Journal of Economics and Development Studies
June 2015, Vol. 3, No. 2, pp. 7-18
ISSN: 2334-2382 (Print), 2334-2390 (Online)

Published by American Research Institute for Policy Development
DOI: 10.15640/jeds.v3n2a2
URL: http://dx.doi.org/10.15640/jeds.v3n2a2

Credible Fiscal Policy and Exchange Rates Stabilization

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Abstract

This paper aims at analyzing the potential impact of fiscal policy credibility on the exchange rates stabilization. Motivated by the fact that empirical studies concerning this aspect are still limited, we take the case of Indonesia over the period 2001-2013. Based on the quarterly data analysis, we found that the impact of credible fiscal policy typically depends on characteristics of fiscal rules commitment. In one hand, the credible debt rule policy reduces the exchange rate fluctuation. In contrast, the deficit rule policy – which is incredible – does not have any impact on the exchange rate and thus does not support to the exchange rates stabilization. Given those results, we conclude that credibility matters in stabilizing foreign exchange market. Accordingly, improving the credibility of fiscal policy should be an integral part of the exchange rates stabilization program.

Keywords: Deficit Rule, Debt Rule, Credibility, Discretionary Fiscal Policy, Exchange Rate

JEL Codes: E6, H3, H6

Introduction

Over the last few years, public finance has been internationally characterized by rising deficits and public debt. In a bid to achieve the goal of sustainable public finances (as well as to reduce debt to sustainable levels), many countries have adopted some form of fiscal rule (or a combination of fiscal rules). In fact, there are currently 87 countries around the world that have been implementing fiscal rules (IMF, 2013). Generally, it is widely accepted that a government with a strong reputation of fiscal prudence does not necessarily need to be constrained by rules. However, when this is not the case, international evidence shows that fiscal rules can provide a useful framework for fiscal policy and can ultimately contribute to macroeconomic stability and economic growth (Galí, 1995; Rother, 2004; Fatás and Mihov, 2003, 2006; Badinger, 2009; Sacchi and Salotti, 2014). In the context of exchange rates stabilization, however, literature on the impact of fiscal rules is limited. While exchange rates are one of the most studied topics in international monetary economics, unfortunately, most papers analyzing their determinants do not focus on the fiscal variables (De Castro and Fernández-Caballero, 2011). More specifically, most of empirical studies rely on the discretionary fiscal policy, mainly government spending shocks, to affect the exchange rates (Frenkel and Razin, 1996; Enders *et al*., 2011, among others). In contrast, only a few papers assess the effects of fiscal rules based policy on the nominal or real exchange rate, relative prices, or the terms of trade in developing countries (Bénétrix and Lane, 2013). As a result, there is still no consensus on the size or even the sign of the effects of fiscal rules policy on the exchange rate movement. Accordingly, it seems that further empirical work is desirable in order to make progress in understanding the relation between fiscal rules and the stable exchange rates. Indonesia provides a unique opportunity to assess the nature of macroeconomic stabilization policy. Experiences of a dramatic depreciation, sky-rocketing inflation rate, and deep negative growth in accordance with Asian financial crisis in 1997/98 had directed the monetary authority to focus on the economic recovery and stabilization. Accordingly, since 1999, Indonesia has been implementing Act No. 23/1999 regarding the central bank independency.

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Also, refer to Act No. 3/2004, under free floating exchange rate system, since July 2005 the central bank of Indonesia has been officially adopting inflation targeting in the monetary policy frameworks. In this circumstance, the central bank of Indonesia operationally relies on BI Rate to control inflation rate replacing money stock as short-term monetary base target as implied by the older regulation. All of them are subjected to achieve the single goal, *i.e.* Rupiah stabilization both in terms of inflation and exchange rate. At the same time, the sharp increase in fiscal deficits and public debt has raised concerns about the sustainability of public finances and highlighted the need for a significant adjustment over the medium term. According to the Act No. 17/2003, since 2004 Indonesia has been operating a fiscal rules based on maximum deficits and debt (3 and 60 percent of GDP respectively) replacing the balance budget rule that had been implemented since 1967 resulting the high monetization of hidden deficits (Snyder, 1985). Then in 2008, the government attempted to revive economic activity through various fiscal stimulus measures to face the adverse impacts of the global financial crisis. In fact, the fiscal stimulus programs have contributed substantially to Indonesia faster and stronger than expected recovery (Hur *et al*., 2010). After that, gradually Indonesia in 2010s has been one of the largest developing countries implementing various economic liberalization reforms that produce strong economic growth (Abdurohman, 2013). However, the significant increase in discretionary spending (particularly oil and electricity subsidies) and the increase in interest payments in the recent years, resulting from high interest rates set by the central bank to maintain the strength of the exchange rate, has contributed to the deteriorating public finances (Ikhsan, 2014). While the fiscal rule helps to establish rules on the government budget, those facts bring us back to the challenge for dominant exchange rate determination theories, which are typically silent about the role of credible fiscal policy and therefore warrant further attention.

Surprisingly, the rule has not been tested, as Indonesia's fiscal performance has been significantly better than the limits contained in the fiscal rule (Blöndal *et al*., 2009). The lack of an economic theory fundamentals based explanation of the connection between the statutory instruments and the depreciation of the exchange rate brings into focus issues to do with the credibility of general economic policy management and in particular fiscal policy management. Essentially, it is the private sector's perception that the government will carry out its proposed policy announcements as planned. Therefore, it plays a central role in the determination and prosecution of several economic policies. Concerning fiscal deficits driven by spending, credibility is essentially what determines government's solvency and ability to borrow. If creditors do not believe a government is credible, i.e. capable of following a plan to service outstanding debt on market terms in the future, they will not lend to finance its debt which will most likely create a situation of "debt overhang", followed by rapid default and negative economic consequences. If, on the other hand, private investors consider the government to be fiscally credible, the latter might be able to carry its adjustment program as planned or even postpone it and taking it smoothly to avoid political and social clashes. Therefore, addressing these issues would have gone a long way in allaying investor fears about future economic prospects of the country. This paper explores the potential linkage between credibility of fiscal policy rules and exchange rate stabilization in the case of Indonesia. The rest of the paper is divided into five sections. 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

Macroeconomic literature offers various explanations on how fiscal policy affects the exchange rate. Each of them gives different conclusion depending on the type of fiscal policy measures. In short, there are two forces working on the exchange rates from opposite directions, due to an application of fiscal policy. Which force will dominate will depend on the specific case in question. In general, the traditional and contemporary versions of open-economy macroeconomic models with nominal rigidities typically project that an expansion in government spending should be associated with appreciation (Corsetti and Pesenti 2001). Later, Bénétrix and Lane (2013) show that the different types of government spending determine the degree of currency appreciation. They argue that shocks to public investment generating larger and more persistent real appreciation than shocks to government consumption. Regarding the government consumption expenditure, they also show that the impact of shocks to the wage component is more persistent real appreciation than that of shocks to the non-wage component. On the other hand, it is also possible to construct models in which a fiscal expansion is associated with depreciation. Regarding to the government expenditure, for example, it has a direct import effect whereby government purchases increase imports directly. This is certainly the case in most of these, relatively small, economies and should be expected to put a downward pressure on the exchange rate.

In the large economies, the unanticipated exchange rate depreciation can be beggar-thy-self rather than beggar-thy-neighbor, as gains in domestic output are offset by deteriorating terms of trade. Annicchiarico (2006) argued that after a fiscal expansion the respect of public solvency is not sufficient to avoid the depreciation of the exchange rate in the long-run. According to Ravn *et al*. (2007), an increase in government spending provides an incentive for firms to lower domestic mark ups relative to foreign mark ups, leading to a real depreciation. Kollmann (2010) presents a model with incomplete financial markets that can also solve the government purchases–real exchange rate puzzle, even when government purchases are non-productive. Market incompleteness limits risk sharing, and thus exacerbates the negative wealth effect of a rise in home non-productive government purchases, which strengthens the increase in the home labor supply and output, and thus may depreciate the home real exchange rate. Those studies above focus merely on the government expenditures and implicitly neglect the interaction with government revenues. How fiscal policy affects the exchange rate could be traced by deficit channel. The budget deficit leads to a reduction in aggregate savings relative to investment demand, a rise in the real interest rate, and consequently capital inflows and exchange rate appreciation (see: Branson, 1985 and Krugman, 1995, for example).

The comprehensive model to analyze the impact of budget deficit on exchange rates is pioneered by Hakkio (1996). Budget deficit reduction has both direct and indirect effects on the demand for funds, which lead to different effects on the exchange rate. Deficit reduction can lead to a weaker exchange rate by reducing the demand for funds by the government, or it can lead to a stronger exchange rate either by reducing expected inflation, reducing the foreign exchange risk premium, or increasing the expected after-tax rate of return on domestic assets. The impact of deficit could be different following the characteristics of deficit (Piersanti, 2002). The current and expected future budget deficits are positively correlated with the current account deficit, the capital stock, and the real exchange rate. Meanwhile, the cyclical deficits are to be expected and have no direct effect on exchange rates. Even a single year's structural deficit is too small to have any effect on exchange rates. With many years of structural deficits, the public debt increases to the point where it might affect exchange rates, but even that connection is tenuous at best. The impact of fiscal policy also depends on the exchange rate regime. In a fixed exchange rate regime, an exchange rate change can be a swift way to change the real exchange rate in the short run. Fiscal policy also affects relative prices, and fiscal policy response to various types of shocks can therefore be crucial for the credibility of an exchange rate peg (Andersen and Chiriaeva, 2007). In the flexible exchange rate system, in contrast, the conclusions reveal that there is a significant relationship between inflation and exchange rate. Inflation causes the foreign currency to depreciate in both short and long run. However, that there is no significant and direct relationship between budget deficit and exchange rate. Furthermore, increases in interest rate and income lead to appreciation of the currency while a decrease in them produces depreciation in the currency in nominal and real exchange rates (Kara, 2011).

Beyond the adoption of exchange rate system, the method used to finance the deficit cannot be neglected to analyze its impact on exchange rate. Stoker (1999) presents a two-country cash-in-advance model to calculate explicitly the long- and short-term effects of government deficit spending on the exchange rate. It is shown that increases in deficit spending result in a short-term appreciation of the currency. The currency will eventually depreciate, to what degree and for how long depending on the method used to finance the deficit. When the deficit is financed by debt, the national debt has a definite impact on the foreign exchange rates. If a country is perceived to have a high national debt, without a credible plan for dealing with it, that can have a negative impact on the value of its currency. In contrast, when the government is expected to enter surplus, meaning it spends less than it takes in from taxes. That means the government will begin cutting its national debt. The expectation of this, and the perception of the government as fiscally responsible, is therefore raising the value of the currency. The ratios of public and external debt to GDP constitute crucial indicators in assessing the financial and fiscal vulnerability. In one hand, high ratios of public debt jeopardize its sustainability and its solvency position. On the other hand, a high proportion of exchange rate exposure in debt composition may abruptly worsen its sustainability in times of financial stress, characterized by problems of access to external markets or by sharp exchange rate movements (Acevedo *et al*., 2010). Therefore, deleveraging from high debt can provoke deep recession with significant international side effects. The exchange rate of the deleveraging country will depreciate in the short run and appreciate in the long run (Benigno and Romei, 2014). San and Su (2003) reexamine the relationship between budget deficits and exchange rates to seven Asian countries and eight Euro-currency countries. The results indicate that because of the indirect effect of the expected inflation rate, the risk premium, and the expected return rate, currency values are inversely related to budget deficits.

However, the empirical results also present evidence supporting the Ricardian equivalence proposition that there is no direct effect of budget deficits on exchange rates. Evidence of insignificant correlations between budget deficits and interest rates has been interpreted as support for the Ricardian equivalence proposition. Alternatively, international capital flows could transfer deficits' effects from interest rates to exchange rates. Beck (1994) investigates these alternative hypotheses by testing the significance of budget deficit and government spending changes on exchange rates in five industrialized countries. The estimation uses forecast data for the fiscal policy expectations variables. The evidence is mixed: it supports the open economy hypothesis in three countries, but the Ricardian equivalence proposition in one country. Those results are supported by Apergis (1998). He attempts to examine the relationship between budget deficits and exchange rates in eight OECD countries. The empirical findings provide evidence in favor of the association between exchange rates and budget deficits with the impact of these deficits on the exchange rate, however, not being uniform. In certain cases budget deficits seem to have led to currency depreciation, while in others to a currency appreciation.

With respect to the deficit financed by seigniorage, Canzoneri *et al*. (2000) examine the implications of a new theory of price determination for the maintenance of various exchange rate systems and common currency areas. It shows that deeper monetary integration requires the fiscal discipline. The government must guarantee fiscal solvency for any sequence of prices or exchange rates. Monetary policy alone can control the expected rate of inflation (or depreciation), but in Non-Ricardian regimes monetary policy cannot control the variability of prices (or exchange rates) in countries where seigniorage revenues are negligible. In relation to government budget deficit financed by taxes, Annicchiarico *et al*. (2011) investigates currency crises in an optimizing general equilibrium model with overlapping generations. It is shown that a rise in government budget deficits financed by future taxes generates a decumulation of external assets, leading up to a speculative attack and forcing the monetary authorities to abandon the peg. A constraint on the exchange rate should, in principle, act as a disciplinary device on the fiscal authorities, or more generally on economic policies. 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. Tsen (2012) found that an increase in the real oil price will lead to an appreciation of the real exchange rate in Indonesia. Compared to the real interest rate, productivity, and reserve differentials, the real oil price is relatively less important in the real exchange rate determination. Since the oil price is one of the key assumptions for government to establish the planned state budget, we conclude that fiscal variables matter in the exchange rate stabilization. Kuncoro (2015) found that discretionary government spending policy shock reduces the exchange rates volatility.

Research Method

The literature and empirical studies above provides a differing result of the impact of fiscal policy on the exchange rates. This paper fills the gap by employing fiscal policy credibility to explain the exchange rate fluctuation. Our main contributions are (1) we integrate discretionary and fiscal rule policy to explain the exchange rate movement; and (2) we concern with the credibility of fiscal rules. We hypothesize that the credible fiscal policy potentially can reduce the exchange rate fluctuation. We measure the fiscal policy credibility using forecast error based on the deviation of actual budget from the planned one. As noted by Naert and Goeminne (2011) assessing the quality of forecasts can be done using a multitude of techniques. For first preliminary results we opt to give a qualitative indication of forecast accuracy by presenting some descriptive statistics and by applying a graphical analysis. This method has the advantage of being straightforward; still it does not permit to test the statistical significance of the results. In this paper, we assume that budgetary projections have to be regarded as the announcements of a political target. Analogously to Annett (2006) and Pina and Venes (2011) the credibility of fiscal policy (E_t) is measured as the difference between its actual budget balance in year t (A_t), and its most recent target for the budget balance for year t in t-1 (P_t), or thus:

$$E_t = A_t - P_t \quad (1)$$

Positive values of E_t mean a better-than-projected policy execution, yielding a higher surplus or a lower deficit. Negative values indicate that governments achieved results that were worse than projected or that forecasts were optimistic, that is, underestimations of the deficit or overestimations of the surplus.

In the similar way, we might construct the credibility of fiscal policy index (*CI*) as follows:

$$CI = \frac{A_t}{P_t} \quad (2)$$

Based on this formula, the accuracy of fiscal policy is indicated by a score of 1. If the budget realization were less than what has been targeted before, the credibility index would be indicated less than 1. Meanwhile, if the budget realization exceeds the projected figures, the index will be more than 1. We will use both the two measures in the context of deficit and debt rule policy credibility. Furthermore, budget deficit is the difference between government revenue end government expenditure. This applies for the actual (subscript A) and the planned (subscript P) budgets:

$$Def_A = Rev_A - Exp_A \quad (3)$$
$$Def_P = Rev_P - Exp_P \quad (4)$$

Refer to (2), the deficit rule 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 rule policy credibility.

$$Z_{11} = Def_A \div Def_P \quad (5)$$

Alternatively, we also use the difference between the actual deficit to GDP ratio and the planned deficit to GDP ratio:

$$Z_{12} = Def_A / Y - Def_P / Y \quad (6)$$

As (1), 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. The above methods merely based on the planned budget which is typically predetermined in the previous year. As explained in the previous section, in fact there are many adjustments in the current period. To accommodate them, we estimate the actual budget (*F*) using the key macroeconomic variable (*Y*). In this case, we may construct a regression model linking the two variables. Regarding the government expenditure, fiscal policy is a possible automatic stabilizer. The most important fiscal policy lever in the hands of the Indonesian government is government consumption. It would be worthwhile to see how change in government consumption impacts the final output in the economy in general and the exchange rate in particular. Following methodology used by Akitoby *et al.* (2006), we suppose there is a steady-state (or long-run path) relationship between actual budget and the key macroeconomic variable given by:

$$F_t = C\, Y_t^{\delta} \quad (8)$$

Equation (8) can also be written in the logarithmic linear form:

$$\text{Log } F_t = \text{Log } C + \delta \text{ Log } Y_t + \mu_t \quad (9)$$

Transforming into first-difference, (9) becomes:

$$\Delta \text{ Log } F_t = \text{Log } C + \delta \, \Delta \text{ Log } Y_t + \mu_t \quad (10)$$

where C and δ are parameter to be estimated. μ_t is independent and identically distributed disturbance terms with mean 0 and variance σ^2. It also represents the forecasting error given available information of *Y* in period *t*. Furthermore, according to Fatás and Mihov (2003; 2006), the term of μ_t in equation (10) above is a quantitative estimate of the discretionary policy shock in government spending. We also extract the unsystematic component of government expenditure as measure to identify the power of discretionary fiscal policy.

$$Z_2 = \mu_t \quad (11)$$

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 (9). The difference between fitted value and actual one presents the debt rule credibility:

$$Z_3 = \exp [(\text{Log Debt})_A - (\text{Log Debt})_P] \quad (12a)$$
$$Z_3 Y = (\text{Log Debt})_A \div (\text{Log Debt})_P \quad (12b)$$

In cases where δ is insignificant, there is no steady-state relationship between fiscal variable and output, according to Aizenman and Marion (1993), therefore, the unexpected effect of fiscal policy can be calculated by fitting a first-order autoregressive process and ρ is best estimated by omitting the output variable such that:

$$\text{Log Debt}_t = a + \rho \text{ Log Debt}_{t-1} + \varepsilon_t \quad (13a)$$

$$Z_3AR = (\text{Log Debt})_A \div (\text{Log Debt})_{AR} \quad (13b)$$

Alternatively, we also use fiscal gap using Hodrick-Prescott (HP) filter procedure which widely used to estimate the potential output:

$$Z_3HP = (\text{Log Debt})_A \div (\text{Log Debt})_{HP} \quad (14)$$

What affects exchange rates more strongly is external debt: what a country owes to the rest of the world. The government debt is only a small part of external debt. Much of it is the trade imbalance and this is an important classical factor in the exchange rate. Eventually, we can construct the relative change in foreign currency rate (*ER*) model that is a function of deficit rule credibility (Z_1), discretionary government expenditure (Z_2), debt rule credibility (Z_3), and Openness:

$$\Delta \text{ Log ER} = \theta + \varphi_1 Z_1 + \varphi_2 Z_2 + \varphi_3 Z_3 + \phi_1 \text{ Openness} + \phi_2 \text{ Log ER}_{(-1)} + \xi_t \quad (15)$$

The degree of economic openness is calculated from the following equation:

$$\text{Openness} = (EX + IM) \div Y \quad (16)$$

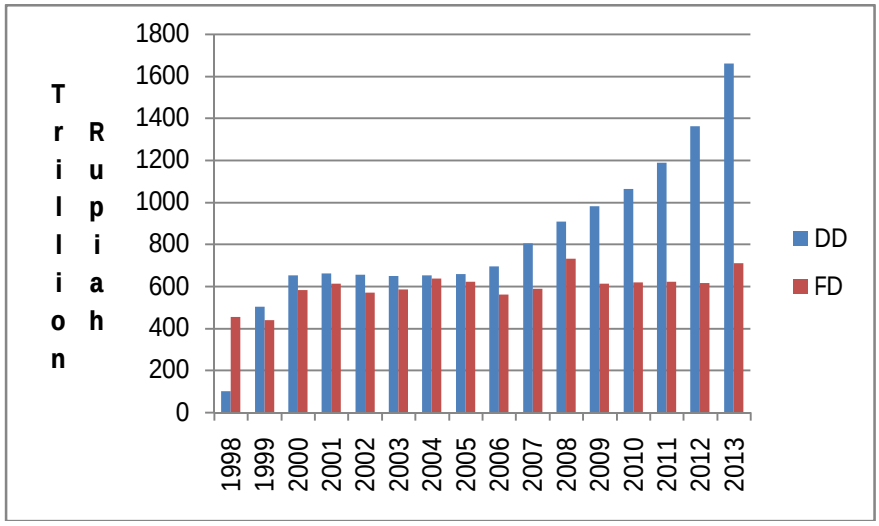
where *EX* is export and *IM* is import values respectively. The lagged dependent variable is incorporated in the model to capture the degree of persistency. Since we concern with credibility, we need reliable and long span time series data on fiscal policy comprising revenue, expenditure, and, consequently, deficit. 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 interpolated 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. As comparison, we also analyze the quarterly data on government expenditure derived from the national income standard account based on expenditure approach. This is intended that our study will be comparable to similar studies in other countries. The selected key macroeconomic variable is GDP. The GDP is used the main factor for government to set the state budget projection for the next year. The GDP data are available in quarter basis. Those variables are presented in 2000 constant price. The sample periods chosen for this study extend from 2001(1) to 2013(4). The total observation is 52 sample points. All of the data are taken from the Central Bank of Indonesia (www.bi.go.id) and Central Board of Statistics (www.bps.go.id). Regarding the relative change in foreign currency rate, we use the real effective exchange rate -- that is an index that describes the relative strength of a currency relative to a basket of other currencies adjusted by relative consumer price index -- instead of bilateral or nominal effective exchange rates. The data of real effective exchange rate are electronically taken from the publications of Bank of International Settlement (www.bis.org). The real effective exchange rate data are stated on 2010 base year (2010 = 100). 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 (Snyder, 1985), crowding out effect (Kuncoro, 2000), and external imbalance (Adji, 1998). When the Asian financial crisis, in the mid 1997, the external debt increased significantly from more than USD 136 billion in 1997 to more than USD 151 billion in 1998, mainly due to the depreciation of Rupiah. 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 four-fold and almost three-quarters of those was domestic debt for bank restructuring (Boediono, 2009). In the reformation era, Indonesia's government and parliament made a political decision that most deficits should be ultimately financed by domestic financial resources.

As a result, the amount domestic debt stock has been ten times (100 trillion in 1998 to 1.000 trillion Rupiah in 2009). Only within one decade, the domestic debt has been higher than the foreign debt (Figure 1). Consequently, the public debt services have been sky-rocketing. The domestic debt service payment was two-fold than that of foreign debt. Moreover, most government external debts were due in early 2000s. Given the high the interest rate and amortization payments, the state budget problems then shifted from the stimulus to fiscal sustainability (Rahmany, 2004). In accordance with the fiscal stimulus to prevent the contagion effect of the global financial crisis in the late 2000s, the increase of budget deficit was quite higher. Even though the debt ratio has been decreasing in the recent years, the new financing both from foreign and domestic financial resources are still required in forthcoming years to meet the expenditure needs. While printing money is strictly forbidden by the law of central bank, the question is then how to keep the budget deficit at a safe level so that the deficit can be financed. Hur *et al*. (2010) argue that the greatest structural challenge in the medium term for emerging Asia (including Indonesia) is to rebalance growth away from excessive dependence on exports toward domestic demand. In light of the fact that Indonesia is a small-government size in the international context, the scope for shifting the composition of government spending remains limited. Therefore, implementing pro-rebalancing fiscal measures requires the fiscal policy predictability which is likely based on the fiscal discipline.

Figure 1: Domestic Debt (DD) and Foreign Debt (FD)



Source: Debt Management Office, Ministry of Finance Republic of Indonesia

Fiscal discipline is defined as the capacity of a government to maintain smooth financial operation and long-term fiscal health (Hou, 2003). Thus defined, fiscal discipline necessarily branches into (1) multi-year perspective on budgeting and (2) mechanisms to maintain fiscal health and stability over business cycles. Figure 2 presents the evolution of the discretionary fiscal policy and economic cycles. It seems that there is no synchronized pattern between the two variables of interest implying a-cyclical discretionary fiscal policy. As introduced in the previous section, the significant increase in discretionary spending (particularly oil and electricity subsidies) and the increase in interest payments in the recent years, resulting from high interest rates set by the central bank to maintain the strength of the exchange rate, has contributed to the deteriorating public finances (Ikhsan, 2014). Figure 2 also delivers the exchange rate fluctuations. It seems that there is a weak correlation between discretionary spending and exchange rate movement. When we divide our observation into pre- and post-global financial crisis, the conclusion does not change. The coefficient of correlation between the two variables is -0.06 and -0.01 respectively. Those raise a preliminary hypothesis that the discretionary government expenditure policy is ineffective to stabilize exchange rates suggesting that the fiscal policy based rules is potential to address this problem. We hypothesize that the fiscal rule-based policy matters to stabilize the exchange rates.

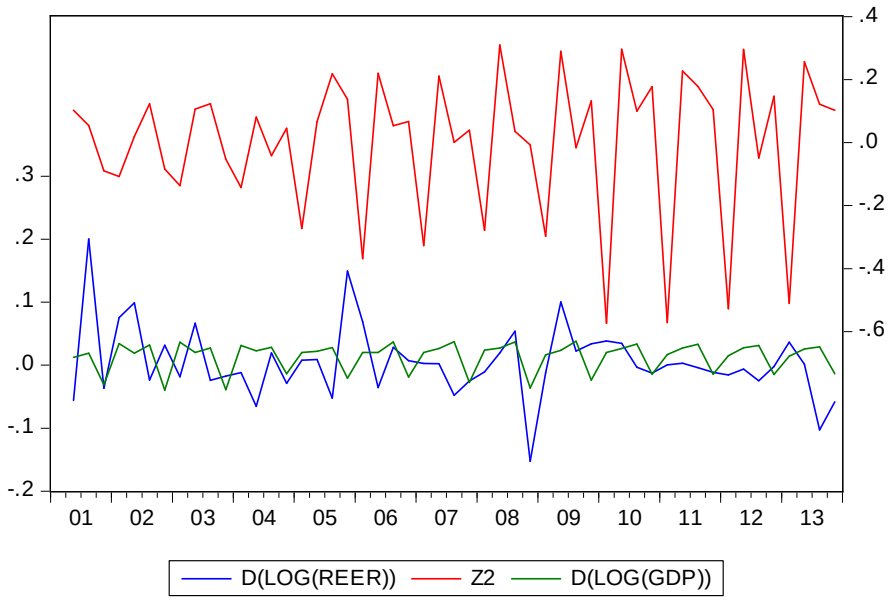


Figure 2: Discretionary Fiscal Policy, Economic Cycle, and Exchange Rates Fluctuation

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 relative change in real effective exchange rate is 0.5 percent. However, they are highly fluctuated ranging from -0.15 to 20 percent. The large standard deviation compared to its mean value supports to the conclusion that the movement of the real effective exchange rate considerably varies. The deficit rule credibility for the two measurements confirms to each other. They indicate that the deviation of actual deficit from the planned one is substantial. The average of Z_{11} suggests that the actual deficit is 75 percent of the planned deficit. In the relative term, the actual deficit to GDP ratio is on the average 0.4 percent higher than the planned deficit to GDP ratio (Z_{12}) indicating upward deficit bias. However, when we look at the skewness index, most of the data locate in the left side and thus consistent with the first measurement. Those figures imply that the deficit rule is incredible. As expected, the average value of discretionary fiscal policy (Z_2) is zero. The median value is closer to the maximum rather than the minimum values suggesting that the most data series lay in the left side of the mean value. The negative value of skewness (-1.05) proves that the series are not symmetric or normal distribution but skewed to the left. In contrast to the deficit rule, the average values of debt rule for the four measurements and degree of economic openness are close to each others. Each the median value is not far enough to the respective mean. In addition, each the maximum value is also relatively close to the minimum value. Given the relatively small standard deviation of the four measurements and they are normally distributed, we can infer that the debt rule is more credible than the deficit rule.

Table 1: Descriptive Statistics

	d(reer)	Z_{11}	Z_{12}	Z_2	Z_3	Z_3Y	Z_3AR	Z_3HP	OPEN
Mean	0.0050	0.7457	0.0041	0.0000	1.0007	1.0013	1.0001	0.9987	0.5492
Median	-0.0019	0.7180	0.0041	0.0542	0.9950	0.9843	0.9994	0.9943	0.5482
Max	0.2004	3.0792	0.0410	0.3099	1.0929	1.4270	1.0449	1.0899	0.7810
Min	-0.1524	-0.4397	-0.0723	-0.5730	0.9402	0.8204	0.9315	0.9338	0.4375
Std. Dev.	0.0574	0.6621	0.0158	0.2284	0.0362	0.1441	0.0209	0.0348	0.0674
Skewness	0.7117	0.9996	-1.9912	-1.0463	0.5660	1.1335	-0.1941	0.4207	0.6611
Kurtosis	5.5671	5.1961	12.7147	3.4408	2.4695	4.1358	4.2492	2.6828	4.1182
Obs.	51	51	51	51	51	51	51	51	51

In the proceeding section, we focus on the time series properties of each series. Many studies point out that using 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 stationary*). 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 among the five variables with 1 lag in all cases and no deterministic trend. The trace statistics together with maximum eigen-value (λ *max*) for testing the rank of co-integration are shown in Table 2. The four tests perform the presence of the co-integrating equations (at most 2 or even 4) between the non stationary (or 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 Test

Hypothesized No. of CE(s)	Eigen-value	Trace Statistic	0.05 Critical Value	Prob.**
Unrestricted Co-integration Rank Test (Trace): DREER Z_{11} Z_2 Z_3 Openness				
None *	0.6769	133.6143	69.8189	0.0000
At most 1 *	0.5760	78.2508	47.8561	0.0000
At most 2 *	0.3554	36.2043	29.7971	0.0080
At most 3	0.2058	14.6846	15.4947	0.0660
At most 4	0.0669	3.3946	3.8415	0.0654
Unrestricted Co-integration Rank Test (Trace): DREER Z_{12} Z_2 Z_3Y Openness				
None *	0.8920	199.3569	69.8189	0.0000
At most 1 *	0.6155	90.2973	47.8561	0.0000
At most 2 *	0.4597	43.4627	29.7971	0.0008
At most 3	0.2290	13.2950	15.4947	0.1044
At most 4	0.0111	0.5486	3.8415	0.4589
Unrestricted Co-integration Rank Test (Trace): DREER Z_{12} Z_2 Z_3AR Openness				
None *	0.6857	129.3588	69.8189	0.0000
At most 1 *	0.4667	72.6523	47.8561	0.0001
At most 2 *	0.4247	41.8446	29.7971	0.0013
At most 3	0.1714	14.7517	15.4947	0.0645
At most 4 *	0.1069	5.5388	3.8415	0.0186
Unrestricted Co-integration Rank Test (Trace): DREER Z_{12} Z_2 Z_3HP Openness				
None *	0.6818	144.7531	69.8189	0.0000
At most 1 *	0.6402	88.6425	47.8561	0.0000
At most 2 *	0.4171	38.5601	29.7971	0.0038
At most 3	0.1489	12.1133	15.4947	0.1516
At most 4 *	0.0824	4.2148	3.8415	0.0401
* denotes rejection of the hypothesis at the 0.05 level				
** MacKinnon-Haug-Michelis (1999) *p*-values				

After ensuring that all of the variables of interest are co-integrated, we move on the analysis of the magnitude of influence for each independent variable on the exchange rate fluctuation. Table 3 reports the OLS estimation results of four regression models as specified equation (15) in the previous section. Most the hypothesized variables are found to be statistically significant at 5 percent. In some cases, the significance is at 1 percent confidence level. They are confirmed by the moderately high coefficient of determination (R^2) and F statistic values. The exchange rate equation is generally in line with the existing literature. The results show that the deficit rule policy credibility is statistically insignificant in all of the four specification models. Moreover, the magnitude is inconsistent, *i.e.* positive in (1) and (3) models but becomes negative in (2) and (4) models. These results inform that the incredible deficit rule policy, in the form of large deviation from the planned budget, has no impact on the exchange rates stabilization.

*) We do not report the unit roots test because of lack of space. The complete result can be obtained from the author upon request.

Table 3: Estimation Results of Relative Change in Real Effective Exchange Rate

	(1)		(2)		(3)		(4)	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
C	3.0453	0.0000	2.2702	0.0000	2.6152	0.0000	3.2856	0.0000
Z_{11}	0.0026	0.8017	-	-	-	-	-	-
Z_{12}	-	-	-0.0431	0.9269	0.0083	0.9862	-0.0069	0.9861
Z_2	0.0110	0.6906	0.0145	0.6366	0.0003	0.9934	0.0136	0.6140
Z_3	-0.7572	0.0003	-	-	-	-	-	-
Z_3Y			-0.1246	0.0203	-	-	-	-
Z_3AR	-	-	-	-	-0.7358	0.0490	-	-
Z_3HP	-	-	-	-	-	-	-0.8383	0.0000
Open	-0.4790	0.0005	-0.4545	0.0025	-0.4433	0.0036	-0.5290	0.0001
Lag	-0.4508	0.0000	-0.4216	0.0000	-0.3637	0.0001	-0.4801	0.0000
R^2		0.4823		0.3678		0.3460		0.5114
R^2-adj		0.4247		0.2975		0.2733		0.4571
SEE		0.0435		0.0481		0.0489		0.0423
F		8.3832		5.2358		4.7614		9.4189
DW		2.1553		1.9724		2.1155		2.1786
N		51		51		51		51

The neglected impact of deficit rule policy credibility may be attributed to the fact that deficit bias is highly driven by the large amount of oil subsidy. The oil price is set by the government under government subsidy. Despite the fact that Indonesia is exporting oil, the country also imports oil from other countries. The surplus of importing value over the exporting value makes Indonesia a net oil importing country. Therefore, the repercussions from price increase in the world market could not be avoided from spill-over to the local market. As a net oil importer country, Indonesia faces a dilemma when the world crude oil price increases. In one hand, the central government revenue increases substantially due to oil and gas taxes. On the other hand, the central government has to spend more subsidies to avoid the increase of domestic fuel prices. Being a government control item, the event of oil price surge has inflicted a soaring fuel subsidy bill to the government. This situation pressured the Indonesia's government to review its policy on oil prices and finally decides implement oil price increase in the local market. The government's decision to slowly liberalize the local oil market has triggered mixed responses from the public, particularly households and business units. As a result, the budget deficit decreases after the government reduced subsidy through increases the domestic oil prices. The unpredictability world oil prices and subsidy and hence deficit generates uncertainty in foreign exchange market. This finding basically is in line with Tsen (2012). The discretionary fiscal policy does not have any impact on the exchange rate movements. The corresponding coefficient is statistically insignificant for four model specifications. This supports to the result of visual inspection as explained above. This finding, however, is contrary to the previous empirical studies. Most studies found that the discretionary fiscal policy significantly affect (either positively or negatively) to the exchange rates. This difference may due to the method, time covered, and type of data. In the case of Indonesia, Kuncoro (2015), for example, focused on the exchange rates volatility and found the positive impact. This paper, in contrast, concentrates on the exchange rates fluctuation. Given the different result, we can conclude that the discretionary fiscal policy potentially reduces the exchange rates volatility particularly in the long-term but it cannot be relied to absorb to stabilize the exchange rates fluctuation in the short-term.

The debt rule policy credibility – as previously hypothesized – successfully appreciates the real effective exchange rate. It holds for all of the model specifications. It implies that the narrow gap between the actual debt level and its target reduces substantial uncertainty in the current period then is transformed into lower risk in the prices level. Eventually, the behavior of exchange rate tends to be stable or even decline in the long-run, as found by Abimanyu (1998), with respect to the increase in credible debt rule. Furthermore, looking at the control variable, the estimated coefficient of the openness is statistically significant. It suggests that the exchange rate movement is conversely related to the degree of economic openness. The higher the economic openness, the lower exchange rates fluctuated. However, the negative and significant effects of degree of economic openness points out to the sensitivity of exchange rates fluctuation to external shocks which are beyond from monetary and fiscal authorities control. The estimation of the lagged dependent variable gives the significant coefficients.

The associated coefficient displays persistence. The exchange rates persistence can be considered as a measure of the degree of dependence of current exchange rates behavior on its own past developments. The coefficient of lagged dependent variable is 0.4 suggesting that a change in the exchange rates between quarter *t-1* and *t* drives up the exchange rate process in *t* only 0.4 percent partial adjustments to respond to the desired/targeted exchange rate. Consequently, the exchange rate tends to be less persistent than to respond to external economic conditions in the short-run.

Concluding Remarks

The aim of this paper was to provide direct empirical evidence on the relationship between discretionary as well as fiscal rule policy and exchange rates movement in Indonesia over the period 2001–2013. To the best our knowledge, this is the first study that investigates the effectiveness of fiscal policy by linking those variables in the case of Indonesia. We use the ordinary least squares models and conduct Johansen co-integration tests. We analyzed the quarterly data on government expenditure, deficit, and debt and their impact on the real effective exchange rates fluctuation. The motivation behind this paper is that the theory and empirics imply that expansionary government expenditure can either induces exchange rate appreciation or depreciation. The empirical study also affirms that discretionary government expenditure, credibility of fiscal rules policy, degree of economic openness, and exchange rates movement are co-integrated implying they have a long-term relationship. In the long-term, the degree of economic openness and the credible debt rule policy have the highest impact on the exchange rates downward pressure. Our synthesizing approach does prove that the influence of expansionary government spending on the exchange rates fluctuation pressure typically depends on the characteristics of fiscal policy shock. Our results confirm that both the discretionary government spending shock policy and deficit rule policy have no impact on the exchange rate movement. Meanwhile, the credible fiscal rule in particular debt rule policy significantly reduces the exchange rates fluctuation. The results above are robust in all of the specified models. Those findings provide some important economic implications. First, they suggest that political and institutional factors are the main obstacle in the short-run for government to effectively play an important role to the exchange rate market via signaling mechanism. Second, the sound and prudent fiscal policy management is necessary to avoid possible dramatic change in exchange rates in the long-term in relation to the increase in deficit. Third, as a consequence, they suggest that credibility of fiscal policy improvement should be an integral part of the exchange rates stabilization program.

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