

## THE IMPACT OF FISCAL CREDIBILITY ON THE EXCHANGE RATE

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### ABSTRACT

*This paper shows that there are positive effects of government debt to exchange rate stability. Government can do to stabilize the exchange rate by limiting the country's debt due to the high burden of government debt would reduce the flexibility to allocate the budget. In an economy with free capital movements, exchange rate volatility becomes the price that must be paid. Fiscal rules have a purpose, which seeks to give credibility to the implementation of macro-economic policies by removing interventions that are discretionary. Therefore, if enforce these policies, for example deficit rule, and discretionary, it will has not effect to diminish the exchange rate volatility. While the through the reduction of government debt can be affect the stability of the exchange rate. These finding if the debt can be realized closely to the planned debt, deviation will be small then exchange rate stabilize. If the government cannot control the aggressiveness of this fiscal, feared would threaten fiscal sustainability and affect economic performance. In addition, the policy can be done to maximize revenue through tax increases. Both are considered to be able to keep the exchange rate stabilization.*

Key words: Exchange rate, Deficit rule, Debt rule, Discretionary

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### Introduction

In three decades, interest in macroeconomic rule-based policy has increased. In the area of monetary economics, since it was introduced in New Zealand, Canada, England, Sweden, and Australia in the early 1990, inflation targeting has been adopted in many countries. In the field of public economic, fiscal rules received considerable popularity in various parts of the world. Fiscal rules have purpose to give credibility to the implementation of macro-economic policies by removing interventions that are discretionary (Kopits, 2001). Discretionary policy is able to respond the unexpected shock. Nevertheless, discretionary policy can also be a target, so the deficit continuous and pro-cyclical policies, rising debt levels, over time, losing its credibility (Kumar and Ter-Minassian, 2007) due to the volatility of fiscal policy.

The global financial crisis that occurred in mid-2008 giving challenges to both the rules of the policy. In the theory, inflation targeting requires a free exchange rate system. In economy with free capital movements, exchange rate fluctuation is the price that should be the price to pay (Sek and Ooi, 2012). With that reality, the problem of inflation will be more burdened to fiscal policy. However, in the environment of high inflation, fiscal spending increase inflation expectations and loan costs, which affect the effectiveness of fiscal policy. In that uncertainty, the confidence effects are likely to become more important and how agents in response will largely depend on government policy and credibility (Tang, 2010).

Indonesia provides a unique opportunity to analyze the nature of macro-economic stabilization policies. The experience of the dramatic depreciation, high inflation, and negative economic growth in line with the Asian financial crisis during 1997-1998 has led monetary authorities to focus their efforts on economic recovery and stabilization. Therefore, since 1999, Indonesia has been implementing Law No. 23/1999 on central bank independence.

Different from 1997 crisis, the economic crisis in 2010 and 2012 has caused several developed countries, including the countries that joined the EU in society such as Greek, Italian, Spain has a high debt burden that tends toward the fiscal instability. The implementation of an aggressive fiscal resulted increasingly narrow fiscal space to act as an effective macro policy. Although the central bank has done reduction in interest rate to near 0 percent, monetary policy failed to increase the output (Blanchard et al, 2010).

Hubbard (2012) explained there are two issues to be faced fiscal country in the future that is the volume of uncontrolled debt and the planned budget deficit. The fiscal problems will continue to increase along with the increase in life expectancy and high government spending to fund society welfare programs. This condition caused reduced effectiveness of fiscal policy due to

limited fiscal space. To reduce the fiscal burden of the few countries tightening budgets, for instance the United States in 2013 to tighten its budget up to \$85 billion, the UK did a program deficit cuts of up to 25 percent along with created new jobs, with the expectation fiscal policy can stabilize the returned economy (Kompas, 2012).

The effectiveness of fiscal policy to improve the economy is still debated until now, but empirically the effectiveness of fiscal policy has been demonstrated in China, India and Eastern Europe. These countries have implemented pro-cycle fiscal policy as the major policy and the result these countries were able to overcome the crisis (Blanchard et al, 2010). The exchange rate influenced to fiscal policy because when the government reducing national savings by increasing government expenditure or cutting taxes will be caused budget deficits. Thus result in inventories dollars which was invested to foreign countries, the dollar becomes is less valuable and domestic goods become cheaper to foreign goods. The second section is on the theoretical framework as well as the related empirical studies. This is followed by the third section which explains the econometric procedure and data used. The proceeding section exposes the empirical findings. The last section provides some concluding remarks of this paper.

## Literature Review

Fiscal policy rules set numerical targets for the aggregate budget. More specifically, they cause permanent constraints on fiscal policy, stated in a summary of the results of the fiscal indicators, such as the development of the government budget deficits, debt, expenses or income (Kopits and Symansky, 1998).

The implementation of fiscal rules is supported by a diverse group of thought. The (Neo) classical paradigm advocated the importance of fiscal rules are primarily aimed at limiting government spending, budget deficits and government debt in order to maintain fiscal sustainability. The (Neo) classical paradigm argues that the restrictions are necessary conditions to avoid the crowding-out effect. This fiscal expansion, will force the central bank to stop the fixed exchange rate at the time at some point.

At the same time, a sharply increase in fiscal deficits and public debt have raised concerns about the sustainability of public finances and highlighted the need for significant adjustments in the medium term. According to Law No. 17/2003, since 2004, Indonesia has implemented a fiscal policy rule based on deficit and debt (maximum respectively 3 and 60 percent of GDP) replaces the balanced budget rule which has been implemented since 1967 with a deficit monetization hidden very high (Snyder, 1985).

Ngai (2012) examined the direct and indirect effects in the reduction of the deficit if it can significantly affect the exchange rate. The result shows that the country can increase its exchange rate by reducing the budget deficit through spending cuts when high inflation and large government debt because the deficit reduction reduces the risk of monetization and default.

Discretionary fiscal policy has contributed significantly to economic stability. (Alan Aurbach). On the other hand, empirical studies have shown the related of short-term government spending and private consumption were positively correlated Ravn (2011). Explaining Argentina, Calvo et al (2004) The two fiscal issues analyzed are fiscal consolidation and government spending effects indifferent states of debt. Fiscal consolidations have a negative effect on output, despite of falling risk premia. While a faster consolidation lowers debt and risk premia more quickly, it is more counterproductive than a slower consolidation because of higher current taxes, as well as expecting higher future tax rates. Increasing government spending in a high-debt state pushes the economy closer to its fiscal limits, raising risk premia and default probabilities. The expansionary effect of a spending increase is weaker in a high-debt state than in a low-debt state.

Sargan (2012), examines the interaction coefficient of the exchange rate with negative import and the results are statistically significant at the 5 percent, which indicates that the company is importing more inputs tend to reduce their investment at a time when there are exchange rate devaluation. Coefficient of interaction with exports unexpectedly has a negative sign, but not statistically significant. Based on Sargan (2012), the effects of macroeconomic conditions on the composition of the company's debt in Brazil, that companies tend to change the currency composition of debt more in response to changes in the exchange rate risk and the result shows the interaction coefficients debt dollar exchange rate is currently negative, but not statistically different from zero.

While Bonomo (2010), examined the interaction between the exchange value of the depreciation and debt in foreign currency was allowed to vary in different periods. We took 1995-1998 as the base period and include additional clarification by multiplying dummies variable periods (1990-1994 and 1999-2002) by interactions between variations in the exchange rate and debt in foreign currency. Now interaction variable coefficient positive and significantly different from zero at 1 percent, and an additional term for the period 1999-2002 is negative, and is also significantly different from zero at 1 percent. Hakkio (2012), analyzing that effects of the reduction of the budget deficit on the exchange rate of a country, these results indicate that the reduction of the deficit through tax increases tended to weaken the exchange rate on inflation and debt, while a deficit reduction through the spending cuts tended to strengthen the country's exchange rate on inflation and debt.

In the case of Indonesia, the related studies regarding the impact of fiscal policy on exchange rate are limited. Abimanyu (1998) analyzed the relationship between the actual real exchange rate, the equilibrium real exchange rate, and other macroeconomic variables. The estimate shows that, out of nine explanatory independent variables, only government consumption and the fiscal deficit have significant effects on the real exchange rate variable. Increases in both government consumption and the fiscal deficit appreciate the real exchange rate. Kuncoro (2015) found that discretionary government spending policy shock reduces the exchange rates volatility.

Empirically study of discussing again the credibility of fiscal policy. In the next section, we empirically examine the whether the credibility of fiscal policy significantly affect the exchange rate.

### Research Method

Given that a wide range of fiscal rules is conceivable and that the design of the appropriate fiscal framework depends on country-specific circumstances, the effectiveness of fiscal credibility to address the fiscal policy volatility is hard to be generalized, however. Studies of the effect of fiscal institutions in general and fiscal rules in particular, face severe empirical limitations.

As noted by Bova et al. (2014), fiscal rules, however strong, cannot replace a commitment to abide by the rules, which is largely a political factor, and thus difficult to measure. Build a direct relationship between the rules and the results given the same challenge, as the result may be due to a number of other factors, some difficult to observe. And even if the link is found, it may be impossible to determine the direction of causality (fiscal discipline may have led to the establishment of the rule, not vice versa).

We use the cyclical component of output variables to identify the cyclicity of fiscal policy using the Hodrick-Prescott (HP) filter procedure as performed by Furceri (2007) and Afonso and Furceri (2008). The unexpected effect of fiscal policy can be calculated by fitting a first-order autoregressive process and  $\rho$  is best estimated by omitting the output variable such that:

$$\Delta \text{Log } G_t = a + \rho \Delta \text{Log } G_{t-1} + \varepsilon_t$$

Furthermore, according to Fatas and Mihov (2003), the term  $\varepsilon$  them above equation is a quantitative estimate of the shock discretionary government spending policies. We also extract the systematic component of government spending as a measure to identify the power of discretionary fiscal policy.

$$Z_3 : \text{€}$$

$$\text{Def}_A = \text{Rev}_A - \text{Exp}_A$$

$$\text{Def}_P = \text{Rev}_P - \text{Exp}_P$$

In short, fiscal policy is said to be credible if there is a little difference between actual and projected fiscal measures (Naert, 2011). Hence, the ratio of the actual deficit to the planned deficit represents the deficit policy credibility.

The accuracy of deficit rule policy is indicated by a score of 1. If the deficit budget realization in the current period is less than what has been targeted before, the budget deficit credibility index would be indicated less than 1. Meanwhile, if the budget deficit realization exceeds the projected figures, the index will be more than 1.

$$Z_1 = \text{Def}_A \div \text{Def}_P$$

The similar idea is applied for debt because debt is a legacy of past deficits. Unfortunately, neither flow nor stock of the planned debt for each year in Indonesia is unavailable. Hence, we estimate the projected total debt level using HP filter procedure. The difference between the actual debt stock and the projected debt stock level indicates the debt rule policy credibility.

$$Z_2 = \text{Debt}_A \div (\text{Debt}_P)_{HP}$$

Since we concern with credibility, we need reliable and long span time series data on fiscal policy comprising revenue, expenditure, and, consequently, deficit. The sample periods chosen for this study extend from 2001(1) to 2013(4). The total observation operationally is 52 sample points. Most of the data are publicly available in quarterly. Even the debt data are published in monthly basis. Unfortunately, the quarterly or monthly data of government budget are publicly unavailable. Data on monthly cash disbursement of functional government budget has never been released by Ministry of Finance to the public. In addition, the cash inflow of tax received only published only for some recent months. Regarding to the limitation, in this paper we use annual data and interpolate them into quarterly basis. This is because the planned budget is established once time even though then revised in the mid year. In the mid-year budget revision, the government does not announce the new targeted budget. Therefore, we analyze the difference between the accumulation of actual budget (before and after budget revision) and the original planned budget. We interpolated linearly them into quarterly in order to fit to the other data. Most of the data are taken from the central bank of Indonesia ([www.bi.go.id](http://www.bi.go.id)) and Central Board of Statistics ([www.bps.go.id](http://www.bps.go.id)). Most of the results are calculated in econometric program Eviews 8.

### Results and Discussion

Budget deficit in particular and public debt in general have been a key political and economic issue. Given the substantial deficits for a long time and consequently the high public debt accumulation, it has been criticized due to excess burden in terms of interest payment (Kuncoro 2011), persistent inflation (Synder 1985), crowding out effect (Kuncoro 2010).

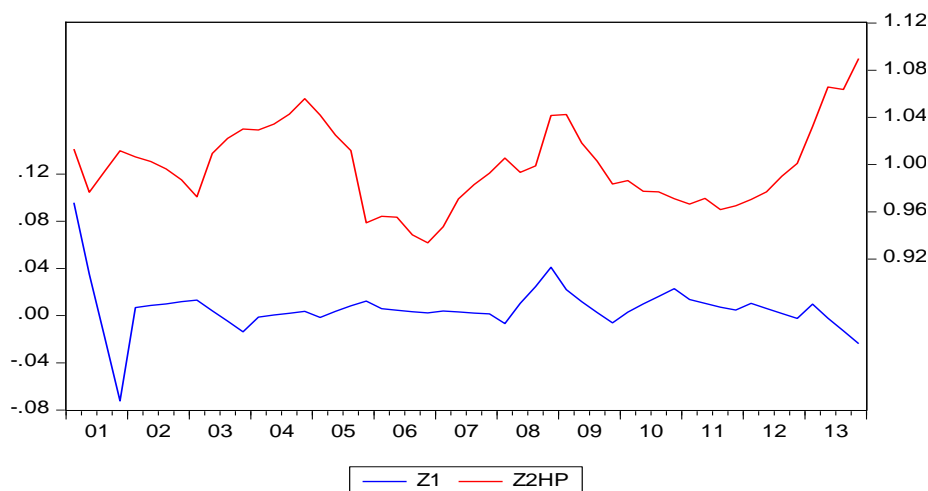
The economic crisis that occurred in Indonesia in 1997-1998 has made the government's debt to foreign state the increasing significantly if calculated in rupiah. This is due to the exchange rate of the rupiah against the US dollar, encounter

a very sharp depreciation. The government's debt to foreign state in 2000 until 2006 is decreasing due to the policy of privatization from some BUMN (Government-based company) and shares owned by the private company was taken over by the government. The increase of foreign debt occurred in the year 2011, is approximately 94,82 percent through August 2014. This condition is worrisome because it shows that the government ability to pay its debt is weakened. This condition should be necessary due to the continuous increase of debt since first quarter until 2013.

In fact, budget APBN condition in Indonesia from 1990 to 2012 tends to encounter budget deficit enhancement. Actually, when seen in the period 1990 to 1997, the budget deficit tends to be stable. In the next period, after economic crisis in Indonesia, the budget deficit also has some fluctuation on period 1995 to 2005. At that time, the government was still adjusting with the after-crisis economic condition, and took a consideration about whether it will adopt expansion or contraction policy. Later in the period 2006 to 2012, state budget is always encounter deficit. But, the outcome is still greater, for debt installments payment and its interest, also subsidies expenses. Since that, Indonesia has experienced the decrease in government revenue and the increase in government spending to undertake the socio-economic impacts. As a result, Indonesia's government collapsed under heavy debt burden to cover the state budget deficit. The government debt increased three to fourfold and almost three-quarters of those was domestic debt for bank restructuring (Boediono, 2009).

In 2012, Indonesia the current transaction the balance of payments back record deficits. Deficit was the biggest in history, which the amount is US \$24.4 billion, or approximately 2.8 percent of Gross Domestic Product (GDP). This condition indicated that the income should be transferred to foreign countries, is bigger than the income that received from the foreign. One of income which is transferred out is interest of foreign debt.

Figure 1: Debt Rule and Deficit rule



The rupiah exchange rate against the dollar had been fluctuation from January 1999 to June 2010. In 1999, rupiah was strengthened against the dollar, compared with the previous year. In 2000, rupiah was weakened again to Rp 9.595 per dollar. Rupiah experienced a slight appreciation in 2009 with amount of 1.54 percent (strengthened at the end of year 2000 in the amount of Rp 9.595 and at the end of 2009 in the amount of Rp 9.447). In 2001, rupiah depreciation was 8.93 percent from the previous year and in the year 2008 was 16.26 percent from the previous year. The largest depreciation was occurred in 2008 and the largest appreciation occurred in 2003 is 5.32 percent.

On October 2013, due to the weakening of the exchange rate and trading deficit, inflation was blow up. In addition, the exchange rate can also find a new equilibrium point. With the condition of the current account balance, and the balance of trade deficit that being faced by Indonesia, the new equilibrium point of rupiah will be in the range of Rp 10.500 to Rp 11.000 per US dollar (USD). The negative impacts were a new financial crisis and the high interest rates that disrupt the balance of the property business.

Figure 2: Discretionary and Exchange Rate

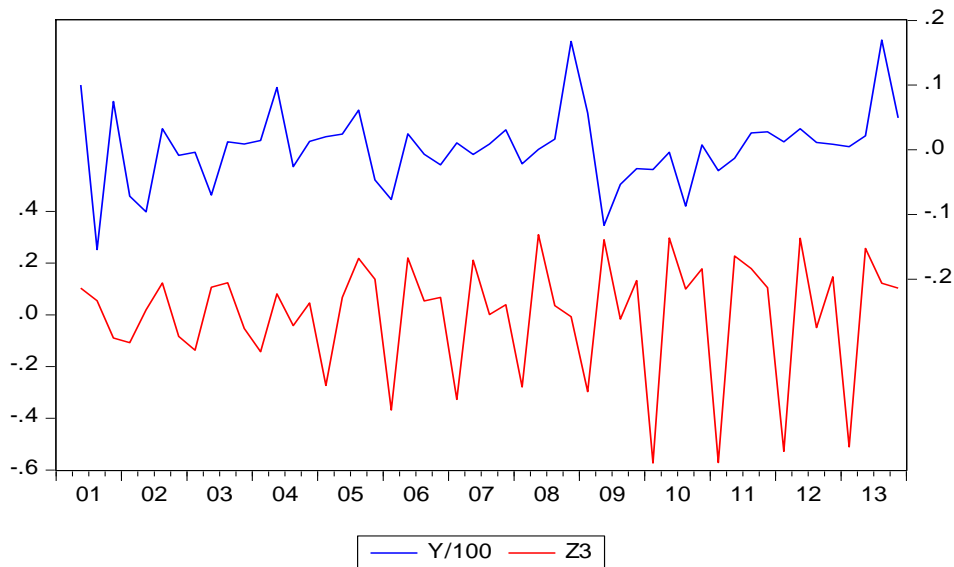


Table 1 further presents the elementary statistics covering mean, median, and extreme (maximum and minimum) values for variables of interest. The average value of the exchange rate with fiscal development policy models deficit rule, debt rule, and discretionary (Z1, Z2HP, Z3) is not close to each other. Each median value is not close to the individual average value (particularly Z1, Z2HP, and Z3). In addition, the credibility of deficit policy (Z1) has the largest value of kurtosis. Kurtosis measures the flatness of peakedness distribution. Most of the kurtosis values from this series less than three. The results that showing only ER, Z1, Z3 series that have the kurtosis values exceeding 3, indicates that the distribution tails are thicker than normal (leptokurtic).

Symmetrical distribution the six variables were confirmed by a slope moderate value. Skewness can identification symmetric or normal distribution, whom the value is estimated to be zero. The slope values of volatility variable that slightly lower than 0, indicates that the series is shifting to the left ER. On the contrary, the slope value for the credibility index greater than 0, indicates that the corresponding series is shifting to the right Z2HP; top tail of distribution is thicker than the lower tail.

Table 1: Descriptive

	Y/100	Z1	Z2HP	Z3
Mean	0.003386	0.004122	0.998749	1.966-06
Median	0.009000	0.004100	0.994300	0.054200
Maximum	0.169600	0.041000	1.089900	0.309900
Minimum	-0.154200	-0.072300	0.933800	-0.573000
Std. Dev.	0.059765	0.015752	0.034848	0.228436
Skewness	0.236783	-1.993809	0.420893	-1.046265
Kurtosis	4.504202	12.72973	2.683952	3.440701
Jarque-Bera	5.284634	234.9587	1.718043	9.717410
Probability	0.071196	0.000000	0.423576	0.007761
Sum	0.172700	0.210200	50.93620	0.000100
Sum Sq. Dev.	0.178591	0.012406	0.060720	2.609140
Observations	51	51	51	51

In the next section, we focus on the time series properties of each series. Many studies point out that using a non-stationary macroeconomic variable in time series analysis causes superiority problems. It is well known in literature that applying regression on a set of non-stationary series is likely to produce a spurious estimation. Thus, a unit roots test should precede any empirical study employing such variables. The conventional ADF unit roots test presents that all series do not have the same degree of stationarity. Dealing with the difference level of data stationary, we conduct the co-integration test.

Using Johansen's maximum likelihood approach, we test the bi-variate between the four variables in the model with 2 lags. The trace statistics together with maximum eigen-value ( $\lambda_{max}$ ) for testing the rank of co-integration are shown in Table one. The test shows the existence of co-integration. It means that the null hypothesis of no co-integration is rejected suggesting the presence of co-integrating relation. In other words, all of those variables in each model are said to be co-integrated. Hence, the test performs the presence of the co-integrating equations between the non-stationary (stationary at the different levels) series which means that the linear combinations of them are stationary and, consequently, those series tend to move towards the equilibrium relationship in the long-run.

Table 2: Co-Integration

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.6124	100.2181	47.8561	0.0000
At most 1 *	0.4444	53.77423	29.7970	0.0000
At most 2 *	0.3674	24.97131	15.4947	0.0014
At most 3	0.0503	2.531217	3.84146	0.1116

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

The table 3 above is the result of the execution that was done using eviews software. As seen from the indicators Z1 (deficit rule), Z2HP (debt rule), Z3 (discretionary).

Probability of Z1 is insignificant because the probability value > 0.05, so an increase of 1 percent deficit rule is not followed by an increase in the exchange rate. This is due to the difference with developed country condition, where the deficit affect the exchange rate, while Indonesia it self is still a developing country. Every increase in deficit rule, Indonesia will raise the exchange rate and having depreciation due to the increase of its currency. Results in this study are consistent with Walker (2008) who said, the uncontrolled expenditure of United States government and some policies of tax cuts, lead to greater US budget deficit, which must be covered by debt. This finding is in contrast to Burney (1992) who did his research in Pakistan, and found that a significant deficit rule directly affects the real exchange rate through the price level, while the indirect influence is through interest rates and money deployment growth.

Probability of Z2HP is significant because the probability value < 0.05, so the increase of 1 percent deficit rule will be followed by an increase in the exchange rate. Z2HP similarly to Z1, by setting policy through the repression of government debt, will increasing the exchange rate and result in the presence of depreciation, as seen from the probability value that is equal to 0.01. Adjusted R2 value is 0.073396. We can obtain the Z2HP coefficient value that is equal to 0.617162. That means, one percent increase in fiscal credibility will increase the value of the exchange rate by 2.56 percent. The difference between the Z1 and Z2HP, Z1 is not significant whereas Z2HP is significant. Z2HP effect on the stability of the exchange rate, so that in order to be stable, the government should take a repression of government debt policy and increase state budget through tax increases. The results are consistent with Sitorus (1996), concluded that Indonesia experienced a big risk of foreign debt exchange, because the foreign debt is in the form of foreign exchange. If there is a appreciation or depreciation of the rupiah against foreign currencies, it will have an impact on the foreign debt. Depreciation will lead Indonesia's foreign debt increase, because Indonesia paid its foreign debts in foreign currencies, and vice versa. Exchange rate risk is not only burden the state budget, but also the national economy.

While discretionary coefficient of Z3 that equal to 0.019310, indicate a positive significant between discretionary and exchange rates. Z3 probability is not significant because the probability of values > 0,05. The greater the rate of government spending, the greater the exchange will rise. But actually, this coefficient dont have any meaning from the partial side, because discretionary was not statistically affect the exchange rate significantly. Therefore, if we enforce these policies, for example deficit rule, and discretionary, it will has not effect to diminish the exchange rate volatility.

Table 3: Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.6146	0.2407	-2.5527	0.0140
Z1	0.3997	0.5318	0.7516	0.4560
Z2HP	0.6171	0.2404	2.5670	0.0135
Z3	0.0193	0.0356	0.5420	0.5903
R-squared	0.1289	Mean dependent var		0.0033
Adjusted R-squared	0.0733	S.D. dependent var		0.0597
S.E. of regression	0.0575	Akaike info criterion		-2.7978
Sum squared resid	0.1555	Schwarz criterion		-2.6463
Log likelihood	75.3450	Hannan-Quinn criter.		-2.7399
F-statistic	2.3201	Durbin-Watson stat		2.2274

considered to be able to keep the stabilization of exchange rate.

Implications that can be done by the government in stabilizing the exchange rate through the state debt restrictions due to the high debt burden would reduce the flexibility the government to allocate its budget. If the government can't control the aggressiveness of this fiscal, it is feared that it would be threaten fiscal sustainability and affect economic performance. In addition, the policy also can be done by maximizing revenue through tax increases. Both are considered to be able to stabilize the exchange rate.

### Concluding Remarks

The existence of positive impact on the of government debt to the stability of the exchange rate on the results of this study at 61.71623 coefficient implies that 1% increasing in fiscal credibility will increase the value of the exchange rate by 2.56%. The rest was influenced by other macroeconomic variables, that GDP, IHSG, interest rates, TOT, and CPI. Therefore, if we enforce these policies, for example deficit rule, and discretionary, it will has not effect to diminish the exchange rate volatility. These finding if the debt can be realized closely to the planned debt, deviation will be small then exchange rate stabilize. Explaining Argentina, The two fiscal issues analyzed are fiscal consolidation and government spending effects indifferent states of debt. Fiscal consolidations have a negative effect on output, despite of falling risk premia. While a faster consolidation lowers debt and risk premia more quickly, it is more counterproductive than a slower consolidation because of higher current taxes, as well as expecting higher future tax rates. Increasing government spending in a high-debt state pushes the economy closer to its fiscal limits, raising risk premia and default probabilities. The expansionary effect of a spending increase is weaker in a high-debt state than in a low-debt state. Implications government can do in stabilizing the exchange rate through the state debt restrictions due to the high debt burden would reduce the flexibility the government allocates its budget. If the government cannot control the aggressiveness of this fiscal, it is feared would threaten fiscal sustainability and affect economic performance. In addition, the policy can be done to maximize revenue through tax increases. Both are considered to be able to stabilize the exchange rate.

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