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ASSESSING ECONOMIC GROWTH AND FISCAL POLICY IN INDONESIA

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ABSTRACT: This paper attempts to analyze the economic development and fiscal policy in Indonesia. Especially, it investigates whether Wagner and/or Keynes law(s) of economic development apply in the country and what variables determine the economic growth and fiscal policies. Technically, the paper uses econometric model called Autoregressive Distributed Lag model and Vector Auto Regression model to analyze both short and long run periods. The main finding is that both Wagner and Keynes law(s) occur in the Indonesian economy. Particularly, economic growth is influenced by government expenditures variables, namely employment expenditures, good expenditures and non tax income. Meanwhile, government expenditures are determined by exports of oil, imports and payment of debts. As such, the paper suggests that policy makers use employment expenditures as the fiscal policy variable while imports and exports of oil are the aggregate economy policy variables.

KEYWORDS: Wagner, Keynes, Fiscal.

JEL Classification**:** E12, E62

Introduction

Indonesia was ever been grouped as one of the East Asian Miracle countries because of its rapid economic growth and development (Stiglitz, 1996:1). The economic reformation in late 1980s has caused the flowing of foreign investment to the country, particularly to the export-oriented manufacturing sectors. Moreover, from early 1980's into late 1990's, Indonesia fortunately faced post-oil boom and complemented by the government's financial deregulation and renewed liberalization that condition has expanded the business sectors very rapidly and boosted economic growth. Hence, economic growth grew up over 7% from 1989 to 1997 positioning Indonesia into the one of those Asian miracle countries.

Nonetheless, despite such remarkable achievement, Indonesia was also part of the countries in Asia which suffered by economic crisis in 1997–1998. Such promising economic growth shrunk and Rupiah currency deeply depreciated during those difficult periods. However, starting in the year 2000's the country has slowly regained its economic momentum shown by its relatively stable exchange rate, increasing trend of economic growth and under controlled inflation.

In particular, the economy itself is dominated by transport and communication sectors; trade, hotel and restaurant; and construction sectors. These three non tradable sectors account for 32.3% of total GDP (2008). Manufacturing sector and, mining and quarrying sectors are also promising sectors which record 38.5% of total GDP (2008) besides agriculture sector which counts 15.3% of total GDP (2008). However from the expenditure side, the strength of the economy is in investments (construction) and private consumptions. The construction expenditures appear in the form of investment in machinery and appliance investment (World Bank, 2008: 6).

In this case, the role of government through fiscal policy seems very crucial in determining the direction of the economic development whilst the business (private) sectors shape the size of economic growth through their industrial and business activities (World Bank, 2008: 6). Nonetheless, in 2000's some external problems have affected the performance of the economy. Particularly, government had to reform its domestic oil policy because of the 2005-2006 world oil price shock besides releasing the economic stimulus program at the end of 2008 to help Indonesian economy from the severe impact of global financial crisis 2008-2009.

This paper attempts to analyze the economic development in Indonesia especially to investigate the relation between economic growth and government fiscal policy as illustrated before. The wagner's law of economic development which states that

economic growth leads to government expenditures and the Keynes' law which states that government expenditures determine economic growth will be examined and approved in this country case. Hopefully, the output of this paper could support the economic development process in Indonesia particularly suggesting what are the best economic development policies referring to the examination result of this paper.

Wagner Law and Keynesian Law on Economic Development

The correlation between government expenditures (fiscal policy) and economic growth has commonly connoted with two different laws. Firstly, the government expenditure is the triggering factor of economic growth which is Keynesian (1949) law of economic development. On the other hand, secondly, economic growth is believed as the deriving factor of the government expenditures which is Wagnerian (1890) law of economic development. Or, it can be said that Keynesian law addresses the importance of the government policy (fiscal policy) in leading the economic growth whilst Wagner relies on the aggregate economic mechanism which determines government policy.

In the context of modern economic policy, Keynes and Wagner laws above are very essential to be investigated by a country in order to precisely know the driver of economic development with respect to domestic output and fiscal policy. If the government expenditure is proven as the deterministic factor of aggregate national income, fiscal policy of the country should be positioned as the centre of economic development policy. The sources of government incomes and expenditures in this sense should comply with the needs of the economy. Further, fiscal policy should be able to inflate the economy through the productive allocation of government spending.

Usually, this law of economic development appears when a country has been suffered by economic crisis. Specifically, when the economic activities are highly impacted and there is a minimal hope to rebound except if government intervenes such economic condition with its fiscal policy. Indonesia in this case was ever severely hit by economic crisis in late 1990's and lately the global financial crisis in some ways also influenced the economic performance. To recover from that economic turbulence, fiscal policy played an important role in stimulating aggregate demand.

The other way around, if the aggregate national income is found to be the leading factor of the government expenditures, improving the economy performance is the centre of economic policy. Fiscal policy is going to be passive whilst private

sectors, economic deregulation and external economic activities play as the agents of economic development. Fiscal policy at least exists as the guardian of economic activities which is to prevent and protect the economy from unpleasant economic conditions and economic instability.

In fact, Indonesian economy was also driven by private sector activities through industrialization and foreign investment projects in some strategic sectors. This happened particularly before 1997's economic crisis and early 2000's as mentioned above. Therefore, in conclusion Indonesia has ever faced two experiences of economic development mechanism. Hence, exercising the two economic development laws (Keynes and Wagner) for the context Indonesia is very crucial for some reasons. Firstly, it is to test the existence of both laws (Keynes, Wagner or both of them) in Indonesia economy. Secondly, it is to trace any causality between the two laws (Keynes or Wagner) in Indonesian case. Lastly, it is to find which one of them (or both of them) best describes the agent(s) of economic development in the country.

Assumptions and Economic Modeling

The period of economic analysis was quarterly data from 1980 into 2008 due to limitation of the available fiscal data. The sources of data are from the central bank and ministry of finance capturing the data of:

- Economic growth and its elements from the expenditure side such as consumptions, investments, government expenditures and net export-import;
- Balance of payment and its breakdown such as trade balance, current account, services, capital account, overall balance, etc and;
- Government budget including sources of government incomes and government spending.

Those three macroeconomic indicators represent economic development process and fit with the purpose of the paper. In details, GDP stands for the domestic business sectors and economic activities; balance of payment represents economic activities with foreign parties including the involvement of foreign investors and; government budget reveals the government's fiscal policy.

Technically, the analysis constructs structural equation model with two approaches. The first one is Auto Regressive Distributed Lag (ARDL) model reflecting the dynamic short-term relation among variables in the model, such that:

$$Y_t = c + \alpha_1 X_1 + \alpha_2 X_2 \ldots + \beta_1 X_{t-1} + \beta_2 X_{t-2} + \ldots + \beta_1 Y_{t-1} + \beta_2 Y_{t-2} + \ldots + e \quad (1)$$

ARDL is chosen because (Studentmund, 2005: 173-175): (1) this technique allows each variable to be treated as independent or dependent variable in the equation; (2) besides in level, time lag of the variable(s) is often more influential to explain the dependent variable; (3) it can trace the causal relationship among variables which is one of the main purposes of this research; (4) It can detect the policy controlled variable(s).

The second one is long run dynamic model reflecting the cointegration among variables in the long run, such that:

$$Y_t = c + \alpha_1 X_1 + \alpha_2 X_2 + \ldots + \beta_1 Y_{t-1} + \beta_2 Y_{t-2} + \ldots + \varphi_1 ECM_{t-1} + \varphi_2 ECM_{t-2} + \ldots + v \quad (2)$$

In this technique, the dependent and independent variables are cointegrated if a linear combination of their individual integrated series (I(d)) is stationary or if $X_t \sim I(d)$ so $Y_t \sim I(d)$. Principally, when the residual from of regression is stationary or I(0) (Baltagi: 366-368). In this case the differences among variables in the short-run are cancelling out in the long-run.

The modeling process is done through 4 stages. The first stage is defining variables and model specification which consist of: (i) stationary (unit root) test; (ii) correlation coefficient test and; (iii) granger causality test. The basic idea of stationary test can be explained by taking a simple AR (Autoregressive) (1) process such that:

$$Y_t = a_0 + a_1 Y_{t-1} + \varepsilon_t \quad (3)$$

where Y_{t-1} is the lag independent variable which might contain a constant and trend; a is a constant and; ε is assumed to be a white noise (Enders, 1995: 70). If $|a_1| \geq 1$, Y_t is a non stationary series meaning it has a trend; does not have constant mean and; the variance is time variant. So, the hypothesis of stationary can be evaluated by testing whether absolute value of a_1 is strictly less than one.

Two common tests used in this stage are Augmented Dickey-Fuller (ADF) and Phillip and Perron (PP). ADF re-estimates equation (3) by subtracting Y_{t-1} such that (Lutkepohl and Kratzig, 2004:54):

$$\Delta Y_t = \alpha Y_{t-1} + \sum_{j=1}^{p-1} a_j \Delta Y_{t-j} + \varepsilon_t \quad (4)$$

where $\alpha = -a$, null and alternative hypothesis of H_0: $\alpha = 0$ and H_1: $\alpha < 0$; with $t_\alpha <$

α/(se(α)). The basic idea of ADF is to correct a high order serial correlation by adding lagged difference terms in the right hand side of the equation. Meanwhile, Phillips and Perron (PP) use nonparametric statistical methods to take care of the serial correlation in the error terms without adding lagged difference terms (Gujarati, 2004: 818).

Further, correlation coefficient is used to asses how strong the linear relation between dependent and independent variables. The correlation coefficient formula is:

$$r_{1,2} = \frac{\sum[(X_{1i} - \overline{X}_1)(X_{2i} - \overline{X_2})]}{\sqrt{\sum(X_{1i} - \overline{X_1})^2 \sum(X_{2i} - \overline{X_2})^2}} \quad (5)$$

with r value ranges between $-1 \leq r \leq 1$. If two variables has a perfect positive linear correlation, r = 1; it they have a perfect negative linear correlation, r = -1; and if there is no linear correlation, r = 0. Finally, granger causality specifically detects how much current dependent variable (Y_t) can be explained by past value of it (Y_{t-n}) and lag value of independent variables (X_{t-n}). Therefore, Y_t is said to be granger cause by X_t if the latter explain the former as well as lag of the former.

The second stage is constructing the ARDL models as described previously as well as fitting it with the requirement of classical normal error term in order to be a robust Gauss-Markov model. Technically, the six classical assumptions called classical error term plus one additional classical assumption called classical normal error term have to be met which are below:

1. The regression model is linear in the coefficient, correctly specified and has an additive error term;
2. The error term has a zero population mean;
3. All explanatory variables are uncorrelated with the error term;
4. Observations of the error term are uncorrelated with each other (no serial correlation);
5. The error term has a constant variance (no heteroskedasticity);
6. No explanatory variable is a perfect linier function of any other explanatory variable(s) (no perfect multicollinierity);
7. The error term is normally distributed.

If the regressed model violates one of the OLS properties above, the necessary adjustments should be taken to make it comply with such properties.

The third stage is building the short-run dynamic model. However, to build the long-run dynamic model, the forth stage, the process starts detecting any long-run causality (cointegrated model) between variables in the national income and government expenditures. It is conducted by using Johansen Multivariate Cointegration Analysis. If the multivariate long- run relationships exist in the model, the reality in short-run model tends to apply in the long-run relationship as well.

Thus, the economic development and performance as well as the fiscal policy do not only affect the short-term economic performance but also the long-term one. Moreover, Johansen analysis also tries to find the sufficient lags which will create a more well-behaved disturbance term and investigate through Vector Auto Regression (VAR) model of order p such that (Baltagi: 360-368):

$$\psi_t = c + \phi_1 \psi_{t-1} + ... + \phi_p \psi_{t-p} + \varepsilon \tag{6}$$

Where ψ is k-vector of non stationary variables, Φ is coefficient of lag such k-vector and ε is residual of the model.

If Johansen test notices any cointegrated variables, Granger causality process is taken to construct the long-run dynamic model of the existing short-run model. The method is called Error Correction Model (ECM) which is (for example of 2 variables):

$$\Delta Y_t = c + \varphi_t ECM_{t-n} + \alpha_0 \Delta X_t + \sum_{i=1}^{n} \alpha_i \Delta X_n + \sum_{i=1}^{n} \beta_i \Delta Y_n + \upsilon_t \tag{7}$$

$$\Delta X_t = c + \lambda_t ECM_{t-n} + \eta_0 \Delta Y_t + \sum_{i=1}^{n} \eta_i \Delta Y_n + \sum_{i=1}^{n} \omega_i \Delta X_n + \upsilon_t \tag{8}$$

ECM in models (6) and (7) is the fitted value of residual from the non stationary regression which represents the disequilibrium residuals of such cointegrated model. The final stage is interpreting the result of the models. It will determine which laws (Wagner or Keynes) truely applied in the Indonesian economic development model; what deterministic factors in the short-run and long-run equilibrium and; what economic policy should be adopted.

Defining Variables and Model Specification

After testing all variables involved in three macroeconomic indicators, the aggregate economic variable is significantly represented by GDP in its current

price (GDPB), the balance of payment stands for total exports of oil (OE) and total imports (I) and the government budget corresponds to the employee expenditures (EE), good expenditures (GE), Non Tax Incomes (NTI), payment of total debts (domestic and foreign) (DB), and total government expenditures (GVE). Other variables are less correlated and they do not have causality to explain either output side or government spending side.

Initially, in order to give an overall description of all variables, the statistical summary of those significant variables is depicted in table 1. A high variance of data occurs in some strategic variables which are GDP (GDPB), Debt Payment (DB), Employee Expenditures (EE), Good Expenditures (GE), Non Tax Incomes and total Government Expenditures (GE).

Table 1. Statistical Summary

Variable	Mean	Median	Std Deviation
Gross Domestic Product (GDPB)*	252,863	92,988	312,337
Debt Payment (DB)**	8,020	4,795	8,028
Oil Export (OE)**	3,461	3,084	1,466
Total Import (I)**	4,851	4,086	2,378
Employee Expenditure (EE)*	6,120	2,931	7,163
Non Tax Income (NTI)*	15,209	5,243	22,118
Good Expenditure (GE)*	2,498	906	4,279
Total Government Expenditure (GVE)*	14,278	8,023	16,142

* billion Rp; ** million USD

Sources: Bank Indonesia, Ministry of Finance and CEIC data based

Amongst other reasons, the severe impact of 1997-Asian economic crisis to the economy was the most influential factor causing such high variance. Indonesia lost 13.5% of its GDP during 1997-1998, had to pay foreign loan of USD138 billion (March 1998)[1] and the value was inflated due to the 80% depreciation of Rupiah from Rp2,400/USD into Rp17,000/USD (Jan 22nd, 1998). Meanwhile, the foreign reserves were only USD14.4 billion in that time. Government expenditures were also down because of the less government revenues such as a drop in the non tax incomes.

Then, for the purpose of establishing ADRL model, the unit root test of those variables with ADF and PP test is given by table 2. ADF and PP tests express that all variables are precisely stationary in their first difference (I(1)) except Non Tax

[1] USD72.5 billion was foreign debt of private sector where USD20 billion of it matured at the end of 1998.

Incomes (NTI) which is stationary in level (I(0)) and Good Expenses (GE) and Total Government Expenditure (GVE) which can either stationary in level (I(0)) or in first difference (I(1)). From this result, the model of national income and fiscal policy can be initially identified as functions of:

$$GDP = f(EE, GE, NTI) \tag{9}$$

$$GVE = f(OE, DB, I) \tag{10}$$

Table 2. Stationary Test

Variable Name	Augmented Dickey-Fuller		Phillip and Perron	
	Level	1st Difference	Level	1st Difference
GDPB	2.607	2.729	11.845	-5.295***
DB	-0.74	-21.349***	-1.867	-20.673***
OE	0.902	-9.070***	0.902	-9.028***
I	-0.436	-13.382***	-0.911	-13.637***
EE	7.143	1.393	3.15	-14.585***
NTI	2.128	0.879	-7.011***	
GE	2.623	-2.690*	-6.715***	
GVE	4.372	-4.25***	-3.366**	

Note: *,**,*** refers to stastical significance of 10%, 5% and 1%

Following unit root test, the investigation through coefficient of correlation is needed to check the correlation among variables in models (9) and (10) above. The result is written in table 3. GDP correlates more than 50% with Employee Expenses (EE), Good Expenses (GE) and Non Tax Incomes (NTI) with the highest correlation in NTI. However, unlike others, GDP and GE shows a negative correlation meaning government investment in goods does not give direct (short-term) impact on the growth of the economy.

Table 3. Coefficient of Correlation

Variable Name	Value of Coefficient of Correlation					
	D(EE)	D(GE)	NTI	D(OE)	D(DB)	D(I)
D(GDPB)	0.3209	-0.117	0.565			
D(GVE)				0.265	0.398	0.252

Meanwhile, total government expenditures (GVE) show strong and positive

correlation with exports of oil (OE), payment of debts (DB) and total imports (I). The highest correlation comes from debt payment as before the 1997 Asian crisis debt was the dominant component in the government budget as described before. The export and import activities are also the major factors which determine the magnitude of government spending (fiscal policy).

Finally, Granger Causality test complements coefficient of correlation in particular to know the direction of the identified correlation among variables. Table 4 lists the result of the Granger Causality test.

Table 4. Granger Causality Test

Null Hypothesis	F-Statistics	P-value	Conclusion
EE does not Granger Cause D(GDP)	72.9722	0.000	Not accepted
GE does not Granger Cause D(GDP)	36.215	0.000	Not accepted
NTI does not Granger Cause D(GDP)	34.0611	0.000	Not accepted
D(OE) does not Granger Cause D(GVE)	5.2917	0.023	Not accepted
D(DB) does not Granger Cause D(GVE)	4.9700	0.027	Not accepted
D(I) does not Granger Cause D(GVE)	15.8789	0.000	Not accepted

Granger test confirms initially that Keynes law potentially happens in Indonesian case where fiscal policy represented by employment expenses, good expenses and non tax incomes cooperatively influence the changes in national incomes (gross domestic product). On the other way around, Wagner law potentially applies as well. Changes in government expenditure (fiscal policy) depend on the changes in total exports, total debt payments and total imports. ARDL model below further analyzes the two indications above.

Autoregressive Distributed Lag (ARDL) Model

Continuing the previous findings, ARDL model further inspects the relation between dependent and independent variables including which lag(s) of independent variables that best explain the dependent variable. The first ARDL regression of model (9) gives detail of the model as in the following:

$$\Delta(GDPB_t) = c+\beta_1\Delta(EE_t)+\beta_2\Delta(EE_{t-1}) + \beta_3\Delta(GE_{t-3}) + \beta_3(NTI_t) + \beta_3(NTI_{t-1}) + e \quad (11)$$

Table 5 depicts the result of this estimated GDP model (Keynes law). The regression has fit the requirement of classical normal error term including Ramsey RESET test for correctly specified equation.

Table 5. Estimated GDP Model

Dependent Variable: D(GDPB)		
Independent Variable	***Coefficient***	***t-statistic***
Constant	-213.7527	-0.1460
D(EE)	2.9183	4.1230
D(EE(-1))	1.8229	2.0881
GE(-3)	1.9816	3.8257
NTI	0.3116	3.7174
NTI(-1)	0.3636	4.8427
Diagnostic Analysis	***Value***	***P-value***
R-squared	*0.7057*	
Residual Sum of Square	*1.49E+10*	
Akaike Info Criterion	*21.66*	
F-Statistics	*50.3775*	*0.0000*
Jarque Bera	*74.4842*	*0.0000*
LM test	*0.7933*	*0.3751*
ARCH LM test	*1.5314*	*0.2185*
Ramsey RESET	*4.2361*	*0.0420*

Table 6. Estimated Government Expenditures Model

Dependent Variable: D(GVE)		
Independent Variable	***Coefficient***	***t-statistic***
Constant	1144.758	1.5399
D(DB(-4))	0.5958	2.5290
D(I(-3))	-3.4843	-3.9490
D(OE(-4))	5.0480	2.7985
D(GVE(-1))	-0.4193	-5.7741
D(GVE(-3))	-0.3627	-4.2299
Diagnostic Analysis	***Value***	***P-value***
R-squared	*0.5381*	
Residual Sum of Square	*6.13E+09*	
Akaike Info Criterion	*20.7837*	
F-Statistics	*24.2399*	*0.0000*
Jarque Bera	*52.6191*	*0.0000*
LM test	*4.1217*	*0.04491*
ARCH LM test	*4.7553*	*0.03139*
Ramsey RESET	*0.906*	*0.3433*

The model reveals that the current changes and the last period of employment expenditures (ΔEE_t and ΔEE_{t-1}); together with the last quarter of good expenditures (ΔGE_{t-3}) are the dominant variables from government budget (fiscal policy) which influence the current changes of economic growth ($\Delta GDPB_t$). Following those three variables, the current and the last one period of non tax incomes also affect such changes of GDP but with a lower magnitude. This model suggests that it is the last quarter of good expenditures which positively impact the economic growth because the current level of good expenditures give negative impact on economic growth as previously detected.

Meanwhile, the second ARDL regression of model (10) constructs the robust model of total government expenditures as in the following:

$$\Delta(GVE_t)=c+\beta_1\Delta(DB_{t-4})+\beta_2\Delta(I_{t-3})+\beta_3\Delta(OE_{t-4})+\beta_3\Delta(GVE_{t-1})+\beta_3\Delta(GVE_{t-3})+e \qquad (12)$$

Table 6 displays the regression outputs which have also fitted the requirement of classical normal error term including Ramsey RESET test for correctly specified equation. Particularly, the model clarifies that the current changes in total government expenditures (ΔGVE_t) are triggered principally by the changes in the last four periods of exports of oil (ΔOE_{t-4}) and the last quarter of total imports (ΔI_{t-3}). Besides those variables, the changes in the last four periods of debt payments (ΔDB_{t-4}) and the changes in the last one and three (quarter) periods of total government expenditures (ΔGVE_{t-1} and ΔGVE_{t-3}) affect changes in the current government expenditures (ΔGVE_t).

Interestingly, unlike the original idea of Wagner's law which says that government expenditures depend fully on the economic outputs, this robust model of government expenditures shows that not only real sector activities (economic output) affects it but also the previous (lag of) government expenditures. Therefore, the pure Wagner law does not appear in this case. However, the GDP model indicates the pure application of Keynes law as it is explained by all government expenditure's variables without any involvement of the previous GDP variable.

Long Run Dynamic Model

Continuing the short-run model above, this section observes the existence of long-run relationship (cointegration) among variables in models (9) and (10). First of all, all variables in model (9) are not stationary in level except Non Tax Incomes (NTI). Hence, Johansen Multivariate Analysis exercises model (9) without non tax income. The trace test and maximum eigenvalue test indicate three cointegrating

variables at 5% level as illustrated in tables 7 and 8:

Table 7. Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistics	0.05 Critical Value	Prob**
None*	0.409118	89.42427	29.79707	0.0000
At most 1*	0.187774	31.54901	15.49471	0.0001
At most 2*	0.075805	8.671514	3.841466	0.0032

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 8. Unrestricted Cointegration Rank Test (Max Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max Eigen Statistics	0.05 Critical Value	Prob**
None*	0.409118	57.87526	21.13162	0.0000
At most 1*	0.187774	22.87749	14.2646	0.0017
At most 2*	0.075805	8.671514	3.841466	0.0032

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 lev
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Next, all variables in model (10) are also not stationary in level so that Johansen Multivariate Analysis examines them together unexceptionally. Table 9 displays the result of the test and implies that only one cointegrating variables appears at 5% level which is from trace test whilst Maximum Eigenvalue test does not indicate any cointegration among variables.

Table 9. Unrestricted Cointegration Rank (Trace) Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistics	0.05 Critical Value	Prob**
None*	0.216968	54.52817	47.85613	0.0104
At most 1*	0.154327	27.62422	29.79707	0.0873
At most 2*	0.047981	9.185742	15.49471	0.3485
At most 3*	0.033754	3.777052	3.841466	0.052

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

These findings underline the further analysis to identify the causal relationship of variables by using Granger causality (as stated previously) with ECM variable. For model (9) which is the GDP-Government expenditure model, Granger causality test creates a model that consist of dependent variable, error correction model (ECM) variable, lag of dependent variable and lag of three independent variables as written below:

$$\Delta(GDPB_t)=c+\varphi ECM_{t-1}+\alpha_0\Delta(GDPB_{t-1})+\beta_0\Delta(EE_{t-1})+\delta_0\Delta(GE_{t-1})+e \quad (13)$$

$$\Delta(EE_t)=c+\varphi ECM_{t-1}+\beta_0\Delta(EE_{t-1})+\alpha_0\Delta(GDPB_{t-1})+\delta_0\Delta(GE_{t-1})+e \quad (14)$$

$$\Delta(GE_t)=c+\varphi ECM_{t-1}+\delta_0\Delta(GE_{t-1})+\alpha_0\Delta(GDPB_{t-1})+\beta_0\Delta(EE_{t-1})+e \quad (15)$$

Table 10. Causality Test of GDP Group

	GDPB	GE	EE
GDPB (-1)	0.9024	0.0676	0.0055
	-0.1120	-0.0204	-0.0071
	[8.0555]***	[3.3174]***	-0.0071
GDPB (-2)	0.1549	-0.0696	0.0228
	-0.1169	-0.0213	-0.0074
	[1.32514]	[-3.2703]***	[3.0696]***
GE (-1)	1.0554	-0.0019	0.0282
	-0.5695	-0.1036	-0.0362
	[1.85314]*	[-0.01858]	[0.77994]
GE (-2)	0.6917	0.0140	0.0144
	-0.6174	-0.1123	-0.0392
	[1.12045]	[0.12502]	[0.36649]
EE (-1)	2.2453	0.2195	-0.0002
	-1.0220	-0.1859	-0.0649
	[2.1969]**	[1.18064]	[-0.00284]
EE (-2)	-3.0934	0.2608	-0.1514
	-1.1128	-0.2025	-0.0707
	[-2.7797]***	[1.28835]	[-2.1420]**
C	-703.8928	-535.1670	284.4007
	-1823.0900	-331.6830	-115.7660
	[-0.38610]	[-1.61349]	[2.4566]**
ECM1	-0.0194	-0.0050	-0.0254
	-0.0296	-0.0054	-0.0019
	[-0.65675]	[-0.92594]	[-13.521]***

*,**,*** rejection of hypothesis at 10%, 5%, 1%

Table 11. Causality Test of Government Exp Group

	GVE	DB	I	OE
GVE (-1)	-0.099264	-0.021778	-0.025933	-0.00927
	-0.05129	-0.0392	-0.01085	-0.00558
	[-1.9353]*	[-0.55553]	[-2.3897]**	[-1.66070]
GVE (-2)	0.181107	0.055923	0.037352	0.019217
	-0.04991	-0.03815	-0.01056	-0.00543
	[3.6284]***	[1.4659]	[3.5369]***	[3.5375]***
DB (-1)	0.401955	0.346244	0.006751	0.003301
	-0.12006	-0.09176	-0.0254	-0.01307
	[3.3480]***	[3.7733]***	[0.26578]	[0.25262]
DB (-2)	0.59769	0.569864	-0.007628	-0.006236
	-0.12086	-0.09237	-0.02557	-0.01315
	[4.9454]***	[6.1692]***	[-0.29832]	[-0.47406]
I (-1)	2.330673	0.388326	0.805357	0.058581
	-0.4723	-0.36098	-0.09993	-0.0514
	[4.9347]***	[1.07575]	[8.0594]***	[1.13964]
I (-2)	-0.204573	-0.344216	0.095691	-0.020606
	-0.49559	-0.37878	-0.10486	-0.05394
	[-0.41278]	[-0.90874]	[0.91260]	[-0.38202]
OE (-1)	2.904788	0.342577	0.183234	1.116662
	-0.92729	-0.70873	-0.19619	-0.10092
	[3.1325]***	[0.48337]	[0.93395]	[11.064]***
OE (-2)	-1.038129	-0.335947	-0.109083	-0.22435
	-0.97496	-0.74516	-0.20628	-0.10611
	[-1.06479]	[-0.45084]	[-0.52882]	[-2.1143]**
C	-11070.87	250.4224	158.2912	110.207
	-1265.61	-967.309	-267.773	-137.744
	[-8.7474]***	[0.25889]	[0.59114]	[0.80009]
ECM1	0.900462	-0.08001	-0.007282	0.00244
	-0.05162	-0.03945	-0.01092	-0.00562
	[17.444]***	[-2.0279]**	[-0.66676]	[0.43436]

*,**,*** rejection of hypothesis at 10%, 5%, 1%

And the same procedure with model (10) which is the Government expenditures-GDP model, Granger causality test creates a model that consists of dependent variable, error correction model (ECM) variable, lag of dependent variable and lag of four independent variables as written below:

$$\Delta(GVE_t) = c+\varphi ECM_{t-1}+\alpha_0\Delta(GVE_{t-1})+\beta_0\Delta(DB_{t-1})+\delta_0\Delta(I_{t-1})+\theta_0\Delta(OE_{t-1}) + e \quad (16)$$

$$\Delta(DB_t) = c + \varphi ECM_{t-1} + \beta_0\Delta(DB_{t-1}) + \alpha_0\Delta(GVE_{t-1}) + \delta_0\Delta(I_{t-1}) + \theta_0\Delta(OE_{t-1}) + e \quad (17)$$

$$\Delta(I_t) = c + \varphi ECM_{t-1} + \delta_0\Delta(I_{t-1}) + \alpha_0\Delta(GVE_{t-1}) + \beta_0\Delta(DB_{t-1}) + \theta_0\Delta(OE_{t-1}) + e \quad (18)$$

$$\Delta(OE_t) = c + \varphi ECM_{t-1} + \theta_0\Delta(OE_{t-1}) + \alpha_0\Delta(GVE_{t-1}) + \beta_0\Delta(DB_{t-1}) + \delta_0\Delta(I_{t-1}) + e \quad (19)$$

Then the running of models (13)-(15) and (16)-(19) generates the long-run dynamic model of GDP-government expenditures and Government expenditures-GDP and are both displayed in tables 10 and 11 respectively. Table 10 explains that GDP and employment expenditures have a bicausality relationship. Meanwhile, good expenditures depend on GDP in one way causality. Meanwhile, table 11 finds that both total imports (I) and exports of oil (OE) have a bicausality with government expenditures whilst payment of debt influences total government expenditures in one way causality.

Models' Findings and the Historical Condition

ARDL models suggest that economic growth relies on the contribution of fiscal policy. From the expenditure side of the government budget, the current and the last period employment expenditures directly influence the current economic growth followed by the last quarter of good expenditures. In addition, from the income side of the government budget, the current and the last period of non tax incomes cooperatively determine the current GDP. It is because the more government earns money, the more its spending. Therefore, it is important for fiscal authority to concentrate on those influential variables with the aim to increase the economic output. In fact, unless caused by economic crisis (such as 1997-1998 economic crisis), the role of fiscal policy to advance economic growth is not really satisfactory.

On the other way around, ARDL models also suggest that the recent government expenditures depend positively on the performance of real sectors. When the business activities are in pleasant condition because of the prospective economic condition, the government budget will be going along such promising economic activities. The exports of oil and the ability to pay foreign debts imply the healthy and prospective business of private sectors leading to the higher government incomes (for example from tax) and allowing spending more funds to various projects.

Meanwhile, during the early period of spiking world oil price (2005-2006), government took strategic policy to progressively reduce the oil subsidy in the domestic oil price (Ismal, 2006: 16). As a result, since that period, although total import of oil was raised due to the domestic demand of oil, the government expenditures (for domestic oil subsidy) were decreasing. Finally, the government expenditures have cycles of flow of funds. The current government expenditures go down if they went up in the last one and three periods and vice versa.

The long-run dynamic models of economic growth and fiscal policy inform some other messages. Firstly, among government expenditure variables which affect economic growth, the employment expenditures are the one with bicausality. The issue of the salary of state employees (people who work in the various government departments and institutions) can clearly explain this finding. Whenever government adjusts their salary (employee expenditures) it will directly impacts the domestic price (inflation) and economic growth later one.

Secondly, among the balance of payment variables and the aggregate demand variables, total imports and exports of oil are the most influential ones influencing the magnitude of government expenditures as recognized by their bicausality. Actually, the historical activities of imports and exports of oil imply the ability of government budget to do expansion or contraction.

Closing Remarks

Referring to the results of economic modeling, Wagner and Keynes law apply in Indonesian economic development even with causality indication between them. According to its natural role which says that fiscal policy plays an essential position in the situation of economic slow down, it can be done in the country through activating the employment expenditures as the influential fiscal policy variable. And, in the normal and prospective economic condition where fiscal policy exists passively, activating the export and import activities is very essential to perform the well-appropriate government expenditures and economic growth. Indeed these two real sector variables are policy variables during the prospective economic condition.

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