



Changes in The Keynesian Classical Static Model and the Derivation of IS-LM Aggregate Demand Against Post-Covid-19 Aggregate Demand In The Five Largest GDP Countries

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Abstract

The purpose of this study is to analyze the Classical and Keynesian models in controlling aggregate demand (money supply) after Covid19 in the five largest GDP countries, where the countries are Brazil, Russia, India, Germany and Indonesia. This study uses the Simultaneous regression analysis method, with testing using Eviews 10 and different tests using SPSS 25. The results of Simultaneous regression analysis show that INV, KPM have a positive inelastic effect on JUB. KPM, SB, TAX and JUB have a positive elastic effect on GDP. Different tests showed that in India, Germany and Indonesia there were significant differences in JUB and SB before and after the occurrence of Covid-19, in Brazil and Russia there was no significant difference in JUB, but SB experienced significant differences before and after Covid-19.

Keywords : Classical and Keynesian Models, Covid-19.



I. INTRODUCTION

Economic growth is the rate of growth formed from various economic sectors which indirectly describes the level of economic growth that occurs. For the country, this indicator is important to determine the success of development in the future [1][2]. Growth must go hand in hand and in a planned manner, seeking to create equal opportunities and share development results more equitably.

In an economy, there are various variables that are used as economic stability, even most of the variables are used with the aim of increasing a country's economic growth, in addition to the variable there is a shock (shock) which is the meeting point for measuring the stability or instability of the economy [3][4]. When a shock hits a country, an analysis will be carried out to see what causes expansion, contraction and recession (economic fluctuations) [5][6]. The conditions experienced by Indonesia last

year were in line with the dynamics of the global economy.

The development of Covid-19 shows conditions that are getting worse, judging by the case data and the highest number of deaths [7][8][9]. The country most severely affected by Covid-19 is China, followed by Italy, USA, Spain and others [10]. In the current era of modernization, people from various countries understand that the global environment is an important part of life that must be maintained both physically and non-physically and seeks to improve a productive social environment [11].

In macro analysis, the level of economic growth achieved by a country is measured by the development of real national income achieved by a country/region. This production is measured in the added value created by the economic sectors in the region concerned which is known in total as gross domestic product (GDP) [12].

Table 1.1: List of World's Largest GDP in 2019.

No.	Country	List of World's Largest GDP in 2019
1.	CHINA	US\$ 25,27 trillion
2.	UNITED STATES OF AMERICA	US\$ 20,49 trillion
3.	INDIA	US\$ 19,82 trillion
4.	JAPAN	US\$ 10,51 trillion
5.	GERMAN	US\$ 4,88 trillion
6.	RUSSIA	US\$ 4,88 trillion
7.	INDONESIA	US\$ 3,55 trillion
8.	BRASIL	US\$ 3,49 trillion
9.	UNITED KINGDOM (United Kingdom)	US\$ 3,37 trillion
10.	FRANCE	US\$ 3,04 trillion

The data above shows that of the 30 Highest GDP Contributing countries and also IMF data, namely the Top 10 World's Largest GDP, which include Brazil, Russia, India, Germany and Indonesia which are

able to contribute to a GDP of US\$36.62 Trillion.

Table 1.2: Quarterly Data on Changes in GDP In The Five Largest GDP Countries 2019-2020

Kuartal	NEGARA				
	BRAZIL	RUSSIA	INDIA	GERMAN	INDONESIA
Before COVID-19					
Q3/2019	478911.000	437450.052	701991.797	963229.885	287795.465
Q4/2019	467667.000	468883.797	727746.246	966046.612	285649.427
After COVID -19					
Q1/2020	366312.000	373580.232	720594.372	946826.193	275570.400
Q2/2020	330216.000	327048.629	513302.462	858540.347	246020.101
Q3/2020	368486.000	374857.080	637318.225	981372.344	264610.704
Q4/2020	373432.000	406275.885	739298.575	1009253.888	273105.833

Source: Ceicdata

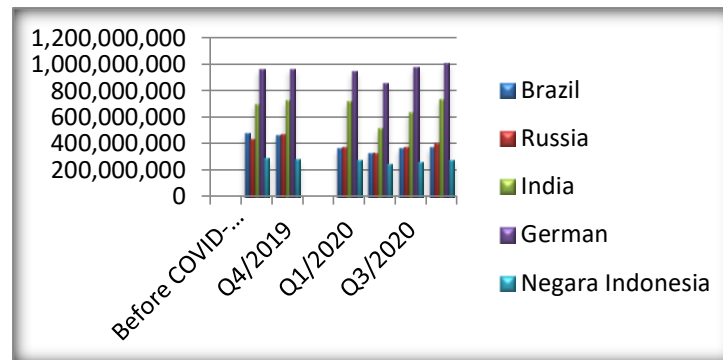


Figure 1.1: Graph of Quarterly Data Changes in GDP In The Five Largest GDP Countries 2019-2020

Indonesia's economic growth until the end of 2020 has the potential to increase. However, this increase can only be achieved if the government is able to anticipate and overcome various factors that have the potential to emerge and factors that are still hampering economic growth itself. As is well known, Indonesia's economic growth in the 4th Quarter of 2019 managed to rise, but fell again insignificantly until the 2nd Quarter of 2020.

Changes in economic growth are also based on the problem of the money supply in society. The effect of the money supply (JUB) on economic growth only applies in the short term and also in the long term. . This is in line with research conducted by [13], that the money supply is positively and significantly related to economic growth. Then the demand for money (JUB) is determined by the level of income (GDP).

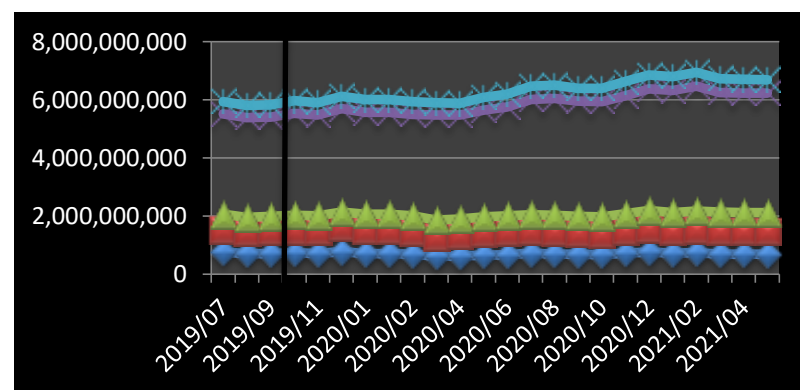


Figure 1.2: Graph of JUB Data In The Five Largest GDP Countries for July 2019 – April 2021

Source: CEIC Data

As it is known that Covid-19 appeared in January 2020, this also has an impact on the money supply in the community. In the short term, the money

supply has a positive and insignificant effect on GDP, while in the long term the money supply has a positive and significant effect on GDP. GDP. The new increase in



the money supply is transmitted in the long term to consumers and producers, so that it will create goods and services that will create increased economic growth.

According to Keynes, the main factor that determines the economic performance of a country is aggregate expenditure, which is public spending on goods and services. Household

consumption decisions affect the overall behavior of the economy in both the long and short term. In the short term fluctuations in consumption have a significant effect on economic fluctuations and in the long term household consumption decisions will affect other macroeconomic variables.

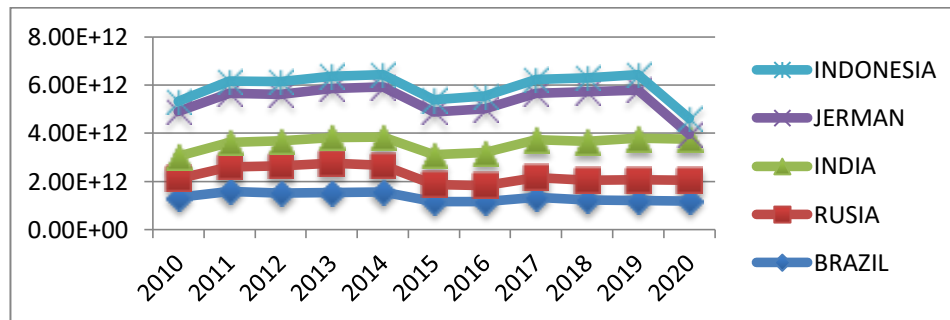


Figure 1.3: Graph of Household Consumption Data In The Five Largest GDP Countries 2010-2020
Source: Worldbank

From the table and graph above, it can be seen that household consumption only in India experienced a significant increase. In 2010. Thus, the increase in household consumption greatly affects GDP, where it was found that household consumption expenditure has a positive and significant effect on economic growth of [14][15]. Meanwhile, Brazil, Russia, Germany and Indonesia experienced fluctuations. However, in 2020 Brazil, Russia, India, Germany and Indonesia experienced a decline due to the impact of

Covid-19, then GDP fell, so household consumption would also decrease[16][17].

II. METHODOLOGY

Data analysis technique

This research was conducted in five of the Largest GDP Countries, namely Brazil, Russia, India, Germany and Indonesia. The data used in this study is secondary data taken and processed from the Worldbank (World Bank) and CEICdata.com from 2010-2019 (10 Years).

1. Simultaneous Method

Based on the criteria above, the identified equations in this study are as follows:

$$\text{LOG(JUB)} = C(11) + C(12)*\text{LOG(KRT)} + C(13)*\text{LOG(INV)} + C(14)*\text{LOG(KPM)} + C(15)*\text{LOG(PDB)} + e_1$$

$$\text{LOG(PDB)} = C(21) + C(22)*\text{LOG(KPM)} + C(23)*\text{LOG(SB)} + C(24)*\text{LOG(TAX)} + C(25)*\text{LOG(JUB)} + e_2$$

Based on the above formula, the four equations above can be tested for identification as follows:

Table 3.1: Equation Identification Test Table

Equality	K-k	m-1	Hasil	Identification
Money supply	4-2	4-1	2>1	<i>Over identified</i>
PDB	4-3	4-1	2>1	<i>Over identified</i>

Determination of conditions that are exactly identified or over identified is done with the following formula:

$K-k < m-1$: called under identified

$K-k = m-1$: called exact identified



$K - k > m - 1$: called over identified

Where;

K = Number of predetermine exogenous variables in the model

M = Number of predefined exogenous variables in equation

k = Number of exogenous variables in the equation.

1. Test Different

a. Different Test Independent Sample T Test.

Independent Sample T Test was used to test the significance of the difference in the mean of the two groups. This test is also used to test the effect of the independent variable on the dependent variable. To examine the significant differences in inflation, interest rates and exchange rates

before and during covid-19-19 in Emerging Markets Countries.,

The basis for making the decision to accept or reject H_0 in this test is as follows.

- H_0 is rejected and H_a is accepted if sig (2-tailed) = 0.05, where there is a significant difference in the variables before and during the COVID-19 pandemic.
- H_0 is accepted and H_a is rejected if sig (2-tailed) = 0.05, where there is no significant difference in the variables before and during the COVID-19 pandemic

III. RESULTS

Simultaneous Method

Table 4.1: Estimated Results of the Simultaneous Equation

System: NEWSIMULTAN				
Estimation Method: Two-Stage Least Squares				
Date: 01/17/21 Time: 21:31				
Sample: 1 50				
Included observations: 50				
Total system (balanced) observations 100				
	Coefficient	Std. Error	t-Statistic	Prob.
C(10)	-7.474201	2.202859	-3.392954	0.0010
C(11)	-3.832346	2.983768	-1.284398	0.2023
C(12)	0.403700	0.211491	1.908826	0.0595
C(13)	1.084550	0.112501	9.640350	0.0000
C(14)	5.597470	2.825882	1.980787	0.0507
C(20)	3.080384	0.249880	12.32743	0.0000
C(21)	-0.444774	0.070804	-6.281810	0.0000
C(22)	-0.005118	0.001898	-2.696661	0.0084
C(23)	0.086232	0.027931	3.087310	0.0027
C(24)	0.452591	0.116138	3.897023	0.0002
Determinant residual covariance 3.67E-08				
Equation: LOG(JUB)=C(10)+C(11)*LOG(KRT)+C(12)*LOG(INV)+C(13)*LOG(KPM)+C(14)*LOG(PDB)				
Instruments: KRT INV KPM SB TAX C				

Source: Output Eviews 10

Result of Equation 1:

Based on this equation, the output results of Eviews10 with the Two-Stage Least Square model are as follows:

$$JUB = -7.474201 - 3.83 * KRT + 0.40 * INV + 1.08 * KPM + 5.59 * PDB + e_1$$



Based on the estimation results above, it can be shown that $R^2 = 0.833749$ which means that the variables KRT, INV, KPM and PDB are able to explain GDP of 83.37% and the remaining 16.63% JUB is influenced by other variables outside the estimates in the model.

Based on the estimation results obtained by the t-count value, there is 1 variable that affects the JUB variable where the investment prob value is $0.00 < 0.05$ so that the variable is declared to have a significant effect. And KRT, INV, GDP > 0.05 so that these variables are declared influential but not significant.

Result of Equation 2:

Based on this equation, the output results of Eviews10 with the Two-Stage Least Square model are as follows:

$$PDB = 3.080384 - 0.44 \cdot KPM - 0.005 \cdot SB + 0.08 \cdot TAX + 0.45 \cdot JUB + e_2$$

Based on the estimation results above, it can be shown that $R^2 = 0.575485$ which means that the KPM, SB, TAX and JUB variables are able to explain GDP by 57.54% and the remaining 42.46% of GDP is influenced by other variables outside the estimates in the model.

Based on the estimation results obtained by the t-count value, there are variables that affect the GDP variable where the prob value of KPM, SB, TAX and JUB > 0.05 so that the variable is declared to have a significant effect.

Difference test

Table 4.2. Brazil National Difference Test results

Paired Samples Test									
		Paired Differences				t	df	Sig. (2- tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	JUB Sebelum - JUB Sesudah	-6535,81818	67160,17874	20249,55579	-51654,64018	38583,00382	-,323	10	,75
Pair 2	SB Sebelum - SB Sesudah	2,50000	,93541	,28204	1,87158	3,12842	8,864	10	,00

Source : Output spss 25, 2022

The average JUB rate in Brazil before the Covid-19 pandemic was 69.88% and after the emergence of this pandemic, the JUB rate rose to 70.54%. The average SB rate in Brazil before the Covid-19 pandemic was 4.7% and after the

emergence of this pandemic, the SB rate decreased to 2.2%. Based on the processed results, it can be seen that the change in JUB is not significant and SB in Brazil occurs significantly.

Table 4.3. Russia National Difference Test results



Paired Samples Test									
		Paired Differences					t	df	Sig. (2- tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	JUB Sebelum - JUB Sesudah	820,909	57039,793	17198,144	39140,763	37498,945	-.048	10	.963
		09	12	72	52	34			
Pair 2	SB Sebelum - SB Sesudah	2,00000	,75000	,22613	1,49614	2,50386	8,844	10	,000

umber: Output SPSS 25, 2021

Sumber: Output SPSS 23, 2021

The average JUB rate in Russia before the Covid-19 pandemic was 75.25% and after the emergence of this pandemic, the JUB rate rose to 75.33%. The average SB rate in Russia before the Covid-19 pandemic was 6.3% and after the

emergence of this pandemic, the SB rate decreased to 4.3%. Based on the processed results, it can be seen that the change in JUB was not significant and SB in Russia occurred significantly.

Table 4.4. India National Difference Test results

Paired Samples Test									
		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	JUB Sebelum - JUB Sesudah	74616,45 455	23248,880 16	7009,80 112	90235,264 76	58997,644 33	10,645	10	.000
Pair 2	SB Sebelum - SB Sesudah	1,00909	,52097	,15708	,65910	1,35908	6,424	10	.000

Sumber: Output SPSS 23, 2021

The average JUB rate in Russia before the Covid-19 pandemic was 75.25% and after the emergence of this pandemic, the JUB rate rose to 75.33%. The average SB rate in Russia before the Covid-19 pandemic was 6.3% and after the emergence of this pandemic, the SB rate decreased to 4.3%. Based on the processed

results, it can be seen that the change in JUB was not significant and SB in Russia occurred significantly.

Table 4.5. German National Difference Test results

Paired Samples Test									
		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	JUB Sebelum - JUB Sesudah	534613,72727	127956,41618	38580,31109	620576,01733	448651,43721	13,857	10	,000
Pair 2	SB Sebelum - SB Sesudah	2,31818	,75076	,22636	1,81382	2,82255	10,241	10	,000

Sumber: Output SPSS 25 2021

The average JUB rate in Germany before the Covid-19 pandemic was 35.19% and after the emergence of this pandemic,

the JUB rate increased by 40.54%. The average SB rate in Germany before the Covid-19 pandemic was 5.3% and after the emergence of this pandemic, the SB rate



decreased by 3%. Based on the processed results, it can be seen that the changes in

JUB and SB in Germany occurred significantly.

Table 4.6. Indonesia National Difference Test results

Paired Samples Test									
		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Paired Sample 1	JUB Sebelum	-	15631,2	4712,99	-	-	8,737	10	,000
	JUB Sesudah	41177,81818	3395	437	51679,02404	30676,61233			
Paired Sample 2	SB Sebelum	-	1,15909	,20226	,06098	-	19,007	10	,000
	SB Sesudah	1,15909	,20226	,06098	1,02321	1,29497			

Sumber: Output SPSS 25, 2021

The average JUB rate in Indonesia before the Covid-19 pandemic was 42.69% and after the emergence of this pandemic, the JUB rate increased to 46.81. The average SB rate in Indonesia before the Covid-19 pandemic was 4.9% and after the

emergence of this pandemic, the SB rate decreased by 3.8%. Based on the processed results, it can be seen that the changes in JUB and SB in Indonesia have occurred significantly

IV. CONCLUSIONS

Simultaneous Regression Conclusion

Based on the results of the analysis and discussion that has been carried out using the Simultaneous method, it can be concluded:

1. Simultaneous effect of classical and keynesian models in The Five Largest GDP Countries that KRT has a negative elastic effect on JUB. INV has a positive inelastic effect on JUB. KPM has a positive inelastic effect on JUB. GDP has a positive elastic effect on JUB.
2. Simultaneous effect of classical and keynesian models in The Five Largest GDP Countries that KPM has a negative inelastic effect on GDP. SB has a negative inelastic effect on GDP. TAX has a positive inelastic effect on GDP. JUB has a positive inelastic effect on JUB.

Conclusion Test Different Test

1. In India, Germany and Indonesia, there are significant differences in

JUB and SB before and after the occurrence of Covid-19.

2. In Brazil and Russia there was no significant difference in JUB, but SB experienced a significant difference before and after Covid-19.



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