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# Two Steps Of Ricardian Equivalence: An Evidence In Indonesia

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## Abstract

Ricardian Equivalence was analyzed through the influence of deficit fiscal policy on consumption, the fiscal deficit policy of Soeharto regime and reform had a difference, the difference lied in the policy as outline in the government budgets preparation. Soeharto regime applied budget concept of the T-account model, while the reform applied budget concept of I-account. The differences of concept budgetting affected the deficit fiscal policy, while the component of deficit fiscal policy consisted of budget deficits, government expenditure, government debt, and tax revenue. The purpose of this paper is to determine the effect of the differences in Soeharto regime and reform toward deficit fiscal policy component, as well as to determine the effect of deficit fiscal policy to domestic consumption, and determine the Ricardian Equivalence phenomenon and formation. Based on these objectives, an analysis tool used was Ordinary Least Squared (OLS) and Two Stage Least Squared (TSLs), with time series data from the years 1969-2013. The analysis showed that the difference reign did not significantly affect the components of deficits fiscal, and Ricardian Equivalence happened in Indonesia by the year 1969-1981 as Ricardian first period, and 1982-2013 as the second period of Ricardian.

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## Keywords

Consumption, Fiscal Policy, Ricardian Equivalence, TSLs

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## INTRODUCTION

The effect of fiscal deficit policy on the economy was still a big question in the economy, various studies had been carried out at different conclusions. That different conclusion was based on three basic ideas, the ideas of the Classics, Keynes' thought, and Ricardian's thought. Ricardian's thought emerged after a difference between the predictions of economists and phenomena that occurred in the United States. According to predictions, the deficit budgetary happened in America would have a negative impact on the economy, where the budget deficit will lead to higher interest rates, lower saving, lower economic growth and raising the budget deficit, but US economy at that time indicated the opposite condition, where the real and nominal interest decreased, increased investment spending, declining unemployment and rising real GNP growth (Barro, 1989). The difference was taken by Barro with previously sparked alternative theory proposed by David Ricardo, and the alternative theory was the theory of Ricardian equivalence (RE).

Ricardian equivalence is based on Seater studies (1993) was a continuation of the permanent income/life cycle hypothesis (PILCH) theory, where this hypothesis can be explained through the logic of government expenditure, taxes and debt affects household decisions in making consumption. Ricardian Equivalence by Gruber (2013) concludes that the budget deficit impact neutral to the economy, where government expenditure financed through debt cannot increase consumption, because of rising government debt would increase the tax burden in the future, so that consumers will prefer to save their income for payment more taxes in the future.

Ricardian Equivalence could happen in two stages, the first stage was when the government implemented of tax cutspolicy, where tax cut policy might not affect consumption significantly, the second stage happened after the tax cuts policy, which would return increased tax revenue; an increase in tax revenue was not significant affect consumption. RE phenomenon could occur with the assumption infinites horizon, a perfectly competitive market, the certainty of

future revenue and tax, lump-sum tax, and full employment.

Ricardian equivalence was basically possible with that five assumptions, but research of Giorgioni & Holden (2010) explained that the phenomenon of Ricardian equivalence can also occur in countries with high debt levels, and the results of the study concluded that Ricardian equivalence occur in ten developing countries, where the state developing a country that has a high debt level.

RE logic in Indonesia could be seen in the government's policy which was implemented into the state budget, where there was a component in the state budget deficit fiscal policy that was applied in the form of setting deficits, government expenditure, government debt, and tax revenue. Indonesia was a developing country that always applied the budget deficit, which the government expenditure was always greater than the government revenue, besides that Indonesia's debt level was also very large. Very big Indonesia's foreign debt once happened when Soeharto regime, and at the end of Soeharto regime left a huge debt to the next generation. At the next government, namely the Reform Order, government foreign debt could be minimized, but the composition of financing sources through the debt increases, in addition to foreign debt, government debt was also derived from Government Securities (SBN) in force since 1998, and loans in the country used since 2010.

Structure of the state budget (APBN) and components fiscal deficit showed a difference between Soeharto regime and governance reform. The differences were in the APBN draft preparation, the amount of the budget deficit, and financing deficit. Therefore, the purpose of this study is to determine the impact of differences in future policy towards component fiscal deficit consisting of budget deficits, government expenditure, government debt and taxes, by estimating Instrumental Variable (IV) of independent variables of the consumption function using Two Stage Least Square (TSLS) first stage. The second objective is to determine domestic consumption in Indonesia by estimating the consumption function using Ordinary Least Square method (OLS) and Two Stage Least Square (TSLS) second stage, the analysis of policy influence budget deficit on consumption in the first stage and the second stage is also in the estimates

using OLS. The third objective is to determine whether Ricardian equivalence phenomenon occurred in Indonesia.

Deviation of RE assumptions, and the state of economy that did not support RE theory, generally found in developing countries, so that it could be deduced that the developing countries did not experience RE phenomenon. Clarify that RE statement did not happen in developing countries, research of Hebbel and Easterly (1993) analyzed RE in 10 developing countries, and the estimation results showed that half of 10 developing countries to follow Keynes's prediction, and the other half followed the classical prediction. Other empirical results, RE occur in some developing countries, although the assumptions and the situation economic in the country's does not support the Ricardian, such as research Giorgioni and Holden (2001), which analyzes RE in 10 developing countries. Results from the study indicated that RE effect on developing countries, because the level of debt in developing countries was quite high, and Ricardian effect in countries with high debt levels.

Pakistan is one of the countries in the Giorgioni and Holden study, specifically research on Pakistan conducted by Waqas & Awan (2011), and Saeed & Khan (2013). Contrary to the research results of Giorgioni & Holden, it conducted specifically on Pakistan Waqas and Awan showed that consumer behavior followed the predictions of Keynes, while Saeed and Khan's research showed that Pakistan consumer behavior followed the Classic predictions. Research in other developing countries is also carried out by Adji (2007), Adji tested RE in Indonesia, the results of the study refused RE, Indonesian consumer behavior in accordance with the thought of Keynes.

Consumer behavior research is also carried out in other countries, such as Pozzi, et.al research (2004), empirical research is not based on RE directly, but the tests was done to see the effects of government debt on private consumption in OECD countries. The analysis showed that government debt had a positive effect on the sensitivity of private consumption. These results indicated that when the government has a high debt level, Keynesian theory is more likely to show consumer behavior. RE empirical research on OECD countries also carried out by Reitschuler & Cuaresma (2004), the results showed that 10 out of 26 OECD countries

support the Ricardian, 9 of the 10 countries are European countries. Proving the occurrence of RE in European countries conducted by Kooij (without years) were analyzed RE in 11 European countries, the results of the analysis showed that 9 countries refused RE, and 2 received RE, the country that receives RE are Netherlands and Spain. Contrary to the results of research Kooij, research in the Netherlands conducted by Heijdra & Dalen (1996) showed that the Dutch consumer behavior incompatible to RE, but according to Keynes thought.

America is also part of the OECD countries that refuse RE on Reitschuler and Cuaresma research (2004). Various studies in the US showed different results, which is Rockerbie (2010), RE research by combining consumer's budget constraint received RE. Research in America with different methods Hatzinikolaou (2013), the analysis showed that consumer behavior after merging the government budget constraint into their own budget constraints more likely to follow the classical prediction. Empirical research was also conducted on four South American countries, research Mohabbat & Khan (2003), the results of research in general 4 South American countries in accordance with the theory of Keynes. RE research in America gave different results, support this statement, Cardia (1997) which analyzed RE in the United States by using four different cases suggested that the impact of fiscal policy on private consumption provided conclusions that were not clear, the meaning could not be determined with certainty theory valid in the United States. Sachsida .ea .al, (2010) by adopting a procedure to analyze RE Cardia and did the test by using super exogeneity tests, the results of research in accordance with the conclusions of Cardia, with stronger results.

**RESEARCH METHODS**

This paper used two methods, Ordinary Least Square (OLS) and Two Stage Least Square (TSLS). OLS was used to estimate the consumption function that did not include instrument variable (IV) into the model, while TSLS used to estimate the consumption function by inserting IV into the model. Two Stage Least Squared (TSLS) by Greene (2012) & Wooldridge (2004) was the method used to estimate identified equation, or a model that had a free variable that was influenced by other variables that were not in the equation. Formed consumption function

models was consisting of domestic consumption (Cdom), GDP as a proxy of income, growth deficit budgetary (PRDF), government expenditure growth (PG), debt growth (PU), tax revenue (Tx), domestic savings (W), interest rates on deposits (i), and credit (Cr) as a proxy of liquidity constraints existence, Second Sergeant dummy variable period (Dm) which consisted of New Order era that lasted from the year 1970-1999, which was denoted by zero (0) and reign of the reforms that took place since the year 2000-2013, which was denoted by number one (1).

**RESULTS AND DISCUSSION**

Consumption determination analysis performed using data from Indonesia in 1970 until 2013, obtained from the Finance and Budget Memorandum in Indonesia, World Bank, Seki Bank Indonesia, and Central Statistics Agency (BPS) in Indonesia. The first method was used to determine whether differences in policy term effect on the policy component of the budget deficit was the first stage of TSLS method, this method was used to estimated models that had been affected by independent variables other variables outside the model, the estimation results are in Table 1.

**Table 1. Estimation Result**

EST DV	$\beta_1, d$ (Loggd)	$\beta_2, d$ (PRDF)	$\beta_3, d$ (PG)	$\beta_4, d$ (PU)	$\beta_5, d$ (Tx)	$\beta_6, d$ (LogW)	$\beta_7, d$ (Cr)	$\beta_8, d$ (Dm)
d(PRDF)	369,5 (0,91)	-	-1,72 (0,6)	0,12 (0,81)	9,1 (0,62)	713,7 (0,61)	14,48 (0,57)	23,29 (0,9)
d(PG)	118,91 (0,45)	-0,003 (0,64)	-	0,04 (0,07)**	-1,72 (0,03)*	-77,5 (0,2)	-1,48 (0,19)	-0,99 (0,9)
d(PU)	2983,6 (0,00)*	0,01 (0,81)	2,04 (0,07)**	-	19,5 (0,00)*	-456,1 (0,3)	7,29 (0,36)	10,67 (0,86)
d(Tx)	-72,9 (0,02)*	0,0007 (0,62)	-0,07 (0,03)*	0,01 (0,00)*	-	7,1 (0,58)	-0,11 (0,63)	1,1 (0,53)

( ) Probability

\* Significant at  $\alpha = 5\%$ , \*\* Significant at  $\alpha = 10\%$

The first stage of TSLS estimation results indicated that positive growth of budget deficit was not significantly affected by dummy variable, with coefficient of 23.29, means that at Reformation the growth of budget deficit was bigger than New Order with a value of 23.29 percent. But the difference in that time

did not significantly affect the growth of budget deficit. The growth of budget deficit in the reform period was greater because at the beginning of Reformation in Indonesia experienced a period of recovery from economic crisis, so the government was trying to stimulated their economy by increasing government expenditure and cut government revenue. The estimation results of negative government expenditure growth did not significantly affect by a dummy variable, with coefficient of -0.99, means that the Reformation was smaller than New Order, but the differences was in the policy period did not have much effect on the government expenditure growth. Variable government debt growth also indicated that the positive dummy variable was not significant to the debt growth, with the coefficient of 10.67 percent, which means that debt growth in Reformation was greater than during the New Order government debt on a larger reform, as a source of government debt also came from foreign loans, government securities, and loans in the country, but the amount of debt growth did not occur significantly because of tax revenue that could be improved on the Reformation. Similar results were shown by the results of the tax estimates, which indicated that the positive dummy variable was not significant to the tax revenue, which means that Reformation tax revenue was bigger than New Order, this thing could happen because government was success in increasing tax revenue. The results estimated the effect of dummy variable to variable components of fiscal deficit was not significant, this means that the variable could not be a dummy explanatory variable of budget deficit growth, the government expenditure growth, government debt growth, and tax revenue. The next stage was to do TSLS estimation in the second stage, at this stage of the estimation carried out on the model of consumption function, by entering the first stage of TSLS estimation result into independent variable. The result TSLS estimation on the second stage shown in Table 2 below.

**Table 2. Estimated Results OLS and TSLS phase II**

Variable	Metode	
	OLS	TSLS
$\beta_1$ d(Loggdp)	1,15 (0,00)*	0,73 (0,03) *
$\beta_2$ d(PRDF)	4,15 (0,36)	5,93 (0,09) **
$\beta_3$ d(PG)	-0,0001 (0,2)	0,001 (0,09) **
$\beta_4$ d(PU)	4,75 (0,06)**	5,93 (0,31)
$\beta_5$ d(Tx)	-0,0003 (0,46)	- 0,001 (0,26)
$\beta_6$ d(LogW)	-0,27 (0,00)*	-0,19 (0,03) *
$\beta_8$ d(Cr)	-0,0001 (0,76)	-5,89 (0,9)
Adjusted R <sup>2</sup>	0,87	0,87

PRDF, PG, PU, Tx on models TSLS is (PRDF) (PG) (PU) (Tx) ( ) probability

\* Significant at  $\alpha = 5\%$ , \*\* Significant at  $\alpha = 10\%$

Where:

Cdom = domestic consumption

GDP = Gross Domestic Product

PRDF = Growth budget deficit

PG = Growth of Government spending

PU = Growth of Debt

Tx = Tax

W = National saving

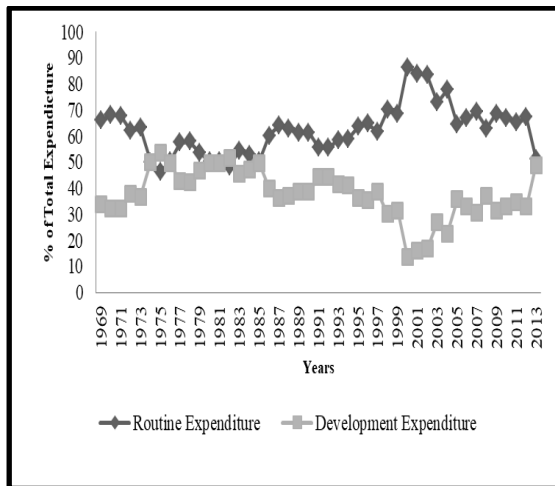
i = interest rate loans

Cr = domestic credit

Estimation Results TSLS on the second stage and OLS showed that the change of positive earnings significantly influence changes in domestic consumption, means that any changes in revenue of 1 trillion, would increase the changes of domestic consumption, the results of such estimated in accordance with the theory of Keynes said that the higher income will increase consumption, in this case the revenue increase response by consumers to improved consumption. Positive variable of budget deficit growth was not significantly toward domestic consumption, means that budget deficit could not stimulate domestic consumption, although the deficit growth could increase domestic consumption changes, the domestic consumption growth influenced positive deficit because the budget deficit increased in government consumption, but could not increase private consumption.

Government expenditure growth Variable along with positive TSLS was not significantly affected change in domestic consumption, while negative OLS estimated with no

significant; to explain the effect of government expenditure on domestic consumption used the results of OLS estimation. TSLS used was not recommended because the instrument variable estimation in the first stage of TSLS estimated were not significantly influence the policy component of the fiscal deficit. Government expenditure did not significantly affect domestic consumption because the majority of government expenditure allocated to routine expenditures, as shown in Figure 1.



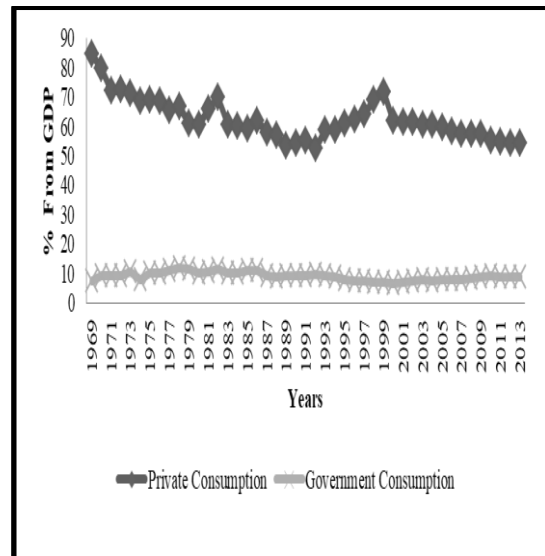
sources: Nota Keuangan dan APBN Indonesia.

**Figure 1 Government Routine Expenditure and Development Expenditure (%)**

The government expenditure allocation into regular expenses could not increase in private consumption, since government expenditure allocated to recurrent expenditures would reduce government expenditure to development.

The estimation results of variable debt growth positively insignificant, meaning that when an increase in debt growth in domestic consumption increased, but the growth of debt did not have much effect on the change in domestic consumption, this happened because of the debt used to finance government expenditure, so that government expenditure increased, government expenditure more dominated by routine expenditures, so the increase in debt that increase government expenditure could not boost private consumption, thus the government debt only increased government consumption, but did not increase in private consumption, overall domestic consumption was not increased, because the domestic

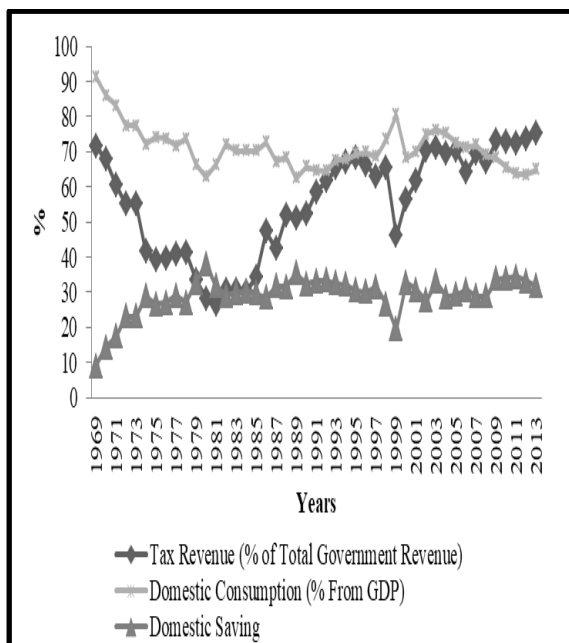
consumption was dominated by private consumption, as shown in Figure 2.



Sources: Nota Keuangan dan APBN Indonesia

**Figure 2 Private Consumption Expenditure and Government Expenditure (%)**

Tax revenue variable was negative not significant, meaning that tax revenue the government negatively affected changes in consumption, higher tax revenues illustrated that the greater tax burden, the greater tax burden decreased in disposable income, reduced income could reduce consumption, but tax revenues did not significantly because consumers used their savings to meet its consumption, which in the previous period, tax cuts were not used to increase consumption, but to boost savings, as shown in Figure 3.



Sources: Nota Keuangan dan APBN Indonesia

**Figure 3. Domestic Consumption and Tax Revenue**

The result of the domestic savings change variable estimation negatively significant to changes in domestic consumption, the results of these estimations could be interpreted that the revenue was used to increase saving would reduce the income used for consumption, thus increasing the savings could reduce consumption. Domestic credit variables affected negative insignificant, meaning that domestic credit supply provided was not used to increase consumption, because the consumers were aware of budgetary constraints that the government would increase the tax burden in the future, so that consumers were using credit to increase his fortune. Based on the data analysis in Figure 3, the first period of Ricardian Equivalence in Indonesia occurred from the year 1970-1983, which at that time Indonesia's tax revenues decreased, which means going of tax cuts policy from 1970 to 1983. The second period Ricardian in Indonesia occurred in 1984-2013, which the government tax revenue increased.

**Table 3. Estimation of Consumption Function on First and Second Period**

Variable	Period	
	First	Second
$\beta_1$ d(Loggdp)	1,21 (0,00)*	1,45 (0,00)*
$\beta_2$ d(PRDF)	6,39 (0,92)	1,45 (0,89)
$\beta_3$ d(PG)	2,44 (0,9)	-0,0003 (0,29)
$\beta_4$ d(PU)	-0,0001 (0,47)	7,56 (0,76)
$\beta_5$ d(Tx)	0,0007 (0,57)	-9,1 (0,9)
$\beta_6$ d(LogW)	-0,21 (0,04)*	-0,44 (0,00)*
$\beta_8$ d(Cr)	0,002 (0,02)*	0,0001 (0,69)
Adjusted R <sup>2</sup>	0,9	0,9

() Probability

\* Significant at  $\alpha = 5\%$ , \*\* Significant at  $\alpha = 10\%$

The result of consumption functions estimation in the first and second period showed that budget deficit component composed of budget deficit growth, government expenditure growth, government debt growth, and tax revenue was insignificantly affected the change in domestic consumption. Policy of tax cuts in the first period increased the change in domestic consumption, but this increase did not happen significantly, this was due to the increase in revenues caused by tax cuts did not increase the interest of consumers to consume, but do savings. Increased tax revenue in the second period to lower domestic consumption, but the decline in consumption did not happen significantly, since consumers pay for a tax increase by using savings in the previous period had been increased.

**CONCLUSION**

The difference in future government policies did not significantly affect the fiscal deficit policy component, which consisted of the budget deficit growth, the growth of government expenditure, the government debt growth and tax revenue. Components of the fiscal deficit policy did not significantly affect domestic consumption; this showed that the government's policy of fiscal deficits could not stimulate the economy through the increased consumption. A neutral effected on the fiscal

deficit policy to describe the consumption of Ricardian equivalence in Indonesia.

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