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THE IMPACT OF COVID-19 ON THE EXPORT–ECONOMIC GROWTH RELATIONSHIP IN INDONESIA, 2019-2020

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Abstract: *This study examines the moderating effect of the Covid-19 pandemic on the relationship between exports and economic growth in Indonesia. Specifically, it analyzes whether variations in additional Covid-19 cases across provinces weaken the impact of changes in the share of real exports on provincial real Gross Regional Domestic Product (GRDP) growth. The analysis applies a dynamic panel data approach using the Generalized Method of Moments (GMM) to address potential endogeneity. The study uses quarterly provincial-level panel data for Indonesia (34 provinces) over the period 2019–2020, with a total of 136 observations. The findings reveal that the Covid-19 pandemic significantly weakens the positive effect of exports on economic growth, although the moderating effect is relatively small than both the direct effect of exports and the direct negative impact of the pandemic. These results suggest that pandemic containment policies should be designed in balance with economic recovery strategies and underscore the importance of considering non-economic shocks in supply-side macroeconomic analysis.*

Keywords: *COVID-19 Pandemic; Economic Growth; Exports; Panel Data Analysis*

Abstrak: *Penelitian ini mengkaji peran pandemi Covid-19 sebagai faktor moderasi dalam hubungan antara ekspor dan pertumbuhan ekonomi di Indonesia. Secara khusus, penelitian ini menganalisis apakah variasi kasus tambahan Covid-19 antar provinsi melemahkan pengaruh perubahan proporsi ekspor riil terhadap pertumbuhan Produk Domestik Regional Bruto (PDRB) riil provinsi. Analisis dilakukan dengan menggunakan pendekatan data panel dinamis melalui metode Generalized Method of Moments (GMM) untuk mengatasi potensi endogenitas. Data yang digunakan adalah data panel kuartalan tingkat provinsi di Indonesia (34 provinsi) selama periode 2019–2020, dengan total 136 observasi. Hasil penelitian menunjukkan bahwa pandemi Covid-19 secara signifikan melemahkan dampak positif ekspor terhadap pertumbuhan ekonomi, meskipun efek moderasi tersebut relatif lebih kecil dibandingkan pengaruh langsung ekspor maupun dampak negatif langsung pandemi. Temuan ini mengindikasikan bahwa kebijakan penanganan pandemi perlu dirancang secara seimbang dengan strategi pemulihan ekonomi, serta menekankan pentingnya mempertimbangkan guncangan non-ekonomi dalam analisis makroekonomi sisi penawaran.*

Kata Kunci: Pandemi COVID-19; Pertumbuhan Ekonomi; Ekspor; Analisis Data Panel

INTRODUCTION

Economic growth plays a crucial role in increasing Indonesia's income level (Pratomo et al., 2020). Thanks to it, Indonesia successfully promoted to an upper-middle-income country in 2020. According to previous research, one of the key factors driving this economic growth is exports (Lee & Fernando, 2021). Export was considered as one of the most important factors in achieving higher economic growth since exports create an accelerator effect (Pane & Patunru, 2021). Thanks to this role, the export-led growth model has a strategic role in increasing the income levels of various countries, including Indonesia (Lee et al., 2023).

However, after just a year in the upper-middle-income group, Indonesia immediately regressed to the lower-middle-income group in 2021. This status remained for two years, as Indonesia successfully re-entered the upper-middle-income group in 2023. Indonesia's decline in 2021 occurred during the Covid-19 pandemic. This raises the suspicion that the role of exports in the export-led growth model weakened during that period. This suspicion is supported by previous research, which emphasized the need for investigation into the effects of the Covid-19 pandemic, given its significant negative impact on global trade flows (Verschuur et al., 2021).

So far, research investigating factors that weaken the role of exports in the export-led growth model has largely focused on economic factors. For example, Egyir et al. (2020) show that the role of exports is reduced due to the adverse effect of foreign debt on exports. However, empirical evidence on the impact of non-economic shocks, such as the Covid-19 pandemic, on the relationship between exports and economic growth remains limited (Wani et al., 2023).

Accordingly, this study addresses the following research question: Does the Covid-19 pandemic weaken the positive impact of exports on economic growth in Indonesia? This question is particularly relevant given the limited number of studies examining export-led growth in countries experiencing changes in income classification, such as Indonesia’s transition between lower-middle-income and upper-middle-income status (Sağlam & Egeli, 2018).

This research is grounded in the export-led growth framework developed by Carvajal and Camargo (2021). In their model, aggregate demand consists of consumption, exports, and imports, assuming zero government spending and taxation. The structural form of the Keynesian demand equation is expressed as:

$$Y = C + X - M \tag{1}$$

where Y denotes income, C denotes consumption, X denotes export, and M denotes import. Exports are treated as an exogenous component of demand, while consumption and imports depend on income. Under these assumptions, the model implies a positive multiplier effect of exports on output.

By rearranging the demand equation, Carvajal and Camargo (2021) derive a reduced-form relationship showing that income is positively related to exports through a Keynesian multiplier mechanism, implying $\partial Y/\partial \overline{X} > 0$.

Based on this theoretical insight, Carvajal and Camargo (2021) propose an empirical specification to test the export-led growth hypothesis:

$$\ln Y_t = b_1 + b_2 \ln X_t + \mu_t \tag{2}$$

where Yt represents real output, X_t represents real exports, b_1 represents a constant term, b_2 captures the export multiplier effect, and μ_t represents an error term which is normally distributed and white noise.

This study extends the baseline export-led growth model by explicitly incorporating the Covid-19 pandemic as a non-economic shock and by introducing an interaction term exports and the pandemic. Thus, the main contribution of this study lies in examining whether the Covid-19 pandemic moderates the export-growth relationship, with the testable hypothesis that the pandemic weakens the positive impact of exports on economic growth.

METHOD

This study is quantitative research that aims to find out whether an increase in the Covid-19 cases reduces the positive impact of exports on economic growth. The period in this study is from Q1 2019 to Q4 2020. In this study, what is meant by the Covid-19 pandemic is the difference in the share of additional positive cases of Covid-19 by province; what is meant by export is the difference in the share of real exports by province; and what is meant by economic growth is the difference in the share of real GRDP by province.

The Covid-19 variable is introduced as a moderating variable because, from a theoretical perspective, a pandemic represents a non-economic supply-side shock that disrupts production capacity, labor mobility, and logistics networks, thereby potentially weakening the transmission mechanism through which exports contribute to economic growth (Bas et al., 2024; Jangam et al., 2024; Leng & Sun, 2024; Nagurney, 2021).

This study uses the difference in share data, not the share data that is commonly used in previous studies (Temiz Dinç & Gökmen, 2019). The reason is that the difference in share data can overcome data limitations and better reflect the movement of GRDP and provinces' export data which is correlated with the Covid-19 pandemic (Egyir et al., 2020). Data shares from the first quarter to fourth quarter 2020 could increase. However, the change in share from 2019 to 2020 on a year-on-year basis may decline. This data management makes the estimation results of the empirical model meaningful. Estimation of the empirical model in this study was done using STATA 15.0 software.

The empirical model used in this research is:

$$grdp_{i,t} = \alpha + \phi\, grdp_{i,t-1} + \beta\, export_{i,t} + \gamma\, covid19_{i,t} + \theta\, (export_{i,t}*covid19_{i,t}) + \varepsilon_{i,t} \tag{3}$$

$grdp_{i,t}$ is the difference in the share of real GRDP by province. $grdp_{i,t}$ is calculated as $[(GRDP_{i,t}/GDP_t)*100\%] - [(GRDP_{i,t-4}/GDP_{t-4})*100\%]$. $grdp_{i,t-1}$ is the previous difference in the share of real GRDP by province. $export_{i,t}$ is the difference in the share of real exports by province. $export_{i,t}$ is calculated as $[(export_{i,t}/\text{total Indonesia's exports}_t)*100\%] - [(export_{i,t-4}/\text{total Indonesia's exports}_{t-4})*100\%]$. $covid19_{i,t}$ is the difference in the share of additional positive cases of Covid-19 by province. $covid19_{i,t}$ is calculated as $[(\text{Covid-19 cases}_{i,t}/\text{total Indonesia's Covid-19 cases}_t)*100\%] - [(\text{Covid-19 cases}_{i,t-4}/\text{total Indonesia's Covid-19 cases}_{t-4})*100\%]$. $export_{i,t}*covid19_{i,t}$ is the interaction between the difference in the share of real exports by province and the difference in the share of additional positive cases of Covid-19 by province. $export_{i,t}*covid19_{i,t}$ is calculated as $\{[(export_{i,t}/\text{total Indonesia's exports}_t)*100\%] - [(export_{i,t-4}/\text{total Indonesia's exports}_{t-4})*100\%]\}*\{[(\text{Covid-19 cases}_{i,t}/\text{total Indonesia's Covid-19 cases}_t)*100\%] - [(\text{Covid-19 cases}_{i,t-4}/\text{total Indonesia's Covid-19 cases}_{t-4})*100\%]\}$. α is constant. ϕ proxies the rate of speed of conditional growth convergence. β, γ, and θ are coefficients. i is a province. t is time in the quarter. $\varepsilon_{i,t}$ is the error term. $\varepsilon_{i,t} = \mu_i + \upsilon_{it}$. $E(\mu_i) = E(\upsilon_{it}) = E(\mu_i\upsilon_{it}) = 0$. μ_i is fixed effects and υ_{it} is idiosyncratic shocks. μ_i and υ_{it} are orthogonal components of $\varepsilon_{i,t}$.

To answer this study's research question, it needs to take the partial derivative of $grdp_{i,t}$ with respect to $export_{i,t}*covid19_{i,t}$. If $\partial grdp_{i,t}/\partial(export_{i,t}*covid19_{i,t}) = \theta < 0$ and statistically significant, then an increase in the Covid-19 cases reduces the positive impact of exports on economic growth. Ultimately, the total conditional marginal effect of export on economic growth in the presence of the Covid-19 is:

$$\partial grdp_{i,t}/\partial export_{i,t} = \beta + \theta*covid19_{i,t} \tag{4}$$

Furthermore, panel data analysis in this study uses dynamic panel data estimation, namely the Two-Step System GMM, as suggested by Egyir et al. (2020). According to Egyir et al. (2020), the Generalized Method of Moments (GMM) is more appropriate to use in analyzing panel data that contains interaction variables and dependent variable lags compared to the pooled ordinary least square, the fixed-effect model and the random effect model. This study assumes that $export_{i,t}$ is an endogenous independent variable (Benfratello et al., 2022). Therefore, from the three options available in the Two-Step System GMM method, this study uses Models with Endogenous Independent Variables.

Then, to ensure that the dynamic panel data estimation that is carried out is successful in producing an efficient estimator, the dynamic panel data estimation is equipped with the Harris-Tzavalis test and the Hansen test. The Harris-Tzavalis test is used to show that the panel data processed in this study is stationary. Unlike the Levin-Lin-Chu test, Breitung test, Im-Pesar-Shin test, Fisher-type test, and Hadri Lagrange multiplier test, the Harris-Tzavalis test was chosen in this study because the Harris-Tzavalis test allows stationarity tests for panel data with a short period (T), but with a large N. This study uses T = 4 (not 8 because it uses the difference, year on year) and N = 136. H_0 from the Harris-Tzavalis test is panel data in non-stationary conditions. Then, the Hansen test is used to show that the model specifications resulting from the Two-Step System GMM (Models with Endogenous Independent Variables) estimation model are correct. H_0 from the Hansen test is that the model specification is correct.

However, previous research reveals that export-led growth is a long-term relationship (Lim et al., 2010). Therefore, to ensure that the results of panel data analysis in this study reflect the reality, it is necessary to make comparisons with time series analysis. In more detail, the time series analysis in this study aims to obtain a correlation coefficient that measures the influence of exports on economic growth. Besides, this time series analysis also aims to predict the magnitude of the decline in economic growth as a result of the Covid-19 pandemic. The results of this time series analysis serve as a benchmark for the results of panel data analysis. This time series analysis adopts the method used by Suryahadi et al. (2020). Meanwhile, the econometric model follows the econometric model of Carvajal and Camargo (2021), namely:

$$lgdp_t = b_1 + b_2 lexport_t + \mu_t \quad (5)$$

where $lgdp_t$ denotes the natural logarithm of the Gross Domestic Product at constant LCU (Local Currency Unit). $lexport_t$ represents the natural logarithm of the exports of goods and services at constant LCU. b_1 is constant. b_2 is coefficient. μ_t is residual. The data used are GDP data and Indonesian exports. The econometric model is then estimated using Ordinary Least Squares (OLS) to test the statistical hypothesis H_0: $b_2 = 0$; H_a: $b_2 > 0$. b_2 generated in this time series analysis is used to predict the effect of the Covid-19 pandemic on economic growth as in Suryahadi et al. (2020). To produce BLUE estimators, this time series analysis is equipped with Dickey-Fuller Unit Root Tests and Johansen Tests for Cointegration. The estimated period in this time series analysis is the annual period from 1960 to 2019. Furthermore, time series analysis is carried out first before panel data analysis is carried out.

This research uses data from various sources. First, data on Gross Domestic Product (constant LCU) and data on exports of goods and services (constant LCU) are derived from World Development Indicators. Second, GRDP data at constant prices (2010 = 100) (in million rupiahs) and data on Indonesian export value by the province of origin of goods and port of loading (in million US $) come from the Central Bureau of Statistics of the Republic of Indonesia. Third, Indonesia Export Prices data is sourced from tradingeconomics.com. Finally, data on the additional number of positive cases of Covid-19 comes from the Indonesian National Board for Disaster Management.

RESULT

As mentioned, to examine the impact of the Covid-19 pandemic on the relationship between exports and economic growth, this research conducts two complementary analyses: time series analysis and panel data analysis. Time series analysis is used to provide an initial benchmark of the export-growth relationship in the long run, while panel data analysis explains how this relationship changes in the presence of the Covid-19 pandemic at the provincial level. If the panel data results are consistent with the time series findings, the estimated moderating effect of Covid-19 can be considered robust. This comparison is particularly important given the relatively short panel data period used in this study.

Time Series Analysis Results

Before estimating the time series regression model, Table 1 presents descriptive statistics to provide an initial overview of the magnitude and variability of GDP and export variables over the sample period. This step helps contextualize the subsequent econometric results.

Tabel 1.

Descriptive Information

Variable	Maximum	Minimum	Mean	Standard Deviation	Observations
$lgdp_t$	36.932	33.942	35.443	0.921	60
$lexport_t$	35.366	32.195	33.864	0.988	60

Source: Author's Computation

Furthermore, stationary is a crucial requirement for time series regression to avoid spurious results. Table 2 reports the unit root test results, which indicate whether the variables are stationary in levels or require transformation.

Table 2. Time Series Unit Root Test Results, Period 1960-2019

Variable	Test Statistic	5% Critical Value*)	MacKinnon Approximate p-value for Z(t)	Result
$lgdp_t$	-0.219	-2.923	0.9363	Non-stationary
$lexport_t$	-0.622	-2.923	0.8660	Non-stationary
$dlgdp_t$	-5.343	-2.924	0.0000	Stationary
$dlexport_t$	-7.817	-2.924	0.0000	Stationary

Source: Author's Computation. *) Interpolated Dickey-Fuller

Based on Table 2, $lgdp_t$ and $lexport_t$ data are not stationary, while their first differences are stationary. Therefore, Equation (5) is estimated using first difference variables.

Table 3 summarizes the core time series regression results, providing evidence on whether exports have a statistically significant effect on economic growth.

Table 3. Time Series Estimation Results by Using Simple Regression

Dependent Variable: $dlgdp_t$	Coefficient
Explanatory Variable	
Constant	0.046***
$ldexport_t$	0.093**
Number of observations	59
F	5.05 (Prob > F = 0.0285)
R-squared	0.0814

Source: Author's Computation.

The estimation results show that exports have a positive and statistically significant effect on economic growth at the 5 percent significance level. The coefficient of the $ldexport_t$ variable shows that when exports increase by 1 percent, the increase will lead to an increase in real output of 0.09 percent, ceteris paribus. Given that the coefficient of the $ldexport_t$ variable is a multiplier, an increase in exports of one million LCUs, for example, would increase the value of real output by 90,000 LCUs. Furthermore, the R-squared of the regression results is 0.08. That means the model is only able to explain the variation in $dlgdp_t$ change by 8 percent. In other words, there are other variables outside the model that can explain the variation of changes in the variable $dlgdp_t$ by 92 percent. This is indicated by the constant which is positive and significant at the level of significance (α) 0.05.

To examine whether exports ($dlexport_t$) and economic growth ($dlgdp_t$) are linked in the long run, this study applies the Johansen Cointegration Test. Table 4 reports the cointegration results, which assess the presence of a long-term equilibrium relationship between the variables.

Table 4. Result of Johansen Tests for Cointegration

Model: $dlgdp_t = f(dlexport_t)$			
Maximum Rank	Trace Statistic	5% Critical Value	Result
0	44.8347	15.41	Reject the null hypothesis of no cointegrating equations
1	17.3615	3.76	Reject the null hypothesis that there is one or fewer cointegrating equation

Source: Author's Computation.

The cointegration test confirms the existence of a long-term relationship between exports ($dlexport_t$) and economic growth ($dlgdp_t$), supporting the export-led growth hypothesis in the Indonesian context.

To provide a clearer preliminary picture of how exports and economic growth evolve over time, this study also presents a graphical illustration of their long-run trends. Figure 1 depicts the historical trends of real exports and real GDP in Indonesia over the period 1960-2019, showing that both variables generally move in the same direction, particularly during periods of economic expansion and contraction.

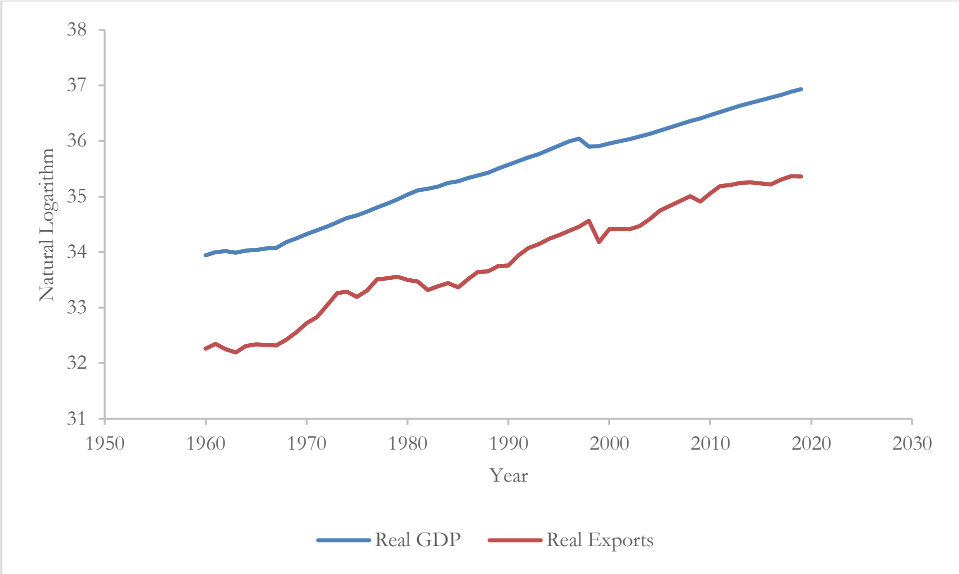

Figure 1. Trends of Real Exports and Real GDP in Indonesia (1960-2019)

Based on the estimated export coefficient, this study follows Suryahadi et al. (2020) to predict the impact of the Covid-19 pandemic on economic growth through the export channel. Table 5 presents alternative scenarios of export contraction and their corresponding effects on economic growth.

Table 5. Estimation Results of Change in Economic Growth in 2020

Export growth rate in 2019 (%)	Source of scenario	Projected export growth rate for 2020 (%)	Change in 2019-20 (percentage points)	Coefficient of correlation	Change in economic growth (%)
-0.87	Investing.com	-7.41	-6.54	0.09	-0.61
-0.87	Bank Indonesia	-5.6	-4.73	0.09	-0.44

Source: Author's Computation.

The simulation results indicate that economic growth is expected to decrease by 0.61 percent when export growth falls to -7.41 percent, and by 0.44 percent when export growth falls to -5.6 percent. These estimates provide a useful benchmark for assessing the magnitude of the Covid-19 shock in the subsequent panel data analysis.

Panel Data Analysis Results

Before estimating the dynamic panel model, Table 6 presents descriptive statistics to illustrate cross-provincial variation in economic growth, exports, Covid-19 cases, and their interaction.

Table 6. Descriptive information

Variable	Maximum	Minimum	Mean	Standard Deviation	Observations
$grdp_{i,t}$	0.296	-0.535	0.000	0.070	136
$export_{i,t}$	3.188	-2.634	0.000	0.794	136
$covid19_{i,t}$	49.800	0.000	2.941	6.113	136
$export_{i,t}$*$covid19_{i,t}$	45.537	-28.537	0.194	7.222	136

Source: Author's Computation.

Stationarity in panel data is examined using the Harris-Tzavalis unit-root test. Table 7 reports the test results, which confirm that all variables are stationary and suitable for dynamic panel estimation.

Table 7. Panel Data Unit Root Test Results by Using Harris-Tzavalis Unit Root Test

Ho: Panels contain unit roots Ha: Panels are stationary				
Variable	Rho Statistic	z	p-value	Results
$grdp_{i,t}$	-0.4880	-8.9541	0.0000	Panels are stationary [I(0)]
$export_{i,t}$	-0.2022	-6.0723	0.0000	Panels are stationary [I(0)]
$covid19_{i,t}$	-0.2734	-6.7904	0.0000	Panels are stationary [I(0)]
$export_{i,t}$*$covid19_{i,t}$	-0.2384	-6.4373	0.0000	Panels are stationary [I(0)]

Source: Author's Computation.

Since all variables are stationary, the dynamic panel data model specified in Equation (3) is estimated using the Two-Step System GMM approach (Models with Endogenous Independent Variables). Table 8 reports the main estimation results, distinguishing between short-run and long-run effects.

Table 8. Dynamic Panel Data Estimation Results by Using Two Step System GMM

Dependent Variable: $grdp_{i,t}$	Coefficient	
Explanatory Variable	Short-run: export & covid19	Long-run: export & covid19
Constant	0.029**	0.019**
$grdp_{i,t-1}$	-0.486***	-0.327***
$export_{i,t}$	0.044**	0.030**
$covid19_{i,t}$	-0.012***	-0.008***
export*$covid19_{i,t}$	-0.004*	-0.002*
AR(1)	(0.328)	
Hansen Test	(0.260)	
Number of Observation	102	
Number of Provinces	34	

Source: Author's Computation. ***, **, * indicates 1%, 5%, 10% levels of significance. p values are in brackets. The long run coefficent is obtained by multiplying each short run coefficient by (1 – [-0.486])-1 (Egyir et al., 2020).

The GMM (Models with Endogenous Independent Variables) Two-Step System regression results show that the coefficient sign of all independent variables is following the theory's predictions. First, the coefficient of the $grdp_{i,t-1}$ variable, which is negative and significant, shows support for the conditional convergence hypothesis for the Indonesian case. That means provinces with lower GRDP grow faster. The variable coefficient of $grdp_{i,t-1}$ of -0.486 (for the short term) and -0.327 (for the long term) reflects the rate of speed of conditional growth convergence.

Then, the coefficient of the $export_{i,t}$ variable is positive and significant at the level of significance (α) 0.05. That means $export_{i,t}$ has a positive and significant effect on $grdp_{i,t}$. The value of the $export_{i,t}$ variable coefficient of 0.044 (for the short term) and 0.030 (for the long term) indicates that every 1 percent increase in $export_{i,t}$ will increase the $grdp_{i,t}$ by 0.044 percent (for the short term) and 0.030 percent (for the long term). This finding is consistent with the export-led growth theory.

The sign of the $covid19_{i,t}$ variable coefficient shows a negative and significant sign at the level of significance (α) 0.01. The $covid19_{i,t}$ variable coefficient which is negative and significant indicates that an increase of 1 percent share in the additional number of provincial Covid-19 cases against the additional number of national Covid-19 cases reduces the share of provincial real output to national real output by 0.012 percent (for the short term) and -0.008 (for long term). This result confirms that increases in Covid-19 cases adversely affect economic growth.

Then, the sign of the coefficient of the $export_{i,t}$*$covid19_{i,t}$ interaction variable is negative and significant at the level of significant (α) 0.1. This significant negative sign states that the 1 percent share increase in the number of additional provincial Covid-19 cases against the additional number of national Covid-19 cases significantly reduces the positive effect of the province's export share on national exports on the share of provincial real output to national real output by 0.004 percent (for the short term) and 0.002 (for long term). This finding confirms that the Covid-19 pandemic weakens the positive impact of exports on economic growth.

Interestingly, the sign of the variable coefficient of $export_{i,t}$ and $covid19_{i,t}$, in absolute terms, is greater than the sign of the coefficient of the variable $export_{i,t}$*$covid19_{i,t}$. That means the variables $export_{i,t}$ and $covid19_{i,t}$ have a direct effect that is greater than the indirect effect, both in the short and long term. In other words, the magnitude of this interaction effect is smaller than the direct effects of exports and Covid-19, suggesting that while the pandemic moderates the export-growth relationship, its primary impact operates through direct economic disruptions.

DISCUSSION

Based on the results of the analysis, it can be seen that the positive and significant impact of exports on economic growth occurs both in the short and long term or during conditions without the Covid-19 pandemic or the Covid-19 pandemic conditions. However, the positive and significant impact of exports on economic growth was greater during the non-pandemic conditions of Covid-19, which was 0.05 percent higher. Thus, this research shows that the Covid-19 pandemic reduces the positive impact of exports on economic growth. This influence is significant and negative as shown by the coefficient of the interaction variable between exports and the Covid-19 pandemic. This finding is in line with evidence from other countries showing that the Covid-

19 pandemic weakened the contribution of exports to economic growth due to disruptions in international trade, logistics, and global value chains (Lu et al., 2025; Velayutham et al., 2022).

Although the Covid-19 pandemic has significantly reduced export performance in support of economic growth, this effect is not large. This can be seen from the direct effect of exports on economic growth which is much greater than the indirect effect. Every time the share of additional positive cases of Covid-19 increases by 1 percent in a province, the province's export share decreases by 0.004 percent in the short term. Similar patterns have been observed in several developing and emerging economies, where exports remained relatively resilient despite the pandemic, particularly in countries with diversified export structure or strong commodity-based exports (Asante-Poku & Van Huellen, 2021; Gnangnon, 2022; Rahman et al., 2022).

The results of this research differ with the research results of Egyir et al. (2020) which examine the impact of debt (economic shock) on the effect of exports on economic growth. Compared with this study, the coefficient of the interaction variable between exports and debt (-0.108) in Egyir et al. (2020) is greater than the coefficient of the interaction variable between exports and the Covid-19 pandemic (-0.044) in this study. This means that the influence of economic shock on exports is greater than the effect of the Covid-19 pandemic (non economic shock) on exports. The implication is that the government's attention in overcoming the Covid-19 pandemic is necessary (Olivia et al., 2020), but must not ignore the handling of an economic variable that has a major influence on the export sector and economic growth. This comparison is consistent with cross-country studies showing that financial and macroeconomic shocks tend to exert a stronger and more persistent effect on export-led growth than health-related shocks, which mainly operate through temporary supply-chain disruptions (Aysun, 2024; Guilloux-Nefussi, 2020; Tetteh & Ntsiful, 2023).

Another thing that can be revealed from the results of this study is that the direct effect of the Covid-19 pandemic on economic growth is greater than the indirect effect of the Covid-19 pandemic through exports on economic growth. This indicates that the Covid-19 pandemic weakens the supply side (i.e., productivity) which is a component of economic growth, not the demand side (i.e., exports), to a greater extent. This result is also supported by international evidence suggesting that the Covid-19 pandemic primarily constrained economic growth through supply-side channels, such as reduced labor mobility, lower firm productivity, and operational shutdowns, rather than through external demand alone (Leng & Sun, 2024; Liu et al., 2023).

CONCLUSION

The results of this research indicate that the Covid-19 pandemic has significantly reduced Indonesia's export performance in driving economic growth. However, this moderating effect was relatively small, that is approximately one-tenth the size of the direct effect of exports in the short run and one-fifteenth in the long run. Similarly, the interaction effect was three times smaller in the short run and four times smaller in the long run than the direct negative impact of the pandemic on economic growth. The study also highlights the importance of considering non-economic shocks in supply-side analysis and demonstrates the analytical value of using change-based data rather than raw levels in macroeconomic research.

These results support the Indonesian government’s policy of balancing pandemic management with economic recovery. From a policy perspective, these findings imply that export-oriented growth strategies should remain a core component of Indonesia’s economic policy, even during periods of health-related crises. Hence, the Indonesian government should implement policies that ensure export continuity, such as trade facilitation, the digitalization of export procedures, and targeted support for export-oriented firms, to help mitigate the adverse effects of future pandemics on economic growth.

In addition, since the direct impact of Covid-19 pandemic on economic growth is larger than its indirect effect through exports, the Indonesian government should implement pandemic mitigation policies that protect productivity, such as ensuring labor mobility with health protocols, supporting firm-level resilience, and strengthening healthcare capacity, to sustain economic performance.

RECOMMENDATION

Further research needs to measure the effect of exports, the Covid-19 pandemic, and the interaction of these two variables on economic growth using other frameworks, including Solow model (Yılmaz, 2024) and endogenous growth model (Kulu, 2024). Further research also needs to use other indicators as a proxy for the Covid-19 pandemic, such as the death rate or cure rate. The use of various frameworks and indicators helps to understand which indicators truly show the optimal negative effect of COVID-19 that reduces the positive impact of exports on economic growth.

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