A note on the effectiveness of intervention in the foreign exchange market: the case of the Philippines

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Abstract

This study primarily examines the extent of daily foreign exchange intervention by the Bangko Sentral ng Pilipinas (BSP) between 2005 and 2010, and its effectiveness in controlling the daily volatility of the exchange rate. Using an exponential GARCH model, we find that participation in the spot market remains the main method used by the BSP to influence the volatility of the exchange rate, while intervention in the foreign exchange market through derivatives is secondary. The results also show that the BSP is sensitive to large swings in the exchange rate. However, we find no evidence that the BSP targets a particular exchange rate level over thirty-day or hundred-day trading horizons. With regard to effectiveness, our estimates indicate that the BSP's intervention in the spot market has been effective in containing same-day volatility. The effectiveness of intervention in the foreign exchange market is measured by how significantly spot market intervention and forward transactions influence the daily return on the exchange rate. Over longer trading days, our results show that intervention at larger volumes or sustained central bank actions are significant in managing large fluctuations in the exchange rate.

Keywords: central banks, foreign exchange intervention, Philippines

JEL classification: E58, F31, G15

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I. Introduction: aspects of foreign exchange intervention/operations

Emerging market economies, the Philippines included, have experienced a surge in capital inflows on the back of renewed risk appetite fuelled by their continued strong growth prospects and higher returns on domestic assets. The massive build-up in capital inflows started in 2002.[2]

The surge in foreign exchange (FX) inflows into the Philippines has allowed Bangko Sentral ng Pilipinas (BSP) to build up its international reserves, which help to insulate the economy against external shocks. Notwithstanding that, structural flows continue to be the dominant source of foreign exchange. The largest share comes from the export sector. Remittances from overseas Filipinos and receipts from business process outsourcing services constitute the second major source of inflows. Direct investments and portfolio flows of non-residents represent relatively smaller shares of nominal GDP.[3]

In the aftermath of the Asian currency crisis of 1997, many emerging market economies have adopted a policy configuration involving exchange rate flexibility that is greater, though still managed to varying degrees, together with ongoing financial integration and some measure of domestic monetary independence. However, these countries have continued to engage in exchange rate management to a great degree (Aizenman and Glick 2008). Hence, in the face of pressures on their currencies to appreciate, they have been accumulating reserves and sterilising the liquidity impact. The accumulation of international reserves has become a key element in enhancing the sustainability of this approach. Nevertheless, concerns about the cost of maintaining monetary stability with this new policy mix suggest a need for higher levels of intervention and sterilisation in order to support such a build-up of international reserves.

The effectiveness of central bank intervention is dependent on the channel through which it influences the exchange rate. In this paper, we focus on two channels: the portfolio channel and the signalling channel.

The *portfolio channel* operates even when intervention by the monetary authority is sterilised, as long as assets denominated in different currencies are imperfect substitutes. Essentially, purchases of foreign currency by the central bank change the supply of domestic vis-à-vis foreign assets. This will result in a change in the relative value of the domestic currency, which will be reflected in the exchange rate, as asset holders will require a higher risk premium to hold the rebalanced portfolio. Consequently, interventions must be significant relative to market turnover to trigger rebalancing or shifts in the behaviour of holders of domestic and foreign assets. In trading environments marked by secret central bank intervention through conduit banks, this channel may be another factor bolstering the effect – through asymmetric information. Conduit banks would have first mover advantages over the other banks, generating higher payoffs through trading behaviour that is

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[2]   International Monetary Fund (2007), World Economic Outlook (WEO), October.

[3]   The reason for the generally meagre share of foreign direct investment, for instance, could be structural, i.e., the persistence of constraints on business competitiveness.

consistent with the central bank. This may trigger a form of herding behaviour,[4] as there is an information cascade in which other market participants sense the formation of a trend based on seemingly private information and follow suit.

As most emerging market economies hold sizable foreign exchange reserves relative to market turnover in the currency market or the domestic stock of government bonds, the portfolio channel is expected to have greater effect.[5]

A separate, though not mutually exclusive, means by which a central bank influences the exchange rate is the *signalling channel*, also known as the "expectations channel". Here, central bank intervention works by conveying information on future values of the exchange rate or of variables that are believed to influence the exchange rate (e.g., monetary policy settings, money supply, etc.). If intervention efforts in the market are clear and credible (i.e., informative), the central bank can anchor expectations. That is, persistent effects on the level or volatility of the exchange rate can be induced by credible central bank action in the foreign exchange market. However, if market participants fail to correctly read the central bank's intentions, the intervention may contribute to volatility in the exchange rate.

A variant of the signalling channel is the *coordination channel*. In periods of great volatility, when the exchange rate can deviate significantly from its equilibrium value, central bank intervention can coordinate the expectations of market participants and infuse the market with the idea that the misalignment of the exchange rate is extreme. Credible intervention changes the expectations of agents and increases the number of market traders who monitor fundamentals, as opposed to those who merely follow trends (e.g., chartists and technical analysts).[6]

This note primarily examines the extent of daily foreign exchange intervention by the BSP between 2005 and 2010, and its effectiveness in controlling the daily volatility of the exchange rate. Volatility often reflects, among other things, uncertainty surrounding economic policies and other fundamental determinants of exchange rates, which the market may be struggling to price accurately. As indicated by Kamil (2008) and Domínguez (1998), central bank intervention is expected to reduce volatility as long as intervention is both credible and unambiguous. Meanwhile, a key advantage of the daily intervention data used in this paper is that they reflect discretionary purchases of dollars made with the explicit intention of reducing the volatility of the domestic currency vis-à-vis the US dollar.

It should be emphasised that our estimation is limited to the 2005-2010 period of BSP intervention in the foreign exchange rate market. A more elaborate model and longer data series can help address broader issues and concepts relating to the effectiveness of intervention strategies. For instance, while we focus on a daily measure of exchange rate volatility, an important issue is whether central bank success in reducing such volatility itself creates an environment (for example,

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[4]   For details, see Evans, Martin and Richard Lyons (2001), "Portfolio balance, price impact and secret intervention", National Bureau of Economic Research Working Paper Number 8356, Cambridge, Massachusetts.

[5]   See Galati, Gabriele and Will Meilick (2002), "Central bank intervention and market expectations", BIS Paper No. 10, Basel, Switzerland.

[6]   See Sarno, Lucio and Mark Taylor (2001), "Official intervention in the foreign exchange market: Is it effective and, if so, how does it work?" *Journal of Economic Literature*, vol. 39, no. 3, pp. 839-868.

through a one-way bet) that reduces the effectiveness of intervention in the longer term. In this paper, we measure the effectiveness of intervention by BSP's ability to influence daily volatility. The short-term horizon of this paper constitutes an important caveat.

The remainder of the paper is organised as follows: Section II presents a brief background on the Philippine foreign exchange market and its interface with other asset markets, and a discussion of the effectiveness of intervention, based on the Philippine case. The section highlights the motives and tactics behind BSP's intervention, and presents a model for the institution's daily intervention in the foreign exchange market and its results. The impacts of BSP's intervention in the foreign exchange market on the BSP's own balance sheet and on the government securities market are also discussed. Section III concludes, with some insights on intervention and monetary policy.

II. The effectiveness of intervention: some empirical insights based on the Philippine case

A. The Philippine foreign exchange (FX) market

The BSP has adopted a floating exchange rate system. Exchange rates are determined by the interplay of supply and demand factors in the FX market. The role of the BSP in the FX market is principally to ensure orderly conditions in the market.

Foreign exchange trading is conducted through the Philippine Dealing System (PDS). The direct market participants include the member banks[7] of the Bankers Association of the Philippines (BAP) and the BSP. Electronic trading[8] is conducted through the Philippine Dealing and Exchange Corporation (PDEx), which was designated by the BAP as the official service provider for USD/PHP spot trading (which involves the purchase or sale of US dollars for immediate delivery, i.e., within one day for US dollars), while Reuters serves as the exclusive distributor of all PDEx data. Trading through the PDEx allows nearly instantaneous transmission of price information and trade confirmations. Banks which do not subscribe to the PDEx can continue to conduct peso-dollar spot transactions via their Reuters Dealing screens. Dealing can also be conducted through brokers.[9] Third currency trading is usually transacted through Reuters Dealing or Bloomberg Financial Services.

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[7] These commercial banks are authorised to engage in spot, outright forward, and swap transactions in peso-dollar as well as third currency transactions. They can trade for their clients or for their own accounts. Relevant BSP circulars regulate banks' long (overbought) and short (oversold) positions when trading for their own account. These positions must not exceed 20 per cent of their unimpaired capital or $50 million, whichever is lower.

[8] Banks are enjoined to give two-way quotes with the normal interbank bid-offer spread of 0.005 pesos. Trading is conducted such that banks offering quotes remain anonymous until a transaction is joined.

[9] Currently, there are two foreign exchange brokers in the Philippines, Tullett Prebon (Philippines), Inc. and ICAP Philippines, Inc.

Since the exchange rate determines the valuation/pricing of peso-denominated assets for non-residents, it serves as a barometer of foreign investors' confidence in the Philippine economy. Market expectations regarding the exchange rate affect domestic markets for bonds, equities, credit and bank deposits. The process involves a feedback loop wherein portfolio flows create appreciation pressure on the exchange rate. This further enhances the attractiveness of Philippine assets. Consequently, BSP participation in the foreign exchange market not only helps to temper the volatility of the exchange rate, but also influences market expectations so that they are more in line with policy objectives. Staff research has shown policy rates to have been effective in containing the formation of asset price bubbles even when portfolio flows are strong. This has not been without cost in terms of policy setting. Recently updated staff estimates have shown that the influence of policy interest rates on domestic interest rates, while still significant, has been diminished by strong FX flows.

B.   Intervention motives and tactics

For the Philippines, the motives driving intervention are: (1) to maintain monetary stability; (2) to curb excessive exchange market speculation; and (3) to discourage sharp capital inflows and outflows (BSP Primer on Exchange Rate, 2012).

BSP never pre-announces its foreign exchange interventions. Its decisions to intervene may be based on current developments or may call for pre-emptive action before the markets react to developing situations. It intervenes in both the spot and forward FX markets, and it also occasionally uses derivatives. Our analysis for the 2005-2012 period indicates that interventions have been successful at limiting exchange rate volatility. Table 1, below, shows that the coefficient of variation and the standard deviation of the peso-dollar exchange rate have declined significantly since the onset of the global financial crisis.

Peso-dollar exchange rate: descriptive statistics   Table 1

in PHP/USD	Mean	Standard Deviation	Coefficient of Variation	Skewness
2012	42.25	0.81	1.93%	0.19
2011	43.31	0.52	1.21%	–0.23
2010	45.13	1.11	2.46%	–0.33
2009	47.65	0.71	1.49%	–0.27
2008	44.45	2.91	6.56%	0.24
2007	46.22	2.10	4.54%	–0.59
2006	51.35	1.15	2.25%	–0.05
2005	55.10	0.84	1.52%	–0.23

Source: Bangko Sentral ng Pilipinas for basic data; author for calculations.

Meanwhile, non-market measures have not been resorted to so far by the BSP to address the increasing volatility of the exchange rate. The BSP is of the view that imposing strict capital controls creates more costs than benefits. First, there are administrative hurdles that must be overcome to effectively implement these restrictions. The tax on international transactions would have to be implemented universally to prevent the creation of tax arbitrage opportunities, and some

difficulties in implementing it could arise due to advances in technology and increasingly sophisticated financial instruments, which allow investors to circumvent controls and/or taxation. Secondly, the imposition of controls hampers the efficient allocation of capital across countries. Finally, the imposition of controls would send negative signals to investors and adversely affect our access to international capital markets and our ability to attract foreign investment.

C. BSP participation in the foreign exchange market

GARCH-type models were estimated to empirically test several observations about BSP intervention in the foreign exchange market. The following exponential GARCH(1,1) specification, taken from Kim, Kortian and Green (2000), was adopted for estimating central bank reaction functions for interventions employing derivatives.

$$Intervention = \sum_{i=0}^{n} \alpha_i S_{t-i} + \beta f(S) + \sum_{j=0}^{m} \delta_j Other\_intervention_{t-j}$$

$$Log(GARCH) = \alpha_1 + \alpha_2 \frac{|\varepsilon_{t-1}|}{\sqrt{GARCH_{t-1}}} + \alpha_3 \frac{\varepsilon_{t-1}}{\sqrt{GARCH_{t-1}}} + \alpha_4 Log(GARCH_{t-1}) + \gamma_3 Z$$

where *Intervention* represents intervention variables (spot market or derivatives transactions), S_{t-i} accounts for contemporaneous and lagged values of the exchange rate, and *f(S)* are other variables that influence the exchange rate, while *Other_intervention* is the other form of intervention employed by the BSP. A simpler GARCH specification is used to estimate the reaction function for spot market intervention by the BSP.[10]

$$\frac{S_t}{S_{t-i}} = \alpha D + \beta Spot + \gamma Forwards + \delta Z$$

$$Log(GARCH) = \alpha_1 + \alpha_2 \frac{|\varepsilon_{t-1}|}{\sqrt{GARCH_{t-1}}} + \alpha_3 \frac{\varepsilon_{t-1}}{\sqrt{GARCH_{t-1}}} + \alpha_4 Log(GARCH_{t-1}) + \gamma_3 Z$$

where $\frac{S_t}{S_{t-i}}$ is the daily return on the exchange rate; **D** is a vector of dummies for calendar effects and post-holiday effects; **Spot** represents a vector of spot intervention variables; **Forwards** accounts for a vector of variables for BSP intervention using derivatives and **Z** is a vector of other variables that may affect the exchange rate.

The main focus of this exercise is to estimate the contemporaneous impact of daily intervention (β in *Spot* and γ in *Forwards*) on the daily return on the exchange rate, $\frac{S_t}{S_{t-i}}$. If the central bank intervention is effective in reducing the volatility of the exchange rate, then β and γ, the parameters of interest, will be both negative and statistically significant.

Based on our estimation of daily intervention by the BSP in the foreign exchange market from 1 December 2005 to 31 December 2010, we find that

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[10] The original model was based on the exponential GARCH modelling framework used in Kim, Kortian and Sheen (2000). However, modifications were included to correct for bias arising from omitted variables and simultaneity. For details, see Kim, Suk-Joong, Tro Kortian and Jeffrey Sheen (2000), "Central bank intervention and exchange rate volatility – Australian evidence", *Journal of International Financial Markets*, vol. 10, pp. 381-405.

participation in the spot market remains the main method used by the BSP to influence the volatility of the exchange rate.[11]

Meanwhile, intervention through derivatives (forwards and FX swaps) serves a secondary role. Derivatives transactions entered into by local banks mostly took the form of forward and swap transactions. In the first three quarters of 2012, derivatives transactions registered a net gain of US$39 million, significantly lower than the US$914 million net gain posted during the same period in 2011.

Moreover, the results show that the BSP is sensitive to large swings in the exchange rate. Quite apart from that, there is no evidence that the BSP targets a particular exchange rate level over thirty-day or hundred-day trading horizons. There is also insufficient evidence to support some market assumptions that the BSP leverages its intervention activity in relation to the magnitude and direction of movements in regional currencies.

With respect to effectiveness, our estimates show that BSP intervention in the spot market has been effective in containing same-day volatility. Should volatility persist, the model indicates that higher-volume interventions or sustained central bank activities over consecutive trading days are significant in managing large fluctuations in the exchange rate. However, there is econometric evidence, albeit preliminary, that the covert nature of BSP spot market intervention appears to induce additional volatility in the exchange rate.[12]

D. Has sterilisation increased in magnitude?

The results of this study show that, in the case of the Philippines, the policies of accumulating international reserves and of sterilising the associated potential inflationary impact have complemented each other in recent years. The overnight reverse repurchase agreement has been an important tool for sterilisation since 1986, along with FX swaps and government bonds.[13] Other instruments for sterilisation include reserve requirements, government deposits with the BSP and the Special Deposit Account (SDA) facility. Beginning in 2006, the SDA facility assumed greater importance as a tool to complement BSP open market operations, though it was established in 1998. Banks can place funds with the BSP under the SDA facility, which is obligated to interest rates that depend on the term of the placements. Data from 1998 onwards show that the SDA was hardly used until 2006. In September 2006, the outstanding SDA balance rose to ₱49.7 billion, and then to ₱1.2 trillion in December 2010. As of 29 January 2013, it is at ₱1.8 trillion.

The effectiveness of each instrument, however, may not be isolated, as the BSP employs a mixture/combination of the instruments in sterilising FX purchases. Also, the relative costs of each instrument vary depending on market and economic conditions. For example, given a benign inflation forecast to the policy horizon, the cost of sterilisation using open market operations or special deposit accounts falls

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[11] Further details of the estimation are available from the author.

[12] Market participants may fail to perceive small volumes of BSP intervention. There are also instances of the market's feeling that the BSP has intervened when it actually has not. The uncertainty generated by the way in which spot market intervention is conducted may result in differential information sets among market participants. Such circumstances can generate volatility.

[13] CBP/BSP bills were an important instrument from 1988 to 1999.

as the BSP cuts rates. The remuneration on reserve requirements may also vary. Effective April 2012, the BSP rationalised the reserve requirements imposed on banks, which include the non-remuneration of reserves, effectively eliminating financial costs to the BSP on this front.

In a recent move by the BSP, the interest rate for the SDA facility was reduced to 2.5 per cent regardless of tenor. Previously, the SDA rate was priced at a premium over the policy rate. This recent decision by the BSP was designed to rationalise the BSP's SDA facility so that it would be consistent with international central banking practice. Amidst manageable liquidity growth and a benign inflation outlook, the operational refinement of the SDA facility is expected to enhance BSP's ability to ensure that liquidity remains adequate to the requirements of the growing economy.

According to our assessments, which use 1986-2010 data for the Philippines and its Asian neighbours (Indonesia, Malaysia, South Korea, Singapore, Thailand, Mainland China and India), increases in foreign reserve inflows tend to be sterilised.[14, 15] In the case of the Philippines, the results showed that there has been a significant increase in the degree of sterilisation since 1986. If one compares the magnitude of sterilisation in different Asian countries, the Philippines appears to be in the middle of the pack. These findings indicate that the policies of accumulating international reserves and sterilising the potential inflationary impact have complemented each other in recent years. Moreover, the findings point to the BSP's having sterilised less than other Asian countries, possibly due to less pressure in the foreign exchange market.

An important observation is that there was a decline in the extent of sterilisation between the 1994-2001 period and the 2002-2010 period. This may indicate that the policy shift from monetary aggregate targeting to inflation targeting has given the BSP greater flexibility for achieving its price stability objective without depending so much on sterilising excessive foreign exchange inflows, and has allowed the flow of excess money to be absorbed by the economy's productive sectors. Mindful of the costs and operational considerations involved in sterilisation, the BSP in recent years has also implemented a package of policy measures to moderate the inflow of foreign exchange. These include exchange rate flexibility, liberalisation of the FX regulatory framework, prepayment of foreign exchange liabilities and support for changes in the fiscal borrowing mix.

E.   Impact on the BSP Balance Sheet

While there are benefits to reserve accumulation, the BSP incurs financial losses from holding more foreign currency assets than foreign currency liabilities when the

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[14]   This is evidenced by the negative relationship between the net foreign assets (NFA) held by the monetary authorities and their net domestic assets. The inference is that any increase in NFA tends to be sterilised through a reduction in NDA. Positive values of NFA accumulation by the central bank correspond to foreign reserve inflows. Negative values of NDA correspond to reductions in domestic assets held by the monetary authorities, typically due to increases in open market operations.

[15]   Also providing evidence for this conclusion is the unpublished paper "Has sterilization increased in magnitude over time?" presented by V. Bayangos at the Advisory Committee Meeting on 29 April 2011.

peso strengthens.[16] In addition, costs are incurred by the BSP since it has to sterilise its intervention in the FX market to mop up the liquidity associated with any operations that it conducts with a view to safeguarding price stability.

Income position of the BSP

For the periods indicated, in billions of pesos   Table 2

	2007	2010	2011	Jan-Sep 2012
Revenue	93.81	113.57	118.74	50.35
Less: Expense	67.05	82.48	115.97	83.14
Equals: Net Operating Income/Loss (–)	26.77	31.08	2.77	–32.79
Plus/Less: Gains/losses on FX Rate Fluctuations	–113.71	–90.12	–36.22	–35.56
Equals: Net Income/Loss (–)	–86.94	–59.04	–33.69	–68.36

Source: Bangko Sentral ng Pilipinas

The surge in capital flows took its toll on the BSP's finances as the central bank posted a net loss of ₱86.9 billion in 2007. During that year, the BSP's net operating income stood at ₱26.8 billion, which was not enough to cover losses from FX rate fluctuations totalling ₱113.7 billion. Similarly, the BSP registered net operating income of ₱31.1 billion in 2010. However, this was not enough to cover the losses from FX fluctuations, which amounted to ₱90.1 billion in that year, resulting in a net loss of ₱59.0 billion for 2010. In 2011, the BSP incurred a net loss of ₱33.7 billion due mainly to FX fluctuations amounting to ₱36.2 billion. For the period of January-September 2012, losses from FX fluctuations stood at ₱35.6 billion. Interest income totalled ₱30.8 billion, but interest expense reached ₱69.3 billion, resulting in a net loss of ₱68.4 billion.[17]

Moreover, the scale of the costs assumed by the BSP as a result of its participation in the FX market has been significant. Based on the latest available data, the BSP was mainly a net buyer of foreign exchange from late 2005 to the end of 2007. When the peso depreciated from early to mid-2008, the BSP was a net seller of dollars, thereby generating marked-to-market gains and trading profits. However, when the peso started to appreciate again in late 2009, the BSP became a net buyer of US dollars, generating greater costs to its balance sheet as the peso rose in value against the dollar.

F. Impact on the profile of government securities

A closer look at the nature of government securities shows that the increase in the holdings of government securities and the move to longer-dated bonds may have been caused by the strategy that government and private issuers adopted to take advantage of excess liquidity in the financial system and the relatively low interest rate environment. Table 3 shows the maturity of government securities as a percentage of the total outstanding from 2000 to 2011. Outstanding government bonds in domestic currency with maturities of more than three years rose from

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[16]   Under Section 71 of the New Central Bank Act, the BSP is required to maintain a net positive foreign asset position at all times.

[17]   The BSP income statement for 2012 is based on preliminary, unaudited, data.

34.5 per cent in 2000 to 67.3 per cent in 2011. On the other hand, outstanding government bonds with maturities of less than one year dropped from 53.0 per cent in 2000 to 17.1 per cent in 2011. Meanwhile, the average maturity of the remaining outstanding domestic government securities increased by around 5 years – from 3.3 years in 2000 to 8.7 years in 2011.

Maturity of government securities at end of year   Table 3

	Government Securities (Percentage of total outstanding)				Central Bank Securities			
	Under 1 year	1 to 3 years	Over 3 years	Other maturities: average (years)	Under 1 year	1 to 3 years	Over 3 years	Other maturities: average (years)
Domestic								
2000	53.02%	12.44%	34.54%	3.31				
2005	41.67%	25.17%	33.16%	3.00				
2010	27.49%	17.78%	54.74%	6.09				
2011	17.14%	15.55%	67.31%	8.69				
Foreign					**BSP does not issue its own debt securities.**			
2000	–	13.00%	87.00%	12.18				
2005	8.00%	6.00%	86.00%	10.34				
2010	7.00%	3.00%	90.00%	12.21				
2011	–	7.00%	93.00%	12.80				

Source: Bureau of the Treasury

The maturity profile of foreign currency government securities is relatively stable except for maturities between one and three years which declined from 13 per cent of the mix in 2000 to 7 per cent in 2011. Moreover, the maturities of foreign currency government bonds are considerably higher than those of domestic currency government bonds.

Holders of domestic government securities*

(In billions of national currency units)   Table 4

	2005	2006	2007	2008	2009	2010	2011
Total	**2,118.17**	**2,121.14**	**2,167.95**	**2,387.97**	**2,452.70**	**2,709.10**	**2,864.26**
Banks	1,065.72	872.84	967.94	958.56	950.79	1,002.11	914.94
Private corporations	48.20	30.70	23.38	21.28	19.26	26.11	17.95
Custodians	0.00	158.74	143.54	140.54	146.02	219.99	355.69
GOCCs	118.36	118.51	138.20	145.72	140.16	149.66	132.21
Insurance companies	74.87	86.04	98.66	116.54	167.81	199.31	228.98
Investment houses	42.63	23.21	15.51	10.67	21.53	18.94	8.15
Local government units	1.40	0.76	0.35	0.00	0.00	0.35	0.15
Tax-exempt institutions	257.14	271.16	265.87	356.84	391.99	438.40	566.68
Others	509.85	559.17	514.51	637.82	615.14	654.24	639.52

* Excludes debt securities issued offshore, i.e. Global Peso Notes (GPN) and US$/Yen/Euro Bonds.

Source: Bureau of the Treasury

As to the holders of government securities, banks constitute the largest segment, holding about 32 per cent of domestic government securities as of end-December 2011 (Table 4). Following closely are custodians and tax-exempt institutions, which accounted for 32.2 per cent of total holdings of government securities at that time.

III. Conclusion: intervention and monetary policy

A market-based exchange rate policy is a necessary component of inflation targeting. Exchange rate flexibility can also serve as an automatic stabiliser and bear part of the burden of adjustment to capital flow surges. The BSP is aware that the exchange rate must not bear the entire burden of adjustments, particularly if the nature of the flows is perceived to be transitory. There is therefore a need to distinguish between more permanent flows, such as exports and remittances, and those driven by cyclical trends (e.g., higher cross-border flows) resulting from such factors as diversification by central banks and sovereign wealth funds (SWFs) in Asia and the Middle East, and structural portfolio adjustments in the private sector as home bias declines worldwide. Exchange rate overshooting can have significant repercussions on the economy – on its competitiveness in particular – that can be difficult to reverse.

In line with the discussions in Section II, it should be noted that while price stability is the primary goal of monetary policy, wide swings in the exchange rate may have destabilising effects on the economy, and hence they too must be managed.[18] To reduce the volatility of exchange rate movements, monetary authorities may opt to intervene in the foreign exchange market and undertake sterilisation to reduce liquidity and inflationary risks. Indeed, given the considerable capital flows to emerging market economies in recent months, monetary authorities have been grappling with two major concerns – price stability and stability of exchange rate movements. Accordingly, authorities have two policy instruments to deal with these concerns: policy interest rates and FX market intervention. Sterilised FX intervention would mitigate inflationary pressures that may result from the excess liquidity arising from the accumulation of FX reserves. On the other hand, accumulation of reserves may have a prudential value as a support in the event of a flow reversal.[19]

As noted previously, our estimation covers a limited period of daily BSP intervention in the foreign exchange rate market: 1 December 2005 to 31 December 2010. A more elaborate model and longer data series to capture broader issues on

[18]   See Ostry, Jonathan D., A. Ghosh, K. Habermeier, L. Laeven, M. Chamon, M. Qureshi and A. Kokenyne (2011), Managing Capital Inflows: What Tools to Use? International Monetary Fund, Washington, D.C.

[19]   For details, see:
(1) International Monetary Fund (2011), "Macroprudential Policy: An Organizing Framework", http://www.imf.org/external/np/pp/eng/2011/031411.pdf
(2) Ostry, Jonathan D., A. Ghosh, K. Habermeier, L. Laeven, M. Chamon, M. Qureshi, and A. Kokenyne (2011), "Managing Capital Inflows: What Tools to Use?" International Monetary Fund, Washington, D.C.
(3) Ostry, J., Ghosh, A., Habermeier, K., Chamon, M., Qureshi, M. and D. Reinhardt (2010), "Capital inflows: the role of controls", IMF Staff Position Note, International Monetary Fund, Washington, D.C.

the impact of central bank intervention on the volatility of exchange rate could help provide more insights on the effectiveness of intervention strategies.

Nevertheless, the paper's findings offer valuable insights. For the period covered by the study, we found that participation in the spot market remains the main method used by the BSP to influence the volatility of the exchange rate, with intervention in the foreign exchange market through derivatives serving a secondary role. Moreover, our results show that the BSP is sensitive to large swings in the exchange rate. However, we found no evidence that the BSP targets a particular level for the exchange rate over thirty-day or hundred-day trading horizons.

As to effectiveness, our estimates indicate that the BSP's intervention in the spot market has been effective in containing intra-day volatility. The effectiveness of intervention in the foreign exchange market is measured by how significantly spot market intervention and forward transactions influence the daily return on the exchange rate. Over longer trading days, our findings indicate that intervention at larger volumes or sustained central bank actions are significant in managing large fluctuations in the exchange rate.

Sterilised intervention is possible at any moment in time, but its sustainability is an important policy issue. Empirical policy studies suggest that the sustainability of the policy depends on the interest rate earned by the foreign reserves, the domestic interest rate, the exchange rate trend, and the evolution of the variables that determine the demand and supply of the monetary base and the impact of sustained sterilisation on the central bank balance sheet. The common thread in these studies is that there is a maximum level for the domestic interest rate at which sterilisation policy is sustainable. When there is an excess supply of foreign currency at the equilibrium exchange rate level, the central bank can determine the exchange rate and has the freedom to establish a domestic interest rate equal to or lower than that maximum level (Frenkel, 2007; Bofinger and Wollmershauser, 2003).

The terms of implementation for policies to check the negative effects of surges in flows require responsive monitoring and penetrating research. In conducting market surveillance, the BSP uses a set of macroprudential indicators to determine the status of financial markets, and also to get a feel of how exogenous shocks are transmitted to the domestic economy and the financial system.

What are some of these macroprudential indicators?

The macroprudential indicators that BSP regularly tracks may be broadly classified according to the two traditional aspects of systemic risk: procyclicality (time-dimension of risk) and interconnectedness (cross-sectional dimension of risk). The procyclicality seen in financial systems bespeaks herd-like market behaviour (see Annex A for a list of macroprudential measures currently in place in the Philippines).

Macroprudential indicators that BSP uses to track the time dimension of risk include the following:

- Philippine Financial Stress Index – This measure takes into consideration flight to liquidity and quality, and uncertainty about the fundamental value of assets, using Treasury bond yields, the interbank lending rate, overnight RRP rate, LIBOR, JP Morgan Philippine sovereign spread, Philippine credit default swap spread, Philippine Stock Exchange Index, Chicago Board Options Exchange

Volatility Index, and Corporate Ba3-rated bond spread vis-à-vis the 10-year Treasury bond rate.

- Bank Distress Index (BDI) – The BDI dates banking crisis episodes in the Philippines and defines a banking crisis as a period during which the BDI is above its mean by more than 1.5 standard deviations.

- Asset Price Bubbles Model – This measures asset price bubbles as the difference between price overvaluation and the portion attributable to short-term frictions.

- Philippine Business Cycle Model – This model warns policymakers of turning points in economic activity from expansion to contraction and vice versa. Insights generated by the model are important in designing appropriate economic policies.

- Early Warning System for Currency Crisis – This measures the probability of a currency crisis, using indicators from the external, monetary, financial, real, and fiscal sectors, and from the global economy.

- Financial market indicators that reveal abnormal price levels and changes that may indicate susceptibility to market disruptions (e.g., data from the foreign exchange market, interest rate market, commodities market and equities market, as well as volatility indices).

- Traditional aggregate banking system indicators, which show stages of the banking system cycle based on historical data – These include reports on consolidated consumer loans, real estate loans, non-performing loans, and capital adequacy. Likewise, stress testing is done on a semi-annual basis to measure the vulnerability of the banking system's capital adequacy ratio to changes in credit and market risks. Furthermore, changes in the liquidity, profitability and asset quality of the banks are monitored on a quarterly basis.

As to the cross-sectional dimension of systemic risk, BSP looks at the linkages between the financial sector and the real sector using the Financial Social Accounting Matrix. This model relates economic variables in the real sectors to variables in the financial sector and presents transactions and transfers between all economic agents. Other tools are currently being developed to strengthen our ability to monitor the interconnectedness of risk.

The insights in this paper raise the broader issue of whether or not intervention is effective under an inflation targeting regime – an issue that can be extended to an economy-wide framework. In the present context, the more relevant question is whether the exchange rate can be included in the monetary authorities' reaction function. The BSP is mindful that while there are benefits to reserve accumulation, there are costs from holding more foreign currency assets than foreign currency liabilities, especially when the peso strengthens and sterilising the intervention in the foreign exchange market to mop up the liquidity bears a price. These measures are conducted with a view to safeguarding price stability.

Annex A:
Macroprudential measures currently in place in the Philippines

For the Philippines, the following macroprudential measures are currently in place:

a.   Measures to directly influence the credit cycle

- Direct controls on lending to specific sectors such as limits on different forms of credit exposures (by borrowing sector and by instrument). For example, for purposes of determining the 20 per cent limit on real estate exposure by banks, the definition of real estate exposure has been recently expanded to include investments in securities (both debt and equity securities) issued for purposes of financing real estate activities.[20]

- Regulation of foreign currency lending by requiring prior approval of the central bank for borrowings denominated in foreign currency if borrower is public sector and/or debt is to be serviced using foreign currency purchased from the banking system.

- Loan-to-value (LTV) caps/ratios such as a maximum LTV of 70% for loans secured by real estate.

b.   Measures to limit the build-up of system-wide financial risk

- Restrictions on distribution of bank profits; distribution is subject to permission by regulators.

- Liquidity requirements such as a requirement that banks maintain 100% asset cover for their FX liabilities, with 30% in the form of liquid assets.

- Limits on open FX net positions and foreign assets.

Measures to reduce interconnectedness, such as leverage ratio and liquidity ratio, are being considered for future implementation by the BSP. Special attention is also being devoted to NDFs that are viewed as being used for speculative purposes.

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[20]   Excluding loans and investments in securities to finance the construction of highways, streets, bridges, tunnels, railways, and other infrastructure for public use.

References

Aizenman, J. and R. Glick (2008), "Sterilization, monetary policy and global financial integration". NBER Working Paper Series, No. 13902, Cambridge, Masssachusetts.

Bangko Sentral ng Pilipinas (2012), *Primer on the Exchange Rate*, BSP, September.

Bofinger, P. and T. Wollmershäuser (2003), "Managed Floating as a Monetary Policy Strategy", *Economics of Planning*, vol. 36, no. 2, pp. 81-109.

Dominguez, K. M. (1998), "Central Bank Intervention and Exchange Rate Volatility", *Journal of International Money and Finance*, vol. 17, pp. 161–190.

Financial Stability Board, International Monetary Fund and the Bank for International Settlements (2011), "Macroprudential Tools and Frameworks". http://www.imf.org/external/np/g20/pdf/102711.pdf

Frenkel, R. (2007), "The Inflation Targeting Scheme and the Developing Economies", in Banco Central de la República Argentina (ed.), *Monetary Policy and Financial Stability: From Theory to Practice. Proceedings of the 2006 Monetary and Banking Seminar*, Buenos Aires.

International Monetary Fund (2011), "Macroprudential Policy: An Organizing Framework". http://www.imf.org/external/np/pp/eng/2011/031411.pdf

Kamil, H. (2008), "Is Central Bank Intervention Effective Under Inflation Targeting Regimes? The Case of Colombia", International Monetary Fund Working Paper 08/88 (April). Downloaded from: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1119428

Kim, Suk-Joong, Tro Kortian and Jeffrey Sheen (2000), "Central bank intervention and exchange rate volatility – Australian evidence", *Journal of International Financial Markets*, vol. 10, pp. 381-405.

Ostry, Jonathan D., A. Ghosh, K. Habermeier, L. Laeven, M. Chamon, M. Qureshi and A. Kokenyne (2011), "Managing Capital Inflows: What Tools to Use?" International Monetary Fund, Washington, D.C.

Ostry, J., Ghosh, A., Habermeier, K., Chamon, M., Qureshi, M. and D. Reinhardt (2010), "Capital inflows: the role of controls", IMF Staff Position Note, International Monetary Fund, Washington, D.C.