Pekobi: Jurnal Pendidikan, Ekonomi, dan Bisnis
Vol. 8 No. 1 Tahun 20XX, Pp 67-80
P-ISSN: 2503- 5142, E-ISSN: 2686- 3235
Journal Homepage: http://openjournal.unpam.ac.id/index.php/Pekobis/index

Determinant of Output Growth during Pandemic Covid-19 in Six ASEAN Countries: Panel Data Approach between 2020:I and 2021: I

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ABSTRACT

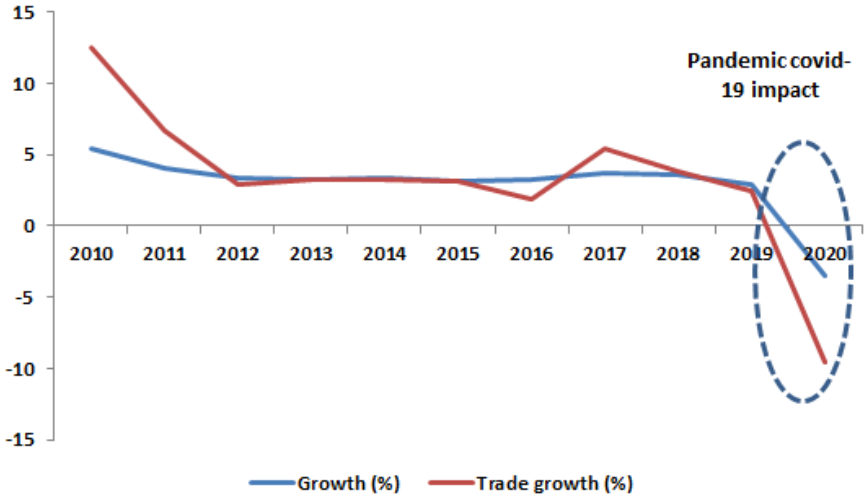
Covid-19 pandemic is blamed to be the one which steal one country's generation because of its severe impacts in economic growth. The study investigates the determinants of output growth during Covid-19 pandemic in six ASEAN countries e.i. Indonesia, Singapore, Thailand, Malaysia, the Philippines, and Viet Nam over the 2020:I - 2021:I period. This study utilises secondary data with panel regression pooled least square (common effect) estimation technique to answer whether the independent variables e.i. central bank policy rate (cbpr), total positive case of Covid-19 (covid), and credit default swap (cds) have significant impact on those six ASEAN countries.We find that cbpr, covid, and cds impact significantly (critical value 95%) on output growth in the six Asian countries. However, cbpr and cds still become puzzle which have a positive relationship with output growth, that might be normal tot the crisis situation. We recommend to include innovation as one prominent factor boosting the growth.
Keywords: Covid-19; output growth; ASEAN; central bank policy rate; credit default swap

INTRODUCTION

The pandemic Covid-19 becomes the primary factor influencing economic turndown from the last month of 2020 to the latest. China was the first infective country and then speedy contagion to other counties. The number of positive cases increases significantly since people inward and outward to China remain high for business purposes and travel. As the case deploys to another country, the Covid-19 shrinks economic and social activity to lessen the infection. Most countries choose to lockdown, but the decision presents consequences, remarkably increasing unemployment.

The pandemic Covid-19 has several impacts on the economy. Firstly, the economic growth becomes subdued. The global financial organizations revised the world economic growth projection due to the pandemic Covid-19. They also admitted that the economic forecast during the pandemic Covid-19 was a tendency to slip because the data was not stable. Furthermore, the pandemic Covid-19 situation is relatively in contrast to that of other crises. The demand and supply have been a decline simultaneously so that the recovery is projected to have for a long time. Previously, the impact of the crisis only pushed down one side.

Before the pandemic, the International Labour Organization (2021) in October 2020 forecasted the global economic growth to accelerate 3.4% after declining in 2019 due to the impact of the trade war. On the other hand, the world trade volume (goods and services) grew 3.2%. A year after the IMF released its global economic outlook report, the institution adjusted the global growth to -4.4% as mounting the positive case of the Covid-19. The international trade shrank to -10.4%.



Graph 1. The Global Economic Growth between 2010 and 2020

Source: International Monetary Fund, 2021, complied

Secondly, as the economic growth weakens, the global unemployment rate increased. The increasing unemployment rate was the lockdown impact taken by the government. As a result, the manufacturing sector reduces its labour absorption to maintain production costs during declining demand. The lockdown affected 2.7 billion workers. About 4 out of 5 workers in the world are affected by the Covid-19 pandemic. The

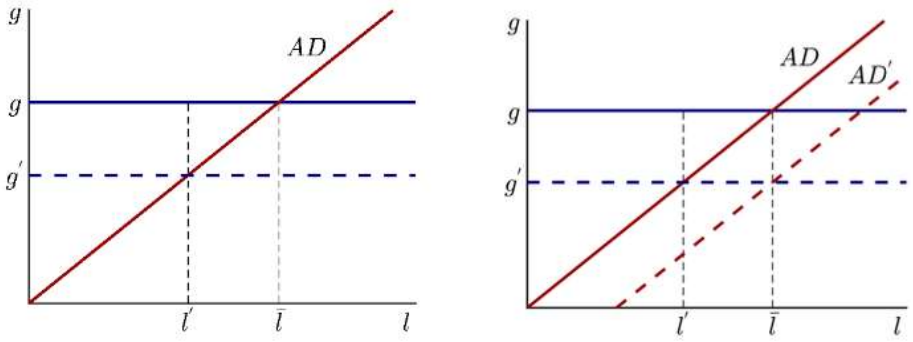
International Labour Organization (2021) projected that about 25 million jobs are threatened with the Covid-19 or the equivalent of losing around US$3.4 trillion in income.

Lastly, on poverty indicators, the World Bank in Kose & Sugawara (2020) explained that if the Covid-19 pandemic did not occur, the agency was targeting a reduction in extreme poverty of up to 3% by 2020. Previously, efforts to reduce extreme global poverty were quite successful. In 1990, global poverty stood at 35.6% and fell to 10% in 2015. The measure of extreme poverty is based on the number of people living on less than US$1.90 per day.

The Covid-19 pandemic has caused the world economy to decline sharply and disrupted the development processes that various countries have carried out. Consumption and investment slowed down due to increased restrictions on labour entry into the market. This condition causes the production of goods and services to shink. Moreover, the Covid-19 disrupted financial markets and fell commodity prices, contracting world trade, supply chains, travel, and tourism.

The World Bank explained that the Covid-19 pandemic caused recessions in almost all countries and became the largest since 1870 (Kose & Sugawara, 2020). From 1870 to 2021, the global economy experienced 14 recessions. The Covid-19 is the fourth deepest and most severe recession since the World War II. The recession caused by Covid-19 is unique because it is the first recession caused by only one cause. The crisis has happened in the last 150 years. In the last few decades, global economic pressures have come from the trade sector, commodity prices to the financial and monetary sectors. With the complexity of the impact of Covid-19, global unemployment is predicted to hit the highest level since 1965.

Fornaro & Wolf (2020) provide an overview of the impact of the Covid pandemic on AD (demand-driven slum), which has the potential to trap the economy into stagnation. Fornaro & Wolf (2020) explained that supply disruptions would continue when Covid-19 lasts a long time. Modelling the impact of Covid-19 on AD adopts the new standard Keynesian model, as defined by Gali (2008). The Keynesian model assumes that employment and output are determined by AD, so AD is dependent (positively) on productivity growth. When productivity growth increases, expectations of future income also increase, including future expenditures.



Graph 2. Impact of Covid-19 on Aggregate Demand

Source: Fornaro dan Wolf, 2020

Carroll & Kimball (1996) explain that when households experience income uncertainty and the risk of declining wealth increases, the marginal propensity to consume (MPC) decreases in line with the decline in wealth. The study of Mian et al. (2013) identified three pathways that can measure the impact of changes in household wealth on expenditure (MPC), namely the wealth effect, indirect effect and access to the credit market. In the wealth effect path, the impact of the decline in MPC is identified through a decrease in wealth, while in the indirect effect path, it is revealed through the employment sector. Access points to credit markets are associated with decreased household wealth used as collateral to the financial sector.

The World Bank identified two pathways for the impact of Covid-19 on people's economic welfare (Kose & Sugawara, 2020). First, the direct impact is in the form of health problems, affecting household activities and income. Covid-19 has also increased health spending for households with positive status. Moreover, these households do not have insurance and are not included in the social protection program. Thus, the expenses will be self-financed. Households with at least one member working in sectors affected by Covid-19 will shake up the household economy.

Informal workers and agricultural workers will be more vulnerable to the impact of shocks, as they generally do not have job protection, health insurance, or paid leave. International Labour Organization (2021) noted that the informal sector contributed for 1/3 of the world's output and 2/3 of the world's workforce in developing countries. The

informal sector is also much more vulnerable to the spread of viruses or other health problems. The share of informal workers in Myanmar, for example, reaches 79% of the total non-agricultural workers; Indonesia and Laos 76% each; Viet Nam 55%; Timor-Leste 54%; and Thailand 51%. At the same time, the share of labour in the agricultural sector in Laos reached 68%; Timor-Leste 50%; Viet Nam 39%; Thailand and Indonesia each 30%.

Second, the indirect impact of Covid-19 is in the form of impacts on producers/consumers and income. Some of the sectors most affected by Covid-19 are the service sector, including retail, transportation and tourism. Indirect effects are usually recorded from changes in producer and consumer prices in the economy. For example, when global and regional growth slows, agriculture and other commodities prices may fall, reducing people's real incomes. On the other hand, if the crisis disrupts the supply chain, the price of manufactured goods may rise, reducing people's real income (Kose & Sugawara, 2020).

Martin et al. (2020) evaluated the socio-economic impact of Covid-19 using a microeconomic model built on the impact of social distancing on household income, savings, consumption, and poverty. The model assumes two periods, namely the crisis period, marked by declining income and can use savings to maintain consumption. Another period is the recovery period when households save to replenish their savings depleted by the crisis. This research was conducted in the San Francisco Bay Area. Assuming people stay at home for about three months, the poverty rate (temporary) increases from 17.1% to 25.9% (assuming no social protection). If the combination of unemployment insurance (UI) and the CARES Act federal stimulus, the increase in poverty can be reduced to 0% and reduce recovery time from 11.8 to 6.7 months.

To minimize the impact of the Covid-19 pandemic on the economy, stakeholders have taken various steps. From the government side, the fiscal sector issued various programs to restore the economy in various countries. In Indonesia, the government spent quite large funds of around IDR695 trillion during 2020. The amount of stimulus of Covid-19 reached about 4% of Indonesian GDP. Singapore spent about 19.7% of GDP while Thailand and Malaysia spent 9.6% and 4.3% of GDP. The Philippines allocated about 3%

of its GDP for economic, social, and health stimulus. Vietnam, Brunei, Myanmar, Cambodia and Laos distributed lower than 3.5% of GDP.

The central bank tends to correct its benchmark interest rate to move the real sector through lending from the monetary side. The data shows that the benchmark interest rate in Indonesia was lowered by 100 bps, while in Singapore, Malaysia, Thailand, the Philippines and Vietnam. They also took the same steps with different levels of correction.

This article will investigate the impact of a series of variables that affect output growth over the Covid-19 in ASEAN. After the background section, the study literature will be explained, followed by the model and estimation. The last part of this article is the discussion and policy recommendations.

METHODOLOGY

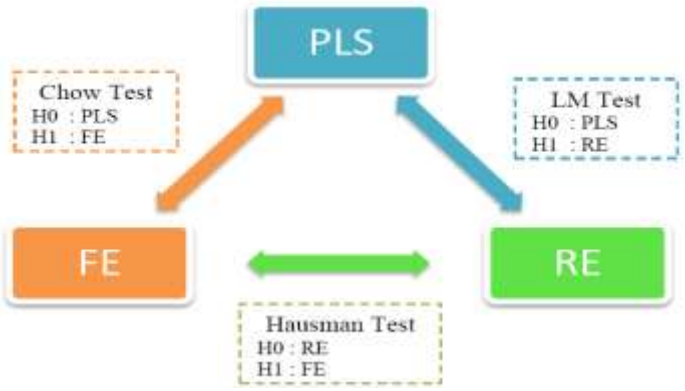
The study proposes a model to investigate the determinants of economic growth during pandemic Covid-19. We collect six data of ASEAN countries: Indonesia, the Phillippines, Malaysia, Thailand, Singapore, and Viet Nam during 2020:I-2021:I.

The model proposed is

$$Y_{it} = \beta_0 + \beta_1 CBPR_{1it} + ln\beta_2 covid_{2it} + \beta_3 cds_{3it} + e_{it}$$

Y_{it}	=	economic growth yearly of six ASEAN countries	
CBPR	=	central bank policy rate of six ASEAN countries	(negative relationship to GDP growth)
Covid	=	the number of positive cases of six ASEAN countries	(negative relationship to GDP growth)
Cds	=	country risk credit default swap as a proxy of	(negative relationship to GDP growth)

Panel data is a combination of cross-section and time-series data. The advantages of this method are: (i) it can take into account individual heterogeneity explicitly by allowing individual-specific variables so that it can test and build more complex behavioural models, (ii) panel data can reduce the problem of omitted variables substantially (Gujarati, 2004). This technique can also overcome the problems of heteroscedasticity and normality and provide more information (high informational content) (Wooldridge, 2003). Panel data analysis has three estimation options, namely Pooled Least Square (PLS), Fixed Effect (FE), and Random Effect (RE). The choice of estimation technique can be explained in the following figure.



Graph 3. How to Determine Panel Estimation Technique

Source: Suwardi, 2011

RESULTS AND DISCUSSION

Results

According to the estimation result of the redundant fixed effect test, the probability of cross-section Chi-square is more than 5%, so PLS becomes the best compared to the FE. Aside from the estimation for determining between the FE and PLS, we need to reveal the RE and FE result. To produce that result, we conducted the estimation using the random effect–Hausman test. The result concluded that the PLS is the best than the RE. The conclusion is based on the cross-section random probability, which is more than 5%. We presented a Lagrange Multiple (LM). The LM test relies on chi-squares distribution with a degree of freedom with the total of independent variables. Based on the result estimation, the estimation technique for the study is the PLS effect. The result concluded that the LM statistic is lower than chi-squares statistics.

Table 1. Estimation Result Fixed Effect versus Common Effect

Redundant Fixed Effects Tests

Pool: PANEL

Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	0.922432	(5,21)	0.4860
Cross-section Chi-square	5.956345	5	0.3105

Source: Author

Table 2. Estimation Result Random Effect and Fixed Effect

Correlated Random Effects - Hausman Test
Pool: PANEL1
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	2.669003	3	0.4455
** WARNING: estimated cross-section random effects variance is zero.			

Source: Author

The table below presents the PLS estimation result. All independent variables have a significant impact dependent variable. The cbpr dan cds impact positively on output growth during the period of research while covid impact negatively. However, the impact of cbpr and cds seems beyond the theory that the central bank policy rate usually negatively impacts output. The goodness of the model is 79,72% depicting the variable independent can explain dependent variable variety about 79,72% while other variables explain the rest. The result of data estimation meets the classical assumption. In terms of autocorrelation terms, the study complies with the durbin-watson stat 1.94.

Table 3. Pool Least Square Estimation Result

Dependent Variable: GDP				
Method: Pooled EGLS (Period SUR)				
Date: 07/07/21 Time: 18:28				
Sample: 2020Q1 2021Q1				
Included observations: 5				
Cross-sections included: 6				
Total pool (balanced) observations: 30				
Linear estimation after one-step weighting matrix				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.565444	1.682846	-2.712930	0.0117
CBPR?	0.914344	0.345396	2.647231	0.0136
COVID?	-0.765844	0.372500	-2.055958	0.0500
CDS?	0.020798	0.005636	3.690184	0.0010
	Weighted Statistics			
R-squared	0.818212	Mean dependent var		-1.102912
Adjusted R-squared	0.797237	S.D. dependent var		2.238899
S.E. of regression	0.953485	Sum squared resid		23.63750
F-statistic	39.00799	Durbin-Watson stat		1.940821
Prob(F-statistic)	0.000000			

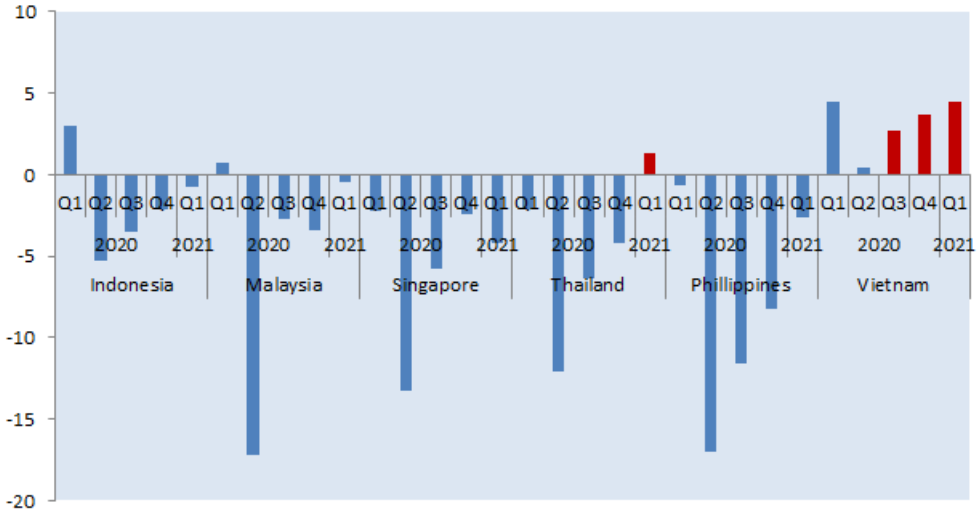
	Unweighted Statistics		
R-squared	0.298932	Mean dependent var	-3.591000
Sum squared resid	696.8961	Durbin-Watson stat	1.973162

Source: Author

Discussion

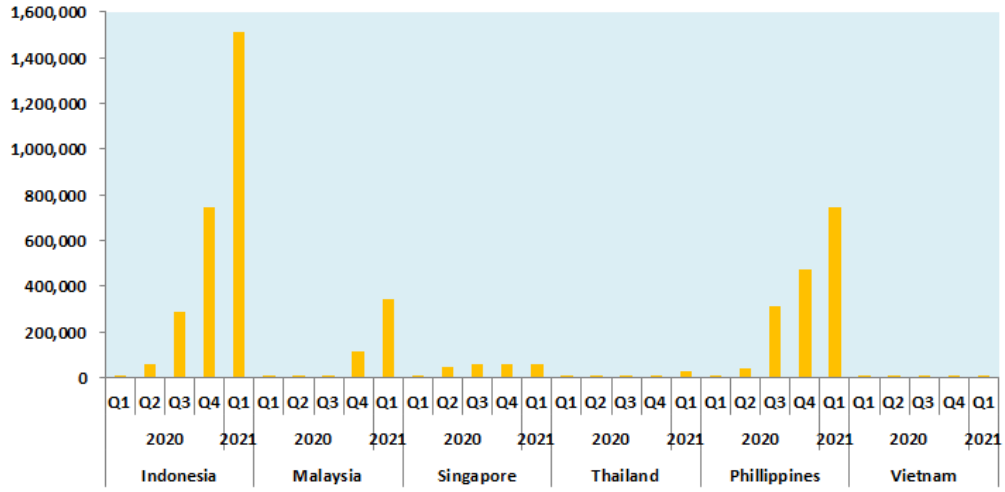
During the pandemic Covid-19, the six ASEAN countries experienced a softening of economic growth. According to the data of Bank Indonesia (2021), only Viet Nam grew positive during the pandemic Covid-19. In the first quarter of 2020, Viet Nam output accelerated 4.48%, while the second quarter declined to a positive 0.39%. Viet Nam satisfies with a 2.69% and 3.68% output growth in the third and the fourth quarter of 2020. In 2021, Viet Nam economic growth reached 4.5%. In addition to Viet Nam, Thailand has grown positively in the first quarter of 2021, while Indonesia, Malaysia, Singapore, and the Philippines still have negative economic growth.

Viet Nam and Thailand succeed in growing positive due to the low of infected pandemic Covid-19. The data of Worldometer (2021) explained that Viet Nam and Thailand only have 2.603 and 28.863 positive cases in the first quarter of 2021. The positive cases in Indonesia reached 1.51 million in the first quarter of 2021, while Malaysia achieved 345.500. The Philippines also has substantial positive victims mounting 747.279 while it was about 60 thousand in Singapore.



Graph 4. Output Growth among Six ASEAN Countries

Source: Bank Indonesia, 2021, compiles

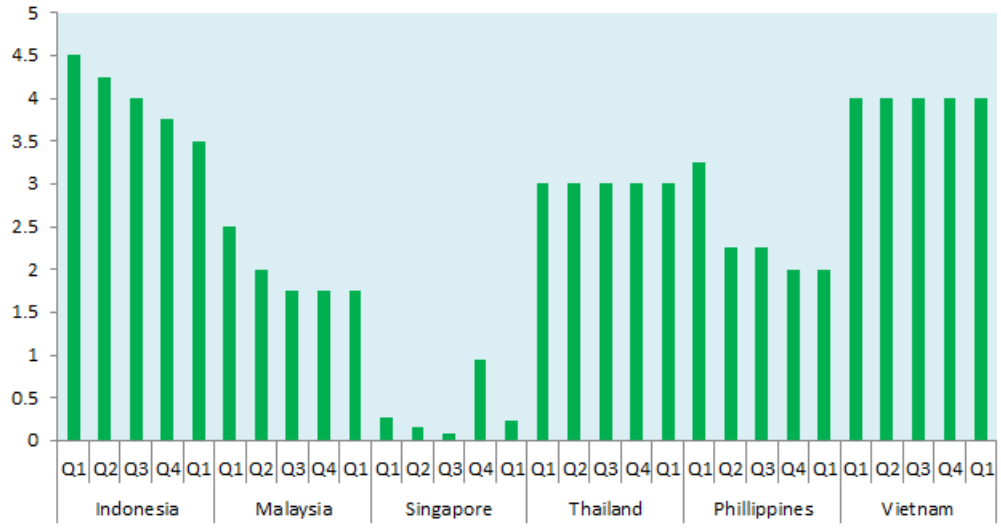


Graph 5. The Positive Covid-19 among Six ASEAN Countries

Source: Worldometers.info, 2021, compiles

There are several lesson-learned taken about how Viet Nam managed the pandemic Covid-19. Only 9 of positive victims die in Viet Nam. Vietnam is a low-income country with a poor health system compared to countries in the ASEAN region. The ratio of doctors and people there is only 8:10 000 people. That level is three times lower than South Korea (Worldometer, 2021). The prominent action taken by Viet Nam government was to lockdown the economy for about three weeks. After that, the government decided to adjust social distancing regulation. Since there is no local infection in 40 days, the government reopened economic and social activity. Viet Nam closed access with China as the WHO announced the Covid-19 becomes a global pandemic. All flight to China is closed down.

The impact of the central bank interest rate policy is positive significantly to determine output growth during the pandemic Covid-19. In theory, both variables have a negative relationship. Six ASEAN counties have the same tendency to cut their interest rate benchmark. The decision was to stimulate actual sector activities throughout interest rate credit declining. This attempt is to trigger loan disbursement. However, the central bank policy rate correction seems to fail to spur credit demand because the real sector remains subdued.

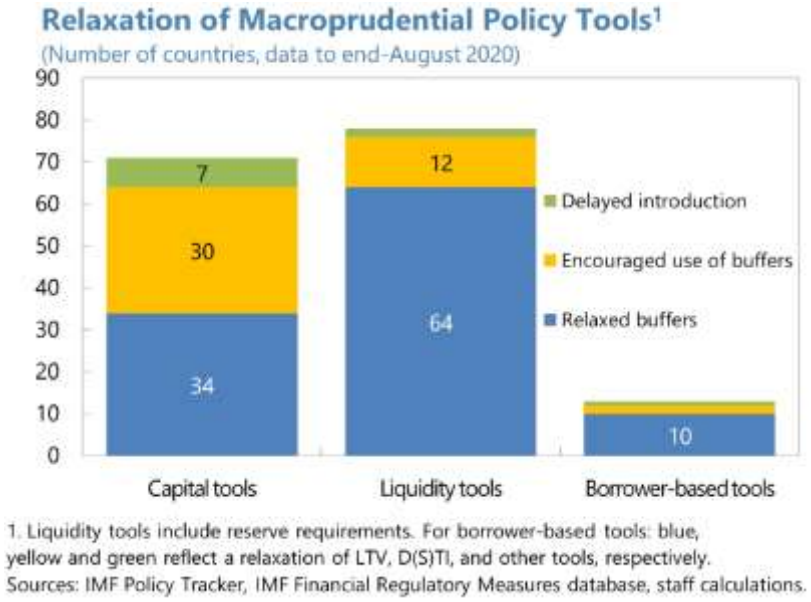


Graph 6. The Central Bank Policy Rate among Six ASEAN Countries

Source: Bank Indonesia, 2021, compiles

Regarding the monetary authority sector on the Covid-19, Cantú et al. (2021) collected various responses from 39 central banks, including advanced and emerging market economies. The study revealed that several tools taken by the central bank: interest rate measures, reserve policies, lending operations, asset purchase programmes and foreign exchange operations. International Monetary Fund (2020) noted that central banks' relaxation most commonly used is liquidity tools, followed by capital tools.

The central bank policy rate adjustment during the pandemic Covid-19 was deemed not to have much impact on stimulating the real sector activity. In order to fill the gap of monetary policy through interest rate policy adjustment, central bank conducted macroprudential policy. International Monetary Fund (2020) applied The International Monetary Fund (2020) noted three conditions that must be met when relaxing macroprudential policies, namely: (i) the existence of buffers (buffers in place), (ii) studies and data related to pressure on the financial sector (evidence of financial stress), and (iii) relaxation will work to relieve financial stress and support lending to the economy. According to Nier & Olafsson (2020) there were three macroprudential policies taken by the central bank during the pandemic Covid-19: capital tools, liquidity tools, and borrower-based tools. Most of central banks supported their financial institution with liquidity tools to avoid the banking crisis.



Graph 7. Relaxation of Macroprudential Policy Tools

Source: IMF, 2020

In Indonesia, the liquidity tool is confirmed by the reserve requirement adjustment. In the beginning of March 2020, Bank Indonesia cut the reserve requirement 50 basis point (bps) for banks supporting productive financing for export and micro, small, and medium enterprises. The regulation also applied for bank promoting financial scheme within the national economic recovery program. In 2020, Bank Indonesia cut the reserve requirement level for several times. This study also sees the impact of country risk that is echoed from credit default swap. The credit default swap is essential to see how the Covid-19 impacts the fiscal sector. For a country with a fiscal deficit, the CDS worsens the fiscal sector since it stimulated an increasing government bond yield.

Covid-19 which worsens the economic condition in all countries is exogeneous factor that cannot be avoided by any country. One lesson to be learned is every nation must have strong fundamental economy as well as other endogenous factors that can strengthen the macroeconomic conditions. Nasikh (2016) showed that innovation and competition can be two prominent elements that can leverage the economic growth. Jumino & Mulyanto (2021) highlight the importance of regional economy to support national growth. Those two studies emphasize the foundations of the economy are not trivial to withstand the crisis, which can be our recommendation for further research.

CONCLUSION

This research aims to shed light on factors affecting growth in six ASEAN countries. Using pooled least square estimation technique, we test whether central bank policy rate (cbpr), total positive case of Covid-19 (covid), and credit default swap (cds) can be the determinant of growth. From the analysis we find that all of variables employed have significant impact on growth. However, cbpr and cdr seems to have different results compared to the common theories. These anomaly are because the real sector does not respond like usual because of Covid-19 pandemic, and these results seem normal to the crisis situation. Further research can include innovation as one prominent variable to boost growth.

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