

## The Evolution of Serbian Forex Through NBS FX Swaps

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**ABSTRACT** – *This paper emphasizes the main goals of using derivatives as a monetary tool, increasing the foreign currency liquidity of commercial banks and controlling the volatility of the national currency.*

*Over the past few years, FX swaps, very often mistaken for currency swaps, became a popular monetary instrument among central banks. Since 2007, inter-central bank swap credit lines have become a role model for supporting the foreign currency liquidity of national commercial banks.*

*The National Bank of Serbia introduced FX swap transactions as part of a special facility for supporting the country's financial stability. Our research indicates that the NBS is not part of a swap credit line, but rather uses FX swaps internally and in a very fragmented manner. The trading volume of the newly-introduced instrument has been quite modest. The quiet introduction of FX swaps has failed to make any insignificant impact on the stabilization of the national currency, and has caused a fairly minor increase in EUR liquidity. At the very end it is worth mentioning that, regardless of the first results, NBS swaps mean that the Serbian forex derivative market has "crossed the Rubicon".*

**KEY WORDS:** *FX swap, monetary policy, central bank, FX currency liquidity, RSD volatility, National Bank of Serbia*

### Introduction

The foreign exchange (FX) swap market has grown strongly over the years, reaching a notional amount outstanding of more than 30,000 billion USD in 2009. This rising popularity of FX swaps as an instrument for hedging or acquiring FX funding, combined with the role of central banks in the FX swap market, has raised questions about the nature of this instrument, as well as of its role in macro-financial stability. This question was given additional weight by the financial crisis and currency and liquidity shortages.

One of the main roles of the FX swap at the macro level is to play the role of crucial instrument for the smooth functioning of financial markets and monetary intervention. Since 2007, central banks have increasingly recognized the impact of FX swaps on financial and economic stability.

The statement above is further borne out by their special exemption from US regulatory oversight. In August 2009, the US Treasury Department released the *Over-the-Counter*

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*Derivatives Market Act of 2009* (OCDMA) in order to prevent some of the causes that led to the financial crisis. The regulation moved all Over-The-Counter (OTC) derivatives trading onto regulated exchanges, except for FX swaps and forwards. These instruments were excluded as they were not considered OTC derivatives under general market conventions because of the short-term nature of the contracts, high turnover and real physical exchange of principal. Following the introduction of OCDMA, in July 2010, the Senate passed financial markets, considered the most comprehensive set of such laws since the 1930s, aiming to significantly modify the OTC markets. Under this legislation, FX swaps and forwards are regulated as derivatives, but it is left to the Secretary of Treasury to write to relevant congressional committees asking for an exemption. In 2011, the US Treasury Department issued a *Notice of Proposed Determination*, stipulating that central clearing and exchange trading requirements would not apply to FX swaps and forwards. In addition, the Treasury confirmed that FX swaps and forwards market operated at high levels of transparency, with these instruments already traded in a highly transparent, liquid, and efficient market. They also pointed out that there was a number of unique factors limiting risk in the FX swaps and forwards market, such as fixed terms and physical exchange of currency, well-functioning settlement process and shorter duration contracts (68 % of the market matures in one week or less, and 98% in one year or less).

In April 2009 the National Bank of Serbia (NBS) introduced FX swaps as part of a special package of facilities for supporting the country's financial stability. The main goal was to improve the liquidity of national commercial banks (both in euros and dinars, the local currency) through swap auctions or as a bilateral agreement between commercial bank and the NBS (Decision on Special Facilities Supporting the Country's Financial Stability, Article 5).

Bearing in mind that Serbia has an underdeveloped OTC market and a non-existent organized derivatives market, it is very important to address this newly introduced instrument, its function, the often overlooked difference between FX and currency swaps, market structure, and FX swap influence on financial stability. It should be emphasized that this paper has no intention of addressing the current dispute over additional regulation of FX swaps. It focuses on FX swaps as a newly-introduced instrument in an underdeveloped financial market (in this case, the Serbian financial market), as well as on the first results achieved.

This paper is organized as follows: the background and key aspects of FX swaps, their functioning, valuation and differences in comparison to currency swaps are presented in Section 2. Section 3 discusses central banks and FX swaps as a monetary tool used to help achieve financial stability. FX swaps introduced by the NBS are comprehensively presented in Section 4. Section 5 presents the first findings on the usage of FX swaps by the central bank as a monetary tool in an underdeveloped financial market.

## **FX swaps**

The Reuters financial glossary defines an FX swap as "simultaneous borrowing and lending of one currency for another with two different value dates." The different value



dates usually refer to spot and forward date. FX swaps were introduced into the market at the beginning of the 1980s and are extensively used today (Table 1).<sup>1</sup>

Dealing with FX swaps has certain advantages. Firstly, they are an interbank instrument which usually excludes clients. Because of counterparties included, it is perceived as an instrument with minimal counterparty risk. Secondly, an FX swap does not assume that banks are buying or selling deposits – they are exchanging them. And finally, in some cases, it is an off-balance-sheet item, so it does not influence assets and liabilities.

Table 1. Amounts Outstanding of OTC Foreign Exchange Derivatives  
(in billions of USD)

Instrument / counterparty	Notional amounts outstanding					Gross market values				
	Dec 2009	Jun 2010	Dec 2010	Jun 2011	Dec 2011	Dec 2009	Jun 2010	Dec 2010	Jun 2011	Dec 2011
<b>Total contracts</b>	<b>49,181</b>	<b>53,153</b>	<b>57,796</b>	<b>64,698</b>	<b>63,349</b>	<b>2,070</b>	<b>2,544</b>	<b>2,482</b>	<b>2,336</b>	<b>2,555</b>
Reporting dealers	18,896	19,924	21,956	26,170	27,953	732	890	899	875	1,041
Other financial institutions	21,445	23,476	25,636	28,854	25,916	888	1,100	1,050	973	989
Non-financial customers	8,840	9,753	10,204	9,675	9,480	449	554	534	489	525
<b>Outright forwards and foreign exchange swaps</b>	<b>23,129</b>	<b>25,624</b>	<b>26,433</b>	<b>31,113</b>	<b>30,526</b>	<b>683</b>	<b>930</b>	<b>886</b>	<b>777</b>	<b>919</b>
Reporting dealers	7,683	8,370	9,262	10,932	11,319	235	315	326	318	351
Other financial institutions	10,497	11,878	13,018	14,529	13,386	300	400	365	302	385
Non-financial customers	4,949	5,376	6,153	5,651	5,820	148	215	194	157	183
<b>Currency swaps</b>	<b>16,509</b>	<b>16,360</b>	<b>19,271</b>	<b>22,228</b>	<b>22,791</b>	<b>1,043</b>	<b>1,201</b>	<b>1,235</b>	<b>1,227</b>	<b>1,318</b>
Reporting dealers	7,112	7,027	8,320	10,075	11,819	332	368	390	387	520
Other financial institutions	7,282	7,274	8,802	9,749	8,613	478	561	586	576	518
Non-financial customers	2,115	2,059	2,149	2,404	2,359	233	252	258	264	280
<b>Options</b>	<b>9,543</b>	<b>11,170</b>	<b>10,092</b>	<b>11,358</b>	<b>10,032</b>	<b>344</b>	<b>413</b>	<b>362</b>	<b>332</b>	<b>318</b>
Reporting dealers	4,101	4,528	4,373	5,163	4,815	166	186	182	170	170
Other financial institutions	3,666	4,324	3,816	4,575	3,917	111	139	98	95	86
Non-financial customers	1,775	2,318	1,902	1,619	1,301	66	88	81	67	62

Source: BIS Statistics

There are three common **types of FX swaps**: spot against forward, forward against forward and short dates forward. In the first case, the first exchange of money takes place on a spot date (2 business days) and the reverse exchange of money takes place on the future date. The second type of FX swap, forward against forward, assumes that the first exchange takes place on a forward date and the reverse exchange is on a later forward date. Short date FX swaps are swaps which run for less than a month.

In case of FX swaps, counterparties can agree on having a **clearinghouse** involved. In that case, the counterparties initially trade up to an agreed threshold of exposure (margin threshold) based on each counterparty's credit rating. A margin call is made by a counterparty when its FX swap position is "in the money," i.e., when the position of the other party is "out of the money." Cash or securities deposited in a margin account can be used as collateral (Barkbu and Ong: 2010).

International Accounting Standard IAS 39 applies to **FX swap accounting**. As there is no initial cost in case of financial derivatives, they would usually be presented in financial statements in the form of a note to the accounts. However, IAS 39 brings derivatives onto financial statements to increase the transparency of risk exposures. FX swaps are carried on the balance sheet at their fair value which is zero on the day the FX swap is transacted. On the balance sheet the value of an FX swap may be positive (if the swap is in-the-money and an asset), negative (if the swap is out-of-the-money and a liability) or zero (Barkbu and Ong:

<sup>1</sup> Some authors, like Hooyman (1993), argue that FX swaps were used even decades before.



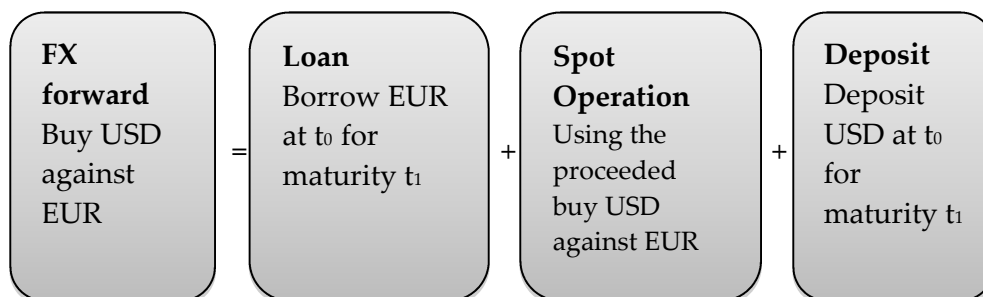
2010). At this juncture we need to emphasize that not all countries follow IAS 39, which implies that in some cases FX swaps remain off-balance-sheet.

Banks **quote FX swaps** by using swap or forward points instead of outright forward quotes. By doing this, risk associated with interest rate differentials is separated from spot exchange rate movements. FX swaps are easy to price based on available forward quotations and by satisfying the covered interest parity condition. By trading FX swaps, traders are basically trading interest rate differentials risks. The FX swap is mainly used for swapping surplus currencies; creating deposit borrowings in another currency; as an alternative to non-liquid money markets; speculation; and roll-over of spot FX position and cash management. These swaps are standard OTC instruments that make it possible institutions to fund their foreign exchange balances in a more liquid way in comparison to forwards, and are used by banks and financial institutions for managing liquidity and shifting delivery dates (Barkbu and Ong: 2010).

**The mechanism of the FX swap** can be explained by introducing a contractual equation to start with (Neftici: 2008). Let us assume there is a forward contract to buy USD against EUR. This contract can be replicated with a portfolio made up of a loan denominated in EUR, spot purchase of USD against EUR, and a deposit in USD. If we exclude transaction costs, bid-ask spread, credit risk and market liquidity, the position can be presented as in Figure 1.

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Figure 1. Contractual Equation



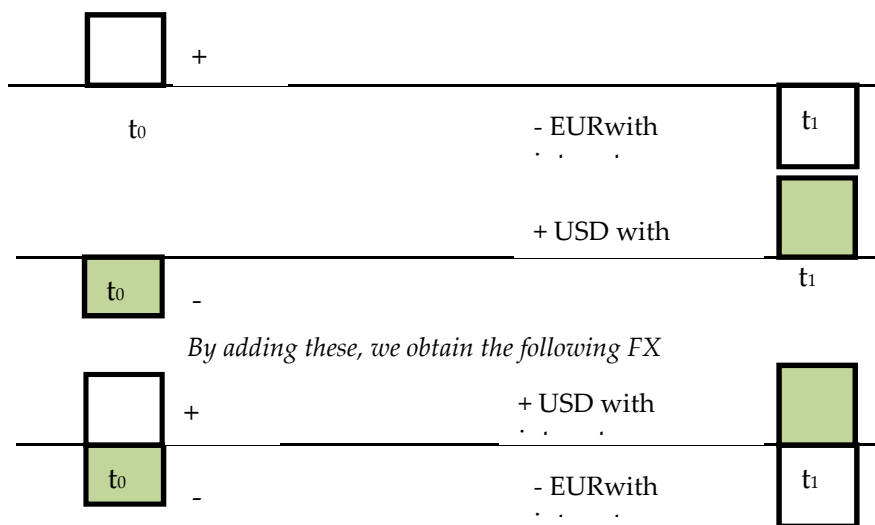
Source: Neftici (2008:60)

In comparison to the contractual equation, the construction of an FX swap includes only one bid-ask spread (Figure 2). The FX swap is combination of money market deposits and money market loans in different currencies written on the same underlying “ticket”. It can be seen as an instance of two counterparties spot purchasing and forward selling two currencies against each other. Interest rates play a crucial role in this instrument, since not both currencies will have equal interest rates between  $t_0$  and  $t_1$ . The difference will be included in the amount exchanged at  $t_1$  as compensation for one side’s loss.

<sup>2</sup> The left and right side generate the same cash flow, although it does not mean that the monetary value is the same. In many cases some of the right-hand side contracts may not even exist in a particular economy.



Figure 2. FX Swap



Source: Neftici (2008:67)

The FX swap is not to be confused with the currency swap, which is a different instrument. A currency swap is like an exchange of two FRNs (floating rate notes) with different currencies. It has two principals in different currencies, which exchange equal values at  $t_0$ . During the period between  $t_0$  and  $t_1$ , the interest in different currencies will be received / paid at the agreed interest rate. At the end the principals from  $t_0$  will be re-exchanged.

Let us assume that there is an agreement to pay 10% on a GBP principal of GBP10,000,000 and receive 10% on a USD principal of \$15,000,000 every year for 5 years. The cash flow is presented in Table 2. The typical usage of a currency swap is conversion from a liability in one currency to a liability in another currency or conversion from an investment in one currency to an investment in another currency.

Table 2. Currency Swap Cash Flow

Year	USD in millions	GBP in millions
0	- 15	+ 10
1	+ 1.5	- 1
2	+ 1.5	- 1
3	+ 1.5	- 1
4	+ 1.5	- 1
5	+ 16.5	- 11

At  $t_1$ , money is re-exchanged in the event that either of these instruments is used, but in an FX swap it is exchanged at a different exchange rate in comparison to a currency swap, where the exchange rate from  $t_0$  is used. This is because in an FX swap there are no interim interest payments. Two parties exchange currencies for a certain period of time, after which

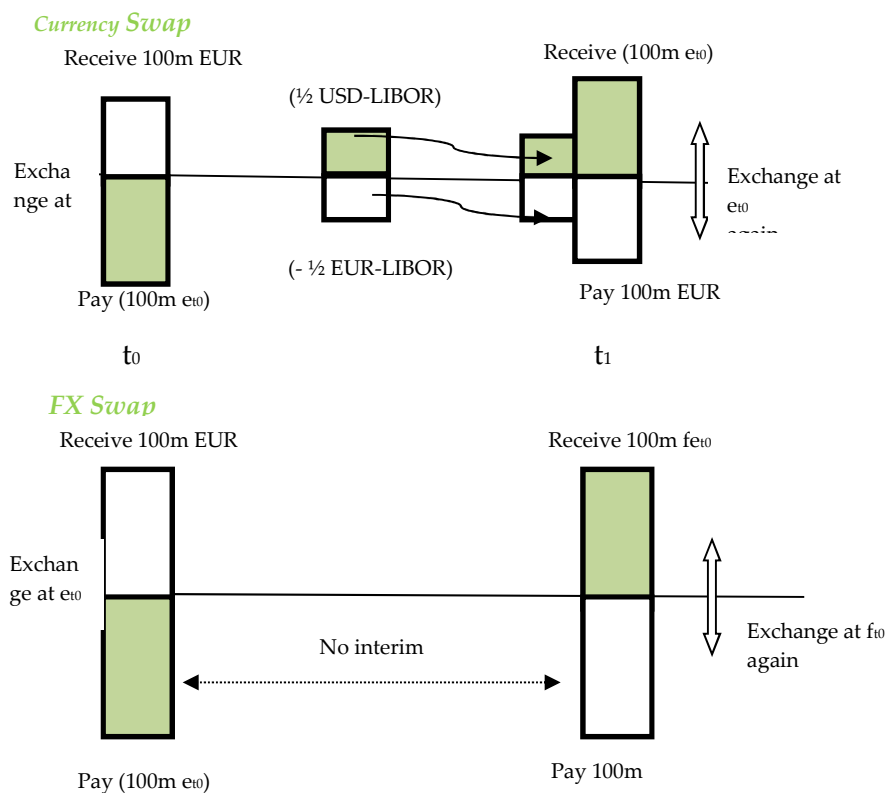


they get their original currencies back. At the same time, the interest rates on those two currencies are not the same, so they need to be compensated for by using the exchange rate. In case 100,000,000 EUR is received and against these 100,000,000 e<sub>t0</sub> USD are paid, where e<sub>t0</sub> is the EUR/USD exchange rate at t<sub>0</sub>, the new exchange rate at t<sub>1</sub> is (Neftici:2008):

$$f_{t_0} = e_{t_0} \frac{1 + L_{t_0}^{USD} \delta}{1 + L_{t_0}^{EUR} \delta}$$

where  $L_{t_0}^{USD}$  is the interest rate for USD at t<sub>0</sub>,  $L_{t_0}^{EUR}$  is the interest rate for EUR at t<sub>0</sub>, and  $\delta$  is the period of time. The comparison of an FX swap and a currency swap is presented in Figure 3.

Figure 3. Comparison of Currency and FX swap



Source: Neftici (2008:149)

### Central banks and FX swaps

Although not originally designed by central banks, FX swaps have become part of the monetary policy intervention toolkit. In a survey conducted by the Bank for International Settlements more than thirteen years ago (BIS 1997:332), seven out of fourteen industrial-country central banks surveyed said they used FX swaps. They were used against either the



US dollar or the Deutschmark (or both), among other tools used to intervene in the open market.

Since then, central banks have discovered that the FX swap could be used for achieving other goals as well. In cases where the initiating agent is a central bank, the basic motivations for introducing FX swaps are to affect domestic liquidity, to manage foreign exchange reserves and to support further development of financial markets. On the odd occasion central banks have been known to use it for the main purpose of hedging and asset liability management (Bartolini, 2002).

Central banks like to use FX swaps mainly because this instrument offers flexibility. From the viewpoint of central banks' risk management, FX swaps are generally no riskier than standard repo operations. It is also important to notice that, in case of combining FX swaps with spot FX interventions, it can lead to significant risk-bearing by the central bank. If the central bank uses the foreign currency obtained as collateral in the swap transaction to defend exchange parity under pressure, it will incur losses if the defense fails before the forward leg of the swap transaction is unwound. FX swaps can be used by the central banks as an instrument for reducing volatility of foreign exchange, as well as liquidity. At the same time it is important to stress that FX swaps can behave as a magnifying glass in case of non-liquid markets and during stressful periods by creating more foreign exchange volatility instead of reducing it (Barkbu and Ong, 2010).

The new era for FX swaps started in December 2007, when the Fed introduced an FX swap system dubbed "swap lines". These swap lines were also introduced by other central banks (Table 3), as part of sets of measures designed to boost market stability. The program enhanced the ability of central banks to provide US dollar funding to financial institutions in their jurisdictions. It relieved pressures in USD funding markets and reduced incentives for foreign financial institutions to sell dollar assets at fire-sale prices.

The swap lines system works as follows. In the first step, a foreign central bank draws a swap line by selling a specific amount of its national currency for USD at the market exchange rate. At the same time the Fed and the foreign central bank agree that the foreign central bank will repurchase its currency at the same exchange rate in the future (Fleming and Klagge, 2010). Looking only at the first part, this swap seems more like a currency swap than an FX swap. The difference appears at the time of maturity of the swap. At the time the swap is concluded, the foreign central bank pays the Fed an amount of interest on the dollars borrowed equal to the amount that the central bank earned on dollar lending to institutions. On the other hand, the Fed does not lend foreign currency and therefore does not pay any interest to the foreign central bank. The foreign currency that the Fed acquires is an asset on its balance sheet.

In classical FX or currency swap there is no third contributor. However, in case of swap lines created by the Fed, the third contributors are institutions under the jurisdiction of foreign central banks, determined by the foreign central bank as eligible. The foreign central bank lends dollars to the eligible commercial banks, and has a right to decide on the required collateral.

After introducing it, the Fed rapidly increased the swap credit line, both in terms of including more central banks and in terms of dollars committed (Table 3 and Chart 1).

Table 3. Swap Lines Opened by the Fed with Central Banks

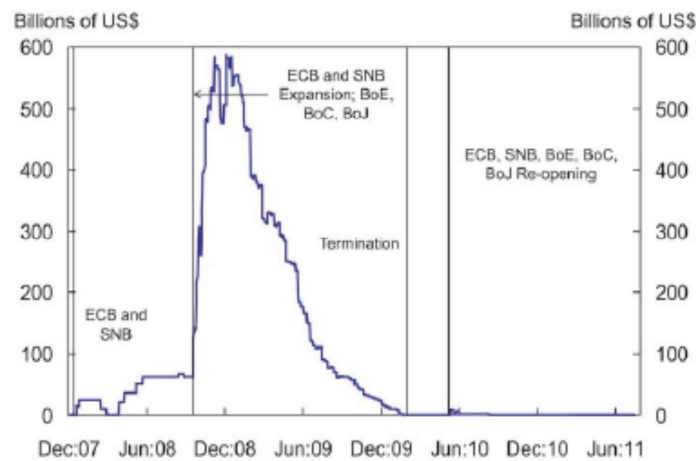
Date	Central Bank
December 12, 2007	European CB, Swiss National Bank
September 18, 2008	Bank of Japan, Bank of England, Bank of Canada
September 24, 2008	Reserve Bank of Australia, Sveriges Riksbank, Norges Bank, Danmarks Nationalbank
October 28, 2008	Reserve Bank of New Zealand
October 29, 2008	Banco Central do Brasil, Banco de Mexico, Bank of Korea, Monetary Authority of Singapore

Source: Fleming and Klagge (2010:3)

During the financial crisis, the Fed introduced the FX swap as a temporary swap line. These temporary arrangements expired in February 2010, but in May 2010 they were re-established with some central banks (Bank of Canada, Bank of England, European Central Bank, Bank of Japan, and Swiss National Bank), in response to the re-emergence of strains in short-term USD funding markets. The use of swap lines has been minimal since May 2010, reaching a peak of USD 9.2 billion compared with a previous peak of USD 586 billion.

The Fed’s swap lines with the European Central Bank (ECB) played a critical role alongside the ECB’s direct efforts to avoid a more rapid reduction in credit in the European Union by making it possible for Europe’s banks to borrow USD from the ECB.

Chart 1. USD FX Swap Facility Usage Since Inception



Source: Federal Reserve System

In addition to re-establishing swap lines, in April 2009 the Fed introduced “foreign-currency liquidity swap lines” which are a mirror image of the previously described FX swap line. The idea was to provide capacity to offer liquidity to US institutions in foreign currency. These lines were created with the ECB, the Bank of England, the Bank of Japan, and the Swiss National Bank. Moreover, in November 2011 these central banks started coordinated action to enhance their capacity to provide liquidity support to the financial system. They reduced fees applied to draws on USD from the Fed’s foreign-currency





liquidity swap lines and extended the terms of those facilities. The main goal was to mitigate the effects of the strains in financial markets to the supply of credit to businesses and households. The measures improved the financial conditions in the euro area and narrow euro-dollar FX swap basis spreads.

### Determinants of NBS FX swaps

The National Bank of Serbia introduced FX swaps with the aim of stabilizing the domestic FX market and minimizing RSD volatility.

In direct trading with domestic commercial banks the NBS can swap sales of EUR for RSD or swap purchases of EUR for RSD. As part of FX swap transactions, the NBS performs spot and forward transaction at the same time. It simultaneously sells/purchases EUR on the spot date and purchases/sells the same amount on the forward date. Swap transactions can be organized as auctions or as direct transactions called "bilateral swaps" (based on a commercial bank's<sup>3</sup> request or as requested by the NBS). All transactions carried out to date were conducted as auctions. Swap auctions are conducted via the web platform dubbed "Monetary Operations of the National Bank of Serbia – Application for Foreign Exchange Trading".

In practice, foreign currency is sold/purchased by using spot exchange rate and swap points defined by the NBS in advance - **auctions at fixed swap points**. The swap points are calculated by using the following formula:

$$\text{Swap points} = \text{spot exchange rate} * \left[ \frac{1 + \left( \frac{k_2}{100} * \frac{d}{360} \right)}{1 + \left( \frac{k_1}{100} * \frac{d}{360} \right)} - 1 \right] * 10,000$$

$$\text{Forward exchange rate} = \text{spot exchange rate} + (\text{swap points}/10,000)$$

Where:

$k_1$  - annual interest rate for the EUR, with two decimal places

$k_2$  - annual interest rate for the RSD, with two decimal places

$d$  - transaction maturity

However, the NBS bylaw allows **variable swap points auctions**, i.e. swap points can be bid by banks. Auctions at variable swap points can result in the NBS purchase/sell foreign exchange at swap points bid by the bank whose bid was accepted at the auction (**auction at variable swap points**), or the NBS can purchase/sell foreign exchange at the same swap points from each bank whose bid was accepted at the auction (**auction at single swap points**).

The key elements of a swap contract are: type of a swap; type of auction; EUR/RSD spot rate; swap points (in case they are fixed); transaction maturity; spot and forward date; and minimal amount that a bank can bid for. Banks, previously notified about the auction and provided with key information from the decision on organization of auction, submit bids to

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<sup>3</sup>In further text banks/bank



the NBS. Fixed swap points auction allows only one bid per bank, in which the bank indicates the amount of foreign exchange to be swap purchased/sold within the swap points announced by the NBS in advance. Where commercial banks' total bids are higher than the central bank's auction offer, the NBS assigns currency to each bank in proportion to its bid.

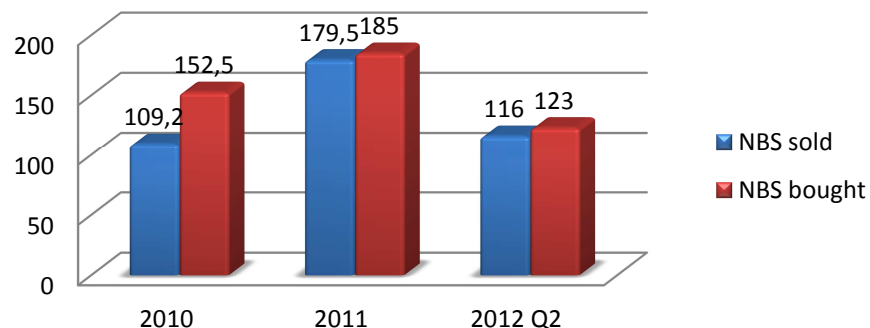
Variable swap points auction allows commercial banks to send not only one, but several purchase/sell bids. The NBS ranks bids depending on the level of swap points specified, ranking them from the lowest to highest. The Governor, or a person authorized by him/her, decides on the lowest and/or highest swap points that a bid may contain to be accepted (**marginal swap points**), and on the total amount of funds that the NBS swap purchases/sells.

In a multiple swap points auction, the NBS will make transactions with banks whose bids are accepted. In a single swap points auction, the transactions will be conducted with all banks whose bids are accepted, at the same swap points, i.e. marginal swap points.

In bilateral swap trading between the NBS and banks, each bank submits a single swap bid that states the amount requested. The NBS responds by sending a bid which includes data about the spot FX rate and the level of swap points at which it is ready to make the transaction. Finally, the bank takes into account the NBS's bid and replies to it on the same day. Alternatively, the NBS can refuse the bid and notify the commercial bank of its refusal on the same day.

Chart 2. NBS FX Swaps

**FX Swaps (in EUR mln)**



Source: National Bank of Serbia

Beginning in May 2009, the NBS held regular FX swap auctions with an average maturity of two weeks. Banks did not show much interest as the swap rates were uncompetitive. In 2010 the NBS continued to organize two-week foreign exchange swaps, but without any real success. Between April and July 2010, the NBS made changes and organized auctions of three-month FX swaps. The goal was to use FX swaps as a regular instrument of EUR/RSD liquidity supply, as well as to encourage interbank swap trading and the development of the FX hedging market, sorely needed in Serbia. A total of 28 swap auctions were held during that year, with the NBS selling EUR 109.2mn and buying EUR 152.5mn. In early March 2011, the NBS once more introduced auction of three-month FX swaps, and organized 88 of them in total. The balance for 2011 was: the NBS sold EUR 179.5mn to banks and bought EUR



185.0mn from them. At year-end, the total amount of receivables swapped by the NBS stood at EUR 111.0mn, while the amount of payables stood at EUR 49.0mn.

In 2012, the NBS continued holding weekly auctions, organized under market conditions and offering limited quantities. During the first half of the year, until June 30, the NBS organized 52 auctions of three-month FX swaps resulting in the sale of 116mn EUR and the purchase of 123mn EUR. On that day, the balance of receivables swapped by the NBS stood at EUR 16.0mn and that of payables at EUR 36.0mn.

### **Impact of FX swaps as a monetary tool of the NBS**

Without any doubt, the NBS introduced FX swaps with the intention to use it as a monetary tool to control significant RSD volatility and improve the liquidity of banks. This has been a concerted effort aimed at changing the classical model of monetary policy by introducing derivatives, previously not used in the Serbian underdeveloped market.

The current RSD FX regime, a so-called “managed float”, is fundamentally unstable. It is directly dependent on the level and structure of the central bank’s reserves, which are recovering with great difficulty, sustained only by significant NBS interventions on the inter-bank FX market, and determined by FDI inflows and the level of liquid commercial banks’ foreign currency reserves. Domestic currency FX rates are highly sensitive and easy influenced by lobbying groups able to speculatively destabilize them. The Serbian dinar used to be additionally supported by an effectively positive and significantly high key monetary policy rate (repo rate).

The consequences of the above exchange rate regime are:

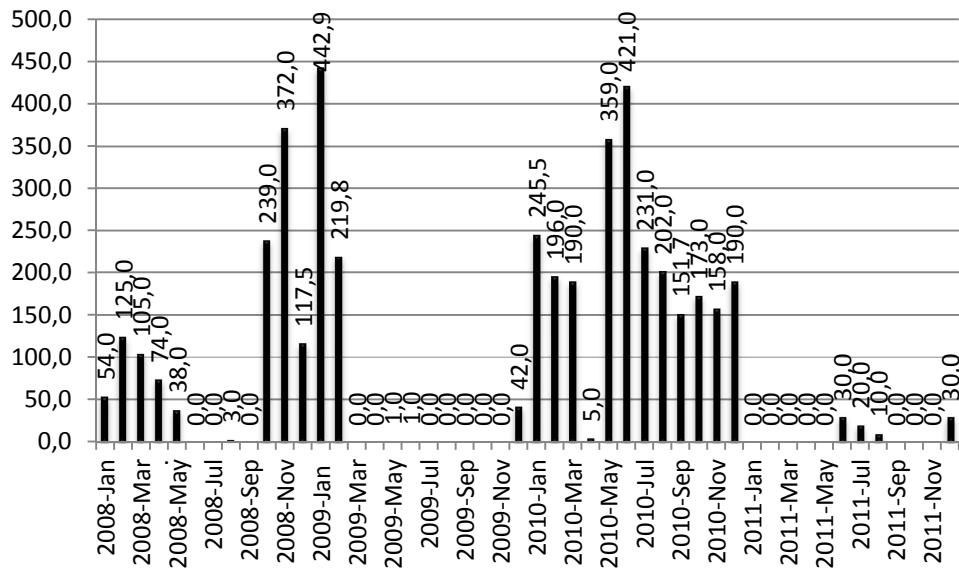
1. Frequent NBS interventions;
2. Decrease in net foreign assets;
3. Significant depreciation of RSD.

NBS interventions were the only tool used to control the stability of the national currency; moreover, during the 2000s, they were insignificant. Rare interventions and occasional appreciation of the dinar were the result of net capital inflows as the result of privatization, net foreign borrowing, a significantly high key policy rate, and acceptably high foreign exchange and RSD reserve requirements for commercial banks. The high level of foreign currency reserves provided the capacity for defending the national currency even during the global financial slump. Therefore, during 2008 and 2009, the NBS intervened to protect the RSD within a reasonable bracket.

The first major attacks on the Serbian dinar started in the last quarter of 2009 and continued until late 2010. In the last quarter of 2009, the NBS intervened by using large amounts, on average EUR 50 million per month, with the aim of keeping the targeted exchange rate. At some point the NBS had to intervene with up to EUR 100 million per day, in order to prevent the psychological margin of 100 RSD/EUR from being exceeded, as this would have been considered as a definite sign of a wrong monetary policy and the end of the contended RSD managed float.



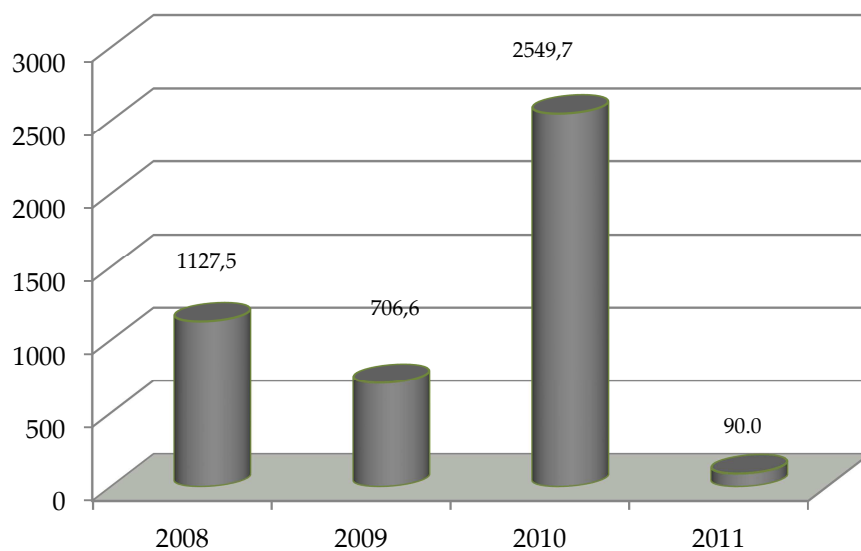
Chart 3. Monthly NBS Interventions, 2008-2011, in millions of EUR



Source: National Bank of Serbia

The psychological threshold was crossed on 17 May 2010, and the NBS became less enthusiastic about defending the national currency but kept up the high volume of monthly interventions (Chart 2 and Chart 3). If NBS continues with this trend, it is certain that the foreign reserves – hardly a renewable source – will see a sharp fall.

Chart 4. Annual interventions by the NBS for period 2008-2011 in millions of EUR



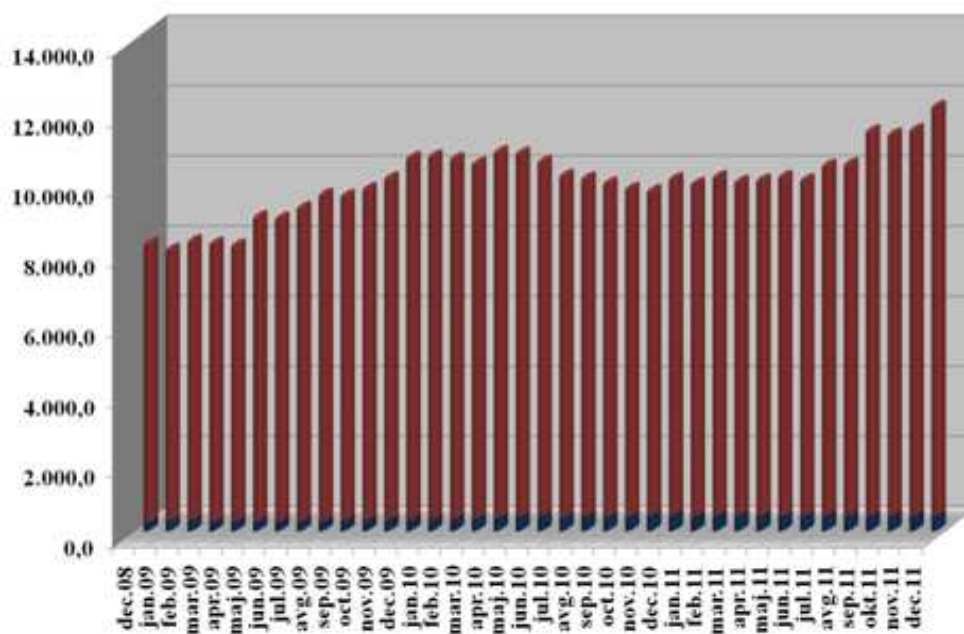
Source: National Bank of Serbia

The research shows that despite enormous interventions in 2010, there has been no noticeable decrease in the amount of foreign currency reserves: conversely, they even grew



by EUR 180 million in April. Although one hopes that the increase was the result of economic growth or greater exports, in fact it was a consequence of the inflow of funds drawn under a stand-by arrangement with the IMF. At first sight, the national foreign reserves might seem reasonably high and stable, at times providing cover for the money supply (M1) of over 400 per cent (for example in January 2010 the cover stood at 442%). However, the essence of the problem is the structure of the foreign reserves, which are very fragile and are mostly the result of national monetary policy measures, primarily the level of foreign currency reserve requirements.

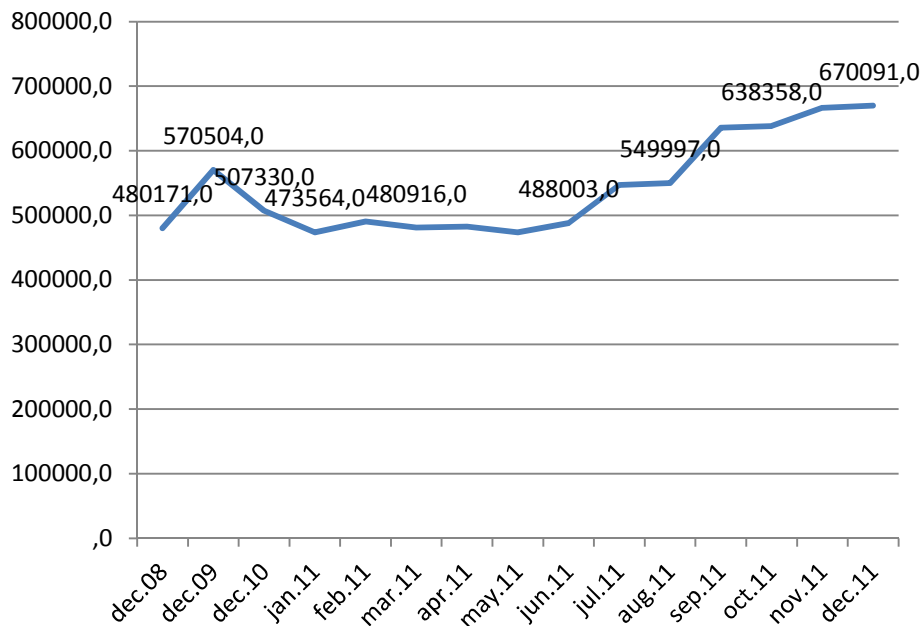
Chart 5. Structure of NBS Foreign Reserves



Source: National Bank of Serbia

According to our research, net foreign assets, the key part of foreign exchange reserves, amount to some EUR 6 billion (Chart 4). The remaining amount is the direct result of the already mentioned drawing of funds under the IMF standby arrangement and reserve requirements for banks. As we have shown, 2010 saw dips in foreign reserves as a result of periodical and aggressive NBS interventions, but, on the other hand, their permanent renewal was rooted in foreign borrowing and reserve requirements. Therefore, the structure of foreign reserves has been changing, yet without any significant change in their total amount. Any further analysis of the impact of FX on monetary stability and the likelihood of the NBS using different monetary tools, we need to point out that net foreign assets are a cornerstone of negotiations between the NBS and the IMF. The quantitative requirement, according to the stand-by arrangement, means that the minimal level of net foreign assets had to be EUR 4.8 billion in September and EUR 4.6 billion in December 2010. As the monetary policy outlined above includes continuous and regular NBS interventions, the bottom level of required net foreign currency assets will be reached quickly, leaving the NBS in a position to change the policy or tools used to date.

Chart 6. Net Foreign Assets, 2008-2010, in Billions of EUR



Source: National Bank of Serbia

The third consequence of using a “managed float” exchange rate regime has been the significant depreciation of RSD. Although FX swaps and many other monetary tools are used to stabilize the national currency, distinct exchange rate volatility emerged in the last quarter of 2008 (Table 4). Constant depreciation to date may seem like modest decline, but, on the contrary, it is a significant drop when one bears in mind the amount of interventions recently made by the NBS. Average annual depreciation for the seven-year period equals 6.90%. If we exclude 2006, when the RSD appreciated against the EUR by 7.60%, we can conclude that the average annual depreciation equalled 8.97%. Total depreciation since the introduction of the euro stands at 67.65%.

Table 4. Depreciation of RSD for period 2003 until 2011

Date	RSD middle exchange rate	Depreciation of RSD (%)	
01.01.2003	68.5845	-	-
31.12.2003	68.3129	-0.40	Appreciation
31.12.2004	78.8850	15.48	Depreciation
31.12.2005	85.5000	8.39	Depreciation
31.12.2006	79.0000	-7.60	Appreciation
31.12.2007	79.2362	0.30	Depreciation
31.12.2008	88.6010	11.82	Depreciation
31.12.2009	95.8888	8.23	Depreciation
31.12.2010	105.4962	10.01	Depreciation
31.12.2011	104.6409	-0.81	Appreciation

Source: National Bank of Serbia



In the first six months of 2010, the dinar depreciated against the euro by 7.67%. A detailed examination of the depreciation at the monthly level is given in Table 5. The impact on the dinar first became apparent at the beginning of the year and grew until May, when the NBS was forced to intervene in the foreign exchange market with EUR 359 million, bringing the total amount expended since the beginning of the year to EUR 1,118.5 million. Despite the aggressive interventions not much was achieved, and the dinar lost more ground to the euro. The volatility of the RSD exchange rate is not the embodiment of banking and economic dogma. It is permanently reduced by *ex post facto* interventions.

Table 5. Depreciation of RSD in 2010 and 2011

Date	RSD middle exchange rate	Depreciation of RSD (%)	
31.12.2009	95.8888	8.23	Depreciation
31.01.2010	98.4620	2.63	Depreciation
28.02.2010	99.6337	1.19	Depreciation
31.03.2010	99.7604	0.13	Depreciation
30.04.2010	99.2683	-0.49	Appreciation
31.05.2010	102.7303	3.46	Depreciation
30.06.2010	104.3704	7.67	Depreciation
31.07.2010	106.2256	1.78	Depreciation
31.08.2010	105.1032	-0.56	Appreciation
30.09.2010	106.1748	1.02	Depreciation
31.10.2010	107.4270	1.18	Depreciation
30.11.2010	107.1945	-0.20	Appreciation
31.12.2010	105.4982	-1.59	Appreciation
31.01.2011	104.6051	-0.58	Appreciation
28.02.2011	103.2237	-1.32	Appreciation
31.03.2011	103.5951	0.35	Depreciation
30.04.2011	99.6292	-3.84	Appreciation
31.05.2011	96.9802	-2.64	Appreciation
30.06.2011	102.4631	5.66	Depreciation
31.07.2011	102.1251	-0.34	Appreciation
31.08.2011	101.5836	-0.53	Appreciation
30.09.2011	101.1732	-0.41	Appreciation
31.10.2011	100.4852	-0.69	Appreciation
30.11.2011	103.9741	3.48	Depreciation
31.12.2011	104.6409	0.65	Depreciation

Source: National Bank of Serbia

## Conclusion

Unlike most other derivatives, FX swaps and forwards have fixed payment obligations, are physically settled, and are predominantly short-term instruments. Since the time they appeared in the intervention toolkits of many central banks around the world, many have thought that the popularity of this instrument was not going to last. However, the last crises proved them wrong, and the FX forward became a powerful tool for managing the liquidity and stability of the financial system.



Swap arrangements, allowing central banks to lend each other currencies, become contingency measures for crises, such as Europe's debt problems. The leaders of the BRICS countries, Brazil, Russia, India, China and South Africa, announced in the fall of 2012 that they would study FX swaps as part of a broader effort to move away from reliance on the dollar and the euro.

The introduction of NBS FX swaps is a positive move in the development of the Serbian FX market. However, this instrument – originally intended to stabilize the daily volatility of the RSD currency rate – has not had the expected effects. The critically small number of auctions and volumes led to corresponding effects on the level of national FX reserves, level of net foreign assets, volume of NBS interventions and appreciation/depreciation of national currency. Furthermore, the NBS has failed to join any currency swap line, as expected. The NBS's main role was predominantly to mediate between banks that bid/offered foreign currencies through FX swaps; the NBS did not use much of its reserves for FX transactions.

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## Razvoj srpskog forexa preko svop transakcija Narodne banke Srbije

*REZIME – Ovaj rad ističe glavne ciljeve korišćenja derivata kao monetarnih instrumenata, povećanje devizne likvidnosti poslovnih banaka i kontrolisanje volatilnosti nacionalne valute.*

*Tokom proteklih nekoliko godina devizni svopovi, koji se vrlo često mešaju sa valutnim svopovima, postali su popularan monetarni instrument centralnih banaka. Od 2007. svop kreditne linije među centralnim bankama postale su primer za podršku devizne likvidnosti domaćih poslovnih banaka.*

*Narodna banka Srbije uvela je devizne svop transakcije, kao deo podrške finansijskoj stabilnosti zemlje. Naše istraživanje pokazuje da NBS nije deo svop kreditne linije, već interno koristi devizni svop na vrlo fragmentiran način. Obim trgovanja na novim instrumentima je prilično skroman. Neprimetno uvođenje deviznih svopova nije uspeo da dobije značajniji uticaj na stabilizaciju domaće valute, i izazvalo je prilično mali porast likvidnosti evra. Na samom kraju vredi pomenuti da je, bez obzira na prve rezultate, samo pojavljivanje svopova Narodne banke Srbije znači da je srpsko tržište derivata "prešlo Rubikon".*

**KLJUČNE REČI:** *devizni svop, monetarna politika, centralna banka, devizna likvidnost, volatilnost dinara, Narodna banka Srbije*

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