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BANKS' HEDGING OPERATIONS WITH CURRENCY AS A METHOD OF ECONOMICAL PROTECTION

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ABSTRACT

This paper includes consideration of the commercial banks' hedging operations, as well as instruments aimed at the performance of these operations. The purpose of this paper is to review the hedging instruments in Russia and abroad and to identify the effectiveness of their use. In addition, attention is paid to the comparison of the applied financial instruments for hedging currency risks in Russia and in countries that are the world financial centers. We also revealed some differences in the management and use of methods aimed at monitoring the economic condition of credit institutions. Presumably, they are related to the specifics of economic activity in the country, financial literacy on a mass scale and historical prerequisites, expressed in the still fragile and relatively young banking and economic system as a whole. After the comparison and analysis of possible options for implementing the financial management levers, we have presented a theoretical hedging model, which is designed to help reducing the risks of currency losses in the conditions of macroeconomic instability. In addition, we analyzed the activity of the largest Russian bank Sberbank PJSC in the context of derivative financial instruments and revealed some patterns. At the end of the paper, we made a conclusion on the study.

INTRODUCTION

KEY WORDS
hedging; currency risk;
commercial banks;
derivatives; Sberbank of
Russia PJSC.

In the context of globalization of world economic processes, the issue of making management decisions in the conditions of uncertainty caused by the supply and demand volatility in the real and financial sectors of the economy remains topical. The main component that characterizes the uncertainty is risk. It determines the likelihood of adverse events for different subjects. [1]

As we know, commercial banks are the key players in the world economic relations. They are exposed to the risk of currency losses while carrying out any type of operations. Typically, losses can occur for various reasons, but the most common one is as follows: due to changes in the currency exchange rate to the payment currency between the contract signing and the contract settlements. Hence it appears the relevance of this topic at the present stage.

To increase the competitiveness of the national economy, it is necessary to properly assess the risks that the banking system carries out and then minimize them. Proceeding from the above, we will determine the purpose of this paper. It consists in reviewing the hedging instruments in Russia and abroad and identifying the effectiveness of their use.

The study object is the commercial banks' hedging transactions, and the study subject, in turn, is the study of the instruments required for these operations.

The research methods used in the paper are as follows: comparison, modeling, analytical methods, analysis, synthesis, deduction. [2,3,4,5]

MATERIALS AND METHODS

Thus, having designated the relevance of the topic of hedging currency risks and the purpose of this paper, we turn to the immediate problem of this issue.

To begin with, many economists have considered the essence of hedging and its place in managing currency risks.

Galanov V.A. gives the following definition of hedging - it is the insurance of the risk of asset value, interest rate or exchange rate using derivative instruments.

The Economist A. Strogalev understands hedging as "the elimination of uncertainty of future cash flows, which makes it possible to have a firm knowledge of future revenues as a result of commercial activity". [5]

In turn, Kolosov I.M. understands hedging as the use of one instrument to reduce the risk associated with the adverse effect of market factors on the price of another one associated with the first instrument or on the cash flows generated by it in his article on innovations in the field of currency hedging at the industrial enterprises. [6]

The objective of this article is to identify the reasons for the low efficiency of currency risk hedging operations in Russia compared to the commercial banks abroad.

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As we know, the banks carry out hedging of currency risks through the operations with currency derivatives (derivative financial instruments). In this case, the currency derivative is a contract whereby the bank takes an obligation or is given the right to perform certain actions after a period of time with respect to the underlying asset. The asset is the foreign exchange rate at the contract date.

The risks, in turn, arise in any currency operations: with currency, with securities denominated in foreign currency, they, in turn, are hedged by the commercial banks.

Speaking of risk, we note that the currency risk, unlike other types of risk, has a specific feature. Since the currency fluctuations may have different directions, both favorable and unfavorable, the deviations are possible. That is, the currency risk brings both a negative and a positive financial result. This feature allows us to call risk two-sided or speculative. Thus, the bank can both earn additional money due to changes in the money value, and incur losses.

The currency risk is a balance sheet risk as a whole, since the exposure of commercial banks to this risk depends on the degree of discrepancy between the size of assets and liabilities in foreign currencies and is called a net foreign exchange position (NFEP).

So, let us move on to the direct consideration of the dynamics of such currency pairs as euro/rouble and US dollar/rouble.



Fig. 1: Volatility dynamics of EUR/RUB currency pair in the period from 10.06.2017 to 14.03.2018.

[Fig. 1] shows the dynamics of the euro exchange rate from June 2017 to March 2018. Its rate was the highest in February 2018, currently its rate is on a gradual increase from the minimum point (67.7440 roubles per 1 euro) and it was 71.3700 roubles per 1 euro on March 19, 2018. In turn, [Fig. 2] shows the euro and US dollar volatility against the rouble. We note that their changes are approximately the same with respect to the rouble, from which we can conclude that they are directly correlated with each other.

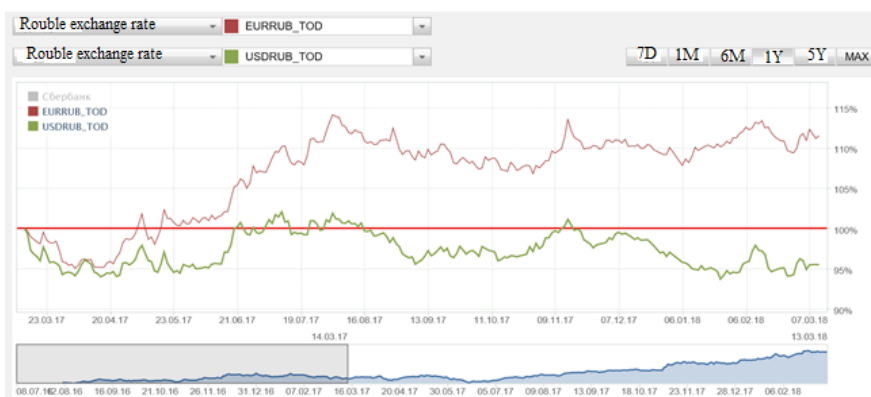


Fig. 2: Volatility dynamics of EUR/RUB and USD/ RUB currency pairs in the period from 23.03.2017 to 14.03.2018.

We can conclude that, given high volatility of the national currency during a crisis period, a commercial bank should increase the volume of currency options (relative to other currency derivatives). This is due to the fact that the currency option gives the right to refuse its execution and thereby minimize losses in case of an unfavorable change in the exchange rate of the national currency.

So, the derivatives act as a multifunctional instrument of hedging currency risk, provided the correctly chosen strategy. Since the use of hedging is risky enough, the commercial banks treat derivatives not as

the universal hedging instruments for currency risk, but as a long-term hedging strategy that can adapt itself to the changing economic conditions.

The economists Lukyanova E.S. and Poltava T.V. place special emphasis on the toolkit for both currency risks and interest rates. In this article, we will discuss in more detail the currency risk hedging instruments. It should be noted that, in addition to instruments, hedging can also be ranked according to other criteria.

RESULTS AND DISCUSSIONS

Based on the state of the banking system, we will analyze the activities of such a mastodon as Sber bank in terms of hedging currency risks and assess the efficiency of operations and the currency risk in relation to the financial assets and liabilities using the consolidated statements provided by them during the periods of high volatility of currency pairs.

Let us start with the fact that Sber bank PJSC annually evaluates the risks using the VaR (Value at Risk) method and supplements them with the stress testing and scenario analysis. Below are the tables with the analysis results. As we can see from [Fig. 3, 4], the risk dynamics has changed slightly at the beginning of 2016 and 2017.

(in billions of Russian roubles)	Value as of December 31, 2015	Effect on own funds	Effect on net profit
Debt security portfolio risk	85,0	3,2%	36,0%
Fund risk	0,3	0,0%	0,1%
Currency risk	11,7	0,4%	4,9%
Commodity risk	0,2	0,0%	0,1%
Market risk (taking into account diversification)	96,4	3,6%	40,8%
Diversification effect	0,6	0,0%	0,2%

Fig. 3: Settlements by risk types as of 01.01.2016.

At the beginning of 2016, the currency risk amounted to 11.7 bln roubles, and the effect on the amount of own funds was 0.4%, which, if we consider this indicator from the point of view of liquidity standards, states that the effect on stability of a credit institution is weak, but the impact on net profit of 4.9% cannot be left without attention. It happened for several reasons. First, at the beginning of 2016, the interest rate risk was part of the debt security portfolio risk. Secondly, the key positions were also taken by the market and interest risks. However, at the present stage, the currency risk is becoming more relevant, and its influence on the own funds is growing.

(in billions of Russian roubles)	Value as of December 31, 2016	Effect on own funds	Effect on profit
Interest risk	37,5	1,3%	6,9%
Fund risk	0,1	0,0%	0,0%
Currency risk	3,3	0,1%	0,6%
Commodity risk	0,1	0,0%	0,0%
Market risk (taking into account diversification)	40,1	1,4%	7,4%
Diversification effect	0,9	0,0%	0,2%

Fig. 4: Settlements by risk types as of 01.01.2017.

As can be seen from [Fig. 4], at the beginning of 2017, the market risk decreased almost twice as compared to the same period in 2017.

Currency risk, in turn, amounted to 3.3 bln roubles, which was 8.4 bln less than in the previous period, and the impact on both own funds and net profit was 0.1% and 0.6 % respectively.

Presumably, this decrease is due to a significant decrease in the currency position and the repayment of a significant share of bonds in foreign currencies in the bank book portfolio. Further, we will analyze the activities of Sberbank PJSC under the foreign currency operations and will use the consolidated statements in this regard. [Fig. 5].

[Fig. 5] shows the grouping of financial assets and liabilities under the foreign exchange risk. It should be noted that the financial assets exceed the liabilities according to the final data. Basically, the operations are made in the national currency, which is quite logical.

[Table 1] reflects the calculation of the net foreign exchange position of Sberbank PJSC on January 1, 2016. As we can see, the majority of operations were made in the national currency, 14,726.7 bln roubles or about 80% of the total volume of currency operations. The second and third places were divided by Turkish lira and US dollars. There were few operations with lira, because there was high currency volatility in this period.

(in billions of Russian roubles)	Roubles	US dollars	Euro	Turkish lira	Other currencies	Total
Assets						
Cash and cash equivalents	1 161,1	709,6	265,3	49,3	148,3	2 333,6
Mandatory cash balances with central banks	118,5	141,4	53,4	11,6	63,0	387,9
Financial assets revalued at fair value through profit or loss (excluding the fair value of derivative financial instruments)	274,4	53,6	1,4	0,6	2,0	332,0
Cash due from banks	200,8	404,5	32,1	0,1	113,1	750,6
Loans and advance payments to the customers	11 326,7	4 787,4	1 131,3	1 016,4	466,0	18 727,8
Securities pledged under repurchase agreements	56,9	2,5	—	160,7	1,9	222,0
Investment securities available for sale	922,0	696,5	147,5	63,1	45,2	1 874,3
Investment securities held to maturity	248,6	184,7	12,0	32,1	0,3	477,7
Other financial assets	417,7	121,6	93,1	13,6	18,5	664,5
Total financial assets	14 726,7	7 101,8	1 736,1	1 347,5	858,3	25 770,4
Liabilities						
Amounts due to banks	590,9	120,9	206,5	79,4	48,2	1 045,9
Amounts due to individuals	7 634,0	2 216,8	1 497,0	411,2	284,7	12 043,7
Amounts due to corporate clients	2 898,7	3 471,1	688,8	344,1	351,9	7 754,6
Debt securities issued	649,5	496,0	138,2	52,5	42,3	1 378,5
Other borrowed funds	—	262,9	88,0	46,5	0,6	398,0
Financial liabilities revalued at fair value through profit or loss, except for debt securities issued, except for the debt securities issued (excluding the fair value of derivative financial instruments)	13,2	15,9	0,3	—	—	29,4
Other financial liabilities	542,3	100,5	20,1	48,8	6,7	718,4
Subordinated loans	506,4	285,9	7,8	—	6,4	806,5
Total financial liabilities	12 835,0	6 970,0	2 646,7	982,5	740,8	24 175,0
Net financial assets/(liabilities)	1 891,7	131,8	(910,6)	365,0	117,5	1 595,4
Net financial derivatives	(484,2)	(117,8)	879,6	(164,3)	24,3	137,6
Credit related liabilities before provision against security (Note 35)	2 837,3	1 176,8	423,3	814,0	103,8	5 355,2

Fig. 5: Analysis of the currency risk of Sberbank PJSC as of 01.01.2016.

Table 1: Calculation of the net foreign exchange position of Sberbank PJSC as of 01.01.2016

Foreign currency	Letter code	Net positions in rouble equivalent, bln roubles		NFEP, % to the capital
		long open currency position	short open currency position	
US dollar	S	131.8		5.5
Euro	EUR		910.6	38.3
Roubles	RUR	1,891.7		79.6
Turkish lira	YTL	365.0		15.3
Other currencies		117.5		4.9
Total:		2,506.0	910.6	
Position opened in Russian roubles (balancing item)				
Total amount of open currency positions		1,595.4		67.2
Capital, ths. roubles	2,375.0			
Currency risk, ths. roubles	11.7			

Analyzing the data from [Fig. 6], it can be argued that at the beginning of 2016, Sberbank PJSC was able to reduce the difference between the assets and liabilities to acceptable values and to reduce the total volume of open currency positions to 1,595.4 bln roubles. It is also perfectly clear that the largest volume in the structure of currency derivatives was occupied by the over-the-counter options, 71.6 bln roubles in assets and 52.1 bln roubles in liabilities. Over-the-counter swaps and forward transactions in assets are in the relatively equal shares and occupy 18 and 19.6% respectively.

Composition of the currency derivatives of Sberbank PJSC, expressed in its assets and liabilities as of December 31, 2015, bln roubles.

	Assets	Liabilities
Market swaps	3,3	0,6
Over-the-counter options	71,6	52,1
Over-the-counter swaps	21,5	53,1
Forward transactions	23,7	14,7
Futures	1,2	1,1
Total	121,3	121,6

Fig. 6: Composition of the currency derivatives of Sberbank PJSC, expressed in its assets and liabilities as of 01.01.2016, bln roubles.

Thus, we can conclude that the following picture is the basis for these indicators:

- 1) There was a planned reduction in the currency position of Sberbank PJSC throughout the year
- 2) There was a significant increase in the share of currency options to 71.6 bln roubles
- 3) The bank adhered to the position of maintaining an optimal balance between its assets and liabilities with respect to currency derivatives.

Next, we will analyze the statements for the next year, and identify the main trends by 01.01.2017. [Fig. 7]

[Fig. 7] presents a similar analysis of the Group's currency risk in respect of financial assets and liabilities as of January 1, 2017.

(in billions of Russian roubles)	Roubles	US dollars	Euro	Turkish lira	Other currencies	Total
Assets						
Cash and cash equivalents	1 639,0	472,6	264,4	67,0	117,8	2 560,8
Mandatory cash balances with central banks	154,9	113,9	57,9	24,2	51,1	402,0
Financial assets revalued at fair value through profit or loss (excluding the fair value of derivative financial instruments)	346,6	46,5	0,4	1,8	3,6	398,9
Cash due from banks	620,7	227,0	46,8	0,1	70,8	965,4
Loans and advance payments to the customers ¹¹	1 082,3	3 957,0	1 160,4	791,1	370,5	17 361,3
Securities pledged under repurchase agreements	16,1	0,3	0,5	96,8	0,2	113,9
Investment securities available for sale	1 032,1	380,1	144,4	27,7	74,6	1 658,9
Investment securities held to maturity	300,5	200,3	13,1	26,5	5,4	545,8
Other financial assets	204,2	52,8	42,9	10,6	4,0	314,5
Total financial assets	15 396,4	5 450,5	1 730,8	1 045,8	698,0	24 321,5
Liabilities						
Amounts due to banks	230,0	108,8	165,6	25,5	32,0	561,9
Amounts due to individuals	8 672,0	1 924,5	1 231,0	359,9	262,2	12 449,6
Amounts due to corporate clients	2 676,6	2 488,1	535,0	312,4	223,1	6 235,2
Debt securities issued	572,3	414,5	97,8	45,4	31,0	1 161,0
Other borrowed funds	—	151,9	70,6	25,9	13,0	261,4
Financial liabilities revalued at fair value through profit or loss, except for debt securities issued, except for the debt securities issued (excluding the fair value of derivative financial instruments)	13,7	16,5	0,8	—	0,2	31,2
Other financial liabilities	224,8	28,7	13,0	39,3	6,8	312,6
Subordinated loans	506,3	227,6	0,6	—	5,4	739,9
Total financial liabilities	12 895,7	5 360,6	2 114,4	808,4	573,7	21 752,8
Net financial assets/(liabilities)	2 500,7	89,9	(383,6)	237,4	124,3	2 568,7
Net financial derivatives	(84,1)	(147,5)	397,4	(68,4)	(72,5)	24,9
Credit related liabilities and performance guarantees before provision against security (Note 35)	2 704,2	908,1	397,7	651,1	97,5	4 758,6

Fig. 7: Analysis of the currency risk of Sberbank PJSC as of 01.01.2017.

[Table 2], similar to [Table 1], reflects the calculation of the net foreign exchange position of Sber bank PJSC on January 1, 2017. As we see, the majority of operations are made in roubles (90%), as well as in Turkish lira (8%). There were little operations with the euro in common with 2015.

On the basis of this [Table 2] and [Table 3] following it, it can be assumed that Sber bank increased the gap between its liabilities and assets expressed in foreign currency derivatives and increased the net foreign exchange position as of 01.01.2017.

The expected increase in the currency position may be due to the rouble strengthening in the period from 01.01.2016 to 01.01.2017. At the same time, the largest share in the structure of currency derivatives was occupied by the over-the-counter swaps - 78.1%, where the over-the-counter swap liabilities amounted to 143.8 bln roubles, which was 90.7 bln roubles more than in 2016, and the over-the-counter options in the portfolio structure decreased both in the part of assets and liabilities by 42.8 bln roubles and 26.7 bln roubles, respectively. The reason for these changes can be found in adjustments to the general course of Sberbank PJSC in the field of working with derivatives, as well as in changes in the behavior of economic entities that are increasingly hedging the currency risk under the contract using the banking sector, and the credit institution, in turn, earns with the risk to its liquidity.

Thus, we can conclude that the main reason for such results was:

- 1) an increase in the bank's net foreign exchange position throughout the year;
- 2) an increase in the share of over-the-counter options relative to other currency derivatives;
- 3) deterioration of the optimal balance between the assets and liabilities for currency derivatives.

Table 2: Calculation of the net foreign exchange position of Sberbank PJSC as of 01.01.2016

Foreign currency	Letter code	Net positions in rouble equivalent, bln roubles		NFEP, % to the capital
		long open currency position	short open currency position	
US dollar	S	89.9		3.2
Euro	EUR		383.6	13.6
Roubles	RUR	2,550.7		90.4
Turkish lira	YTL	237.4		8.4
Other currencies		124.3		4.4
Total:		3,002.3	383.6	
Position opened in Russian roubles (balancing item)				
Total amount of open currency positions		2,568.7		91.0
Capital, ths. roubles	2,821.6			
Currency risk, ths. roubles	3.3			

Table 3: Composition of the currency derivatives of Sberbank PJSC, expressed in its assets and liabilities as of 01.01.2017, bln roubles

	Assets	Liabilities
Market swaps	0.2	0.2
Over-the-counter options	28.8	25.4
Over-the-counter swaps	44.9	143.8
Market options	7.6	3.7
Forward transactions	15.5	7
Futures	2.3	3.4
Total:	134.3	183.5

CONCLUSION

Based on the unstable geopolitical situation, the introduction of new sanctions, Kremlin lists, the currency is fluctuating, which may adversely affect the activities of economic entities of our country. Thus, we have identified a model that is able to hedge the risks. We name this model "X" on a conditional basis. It can be used by the banks regardless of the business scale, since it is universal. [7]

The basic postulates of this model state that to effectively hedge the currency risk during the rouble instability, the credit institution shall:

1. Monitor all changes in the currency derivatives balance, which include both derivatives purchased by the bank for the purpose of hedging its own currency risk (Asset), expressed in the volume of the net foreign exchange position, and purchased by the enterprises from a commercial bank with the goal of hedging their own risks (Liability).
2. If the national currency exchange rate decreases in the future, the bank, according to the model, shall reduce the volume of currency position by transferring funds from the foreign currency assets to liabilities.
3. If the national currency exchange rate has low volatility, the credit institution shall try to increase the asset volumes expressed in the foreign exchange derivatives with respect to the mandatory part. An increase should be optimal and commensurate with the bank's net foreign exchange position. The following formula should be used for the calculation: [8,9]

$$OV_{nfep} = A_{cd} - L_{cd}$$

Where, OV_{nfep} is the optimal value of the net foreign exchange position of a commercial bank, A_{cd} is the asset volume of a commercial bank expressed in foreign currency derivatives, L_{cd} is the volume of the bank's mandatory part expressed in foreign currency derivatives.

4. If the market has high currency volatility, then the credit institution should increase the volume of currency options, relative to other financial instruments. It is so, since in case of an adverse change in the exchange rate, the option gives the right to refuse performance and hedge the loss risk. It is assumed that the bank narrows the currency position, and thereby confirms the correctness of the first paragraph.

So, the "X" model is an option of the organization's behavior in the conditions close to the theoretical one, because often banks cannot unconditionally comply with all postulates. This set of rules can be considered as one of the most effective options for managing the currency risks when the currency is volatile. Also, the "X" model can be considered as one of the possible benchmarks for a commercial bank in order to hedge the foreign exchange risks [10,11].

Thus, it should be noted that the issue of hedging currency risks is one of the most acute. Currency volatility is always present, especially in relation to the national currency of the Russian Federation, and requires monitoring. The "X" model is designed to help solving this problem.

CONFLICT OF INTEREST

There is no conflict of interest.

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None

REFERENCES

- [1] Lavrushyn OI, Larionova IV, Pomorina MA. [2017] Banking Management. 6th ed., updated and revised. M.: Knorus. 414.
- [2] Banking Sector of the Russian Federation [Electronic resource] URL: <http://cbr.ru/analytics/?Prtd=bnksyst> (access date 25.04.2018)
- [3] Annual Statements of Sberbank PJSC [Electronic resource] URL: <http://www.sberbank.com/ru/investor-relations/reports-and-publications/annual-reports> (access date 24.03.2018)
- [4] Zarubayko DR, Temchenko OS. [2017] Hedging Currency Risks by Commercial Banks during the Russian Currency Crisis 2014-2015. *Universum: Economics and Jurisprudence*. 3 (36):14-16.
- [5] Overview of World Currencies [Electronic resource] URL: <https://www.finam.ru/international/quotes/?0=5> (access date 14.03.2018)
- [6] Financial Statements of Sberbank PJSC According to IFRS [Electronic resource] URL: <http://www.sberbank.com/ru/investor-relations/reports-and-publications/ifrs> (access date 30.03.2018)
- [7] Bliss BA, Clark JA, Delisle RJ. [2018] Bank risk, financial stress, and bank derivative use *Journal of Future Markets*. 12-21.
- [8] Broccardo E, Mazzuca M, Yaldis E. [2014] The use and determinants of credit derivatives in Italian banks *Journal of Risk Finance*. 17(4):417-436.
- [9] Li S, Marinc M. [2014] The use of financial derivatives and risks of U.S. bank holding companies *International Review of Financial Analysis*. 35:46-71.
- [10] Shen X, Hartarska V. [2018] Winners and losers from financial derivatives use: evidence from community banks. *Applied Economics*. 1-16.
- [11] Trapp R, Weib GNF. [2016] Derivatives usage, securitization, and the crash sensitivity of bank stocks *Journal of Banking and Finance*. 79:183-205.