY

The data used in this study were sourced from the World Bank, UNCTAD, UNDP, the International Labor Organization, and reports from the World Economic Forum. For data processing, this study uses the SPSS-20 application, where the empirical analysis database was compiled according to the five factors driving competitiveness according to the Lengyel pyramid model which was translated back in this study. The database that used can be seen in appendix 2, where there are 3 indicators that state the revealed competitiveness categories; namely GDP per capita, labor productivity and export value. Meanwhile, there are 9 indicators as a driver of competitiveness. This study uses principal component analysis with three indicators that make up competitiveness. Then factor analysis is used to select the most dominant factor based on the factors driving competitiveness. Finally, the factor scores were then carried out with multivariable linear regression to determine the effect of these driving factors on the revealed competitiveness of ASEAN countries. Principal factor analysis will result in calculations that are more than zero and less than zero. If the country shows the main factor analysis is more than zero then it can be said that the factor has strength. On the other hand, if the factor value is less than zero, then the factor is weak against the state. This value is obtained from the calculation of the principal component analysis, by looking at the value of each factor.

The main objective of this study is to determine the effect of the independent variables (human capital development, human capital high technology, research, and
technology development, and social capital of unemployment) on the dependent variable, namely competitiveness revealed. The very different indicators of the four variables driving competitiveness make the analysis cannot be tested separately. From the indicators of the tested variables, indicators will be selected which then form the variables and then tested using multivariable linear regression analysis with its assumptions. Meanwhile, the revealed competitiveness indicators consisting of three indicators will produce factor values that will be used as dependent variables. The measurement for this uses multivariable linear analysis using SPSS.20 which can be written in the model as follows:

\[ Y = \beta_0 + \beta_1 HCD_{it} + \beta_2 HCH_{it} + \beta_2 RTD_{it} + \beta_2 SCU_{it} + \epsilon_{it} \]

Regression coherence shows the influence of a factor on regional competitiveness. Based on the model above, it can be said that every increase in the independent variables (HCD, HCH, RTD, and SCU) will also increase the dependent variable (RC) by \( \beta_1 \). This analysis uses an error tolerance of 5%.

4 RESULTS AND DISCUSSION

According to a previous study by Lengyel and Rechnitzer in 2013 the indicators forming revealed competitiveness should be tested simultaneously and cannot be tested separately. The main component analysis results obtained: per capita income (gdpcap); labor productivity (labprod) and export value (expva). To make it easier to classify the results of the analysis, each country is given a code as shown in Table 1.
In this study, there were difficulties in obtaining complete data. The data obtained is not easy, because based on the existing indicators, the data sought is not available according to the country and year to be studied, so some indicators must be discarded because there is no availability of the required data. So after going through a search, the indicators used in this study can be obtained as in Table 2.

Table 1. Codes and Names of ASEAN Countries

<table>
<thead>
<tr>
<th>Code</th>
<th>Country</th>
<th>Code</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRN</td>
<td>Brunei Darussalam</td>
<td>MYM</td>
<td>Myanmar</td>
</tr>
<tr>
<td>CAM</td>
<td>Cambodia</td>
<td>PHI</td>
<td>Philippines</td>
</tr>
<tr>
<td>LAO</td>
<td>Lao PDR</td>
<td>SIN</td>
<td>Singapore</td>
</tr>
<tr>
<td>MLY</td>
<td>Malaysia</td>
<td>THA</td>
<td>Thailand</td>
</tr>
<tr>
<td>IDN</td>
<td>Indonesia</td>
<td>VNM</td>
<td>Vietnam</td>
</tr>
</tbody>
</table>

Source: Author

Table 2. Indicators of Revealed Competitiveness and Driver Factors

<table>
<thead>
<tr>
<th>Code</th>
<th>Denomination</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>gdpcap</td>
<td>GDP Per Capita (constant 2015, US$)</td>
<td>World Bank</td>
</tr>
<tr>
<td>Labprod</td>
<td>Output per worker (GDP constant 2010, US$)</td>
<td>ILO</td>
</tr>
<tr>
<td>expva</td>
<td>Exports of goods and services (constant 2015, US$)</td>
<td>World Bank</td>
</tr>
<tr>
<td>Hdi</td>
<td>Human Development</td>
<td>UNDP</td>
</tr>
<tr>
<td>pop1564</td>
<td>Indeks Population ages 15-64 (% of total population)</td>
<td>World Bank</td>
</tr>
<tr>
<td>ahovour</td>
<td>Total weekly hours worked of employed persons</td>
<td>ILO</td>
</tr>
<tr>
<td>hippo</td>
<td>Population with a tertiary education</td>
<td>World Bank</td>
</tr>
<tr>
<td>empind</td>
<td>Employment in industry (% of total employment)</td>
<td>World Bank</td>
</tr>
<tr>
<td>Research</td>
<td>ICT goods exports (% of total goods exports)</td>
<td>World Bank</td>
</tr>
<tr>
<td>Technology</td>
<td>Patent applications</td>
<td>World Bank</td>
</tr>
<tr>
<td>RTD</td>
<td>Social Capital Unemployment (SCU)</td>
<td>ILO</td>
</tr>
<tr>
<td>Unemp</td>
<td>Unemployment, total (% of total labor force)</td>
<td>ILO</td>
</tr>
<tr>
<td>younemp</td>
<td>Youth unemployment rate, 2008, %</td>
<td>ILO</td>
</tr>
</tbody>
</table>

Source: Author

The four factors driving competitiveness are a combination of a number of indicators that have very strong differences. This is what then makes the test must be done together, not separately. The considerations made in including the indicator as the main component of the independent variable here are based on the factor score > 0.5. Then the indicators that make up the independent variables are then regressed with the dependent variable and meet the assumption of free multicollinearity, the data is normally distributed and no autocorrelation is found between the independent variables. Meanwhile, the revealed competitiveness indicators consisting of three indicators will produce factor
values that will be used as dependent variables. Meanwhile, the value of the main RC component will be used as the dependent variable: From the results of the revealed competitiveness test, the three constituent indicators can provide information about the RC by 93.20% with the commonalities value of each indicator, namely: gdpcap: 0.913; labprod: 0.841; expva 0.852. Then the weighting of the four factors driving competitiveness is revealed by interpreting the following:

Table 3. Driver Factors and Component

<table>
<thead>
<tr>
<th>Code</th>
<th>Denomination</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hdi</td>
<td>Human Development</td>
<td>0.828</td>
</tr>
<tr>
<td>pop1564</td>
<td>Indeks Population ages 15-64 (% of total population)</td>
<td>0.945</td>
</tr>
<tr>
<td>outhour</td>
<td>Total weekly hours worked of employed persons</td>
<td>0.804</td>
</tr>
<tr>
<td>hipop</td>
<td>Population with a tertiary education</td>
<td>0.730</td>
</tr>
<tr>
<td>emind</td>
<td>Employment in industry (% of total employment)</td>
<td>0.518</td>
</tr>
<tr>
<td>ICTexp</td>
<td>ICT goods exports (% of total goods exports)</td>
<td>0.745</td>
</tr>
<tr>
<td>patapp</td>
<td>Patent applications</td>
<td>0.752</td>
</tr>
<tr>
<td>Unemp</td>
<td>Unemployment, total (% of total labor force)</td>
<td>0.720</td>
</tr>
<tr>
<td>younemp</td>
<td>Youth unemployment rate, 2008, %</td>
<td>0.981</td>
</tr>
</tbody>
</table>

Source: Analysis Result by SPSS, 2022

From the results of factor analysis based on 9 indicators, the four factors are generated, which contain 72.41% of indicators that can provide information about RC. Then we look at the results of the varimax rotation explaining the component scores of each indicator. Component scores that are in the absolute value > 0.5 are selected for inclusion in the regression model, meaning that the indicator can explain the variable (Table 3). The strength of revealed competitiveness and each factor for Asean countries studied, the results obtained can be seen in Table 4.

Table 4. Factor Analysis of Revealed Competitiveness and Driver Factors

<table>
<thead>
<tr>
<th>Country</th>
<th>RC</th>
<th>HCD</th>
<th>HCH</th>
<th>RTD</th>
<th>SCU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singapore</td>
<td>1.978</td>
<td>1.913</td>
<td>0.945</td>
<td>0.970</td>
<td>0.575</td>
</tr>
<tr>
<td>Malaysia</td>
<td>0.918</td>
<td>0.390</td>
<td>1.230</td>
<td>0.933</td>
<td>0.568</td>
</tr>
<tr>
<td>Vietnam</td>
<td>-0.978</td>
<td>-0.100</td>
<td>0.422</td>
<td>0.772</td>
<td>-0.154</td>
</tr>
<tr>
<td>Thailand</td>
<td>0.029</td>
<td>0.357</td>
<td>0.802</td>
<td>0.761</td>
<td>-0.888</td>
</tr>
<tr>
<td>Philippines</td>
<td>-0.164</td>
<td>-0.737</td>
<td>-0.189</td>
<td>0.750</td>
<td>0.382</td>
</tr>
<tr>
<td>Indonesia</td>
<td>0.081</td>
<td>-0.475</td>
<td>0.377</td>
<td>0.424</td>
<td>0.913</td>
</tr>
<tr>
<td>Laos PDR</td>
<td>-0.881</td>
<td>-0.941</td>
<td>-2.076</td>
<td>-0.944</td>
<td>0.076</td>
</tr>
<tr>
<td>Brunei Darussalam</td>
<td>1.023</td>
<td>1.514</td>
<td>-0.184</td>
<td>-1.001</td>
<td>1.474</td>
</tr>
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<td>Cambodia</td>
<td>-1.294</td>
<td>-1.002</td>
<td>-0.498</td>
<td>-1.111</td>
<td>-1.758</td>
</tr>
<tr>
<td>Myanmar</td>
<td>-0.712</td>
<td>-0.917</td>
<td>-0.919</td>
<td>-1.555</td>
<td>-1.186</td>
</tr>
</tbody>
</table>

Source: Analysis Result by SPSS, 2022
Based on the main component analysis above, it is found that the factor values for RC and each variable are based on countries in ASEAN. According to Lengyel and Rechnitzer (2013) a country with a factor value of more than zero can be said to have a strong factor value, while a country with a value below zero means a weak factor value. After analyzing the factors together, then multivariable linear regression was carried out. The results show that the four independent variables can explain the dependent variable by 98.97% \((R^2 = 0.9897)\). From the regression results using the above model estimation by adding dolls for each country to get the best results, it can be said that this model can be further analyzed. It can be seen from the results of the R Square which is close to one, and the Durbin Watson test > 0.5 then the model is good. Furthermore, to determine the magnitude of the influence of the independent variables separately or partially on the dependent variable, it is necessary to look at the results of the t-test where the t-value must be significant. The value of B in the coefficient table below will be used to form a regression model. Value sig of HCD, HCH, RTD, and SCU variables < 0.05, meaning that all of these independent variables influence the RC.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Koefisien</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCD</td>
<td>2.223</td>
<td>0.000</td>
</tr>
<tr>
<td>HCH</td>
<td>0.914</td>
<td>0.000</td>
</tr>
<tr>
<td>RTD</td>
<td>0.236</td>
<td>0.025</td>
</tr>
<tr>
<td>SCU</td>
<td>0.184</td>
<td>0.004</td>
</tr>
</tbody>
</table>

Source: Analysis Result by Stata (2022)

From several panel data regression tests carried out in the study, it can be said that the model used for analysis was carried out. Where the value of R Square is more than 0.5, then the Durbin-Watson test meets because the value is > 0.5. Furthermore, the results of the F test show that there is an effect of the independent variables on the variables determined simultaneously. The results of the t-test also show that each independent variable has a partial influence on certain variables. The data is also stated to be normally distributed and there is no autocorrelation.

4.1 REVEALED COMPETITIVENESS OF ASEAN COUNTRIES

In this study, trying to classify the categories of countries into four. Referring to previous research by Lengyel and Rechnitzer (2013) who also did the same thing. So, a country with a factor value of more than one can be said to be very strong, then a country
with a factor value between 0-1 can be classified as strong, while a country with a factor value between 0 to -1 can be classified as weak. Finally, countries with a factor value of less than -1 are classified as very weak. Based on this, the results of the classification of competitiveness show spatial characteristics where Singapore and Brunei Darussalam are countries with very high of RC where the factor value is more than 1. Then Malaysia, Indonesia, and Thailand are classified as countries with high factor values where the values are in the 0-1 interval. The Asean countries with weak RC where the factor value is at -1-0 are the Philippines, Myanmar, Laos, and Vietnam. And the Asean countries with very weak competitiveness are Cambodia.

The results above explain that the competitiveness in ASEAN countries is not evenly distributed with each other. Even though it is located in a close area, it does not affect the same competitiveness. If you look at the mapping of the competitive strengths above, it can be seen that countries with a smaller area can have higher competitiveness, they are Singapore and Brunei Darussalam.

4.2 FACTORS DRIVING REVEALED COMPETITIVENESS

The weighting of the four driving factors is interpreted as Factor 1: Human Capital Development (HCD), which consists of the Human Development Index (HDI), the number of people aged 15-65 years of the total population, and the average number of hours worked by workers in a week; Factor 2: Human Capital with Higher Education
(HCH) which consists of components of the population with higher education and workers in the industrial sector; Factor 3: Research, Technology and Development (RTD) which consist of ICT export and the number of patent registrations; Factor 4: Human Capital - Unemployment (SCU) which consists of components: the unemployment rate and the youth unemployment rate.

The spatial distribution of the value of Factor 1 (Human Capital Development: HDI, the population aged 15 years and over, and the average working hours per week.) indicates that there is inequality (Figure 2). It can be seen that the countries of Singapore and Brunei are showing the very strength of HCD in their countries. While Malaysia and Thailand showed a strong HCD factor. Countries that have weak HCD factors are Vietnam, Indonesia, the Philippines, Myanmar, and Lao PDR. And a very weak HCD factor is Cambodia.

![Figure 2. The strength of the HCD factor in ASEAN countries](image_url)

Source: Factor Analysis by SPSS, Maps Made by Arcgis (2022)

From Figure 2 it can be said that the value of the Human Capital Development (HCD) factor and Revealed Competitiveness have a strong relationship, where the value of the HCH factor is very strong, namely Singapore and Brunei Darussalam also have a very strong RC value. Likewise, Cambodia, which is included in the category of the weakest HCD factor, also has the weakest RC value. Furthermore, the second factor (HCH: population with higher education and workers in the industrial sector) shows the uneven strength of ASEAN countries, as shown in Figure 3. It can be seen that only Malaysia has a very strong HCH factor. Meanwhile, Singapore, Thailand, Vietnam, and
Indonesia are countries with high HCH factors. Meanwhile, the weak HCH is owned by Brunei Darussalam, the Philippines, Cambodia, and Myanmar. The Lao PDR country has a very weak HCH factor.

The third factor to be further investigated is RTD (ICT export and number of patent registrations). From the results of calculations and then carried out spatial mapping, it was found that Singapore owned a very strong RTD factor. The countries with strong RTD factors are Malaysia, Thailand, Vietnam, the Philippines, and Indonesia. Brunei Darussalam is a country that has a weak RTD factor. Furthermore, the countries with very weak RTDs are Laos, Cambodia, and Myanmar (Figure 4).
The last factor to be analyzed is Social Capital - Unemployment (the unemployment rate and the youth unemployment rate). This factor is different from the other three factors. This third factor shows the effect of the unemployment variable, which uses the above indicators on countries in ASEAN based on factor analysis. Brunei Darussalam was found with a very strong SCU factor. Then Indonesia, Singapore, Malaysia, the Philippines, and Lao PDR, have strong SCU factors. Furthermore, the value of the weak SCU factor is owned by Vietnam and Thailand. Meanwhile, Myanmar and Cambodia have the weakest SCU factors. (Figure 5)
Results of the above analysis, in addition to countries with high RC, on average they have driving factors namely HCD, HCH, and RTD which have a high positive effect, but also have problems where the higher the competitiveness in a country, the social capital in the form of unemployment also tall. To find out more clearly the influence of the above driving factors on Revealed Competitiveness, it is necessary to do a regression analysis.

4.3 EFFECT OF INDEPENDENT VARIABLES ON REVEALED COMPETITIVENESS

Four independent variables influence the dependent variable based on the results of the multivariable linear regression that has been carried out. As for partially these factors also affect the RC seen from the significance value of less than 0.05. Where HCD has a positive effect, that is, every increase of one HCD unit makes RC increase by 2.223 units. Meanwhile, HCH also has a positive effect, where an increase of one HCH unit can increase RC by 0.914 units. The influence of RTD on RC is positive, where an increase in RTD of one unit causes an increase in RC of 0.236 units. The SCU value has a positive effect, where an increase of one SCU unit causes an increase of 0.184 RC units. If seen from the data above, it can be said that the Revealed Competitiveness is largely determined by HCD and HCH because the increase in these two factors greatly affects the increase in RC with an influence value above 0.5 units. Then it is also known that
simultaneously and independently the independent variable affects the dependent variable. It can be seen that HCD has the strongest influence on RC. Countries that have very strong HCD factor values are Singapore and Brunei Darussalam which show very high RC factor values. On the other hand, Cambodia with a very weak HCD factor value also shows a very weak RC. If it is associated with the results of the regression, it shows that there is a relationship with the results of factor analysis. Meanwhile, SCU has the least effect on RC, which is only 0.184. The calculation in the factor analysis results that the SCU score in Brunei Darussalam is the highest compared to other Asean countries, or in other words, unemployment has a high value, but the RC score of Brunei Darussalam is very high. It can be said that although it has an influence, it is not too large in shaping the RC value.

5 CONCLUSION

Results of this study, it can be said that those with very strong RC factor values are Singapore and Brunei Darussalam, and Cambodia is a country with very weak RC factor values. Then the mapping of the strength of the factors driving competitiveness in ASEAN countries is carried out. Factor 1: The very strong HCDs are Singapore and Brunei Darussalam, and the very weak ones are Cambodia. Factor 2: The very strong HCH is Malaysia, and the very weak is Lao PDR. Factor 3: The very strong RTD is Singapore, and the very weak are Lao PDR, Cambodia, and Myanmar.

Finally, Factor 4: The very strong SCUs are Brunei Darussalam, and the very weak ones are Myanmar and Cambodia. Results of multivariate linear regression found that both simultaneously and partially, HCD, HCH, RTD, and SCU had a significant effect on RC. HCD has the greatest influence on RC. If it is associated with factor analysis, this illustrates the same thing, where countries with very strong HCD values, namely Singapore and Brunei Darussalam also show very strong RC values. Then the SCU variable has the least effect on RC.

In the factor analysis, it is shown that in theory, unemployment is an inhibiting factor for competitiveness. However, because the SCU has little influence on the RC, so even though the value of the SCU factor is very high, it is owned by Brunei Darussalam, and the competitiveness of this country is still very high. This study can provide an overview for each country in ASEAN that the factors driving competitiveness needed to achieve high competitiveness are HCD and HCH because of the large value of the concept
in the regression model. However, elements of RTD and SCU also influence increasing competitiveness. The same thing can also be seen in the mapping of the principal component analysis carried out. Countries with very strong RC also have very strong HCD and HCH factors and vice versa. This can be a consideration for each country in providing policies related to increasing national competitiveness. Because high competitiveness indicates a high level of population welfare as well.

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