INTERNATIONAL APPLICATION MODEL SHORT-LONG TERM BETWEEN GDP AND CONSUMPTION : CASE STUDY INDONESIA

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SUMMARY

More recently, significant fluctuations in the Indonesian economy justify the need to pay more attention to this issue. In this case, the main purpose of this research is to know the relationship between two issues related to Indonesian macro economy called consumption and GDP for data period during 1967 until 2014. This study investigates the relationship between GDP variables and Indonesian consumption consumption variables using the test ARDL, cointegration and Granger causality. The result of the research can be concluded that, there is long-run equilibrium relationship between GDP and consumption with long-term ARDL model, 10% change of consumption will produce long-term change of 44% in GDP. It is not surprising that there is no short-run equilibrium relationship between GDP and consumption. 10% of consumption will result in a short-term ARDL model change of 95% in GDP. The variables and consumption of GDP are cointegrated in the long run significantly at lag interval 10, whereas the use of lag interval 1 and 5 is not credited in the long run. Using a cointegration test with lag interval 1, 5 and 10 indicates significant for all usage slowness. So it can be summarized in the context of GDP and coordinated short-term economic consumption for all the prevailing interval lags. concluded that long-term causality test results between GDP variables and significant consumption with time intervals 5 and 10. intervals 1, 15 and 20 have no long-term causality relationship between GDP variables and consumption variables. a short-term causal model. With lagging intervals of 1, 5, 10 and 15, there is a short-term causal relationship between the variable GDP and consumption. As for the use of delay interval 20 there is no causal relationship in the short term between the variable GDP and consumption in Indonesia.

Keywords: ARDL, cointegration, granger causality, GDP, consumption.

INTRODUCTION

During these years, a lot of researches have been conducted which focuse on the policies used by the Government, in both fiscal and monetary issues. Nevertheless, A small portion of the them are related to the issue of fiscal policy which mainly has the purpose of or in connection with the issue of the national economy in particular. economic problems in the country such as the onset of price hikes, shortages of the State budget and declining tax revenue have resulted in an increasing trend of government and the private sector debts. This issue has convinced the researchers to analysis it in more details. the majority of these studied aim to investigate how was the relationship between GDP and rate of consumption during 1967 to 2014 in the country. Accordingly, in a study, this relationship has been evaluated using the available database. according to following figure, it can be included that consumption had withnessed a growing trend by increace in GDP criteria.

Figure 1 GDP and consumption in Indonesia for the year 1967-2014
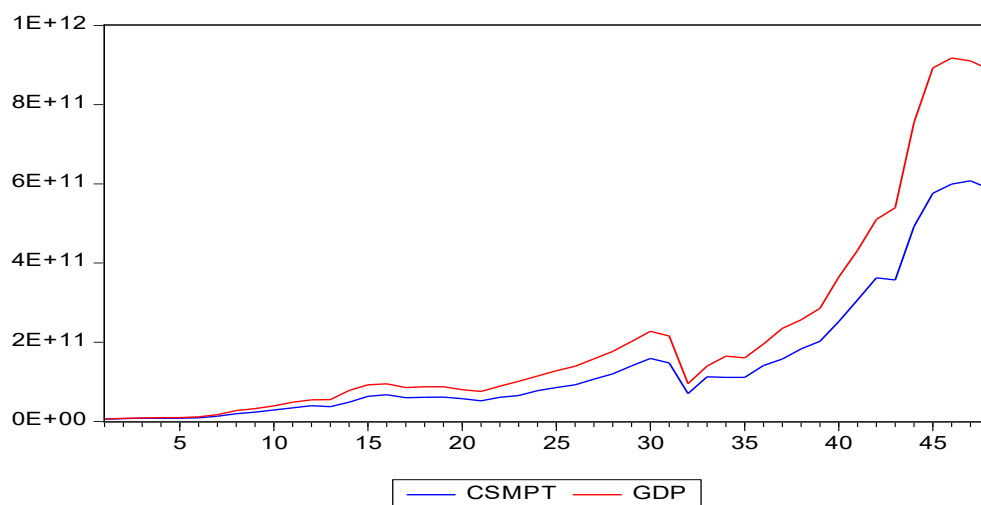
Source : Self Proceed

If the pore over the occurrence of consumption figures rise each year also on accompanied with the increase of the GDP every year too. Thus the author assumes that the two variables have a relationship that was going on explained in the study results. By using these two macroeconomic variables, expressed in actual value, expect to be able to see how the second relationship and result in this variable in the short-term and long-term, as well as on the expected can see if there is a dependency between macroeconomic variables in doing this research. This research will be divided into 5 sections, where section 1 is for introduction, part 2 for literature review, part 3 for research methods, part 4 for results research and part 5 for conclusion research that has been funded.

LITERATURE REVIEW

For literature pertaining to this study, the authors use as the basis of the literature as a basis for understanding the use of modeling in research methods that will be in use. One of them performed by Benazic, M. (2006) [1], Gray, C., et, al. (2007) [2], Rukelj, D. (2009) [3] Svaljek, S. et. Al (2009) [4]. The two researchers do a study related to GDP that exists in their country and relating to the fiscal policy in the activities of the economy. Most of the variables used by them in addition to GDP is an expenditure budget and expenses. The analysis model in use among others such as Granger method, model and vector error correction model of error correction. From the results of their research that, variables in use will have elevated to government revenue as well as have a negative impact on the real sector activity in their country, while government spending figures had

a positive impact on the real sector economy. Other analysis in use by the author namely Hodrick-Prescott filter technique. The author identifies that a cycle happens one considered very sensitive on variable budget revenues and spending as well as against the macroeconomic variables are variables in the thorough.

Gross Domestic Product (GDP) / Gross Domestic Product (GDP) Definition, Types and approach Gross Domestic Product (GDP) is a calculation used by a country as the main measure for the activity of national economy, but basically the whole GDP measures the volume of production of a region (country) geographically. Meanwhile, according to Samuelson. & Nordhaus (2001) [5], Slavin (1999) [7] and Begg, et al (2001) [8] defines GDP as a means to measure the market value of the goods and services produced by the end of the resources that are within a country during a certain period, usually one year. GDP can also be used to study the economy over time or to compare several economies at a time.

According to Samuelson. & Nordhaus¬¬ (2001) [5], McEachern (2000: 147) [6], Slavin (1999) [7] and Begg, et al (2001) [8] There are two kinds of approaches used in the calculation of GDP, namely: 1. the expenditure approach, aggregating all aggregate spending on all final goods and services produced during a year. 2. The income approach, aggregating all the aggregate income received during the year by those who produce the output.

GDP BY EXPENDITURE APPROACH

According to Samuelson. & Nordhaus (2001) [5], McEachern (2000: 149) [6], Slavin (1999) [7] and Begg, et al (2001) [8] to understand the expenditure approach to GDP, we split expenses aggregated into four components, consumption, investment, government purchases, and net exports. We will discuss them one by one

1. Consumption, or more specifically private consumption expenditure, is the purchase of final goods and services by households for one year.

2. Investment, or, more specifically, gross private domestic investment, is spending on new capital goods and additional inventory.

3. Purchase of government, or more specifically government consumption and gross investment, including all levels of government spending on all goods and services, from street cleaning to purge the courtroom, from library books to pay the librarian. In the government's purchase does not include social security, welfare and unemployment insurance. Because these payments reflects the government grants to the recipient and do not reflect the impact of the government.

4. Net exports, equal to the value of exports of goods and services a country minus imports of goods and services the country. Net exports not only includes the value of trade in goods but also services. In Samuelson. & Nordhaus (2001) [5], Slavin (1999) [7] and Begg, et al (2001) [8] approach to spending, aggregate state spending equal to the sum of consumption, C, investment I, government purchases, G, and net exports, the value of exports, X, deducting the value of imports, M, or (XM) the sum of these components generate aggregate spending, or GDP:

$$C + I + G + (X-M) = \text{Expenses aggregate} = GDP$$

GDP BY INCOME APPROACH

According to Samuelson. & Nordhaus (2001) [5], McEachern (2000: 151) [6], Slavin (1999) [7] and Begg, et al (2001) [8] The aggregate income is equal to the sum of all earned income of the owner resources in the economy (because of the resources used in the production process). Double-entry bookkeeping system can ensure that the value of aggregate output equals aggregate income paid to the resources used in the production of such outputs: ie wages, interest, rents, and profits of production.

According to Mankiw (2005) [9], and McEachern (2000: 151) [6]. Aggregate expenditure = GDP is a finished product normally processed by several companies on his way to the consumer. Wooden table, for example, initially as raw wood, then cut by the first company, cut to fit the needs of furniture by a second company, created a table by a third company, and sold by the four companies. Double counting avoided by simply taking into account the market value of the counter at the time of sale to the end user or by calculating the value added at each stage of production. The added value of each company is the same with the selling price of the company is reduced by the amount paid on inputs other companies.

The added value of each phase reflects the return on the owner of the resource at the stage in question. Summation added value at all stages of production equal to the market value of final goods, and the sum of the entire value-added final goods and services is equal to the GDP by the income approach [19].

DATA AND RESEARCH TECHNIQUE ANALISYS

Author uses the data in this study is GDP and consumption Indonesia country, from the year 1967-2014.

ARDL ANALYSIS

In the method of this study the author makes the equation based on existing empirical literature, where the existence of a long-term relationship between GDP and consumption. where the gross domestic product and consumption in GDP and symbolizes with ELC. Data on the use of annual data is uploaded by the author through the website of the world bank on June 13, 2016. The first step the author will use test ARDL in the short and long term to know the relationship of the economic variable.

COINTEGRATION ANALYSIS

This cointegration method to the author proposes a model developed by Pesaran & Shin (1999) [10]. Using the approach of cointegration Johansen (1988) [11], or using the Johansen and Juselius (1990) [12] consider easier in understand and funded although ARDL method has many advantages compared to other such as cointegration methods Granger (1969) [13], Engle & Granger (1987) [14]. In research in writers ignores while Johansen cointegration techniques with large data samples, which could expect to make the validation process be accurate. If we see the ARDL method by using a simple equation, log-linear function in the long term will expect to have a relationship between variables in thoroughly.

However, in the data analysis, the writer is intentionally looking to the model of Narayan (2005), Narayan & Smith (2008), Narayan & Prasad (2008) [15], [16], [17] and are bound to the model Pesaran et al. (2001) [18], where a variable period of time in a thorough range of 30 or over. If there is a long-term relationship between variables in the model

CAUSALITY ANALYSIS

in their study, the relationship between Engle and Granger has been studied (1987) [14], The author did not do the test over Granger causality based error correction model. Same is the case with the test, test the Granger causality also in this study with model the long term and short term.

RESULT AND DISCUSSION

Analysis of the results of this research will be in the form of outlines in table 1 to table 6 :

ARDL MODEL LONG RUN GDP AND CONSUMPTION
ARDL model test of use for long term analysis, at the got results of the relationship between GDP and consumption variables for a meticulous data as follows:

Table 1 ARDL Model Long run GDP and consumption in Indonesia for the year 1967-2014

Dependent Variable: GDP(-1)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-2)	0.445209	0.112365	3.962166	0.0003
CSMPT(-1)	1.508347	0.038512	39.16600	0.0000
CSMPT(-2)	-0.649933	0.177236	-3.667052	0.0007
C	5.390008	2.510009	0.215011	0.8309
@TREND	-2.660008	1.570008	-1.696484	0.0976
R-squared	0.998766	Mean dependent var		2.090011
Adjusted R-squared	0.998643	S.D. dependent var		2.430011
S.E. of regression	8.960009	Sum squared resid		3.210021
Durbin-Watson stat	1.787825	Long-run variance		4.450019

Source : Self Proceed

The long run value of coefficient is positive (4.450019), as required, and is not significant. Importantly, the long-run coefficients from the ARDL equation are reported, with their standard errors, t-statistics, and p-values. First, not surprisingly, there's a long-run equilibrium relationship between the GDP and the consumption with ARDL long run model. Second, there is a relatively quick adjustment in the GDP when the consumption changes. Third, a 10% change in the consumptions will result in a long-run change of 44% in the GDP.

ARDL MODEL SHORT RUN GDP AND CONSUMPTION
Here, ARDL test has been used for the the short-term Analysis and the results is shown in the following table.

Table 2 ARDL Model short run GDP and consumption in indonesia for the year 1967-2014

Dependent Variable: _GDP(-1)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
_GDP(-2)	-0.063131	0.098076	-0.643691	0.5234
_CSMPT(-1)	1.480463	0.035796	41.35793	0.0000
_CSMPT(-2)	0.226323	0.146239	1.547627	0.1296
C	9.150008	1.950009	0.469012	0.6416
@TREND	-80789154	80840215	-0.999368	0.3236
R-squared	0.956290	Mean dependent var		2.010010
Adjusted R-squared	0.951919	S.D. dependent var		4.550010
S.E. of regression	9.980009	Sum squared resid		3.980021
Durbin-Watson stat	1.717751	Long-run variance		3.320019

Source : Self Proceed

Not the same as the long term coefficient value analysis, in the short-term analysis model using ARDL model is positive (3.320019), as needed, and not significant. Note, short-term coefficients of the ARDL equation are reported, with standard errors, t-statistics, and p values. First, it is not surprising, if there is no short-run equilibrium relationship between GDP and consumption. Secondly, there is a relatively quick adjustment of the GDP when the consumption changes. (Remember that the data is observed every year.). Third, a change in consumption of 10% will result in a long-term change of 95% in GDP.

COINTEGRATION MODEL LONG RUN GDP AND CONSUMPTION

In a second analysis with cointegration test, the same as the previous analysis. With cointegration is the analysis of long term and short term in accordance with the equation in to draw by the author on table 3 and 4.

Table 3 Cointegration Model Long run GDP and consumption in Indonesia for the year 1967-2014

Lags interval (in first differences): 1 to 1				
		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.310246	19.71586	15.49471	0.0109
At most 1	0.055581	2.630505	3.841466	0.1048
Lags interval (in first differences): 1 to 5				
		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.295077	14.92359	15.49471	0.0608
At most 1	0.005640	0.237554	3.841466	0.6260
Lags interval (in first differences): 1 to 10				
		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.478634	31.79177	15.49471	0.0001
At most 1 *	0.187739	7.693531	3.841466	0.0055

Source : Self Proceed

Table 3 shows long-term cointegration test results for GDP variables and consumption with cointegration using lags of intervals 1, 5 and 10. The results in the table above show GDP and consumption variables cointegrated in the long term significantly at lags interval 10, whereas the use of interval lags 1 and 5 are not mutually credited in the long run.

COINTEGRATION MODEL SHORT RUN GDP AND CONSUMPTION

Display the following results for the analysis of the short-term test with cointegration.

Table 4 Cointegration Model short run GDP and consumption in Indonesia for the year 1967-2014

Lags interval (in first differences): 1 to 1				
		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.665932	65.23861	15.49471	0.0000
At most 1 *	0.275171	14.80373	3.841466	0.0001
Lags interval (in first differences): 1 to 5				
		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.370146	25.28477	15.49471	0.0012
At most 1 *	0.130425	5.869537	3.841466	0.0154
Lags interval (in first differences): 1 to 10				
		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.258275	17.39057	15.49471	0.0256
At most 1 *	0.157380	6.335837	3.841466	0.0118

Source : Self Proceed

Table 4 above describes for short-term cointegration test results on GDP and consumption variables. Using cointegration tests with lags 1, 5 and 10 interval shows significant for all usage slowness. So it can be summarized in the context of GDP and economic consumption in the short term cointegrate for all interval lags that apply.

CAUSALITY MODEL LONG RUN GDP AND CONSUMPTION

The following test results of causality for GDP and consumption variables on long-term and short term.

Table 5 Causality model long run GDP and consumption in Indonesia for the year 1967-2014

Pairwise Granger Causality Tests			
Lags: 1			
Null Hypothesis:	Obs	F-Statistic	Prob.
GDP does not Granger Cause CSMPT	47	0.02413	0.8773
CSMPT does not Granger Cause GDP		0.50830	0.4796
Lags: 5			
Null Hypothesis:	Obs	F-Statistic	Prob.
GDP does not Granger Cause CSMPT	43	6.37635	0.0003
CSMPT does not Granger Cause GDP		6.77051	0.0002
Lags: 10			
Null Hypothesis:	Obs	F-Statistic	Prob.
GDP does not Granger Cause CSMPT	38	3.95192	0.0063
CSMPT does not Granger Cause GDP		3.29590	0.0149
Lags: 15			
Null Hypothesis:	Obs	F-Statistic	Prob.

GDP does not Granger Cause CSMPT	33	2.19929	0.3569
CSMPT does not Granger Cause GDP		2.52045	0.3206
Lags: 20			
Null Hypothesis:	Obs	F-Statistic	Prob.
GDP does not Granger Cause CSMPT	28	NA	NA
CSMPT does not Granger Cause GDP		NA	NA

Source : Self Proceed

From Table 5 above it can be concluded that long-term causality test results between GDP variables and significant consumption with time interval 5 and 10. When using lag interval 1, 15 and 20 there is no long-term causality relationship between GDP variables and consumption .

CAUSALITY MODEL SHORT RUN GDP AND CONSUMPTION

How about a short-term relationship of causality.

Table 6 Causality model short run GDP and consumption in Indonesia for the year 1967-2014

Pairwise Granger Causality Tests			
Lags: 1			
Null Hypothesis:	Obs	F-Statistic	Prob.
_GDP does not Granger Cause _CSMPT	47	10.4233	0.0024
_CSMPT does not Granger Cause _GDP		5.15595	0.0281
Lags: 5			
Null Hypothesis:	Obs	F-Statistic	Prob.
_GDP does not Granger Cause _CSMPT	43	4.08852	0.0055
_CSMPT does not Granger Cause _GDP		4.09612	0.0055
Lags: 10			
Null Hypothesis:	Obs	F-Statistic	Prob.
_GDP does not Granger Cause _CSMPT	38	2.35351	0.0579
_CSMPT does not Granger Cause _GDP		2.24223	0.0686
Lags: 15			
Null Hypothesis:	Obs	F-Statistic	Prob.
_GDP does not Granger Cause _CSMPT	33	2.17610	0.3598
_CSMPT does not Granger Cause _GDP		2.20757	0.3559
Lags: 20			
Null Hypothesis:	Obs	F-Statistic	Prob.
_GDP does not Granger Cause _CSMPT	28	NA	NA
_CSMPT does not Granger Cause _GDP		NA	NA

Source : Self Proceed

In table 6 above presented the test results for the causality of the model with the short term. Using lags 1, 5, 10 and 15 intervals, there is a short-term causal relationship between the variable GDP and consumption. As for the use of delay interval 20 there is no causal relationship in the short term between the variable GDP and consumption in Indonesia.

CONCLUSION

This study identifies the relationship between GDP and annual consumption economics variables from 1967 to 2014 using ARDL, Cointegration and Causality granger analysis. not surprisingly, there is a long-run equilibrium relationship between GDP and consumption with a long-term ARDL model, a 10% change in consumption will result in long-term change of 44% in GDP. It is not surprising that there is no short-run equilibrium relationship between GDP and consumption. 10% of consumption will result in a short-term change of ARDL model of 95% in GDP. GDP variables and consumption are cointegrated in the long run significantly at lag interval 10, whereas the use of lags 1 and 5 intervals is not credited in the long run. Using a cointegration test with lag interval 1, 5 and 10 indicates significant for all usage slowness. So it can be summarized in the context of GDP and short term economic consumption that is cointegrated for all the prevailing interval lags. concludes that long-term causality test results between GDP variables and significant consumption with time intervals 5 and 10. intervals 1, 15 and 20 have no long-term causality relationship between GDP and consumption variables. causal model with short term. With lagging intervals of 1, 5, 10 and 15, there is a short-term causal relationship between the variable GDP and consumption. As for the use of delay interval 20 there is no causal relationship in the short term between the variable GDP and consumption in Indonesia.

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