

## Foreign Exchange Intervention: Has It Been Effective in Indonesia?

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### *Abstract*

*We assess the motive and effectiveness of foreign exchange intervention in stabilizing exchange rate in Indonesia. High volatility of exchange rate and capital flows since the global crises have forced central banks to complement its interest rate response with foreign exchange intervention in managing domestic objectives of inflation and economic growth. Using Two-Stage Least Squares (2SLS) and Generalized Autoregressive Heteroskedasticity (GARCH) models with monthly data from January 2004 to December 2018, we find that the motive of managing volatility of exchange rate is more visible than of managing the exchange rate changes and its misalignment to its fundamental level. We also find that foreign exchange rate intervention has been effective in Indonesia for managing exchange rate in both volatility and its misalignment to the fundamental levels. The results of this paper provide evidences of the efficacy of foreign exchange intervention in dealing with monetary policy trilemma in small-open economy.*

**Index Terms**--- Foreign exchange intervention, exchange rate, central banks and their policies.

### 1. Introduction

In many of its statements, Bank Indonesia reiterates its commitment to stabilize the Rupiah exchange rate consistent with its fundamental.<sup>1</sup> The needs to stabilize exchange rate seems to have been more pronounced since the global crisis of 2008/2009. Confronted with heightened volatility of capital flows and exchange rate, Bank Indonesia as other central banks in the emerging markets (EMEs) faces monetary policy trilemma for maintaining its independence of setting interest rate for achieving domestic objectives of inflation and economic growth with those of managing capital flows and exchange rate stability. One option would be to adopt full exchange rate flexibility as shock absorber, particularly as Indonesia is inflation targeting country.

However, there may be several reasons supporting Bank Indonesia's foreign exchange intervention to stabilize exchange rate. For one thing, with still relatively shallow foreign exchange market, Rupiah exchange rate is very susceptible to exchange rate movements, capital flows and global financial market uncertainty. From the trade channel, flexibility of exchange rate may not be effective as self-corrective current account adjustments for a country with high dependency of commodity exports while having high import content of its manufacturing industry. From the financial channel, high volatility of exchange rate could drive away foreign investors especially those holding long-term position while it has very detrimental effects to the balance sheet of corporates having foreign exchange borrowing. Volatile exchange rate also carries high social and political impacts in Indonesia.

The importance of intervention in stabilizing the exchange rate raises questions of its motive and effectiveness. As for the motive, a number of literature lead to the following four reasons, i.e. managing exchange rate volatility, preventing the deviation (misalignment) of exchange rate from its fundamental value, accumulating foreign exchange reserves, or providing liquidity in the event of high market pressures (BIS, 2005, 2013). For Indonesia context, the question is which the motive Bank Indonesia refers to when stating “managing the stability of Rupiah exchange rate consistent with its fundamentals”?

Are they in terms of appreciation/depreciation, volatility, or misalignment to its fundamental? How about the other two motives, i.e. foreign reserves accumulation and providing liquidity to the market?

Given these motives, have foreign exchange interventions been effective? Different views exist among central banks and in empirical studies. Surveys to the central banks commonly reveal that interventions are effective in stabilizing exchange rate and preventing misalignment from the fundamental (BIS, 2013, 2005). However, empirical studies do not always lend supports to these beliefs of central banks. Several studies indeed provided strong support for their effectiveness, while other studies concluded their small impacts to exchange rate.

Unfortunately, to our knowledge, there has no empirical study that assess in detail about the motive and effectiveness of foreign exchange intervention in Indonesia. Thus, the purposes of this paper are twofold. First, to provide empirical evidences of which motive of intervention could be revealed from Bank Indonesia's statement, i.e.: managing exchange rate changes (appreciation/depreciation), volatility, or misalignment to the fundamental. Second, to assess the extent to which the intervention is effective to achieve these objectives. Our study shows that the motive of managing volatility of exchange rate is more visible than of managing the exchange rate changes and its misalignment to its fundamental level. We also find that foreign exchange rate intervention has been effective in Indonesia for managing exchange rate in both volatility and its misalignment to the fundamental levels.

## 2. Literature Review

Appropriate exchange rate policy continues to be one of the most debated issues among central banks, even so since the global crisis. Contrary to the theoretical view, exchange rate flexibility does not always play as shock absorber in the economy, especially those in the EMEs. Rigidity in the goods market as well as financial market often prevails, and therefore exchange rate movements may have negatively impacts on the real sector, macro-economy, and monetary conditions. From the analysis of exchange rate behaviors in the 39 countries with 154 different exchange rate system, Calvo and Reinhart (2002) found that many countries do intervene in the foreign exchange market even those that adopt flexible exchange rate system, a phenomenon doubted as "fear of floating". This finding is consistent with Gadanecz and Mehrotra (2013) study to the 52 advanced and emerging economies showing that the relations between exchange rate volatility and economic growth behaving as U-shape. That is, beyond certain level, exchange rate volatility negatively impacts the economic growth even though it could act as shock absorber when its volatility is not large.

### *Motives of Foreign Exchange Intervention*

The objectives or motives of foreign exchange rate intervention differs from one country to another. Survey by Bank for International Settlement (BIS) to the EMEs reported in Moreno (2005) and Mohanty (2013) indicates the following four motives, i.e.: (1) to symmetrically dampen exchange rate volatility, (2) to prevent exchange rate overshooting, (3) to manage deviation of exchange rate from its fundamental level (leaning against the wind), and (4) to provide liquidity in the foreign exchange rate in the event of excessive pressures (market maker of last resort). In the survey from the period before the global crisis (Moreno, 2005), the first and fourth motives rank higher than the second and third motives. In practices, however, many central banks could hardly differentiate between the first, second and third motives. Intervention for preventing exchange rate overshooting, for example, may be perceived as achieving certain level of exchange rate or its deviation from fundamental.

More interesting is the survey after the global crisis (Mohanty, 2013) which reveals three important conclusions. First, it was admitted that exchange rate flexibility plays important role in dampening output volatility in the EMEs. Nonetheless, high volatility of exchange rate increases volatility of output and therefore could be a source of external vulnerability. Second, foreign exchange intervention generally is directed towards dampening its volatility rather than achieving certain level of exchange rate. In addition, central banks in the EMEs do intervene in the market to provide liquidity in the event of large

capital outflows. Third, majority of central banks in the EMEs view that foreign exchange intervention should be consistent with the stance of monetary policy. Continuous intervention in one direction could induce risks in the economy.

### ***Effectiveness of Foreign Exchange Intervention***

There has been no consensus thus far on the effectiveness of foreign exchange intervention. From the practical point of view, BIS survey to 21 EME's central banks shows that most of them believe the intervention achieve their intended objectives (Mohanty dan Berger, 2013). These results confirm earlier survey by BIS (Mihaljek, 2005) as well as other studies (Neely, 2000, 2008). Central banks in the EMEs also act as 'market maker of the last resort', in the event their markets under exchange rate and liquidity pressures of capital reversals from external spillovers. The survey, nonetheless, does not show that intervention is more effective in time of crisis even though central banks already supply a large amount of their foreign exchange reserves.

These believes of EME's central banks, however, have not always been supported by empirical evidences. In their literature review, Menkhoff (2012) and Ostry et. al. (2012) show that interventions in many cases could dampen exchange rate volatility while in other cases could systematically influence exchange rate level. Interventions are generally more effective when they are consistent with the credible monetary policy adopted by central banks (Amato et. al., 2005; Kamil, 2008). These empirical evidences are in contrast with study by Miyajima and Montoro (2013) that shows intervention only has small and even no effects at all to the exchange rate expectation.

Experiences from the EMEs are also vary. Claro and Soto (2013), for example, show that intervention only temporary affected peso in the second half of 2011. Similarly, several studies by Czech National Bank concluded that interventions have only small effect to the exchange rate (Gersl, 2006; Egert dan Komarek, 2005). In contrast, other studies for the case of Peru show that interventions have succeeded in dampening exchange rate volatility (Rossini et. al., 2011; Humala and Rodríguez, 2009). The success of interventions is also evidenced from studies for Brazil and Poland. For the case of Brazil, Kohlscheen (2012) shows intervention by the central bank influences the exchange rate determination according to the ordering of sell/buy transactions in the foreign exchange market. For the case of Poland, Adam et. al. (2013) concludes that intervention following the Greek crisis in the second half of 2011 is evidenced to be able to influences securities yields and exchange rate volatility.

Compared to Latin America and East Europe, there has been not many studies for the case of Asia. Assessments are mostly coming from statements by central banks that interventions have been succeeded in dampening the volatility of exchange rate, and even in managing the misalignment of exchange rate from its fundamental level, as in the case of Indonesia (Warjiyo, 2013). For the case of the Phillippines, Guinigundo (2013) indicates asymmetry in the effect of intervention, in that sell intervention could reduce exchange rate volatility while buy intervention could increase (not reduce) the volatility. Our study is one of attempts to assess empirically the motives and effectiveness of foreign exchange intervention for Indonesia and to some extents for Asia.

### **3. Empirical Model and Data**

Empirical studies on foreign exchange interventions commonly face two main challenges, i.e. model specifications and data availability. Econometric models should be able to address two-ways impacts of intervention and exchange rate. Many studies tackle this problem by adopting econometric models such as *two-stage least square* (2SLS) or GARCH (Ito, 2003; Gersl, 2006, Neely, 2008). Other studies choose bi-variate VAR (Lewis, 1995) or structural VAR (Kim, 2006), while Kearns & Rigobon (2005) use GMM simulations in the simultaneous equations. From the data availability, the central banks mostly do not publish their amounts of foreign exchange intervention. Many empirical studies mostly use the changes of foreign exchange reserves as proxy of the amount of central bank interventions. The

problem is that these changes involve also other foreign exchange receipts and payments by the central banks.

For the empirical model, we follow 2SLS model introduced by Ito (2003) as modified by Gersl (2006) and Neely (2008) to estimate the motives of foreign exchange intervention as the following:

$$INT_t = \alpha_0 + \alpha_1 \Delta s_{t-1} + \alpha_2 (s_{t-1} - \hat{s}_{t-1}) + \alpha_3 VOL_{t-1} + \alpha_4 INT_{t-1} + \varepsilon_t \quad (1)$$

This specification shows three motives of intervention ( $INT_t$ ) by the central bank, i.e. to influence: (1)  $\Delta s_{t-1}$  = exchange rate changes (appreciation/depreciation), (2)  $(s_{t-1} - \hat{s}_{t-1})$  = exchange rate *misalignment* (i.e. the deviation of exchange rate level to its fundamental value), and (3)  $VOL_{t-1}$  = exchange rate volatility. We include lag variable ( $INT_{t-1}$ ) to measure the continuous impacts of intervention. We also add dummy variable to assess the asymmetric effects of intervention with values 1 for depreciation and 0 for appreciation (cf. Manafe & Setyorini, 2019).

Following the 2SLS approach, we use the estimated values of intervention ( $INT_t$ ) from specification (1) to assess the effectiveness of intervention to exchange rate changes ( $\Delta s_t$ ), misalignment of exchange rate to its fundamental value ( $s_t - \hat{s}_t$ ), and exchange rate volatility ( $VOL_t$ ) with the following specification:

$$\Delta s_t = \beta_0 + \beta_1 INT_t + \beta_2 IR_t + \beta_3 CDS_t + \varepsilon_t \quad (2a)$$

$$(s_t - \hat{s}_t) = \beta_0 + \beta_1 INT_t + \beta_2 IR_t + \beta_3 CDS_t + \varepsilon_t \quad (2b)$$

$$VOL_t = \beta_0 + \beta_1 INT_t + \beta_2 IR_t + \beta_3 CDS_t + \varepsilon_t \quad (2c)$$

To take into account other factors affecting the exchange rate, we add two control variables in specification (2) based upon interest rate parity theory, i.e. (domestic and foreign) interest rate differential ( $IR_t$ ) and risk premium ( $CDS_t$ ). The estimated parameter  $\beta_1$  will determine the effectiveness of intervention to the exchange rate misalignment.

We take note that specification models (1) and (2) may involve heteroskedasticity problem between the changes of exchange rate ( $\Delta s_t$ ) and its volatility ( $VOL_t$ ), as they are the first and second moment from the same variable. Thus, to assess the effectiveness of intervention to the changes and volatility of exchange rate, we use the following GARCH specification:

$$\Delta s_t = \gamma_0 + \gamma_1 INT_t + \sum_{i=2}^n \gamma_i X_{it} + \varepsilon_t$$

$$\varepsilon_t | \Omega_{t-1} \sim N(0, \sigma^2)$$

$$\sigma_t^2 = \alpha_0 + \alpha_1 \varepsilon_{t-1}^2 + \alpha_2 \sigma_{t-1}^2 + \alpha_3 INT_t + \sum_{i=4}^n \alpha_i X_{it} + \mu_t \quad (3)$$

The estimated parameters ( $\gamma_1$ ) and ( $\alpha_3$ ) in the specification (3) show the effectiveness of intervention to the changes and volatility of exchange rates, respectively.

We use monthly data from January 2004 to December 2018 to be able to capture the motive and effectiveness of Bank Indonesia's foreign exchange intervention to manage changes, misalignment, and volatility of Rupiah exchange rate. All data are from Bank Indonesia and IMF's Statistics. We define intervention ( $INT_t$ ) as changes in foreign exchange reserves published by Bank Indonesia after adjusting (adding/subtracting) a number of important foreign exchange transactions (receipts/payments). For the receipts, two items are taken into account, i.e. the receipts from oil and gas exports and from sovereign

global bond issuances. For the payments, we adjust the foreign reserves by payments of official external debts (principal and interest).

Exchange rate appreciation/depreciation ( $\Delta s_t$ ) is measured as annual percentage changes (*year-on-year*) of Rupiah nominal exchange rate to US dollar, while volatility ( $VOL_t$ ) is calculated as percentage standard deviation of exchange rate changes ( $\Delta s_t$ ). Exchange rate misalignment ( $s_t - \hat{s}_t$ ) is measured as percentage deviation of Rupiah nominal exchange rate to its fundamental. In this regard, we define the fundamental as the corresponding Rupiah nominal exchange rate when *Real Effective Exchange Rate* (REER) equals to 100. We note this is the simplest measure of exchange rate fundamental based on *Purchasing Power Parity* (PPP) theory.

#### 4. Empirical Findings and Policy Discussions

Table 1 presents the estimated parameters for the motives of foreign exchange intervention as specified in model (1). As alluded to earlier, in addition to the basic model, we also estimated a model with dummy variables with value 1 for depreciation and 0 for appreciation of exchange rate. This is to test the asymmetric behavior of central bank when intervening in the market during period of depreciation and appreciation. The general perception is that central banks are more risk averse towards exchange rate depreciation than of appreciation. This is particularly so in the case of Indonesia, as excessive exchange rate depreciation may have negative impacts to the economy as well as social political conditions (cf. Faggidae, 2019).

Table 1. Indonesia: Motives of Foreign Exchange Intervention

| Explanatory Variables                    | Dependent Variable: INT |             |
|--|-------------------------|-------------|
|  | Model 1                 | Model 2     |
| Constant                                 | -643.8701*              |             |
| $\Delta s_{t-1}$                         | -2.544469 *             |             |
| $(\Delta s_{t-1} - \hat{s}_{t-1})$       | -1100.481               |             |
| $VOL_{t-1}$                              | 110.4617                |             |
| $INT_{t-1}$                              | 0.323420 *              |             |
| Dummy $(\Delta s_{t-1} - \hat{s}_{t-1})$ |                         | 1446.146    |
| Dummy $(VOL_{t-1})$                      |                         | -141.3922 * |
| R-Square                                 | 0.315799                |             |
| Durbin-Watson                            | 2.034142                |             |

Based on the Table 1, there are two equations of intervention policy reactions, namely when there is appreciation or depreciation of the rupiah exchange rate. If the Rupiah exchange rate appreciates, the equation of the reaction function can be written as follows:

$$INT_t = -643.87 - 2.54 \Delta st_{-1} - 1100.48 (\Delta st_{-1} - \hat{s}_{t-1}) + 110.46 VOL_{t-1} + \eta_t$$

When the rupiah exchange rate appreciates, changes in the exchange rate significantly affect the intervention policy reaction negatively by -2.54 with a significance value of 0.002 (< 0.05). On the other hand, misalignment has a negative but insignificant influence of -1100.48 with a significance value of 0.23 (> 0.05). Lastly, volatility has a positive and significant influence of 110.46 with significance value of 0.045 (< 0.05). Both exchange rate changes and volatility have significant influence over intervention policy reaction (volatility has higher coefficient) suggesting that Bank Indonesia will react by buying USD. Based on this, it can be concluded that when the rupiah exchange rate appreciates, the motive of managing volatility of exchange rate is more dominant than two other motives.

However, when the exchange rate depreciates, the dummy variable equals to 1, so the equation of the reaction function can be written as follows:

$$INT_t = -643.87 - 2.54 \Delta st_{-1} + (-1100.48 + 1446.14)(\Delta st_{-1} - \hat{s}_{t-1}) + (110.46 - 141.39) VOL_{t-1} + \eta_t$$

When the rupiah exchange rate depreciates, volatility has changed into a negative and significant effect on the intervention policy reaction. If the exchange rate is increasingly volatile, Bank Indonesia will react by selling USD in the foreign exchange market. The effect of misalignment also turned positive yet still insignificant (0.12 > 0.05). Thus, it can be concluded that when the rupiah exchange rate depreciates, Bank Indonesia intervention is also more driven by managing volatility albeit with opposite direction (by selling USD).

Table 2 reports the estimated parameters using standard 2SLS for the effectiveness of intervention to exchange rate changes, misalignment, and volatility as specification model (2a), (2b), and (2c), respectively. We use estimated values of  $INT_t$  from estimated model (1) with dummy variables.

Table 2. Indonesia: Effectiveness of Foreign Exchange Intervention, 2SLS

| Explanatory Variables | Dependent Variables |                     |           |
|-----------------------|---------------------|---------------------|-----------|
|                       | $\Delta s_t$        | $(s_t - \hat{s}_t)$ | $VOL_t$   |
| Constant              | -117.3706 *         | -0.807470 *         | -4.017978 |
| $INT_t$               | -0.115767 *         | -0.000245 *         | 0.004366  |
| Dummy ( $INT_t$ )     |                     | 0.000401 *          | -0.005959 |
| $IR_t$                | 2.349162            | 0.160593 **         | 0.626039  |
| $CDS_t$               | 0.229674            | 0.003347 *          | 0.032298  |
| R-Square              | 0.492283            | 0.425055            | 0.609236  |
| Durbin-Watson         | 1.744933            | 0.300318            | 1.490516  |

Model (2a) estimates the effectiveness of intervention for managing changes in exchange rate. From the Table 2, the equation of the intervention effectiveness can be written as follows:

$$\Delta st = -117.37 - 0.115 INT_t + 2.349 IR + 0.229 CDS$$

Model (2b) estimates the effectiveness of intervention for managing misalignment. We use dummy variable for intervention to differentiate between selling USD (dummy = 1) and buying USD (dummy = 0) period. This is done considering variable  $INT_t$  has both positive and negative value while  $(s_t - \hat{s}_t)$  has absolute value. From the Table 2, the equation of intervention effectiveness when buying USD can be written as follows:

$$(s_t - \hat{s}_t) = -0.807470 - 0.00024 INT_t + 0.16 IR + 0.229 CDS$$

When the rupiah exchange rate appreciates, if there is no intervention from Bank Indonesia or changes in the control variable, misalignment will be corrected itself by 0.34. Meanwhile, the intervention policies undertaken by Bank Indonesia had a negative and significant effect ( $0.034 < 0.05$ ) of  $-2.4 \times 10^{-4}$ . This suggests the intervention policies by buying USD is effective to reduce misalignment. Meanwhile, the two control variables have a positive and significant effect on misalignment of exchange rates. If there is an increase in the ratio of rupiah and USD interest rates, the misalignment will increase by 0.16. And if there is an increase in CDS, the misalignment will increase by 0.229.

However, when the exchange rate depreciates, the dummy variable is 1, so the equation can be written as follows:

$$(s_t - \hat{s}_t) = -0.807470 + (0.000401 - 0.00024) INT_t + 0.16 IR + 0.229 CDS$$

The intervention policy undertaken by Bank Indonesia now has a negative and significant effect ( $0.000 < 0.05$ ) by  $1.61 \times 10^{-4}$ . Meanwhile, the influence of the two control variables remained the same. So, it can be concluded, the intervention policies undertaken by Bank Indonesia both by buying and selling USD is effective to reduce misalignment.

Model (2c) estimates the effectiveness of intervention for managing volatility. We use dummy variable for intervention to differentiate between selling USD (dummy = 1) and buying USD (dummy = 0) period. This is done considering variable  $INT_t$  has both positive and negative value while  $VOL_t$  has absolute value. From the Table 2, the equation of intervention effectiveness when buying USD can be written as follows:

$$VOL_t = -4.017 + 0.004 INT_t + 2.349 IR + 0.229 CDS$$

However, when the exchange rate depreciates, the dummy variable is 1, so the equation can be written as follows:

$$VOL_t = -4.017 + (0.004 - 0.005) INT_t + 2.349 IR + 0.229 CDS$$

We further use GARCH to address heteroskedasticity problem between foreign exchange changes and its volatility. Table 3 reports the estimated parameters of GARCH for effectiveness of intervention to the changes and volatility of exchange rates, respectively.

Table 3. Indonesia: Effectiveness of Foreign Exchange Intervention, 2SLS

| Explanatory Variables | Dependent Variable: $\Delta s_t$ |                   |
|-----------------------|----------------------------------|-------------------|
|                       | Mean Equation                    | Variance Equation |
| Constant              | -14.27991                        | -26709.65 *       |
| $INT_t$               | -0.015458                        | -5.243897 *       |
| Dummy ( $INT_t$ )     |                                  | 3.568064 *        |
| $IR_t$                | 7.415132                         | 6691.350 *        |
| $GARCH_{t-1}$         |                                  | 0.734895 *        |
| R-Square              | 0.041069                         |                   |
| Durbin-Watson         | 1.642574                         |                   |

From level equation, it shows that  $INT_t$  coefficient is not significant. It is inconclusive whether intervention affects foreign exchange changes. However, the variance equation shows the effectiveness of intervention in managing volatility. Dummy for intervention variable is used to differentiate between selling USD (dummy = 1) and buying USD (dummy = 0) period. This is done considering variable  $INT_t$  has both positive and negative value while  $VOL_t$  has absolute value.

When Dummy ( $INT_t$ ) = 0, the period of buying USD intervention, the coefficient that is read only  $INT_t$  is negative significant, which means that buying intervention (positive) is effective to reduce the exchange rate volatility. However, when Dummy ( $INT_t$ ) = 1, the period of selling USD intervention, the coefficient that is read  $INT_t + \text{Dummy} (INT_t)$  is negative significant, which means that selling intervention (negative) will increase exchange rate volatility.

Therefore, it can be concluded that foreign exchange interventions by buying USD effectively reduce exchange rate volatility (which is a variance of exchange rates), while foreign exchange interventions in the form of selling USD will in fact tend to increase exchange rate volatility.

## 5. Concluding Remarks

The results of this study provide empirical evidence about the motives and effectiveness of Bank Indonesia's intervention policies in managing the Rupiah exchange rate. Three main conclusions can be made: *First*, the motive for intervention by Bank Indonesia is to control volatility compared to two other objectives, this is evidenced from the estimated results of the intervention policy reaction function. Bank Indonesia responds to the appreciation of the exchange rate by selling USD to increase USD supply in the money market. Furthermore, the higher the volatility that occurs when the rupiah appreciates, Bank Indonesia tends to respond by buying USD. Conversely, an increase in volatility when the exchange rate is depreciating will trigger Bank Indonesia to intervene in selling the USD. *Second*, it has been proven empirically that Bank Indonesia is able to control the exchange rate both at the level of volatility and the exchange rate deviation from its fundamentals. Bank Indonesia intervention by selling and buying USD purchases effectively reduces misalignment. *Third*, the GARCH equation proves that the equation shows that foreign exchange interventions by buying USD effectively reduce exchange rate volatility (which is a variance of exchange rates), while foreign exchange interventions in the form of selling USD will in fact tend to increase exchange rate volatility.



## References

- [1] Adam, M., Koziński, W., Zieliński, J. (2013). To what Extent Can Central Banks Influence Exchange Rates with Foreign Exchange Interventions? The Case of Poland. BIS Paper No. 73.
- [2] Amato, Jeffery D. & Andrew Filardo & Gabriele Galati & Goetz von Peter & Feng Zhu. (2005). "Research on exchange rates and monetary policy: an overview," BIS Working Papers 178, Bank for International Settlements.
- [3] Bank Indonesia, "Overview: Synergi for Resiliency and Growth", *Indonesia Economic Report 2018*. March, 2019, p. xvi.
- [4] Calvo, Guillermo A. and Carmen M. Reinhart. "Fear Of Floating," *Quarterly Journal of Economics*, 2002, v107(2, May), 379-408.
- [5] Claro, S., & Soto, C.G. (2013). Exchange rate policy and exchange rate interventions: the Chilean experience.
- [6] Égert, B. & Komarek, L. (2005). Foreign Exchange Interventions and Interest Rate Policy in the Czech Republic: Hand in Glove? Prague, CNB Working Paper, 2005, no. 7.
- [7] Fanggidae, J. P. (2019). Relationships between advertising value and dimensions of advertising. *The International Journal of Social Sciences World (TIJOSSW)*, 1(01), 48-57.
- [8] Gadanez, Blaise & Mehrotra, Aaron N., *The Exchange Rate, Real Economy and Financial Markets* (October 2013). BIS Paper No. 73b.
- [9] Gersl, A. & Holub T. (2006): Foreign Exchange Interventions under Inflation Targeting: The Czech Experience. *Contemporary Economic Policy*, vol. 24, October 2006, no. 4, pp. 475–491
- [10] Guinigundo (2013)
- [11] Humala, Alberto & Gabriel Rodríguez. (2009). "Foreign Exchange Intervention and Exchange Rate Volatility in Peru," Working Papers 2009-008, Banco Central de Reserva del Perú.
- [12] Ito, T. (2003). Is foreign exchange intervention effective? The Japanese experiences in the 1990s. In: Mizen, P. (2003): *Monetary History, Exchange Rates and Financial Markets*. Edward Elgar, Cheltenham, pp. 126–153.
- [13] Kamil, Herman. (2008). Is Central Bank Intervention Effective Under Inflation Targeting Regimes? The Case of Colombia (April 2008). *IMF Working Papers*, Vol. , pp. 1-42.
- [14] Kearns, Jonathan and Roberto Rigobon. (2005). "Identifying The Efficacy Of Central Bank Interventions: Evidence From Australia And Japan," *Journal of International Economics*, v66(1, May), 31-48.
- [15] Kohlscheen, Emanuel. (2013). Order Flow and the Real: Indirect Evidence of the Effectiveness of Sterilized Interventions. Working Paper 426 - Bank of International Settlements. 10.2139/ssrn.2051099.

- [16] Lewis, Karen K. (1995). "Puzzles in international financial markets," *Handbook of International Economics*, in: G. M. Grossman & K. Rogoff (ed.), *Handbook of International Economics*, edition 1, volume 3, chapter 37, pages 1913-1971 Elsevier.
- [17] Manafe, J. D., & Setyorini, T. (2019). The impact of organizational commitment as mediator and moderator relationship between budgeting participation on managerial performance. *The International Journal of Social Sciences World (TIJOSSW)*, 1(01), 11-20.
- [18] Menkhoff, L., L. Sarno, M. Schmeling, and A. Schrimpf, (2012). "Carry Trades and Global Foreign Exchange Volatility" *Journal of Finance*, 67, 681–718.
- [19] Mihaljek, D (2005): "The effectiveness of foreign exchange intervention in emerging market countries", in "Foreign exchange market intervention in emerging markets: motives, techniques and implications", BIS Papers, no 24, May.
- [20] Miyajima, Ken & Carlos Montoro, (2013), Impact of foreign exchange interventions on exchange rate expectations in Ken Miyajima and Carlos Montoro (eds.), *BIS Papers chapters*, vol 73, Bank for International Settlements
- [21] Mohanty, M.S. and B. Berger (2013), "Central bank views on foreign exchange intervention", in "Market volatility and foreign exchange intervention in EMEs: what has changed?". *BIS Papers No 73*, October 2013
- [22] Mohanty, Madhusudan. (2013). "Market volatility and foreign exchange intervention in EMEs: what has changed?," *BIS Papers chapters*, in: Bank for International Settlements (ed.), *Sovereign risk: a world without risk-free assets?*, volume 73, pages 01-10 Bank for International Settlements.
- [23] Moreno, R (2005): "Motives for intervention", in "Foreign exchange market intervention in emerging markets: motives, techniques and implications", *BIS Papers*, no 24, May.
- [24] Neely, C J (2000): "The practice of central bank intervention: looking under the hood", *Central Banking*, 11, November.
- [25] Neely, Christopher J. (2008). "Central bank authorities' beliefs about foreign exchange intervention," *Journal of International Money and Finance*, Elsevier, vol. 27(1), pages 1-25, February.
- [26] Ostry, J. & A. Ghosh & M. Chamon. (2012). "Two targets, two instruments: monetary and exchange rate policies in emerging market economies", *IMF Staff Discussion Note*, SDN/12/01
- [27] Rossini, Renzo & Zenon Quispe & Donita Rodriguez. (2011). "Capital Flows, Monetary Policy and FOREX Interventions in Peru," *Working Papers 2011-008*, Banco Central de Reserva del Perú.
- [28] Warjiyo, P., 2013b, "Indonesia's monetary policy: coping with volatile commodity prices and capital inflows", *BIS Papers No. 70*, January