The Impact of International Trade on the Human Capital Index in Indonesia from 1996 - 2022

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Abstract

This study investigates the impact of export and import levels on the Human Capital Index (HCI) in Indonesia from 1996 to 2022. Secondary data from the World Bank are used in the analysis, with variables including exports, imports, and HCI. Quantitative methods are employed in this research, using the ARDL analysis model. The analysis results indicate that all three variables become stationary after first differencing. However, Johansen Cointegration tests show no Cointegration among these variables. Further testing reveals that the selected ARDL model is (4, 4, 4). According to the estimated model outputs, imports have a small but positive impact on HCI, while exports have a negative and negligible impact.. The conclusion drawn from this study is that exports and imports have relatively insignificant impacts on HCI in Indonesia.

Keywords: Export, Import, Human Capital Index

JEL classification : O02,F03,I01

Introduction

International commerce is now one of the main factors influencing a nation's economic progress in the increasingly interconnected era of globalization (Abdullah, 2023). Amidst the dynamics of the global economy, Indonesia as a developing country is not exempt from the impacts caused by export and import activities on human development. The Human Capital Index (HCI) has played a crucial role in measuring the quality of human life, such as aspects of health, education, and decent living standards (Widarni & Bawono,2020). In an attempt to raise the standard of living in Indonesian society, it is essential to comprehend the connection between exports, imports, and HCI. During the period of 1996-2022, Indonesia has undergone significant economic transformation, including changes in trade structures and policies affecting human development (Sujianto, Dwiningtias, Luksita, & Narmaditya, 2023). An important factor determining Indonesia's economic growth is its imports and exports. As an archipelagic nation rich in natural resources, Indonesia has significant opportunities in the export sector, such as agricultural commodities, mining products, and manufactured goods. Exports are the main source of foreign exchange earnings for the country and play a vital role in supporting economic growth (Susanto, Subagio, Barus, Febrian, & Sani, 2024). On the other hand, imports also have an equally important role in meeting domestic needs for goods and services that are not produced locally. Imports enable Indonesia to access consumer goods, raw materials, and technology necessary to support domestic economic activities. However, dependence on imports can also pose risks to economic stability if not balanced with appropriate policies (Sudarmawan, 2022).

The influence of exports and imports on human development can be understood through several dimensions. Exports and imports can affect overall economic growth, which in turn can impact aspects of human development such as job availability, per capita income, and access to healthcare and education services(Gizaw, Astale, & Kassie, 2022). Strong exports can create new jobs and increase community income, leading to a greater improvement in access to healthcare and education services. However, these impacts are not always evenly

distributed, and there are challenges in ensuring that the economic benefits of exports are fairly distributed across all layers of society (Iqbal, Abbasi, Shinwari, Guangcai, Ahmad, & Tang, 2021).

On the other hand, imports can also influence human development through various mechanisms. Imports of consumer goods and technology can help improve the quality of life for communities by providing access to higher-quality and innovative products (Hanifah, 2022). However, excessive imports can also lead to trade deficits that negatively impact economic stability, ultimately hindering efforts towards human development (Sulisnaningrum, Mutmainah, Bawono, & Drean, 2023). Moreover, the structure of exports and imports can also affect specific economic sectors directly related to human development. For example, increasing exports of high value-added products such as manufactured goods or services can create better job opportunities and raise per capita income for communities (Pan, Amin, Zhu, Chandio, Naminse, & Shah, 2022).

During the period from 1996 to 2022, Indonesia has undergone significant changes in its trade structure, including increased volume and diversification of export products. Developments in infrastructure and progressive trade policies have helped enhance Indonesia's products' ability to compete in the global market. However, challenges such as commodity price fluctuations and global economic uncertainties also affect Indonesia's export performance (Anas, Hill, Narjoko, & Putra, 2022). In this article, we will delve into the influence of exports and imports on the Human Capital Index in Indonesia during this period. A comprehensive analysis will provide better insights into the dynamics of economic growth, social welfare, and policies that can be implemented to achieve sustainable human development in the future. By gaining a deeper understanding of the interaction between international trade and human development, it is hoped that clearer insights into policy actions needed to improve the overall quality of life for Indonesian society can be provided.

Literatur Review

The quality of life or well-being of a society can be measured by establishing the Human Capital Index (HCI), as asserted by the United Nations, which serves as the standard measure of human development (Hunter & Shaffer, 2022). Furthermore, Palindangan & Bakar (2021) elucidate that the Human Capital Index (HCI) is a metric or benchmark that illustrates the degree of human development based on a number of essential aspects of life quality that have the potential to affect individual productivity. There are several methods to develop human resources, such as healthcare services encompassing all aspects that affect life expectancy, strength, stamina, and vitality of the community; job training, including internship programs organized by companies; formal education ranging from elementary to higher levels; as well as non-corporate study programs, including flexible job training programs.

Imports refer to the international trade involving the purchase of goods, services, or other products from foreign for use or trade within a domestic territory (Fadah & Bawono, 2023). In economic context, imports constitute a crucial part of a country's trading activities, enabling the entry of goods from international markets into domestic territory (Tajoli, Airoldi, & Piccardi, 2021). The primary objective of import activities is to fulfill domestic needs for goods and services that are not adequately produced domestically or to obtain goods or services of superior quality or price from abroad. Additionally, imports can also support industrial activities and broaden consumer choices by providing access to goods or services originating from various countries worldwide (Nuri Aslami, 2022).

The import process begins with identifying the goods or services needed for importation, searching for suppliers or manufacturers abroad, negotiating prices and terms of purchase, and finally, the process of shipping and receiving goods domestically. Imports offer various significant benefits to a country (Mahmood, Alkhateeb, & Furqan, 2020). One of these is

making it possible for a nation to satisfy its own demands for products or services that aren't sufficiently produced there. Additionally, imports broaden consumer choices by providing access to goods or services originating from various countries worldwide, thereby enhancing consumer satisfaction (Putri & Taun, 2023).

Import activities support industrial endeavors by providing raw materials, components, or equipment that are not available domestically, thus aiding in boosting the productivity of the industrial sector. Moreover, importing goods or services with better quality or technology from abroad can also drive improvements in the quality of domestic products and stimulate innovation across various economic sectors. Lastly, through imports, a country can also expand its export market by selling goods or services produced domestically to trading partner countries (Jackson & Jabbie, 2021). However, imports also face several challenges. One of them is the risk of trade deficit due to excessive imports, which can disrupt a country's economic stability and currency. Excessive dependence on imports can also make a country vulnerable to fluctuations in prices and supply of goods from abroad. Tariff and non-tariff barriers, such as import tariffs, export quotas, and other non-tariff barriers, can also hinder market access for imported products. Additionally, changes in commodity prices and currency exchange rates in international markets can also affect the prices and costs of imports, adding complexity to the challenges faced by a country's import activities (Baranauskaitė & Jurevičienė, 2021).

Exporting is the process of moving commodities, services, or other things from one nation to another as part of international trade. Within an economic framework, export is a crucial aspect in strengthening a country's economy by increasing foreign exchange earnings and creating job opportunities. Export activities can involve various types of products, ranging from agricultural and industrial goods to services (Sadiah & Ginting, 2024). Through the selling of goods to foreign markets, export operations primarily aim to broaden markets and boost national revenue. Through exports, a country can leverage its comparative and competitive advantages in producing certain goods or services to meet demand in foreign markets. Furthermore, exports can improve the competitiveness of local products on the global market and maximize the use of home resources (Risky & Hendra, 2023).

The export process begins with identifying the products or services to be exported, adjusting to international trade requirements, such as certification and quality standards, and culminates in the shipping process and finalizing transactions with buyers abroad. Export provides several significant benefits to a country (Poulis, 2024). Firstly, through exports, a country can generate vital foreign exchange earnings to pay for imports of goods and services, as well as finance investments and infrastructure development. Secondly, export activities create jobs in the production, distribution, and marketing sectors of exported products or services, making a significant contribution to overall economic growth. Additionally, exports also strengthen the competitiveness of a country's products in the international market through enhancing product quality, efficiency, and innovation. Furthermore, exports aid in diversifying a country's income, which helps reduce economic risks when export commodity prices fluctuate (Ur Rehman, Ahmad, Khan, Popp, & Oláh, 2021).

Research Method

This study looks at the impact of import and export levels on Indonesia's Human Capital Index (HCI), which is displayed as a percentage. This study's secondary data were taken from the official World Bank website and cited. The data type is a time series for the period 1996-2022, and the variables taken are exports, imports, and the Human Capital Index (HCI) in Indonesia. A quantitative method with ARDL analysis modeling was chosen as the test model in this study. Table 1 below is a description of these variables.

Table 1. Variables and Description

Variables	Description	Source	Unit of Analysis
Export	Exports represent the legal sale or transfer of ownership of goods or services from one country to another. Where the value of exports (X1) is an independent variable, and the export data taken is from the year 1996 to 2022 in Indonesia, measured in percentages.	World Bank	Percent
Import	Imports are transactions involving the legal purchase or transfer of ownership of goods or services by one country from another. Where the value of imports (X2) becomes an independent variable, and the import data taken is from the year 1996 to 2022 in Indonesia, measured in percentages.	World Bank	Percent
HCI	The Human Capital Index (HCI) is an important indicator in determining the success of the quality of a country's human development. The HCI assesses how the population's access to education, health, and income results from development. The HCI value (Y) becomes the dependent variable, and the HCI data taken is from the year 1996 to 2022 in Indonesia, measured in percentages.	World Bank	Percent

Result And Discussion

This study's ARDL model seeks to ascertain if variables have a short- or long-term connection. To determine whether the variables have stabilized, run a stationarity test on the data first. The following are the results of the stationarity test:

Table 2. ADF's Unit Root Test Results

Variables	Unit Root	Prob.	Information
Export	Level	0.7070	Not Stationary
	First Diff	0.0000	Stationary
Import	Level	0.2014	Not Stationary
	First Diff	0.0000	Stationary
HCI	Level	0.2586	Not Stationary
	First Diff	0.0000	Stationary

From the data processing as shown in Table 2, it is concluded that all three variables, namely Export, Import, and HCI, are stationary at the First Difference stage. They are declared stationary because the probability value of each variable at the First Difference level is less than 0.05. After conducting the unit root test and the data have become stationary, conducting the Johansen Cointegration test is the next stage. The Johansen Cointegration test yields the following results:

Table 3. Cointegration Johansen Test Results

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.473401	26.71850	29.79707	0.1087
At most 1	0.384156	12.60956	15.49471	0.1299
At most 2	0.084605	1.944789	3.841466	0.1631

It is evident from Table 3's Johansen Cointegration test findings that there is no cointegration. This is due to the fact that the p-value for At most 2>0.05 is 0.1631. This suggests that there is no cointegration because the model satisfies the requirements. The ideal lag is then

determined as the investigation continues. These are the results of the testing that was done to find the ideal latency.

Table 4. Determination of Optimum Lag Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
D(HCI(-1))	-0.912958	0.364612	-2.503914	0.2419
D(HCI(-2))	0.827228	0.293748	2.816119	0.2172
D(HCI(-3))	0.981842	0.236885	4.144807	0.1507
D(HCI(-4))	0.208742	0.171305	1.218540	0.4375
D(EXPORT)	0.152672	0.320583	0.476232	0.7171
D(EXPORT(-1))	-0.872579	0.616904	-1.414449	0.3918
D(EXPORT(-2))	1.531036	0.415554	3.684325	0.1687
D(EXPORT(-3))	1.051453	0.389044	2.702654	0.2256
D(EXPORT(-4))	-0.643124	0.234826	-2.738722	0.2229
D(IMPORT)	-0.418182	0.128990	-3.241963	0.1905
D(IMPORT(-1))	-0.482205	0.278449	-1.731754	0.3334
D(IMPORT(-2))	-1.994851	0.299776	-6.654474	0.0950
D(IMPORT(-3))	-1.558694	0.493008	-3.161601	0.1950
D(IMPORT(-4))	0.271073	0.319872	0.847442	0.5525
C	-136.7781	31.89206	-4.288782	0.1458
R-squared	0.993157	Mean dependent var		15.56250
Adjusted R-squared	0.897361	S.D. dependent var		135.9975
S.E. of regression	43.56988	Akaike info criterion		9.489020
Sum squared resid	1898.334	Schwarz criterion		10.21332
Log likelihood	-60.91216	Hannan-Quinn criter.		9.526111
F-statistic	10.36742	Durbin-Watson stat		3.126045
Prob(F-statistic)	0.239300			

To get the best results while testing the ARDL model, the optimal lag must be established based on the findings of the optimum lag test. The chosen model is ARDL (4, 4, 4), as may be inferred from Table 4's optimal lag testing. This indicates that a maximum lag duration of four is used by the three variables: export, import, and HCI. The Johansen Cointegration bound test is the next stage, and it looks like this:

Table 5. Cointegration Bound Test results

Test Statistic	Value	K
F-Statistic	19.12403	2
Signifikansi	**I (0) Bound**	**I (I) Bound**
10%	2.63	3.35
5%	3.1	3.87
2.5%	3.55	4.38
1%	4.13	5

The outcome of the bound test for cointegration is shown in Table 5, and it can be shown that there is cointegration in this ARDL model since the F-Statistic value of 19.12403 is higher than the critical limit. The ARDL model is appropriate as a forecasting tool since the analyses performed thus far have satisfied the requirements. The second phase is running assumption tests on ARDL Eviews. There are three different kinds of tests that you may run: heteroskedasticity, autocorrelation, and normality. The results are as follows:
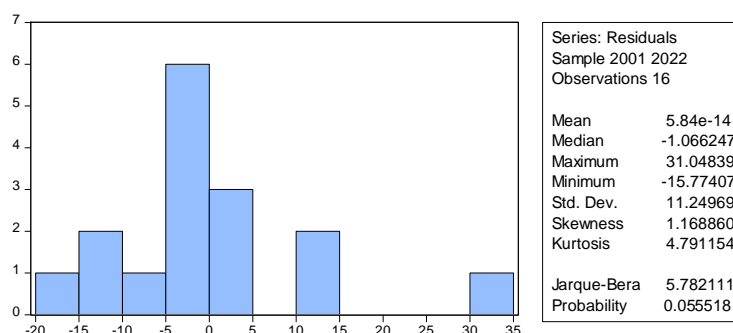
Figure 1. Normality Test Results

Table 6 illustrates the output of the normality test. The output indicate that the p-value or Jarque-Bera probability value of 0.0555 > 0.05, thus fulfilling the criteria for normality. Subsequently, an autocorrelation test was conducted, with the results as follows:

Table 7. Autocorrelation Test results

Breusch-Godfrey Serial Correlation LM Test			
F-Statistic	0.877361	**Prob.F (4,16)**	0.5246
Obs*R-squared	2.232331	**Prob. Chi-Square (4)**	0.3223

The probability value is 0.5246 > 0.05 based on the autocorrelation test findings displayed in Table 7. This suggests that the study does not have an autocorrelation issue. The heteroskedasticity test is the next in the test, and the outcomes are as follows:

Table 8. Heteroscedasticity Test Results

Breusch-Godfrey Serial Correlation LM Test			
F-Statistic	0.126778	**Prob. F (14,1)**	0.9861
Obs*R- squared	10.23401	**Prob. Chi-Square (14)**	0.7449
Scaled explained SS	0.075779	**Prob. Chi-Square (14)**	1.0000

In Table 8, it can be concluded that the Prob.F value is very high, amounting to 0.9861. This indicates that there is no heteroskedasticity issue in the model. The best model testing was then conducted, and the outcomes are as follows:

Table 9. ARDL Model Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(HCI(-1))	-0.912958	0.364612	-2.503914	0.0419
D(HCI(-2))	0.827228	0.293748	2.816119	0.2172
D(HCI(-3))	0.981842	0.236885	4.144807	0.1507
D(HCI(-4))	0.208742	0.171305	1.218540	0.4375
D(EXPORT)	0.152672	0.320583	0.476232	0.0171
D(EXPORT(-1))	-0.872579	0.616904	-1.414449	0.3918
D(EXPORT(-2))	1.531036	0.415554	3.684325	0.1687
D(EXPORT (-3))	1.051453	0.389044	2.702654	0.2256
D(EXPORT (-4))	-0.643124	0.234826	-2.738722	0.2229
D(IMPORT)	-0.418182	0.128990	-3.241963	0.1905
D(IMPORT (-1))	-0.482205	0.278449	-1.731754	0.3334
D(IMPORT (-2))	-1.994851	0.299776	-6.654474	0.0050
D(IMPORT (-3))	-1.558694	0.493008	-3.161601	0.1950
D(IMPORT (-4))	0.271073	0.319872	0.847442	0.5525
C	-136.7781	31.89206	-4.288782	0.1458
R-squared	0.993157	Mean dependent var.		15.56250
Adjusted R- squared	0.897361	S.D. dependent var.		135.9975

S.E. of regression	43.56988	Akaike info criterion	9.489020
Sum squared resid	1898.334	Schwarz criterion	10.21332
Log likelihood	-60.91216	Hannan-Quinn criter.	9.526111
F- statistic	10.36742	Durbin-Watson stat	3.126045
Prob(F-statistic)	0.239300		

From the outputs of testing the best ARDL model (4, 4, 4), the significant factors are only HCI from one year ago, exports at the current time, and imports from two years ago.

Table 10. Long Run Coefficient Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXPORT)	-11.63011	43.32818	-0.268419	0.8331
D(IMPORT)	39.89245	148.9361	0.267849	0.8334
C	1304.469	4908.636	0.265750	0.8346

Based on the ARDL model estimation in that table, a long-term equation is formed:
HCI=1304.469   -
11.63011X1+1304.469X2……………………………………………….(10.1)
The long term coefficient findings from the ARDL model above can be interpreted as follows:
The variable X1 (Export) has a detrimental impact on HCI over time. Although this is not significant, the model predicts that a 1% rise in X1 (Export) will result in an 11.63011% drop in HCI. Long term, import, or variable X2, benefits human-computer interaction. The model predicts that a 1% increase in X2 (Import) would result in a 39.89245% rise in HCI, although this is not statistically significant.

Conclusion

This study relates to the impact of export and import levels on the Human Capital Index (HCI) in Indonesia during the period from 1996 to 2022. The results or conclusions obtained are that the value of exports has a negative influence on Indonesia's HCI. This means that when exports increase, it will decrease the HCI. Conversely, when exports decrease, it will increase the HCI. In the meanwhile, import value has a favorable impact on Indonesia's HCI. This implies that a rise in imports will raise Indonesia's HCI. Both exports and imports have an insignificant influence on Indonesia's HCI.

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