

Fair value hedges with swaps: accounting practice under IFRS

The paper reveals the accounting treatment for hedging against the interest rate risk and the foreign exchange rate risk arising from operations with financial instruments of banks using interest and currency swaps. The economic essence of hedging transactions, the concept and mechanism for the implementation of swap agreements are considered. The article analyses the requirements of IFRS 9 on fair value hedge accounting including qualifying criteria for hedge accounting, hedge effectiveness and ineffectiveness determination, accounting requirements for fair value hedges. The author provides the calculation of the fair value of the floating-for-fixed interest rate swap. The fair value of swaps is measured in terms of bond prices: the fair value is calculated as the difference between the present value of fixed rate bonds of all future periods and the present value of floating-rate bonds for a current period. The results received explain how the change in the fair value of a hedged item is compensated with the reverse change in the fair value of a hedging instrument. The paper covers the accounting practice for fair value hedges of the fixed rate financial liability measured at fair value through profit or loss, with interest rate swap as a hedging instrument. The author introduces the accounting treatment for the fair value hedge of the fixed rate financial liability denominated in foreign currency with the use of currency swap as a hedging instrument. For both hedging procedures any gains or losses on a hedging instrument as well as on a hedged item are recognized in profit or loss. The suggested accounting procedures completely respond to the requirements of IFRS and can be applied by Ukrainian banks.

Keywords: hedge accounting; interest rate swap; currency swap; fair value hedge.

Relevance of the article. Banking institutions provide a variety of financial services and, therefore, operate with different types of financial instruments in order to increase profit or reduce loss and dominate at financial markets. In order to manage own risks, arising from transactions with financial assets and financial liabilities, banks apply derivatives. Derivatives are financial instruments created to manage risks of a business entity performance with financial assets and financial liabilities. There are four common types of derivatives: forwards, futures, options, and swaps.

Derivatives are used by banks to hedge risks. Hedging is a method of banking risk reduction in transactions with financial instruments when derivatives are used to compensate changes in the fair value or cash flows of financial assets and liabilities. Financial instruments entitled to various risks are identified as hedged items. In turn, derivatives that are used to reduce or eliminate changes in the fair value or cash flows of hedged items are determined as hedging instruments. Hedge relationships are classified into three categories: fair value hedge, cash flow hedge, and net investment hedge.

Legal requirements on hedge accounting in Ukraine are determined in the Instruction on Derivatives Accounting in Ukraine, which coincides with the International Financial Reporting Standard (IFRS) 9 «Financial instruments» [1].

Users of legal documents on hedge accounting face certain difficulties, because accounting treatment is disclosed separately from procedures of the fair value assessment for hedging instruments and hedged items. Thus, accounting procedures are more complicated, so far as users can't identify one of three criterions of hedging relationship – inverse relation between changes in fair values of a hedging instrument and a hedged item.

Literature review. Transactions with financial derivatives cover a significant part of banking operations with financial instruments. In turn, swaps, as one of the derivative types, are used to receive trading revenues as well as to hedge risks.

Following the report of International Swaps and Derivatives Association, which unites more than 900 member institutions from 69 countries, whose trades are disclosed under US regulatory documents, in 2018 single currency fixed-for-floating interest rate swaps accounted for 65,6 % of total interest rate derivatives trades of 236,4 trillion dollars. Comparing with the full year 2017, single currency fixed-for-floating interest rate swaps traded notional increased by 25 % to 73 trillion dollars. Overnight index swaps grew by 12,7 % to 53 trillion dollars [2].

The issues of derivative accounting and financial reporting are researched by domestic and foreign scientists. For instance, J.Ramirez has considered hedging transactions in conformity with the risks being hedged. In particular, the author suggests to use interest rate swaps to hedge a risk of the benchmark interest rate movement, which influences the fair value of a financial instrument, as well as a risk of floating interest rates fluctuation, which influence cash inflows and outflows of financial instruments. In addition, the author suggests to use interest rate swaps to hedge foreign exchange risk of fixed-rate and floating-rate financial instruments denominated in currency other than the counterparty's one [3].

Andrzejewski M., Dunal P. and Ożga P. investigated new requirements to hedge accounting under IFRS 9 in comparison with the International Accounting Standard (IAS) 39 [4]. Singh J.P. has compared the requirements of IAS 39 and IFRS 9 on hedge accounting designation, emphasizing on the identification of a risk component and testing for hedge effectiveness [5].

Kuzminskiy Y.A. researched the issues of accounting policy on hedge accounting and analyzed the statements of IFRS 7 on presentation of hedge relationships in financial reports [6]. Pylypenko L.M. considers the issues of methodology and procedures of accounting for derivatives and presentation of information in financial reports [7]. Oliynyk O. and Ksendzuk V. have developed the hedge accounting procedures for non-financial companies, in particular: the list of accounts, which should be implemented in the Chart of Accounts to provide the fair value hedge accounting, initial recognition and remeasurement of hedging instruments [8].

Purpose of the article. The purpose of this study is to develop procedures for banking risks hedge accounting, using interest rate and foreign exchange swaps as follows: the fair value measurement of hedging instruments and hedged items and accounting treatment for fair value hedges and cash flow hedges.

Results. The fair value hedge is a method of reduction or elimination of the fair value movement caused by a benchmark interest rate risk and foreign exchange risk. Fair value hedges are commonly applied to fixed-rate borrowings and available-for-sale securities. As hedging instruments, banks use interest rate swaps. Also, fair value hedges are applied to reduce the foreign exchange risk, using a foreign exchange swap and forward exchange contracts.

A swap is considered as the most popular hedge instrument applied by the banks. A swap is an over-the-counter agreement between two parties to exchange cash flows in future periods. Principals are exchanged at the beginning or at the end of a swap agreement. Two most popular swaps, used as hedging instruments, are an interest rate swap and foreign exchange swap (cross-currency swap).

The interest rate swap is an agreement that requires exchange of contractual cash flows between two parties at fixed or floating interest rates. Banks use interest rate swaps to hedge the fair value of fixed-rate financial assets and liabilities.

The cross-currency swap is an over-the-counter derivative, by the terms of which two counterparties exchange principal and interest payments on the principal denominated in two different currencies. Banks apply cross-currency swaps to hedge the fair value of foreign-currency denominated financial liabilities and available-for-sale financial assets. With currency swaps, banks lock cash flow equivalents in domestic currency from foreign-currency denominated borrowings.

It is generally accepted in world financial markets to use a spot London Interbank Offer Rate (LIBOR) as the swap floating interest rate. A fixed interest rate of a swap is calculated on the basis of the LIBOR on the date of agreement. The change in the fair value of the interest rate swap is calculated as the present value of expected cash flows at each remeasurement date, using the benchmark interest rate as a discount rate. Following Accounting Standard Codification 815 of the Financial Accounting Standards Board (FASB), there are 4 eligible benchmark interest rates: interest rates on Treasury obligations of the US Government, the LIBOR swap rate, the Overnight Index Swap Rate, and the Security Industry and Financial Markets Association Municipal Swap Rate [9]. Therefore, at initial recognition, the benchmark interest rate equals the fixed swap rate.

Principles for hedge accounting are disclosed in International Financial Reporting Standard 9 «Financial Instruments». In order to qualify risk-minimizing relations between two parties as hedge accounting, a bank is required to determine hedging instruments, hedging items, and compliance with qualifying criteria for hedge accounting. Following requirements of the Standard, only those swaps measured at fair value through profit or loss «may be designated as a hedging instrument» [10, p. 6.2.1].

Swaps are used to minimize a benchmark interest rate risk and foreign exchange risk of hedged items that are recognized financial assets and financial liabilities of a bank. It is also required for a bank to prepare all the information on hedge relations in the documentary form, including the nature of a risk being hedged and procedures how to assess efficiency of hedge relations.

In the fair value hedge, the gain or loss on the swap as a hedging instrument is recognized in profit or loss. The only exception is for equity swaps, which hedge equity instruments, for which the bank has made irrevocable decision to measure at fair value through other comprehensive income instead of appropriate fair value through profit or loss. For hedging items a bank is obligated to follow several rules as follows:

- 1) the hedging gain or loss on financial assets and liabilities at fair value through profit or loss adjust their carrying amount and recognized in profit or loss;
- 2) the hedging gain or loss on financial assets measured at fair value through other comprehensive income adjust their carrying amount and shall be recognized in profit or loss; amortization of the fair value of debt instruments measured at fair value through other comprehensive income shall be done using the recalculated effective interest rate; the hedging gain or loss on equity instruments, which are irrevocably classified as those measured at fair value through other comprehensive income at their initial recognition, shall be recognized in other comprehensive income;

3) the hedging gain or loss on financial assets and liabilities measured at amortized cost shall be recognized as discount or premium and amortized to profit or loss using the recalculated effective interest rate [10].

In order to disclose accounting treatment for fair value hedges with swaps, it is necessary to consider an illustrative example.

On 01.07.20X1, a bank issues debt financial instruments that mature in 2.5 years. The principal amount is 500 000 currency units (cu), a fixed interest rate is 5,12 % annual. The fair value of the debt at a recognition date – 494 000 cu. Interests are paid semi-annually. On the same date, the bank enters an interest rate swap, by the terms of which it will receive cash flows at a fixed interest rate and pay floating at a 6-month LIBOR minus 45 basis points (at a trade date the 6-month LIBOR is 5,15 %). Cash flows are exchanged semi-annually. The swap relationship meets the qualifying criteria for hedge and the hedge effectiveness requirements under IFRS 9. The swap agreement is designated as a hedging instrument of the change in the fair value of the debt caused by fluctuations of the benchmark interest rate. On the settlement date, LIBOR swap rates are as follows: the 6-month LIBOR – 5,15 %, the 12-month LIBOR – 5,23 %, the 18-month LIBOR – 5,68 %, the 24-month LIBOR – 5,97 %, the 30-month LIBOR – 6,32 % (in practice, financial markets set LIBOR rates only for periods up to 1 year, while LIBOR rates for periods beyond 1 year are calculated from Eurodollar futures).

Accounting standards codifications determine a LIBOR swap rate as one of four eligible benchmark interest rates. Also, the Libor swap rate is a swap fixed interest rate (LIBOR swap rate). The LIBOR swap rate is calculated as follows:

$$i_{fix} = \frac{1-d_n}{\sum_{t=1}^n d_t} \times n \times 100 \%, \quad (1)$$

where i_{fix} – fixed interest rate;

d_t – discount factor to determine the present value of LIBOR interest rates;

n – number of payment periods.

Following the example, the fixed interest rate of the swap is as follows:

$$i_{fix} = \frac{1 - \frac{1}{(1+0,0632)^{2,5}}}{\frac{1}{(1+0,0515)^{0,5}} + \frac{1}{(1+0,0523)^1} + \frac{1}{(1+0,0568)^{1,5}} + \frac{1}{(1+0,0597)^2} + \frac{1}{(1+0,0632)^{2,5}}} \times 2 \times 100 \% = 6,184 \%$$

To calculate the principal of the hedging instrument, designated to compensate change in the fair value of the hedged item, FASB and IFRS Board both recommend to use a hedge ratio, which is calculated as follows:

$$\text{Hedge ratio} = \frac{D_{debt}}{D_{swap}}, \quad (2)$$

where D_{debt} – duration of the financial liability;

D_{swap} – duration of the interest rate swap.

The duration of the financial liability is calculated using a rate of return on bonds. The rate of return is an interest rate that discounts future cash flows on the liability to the present value:

$$PV_{CF} = \sum_{i=1}^n \frac{CF_n}{(1+i_{ef})^n} = \frac{-12800}{(1+i_{ef})^1} + \frac{-12800}{(1+i_{ef})^2} + \frac{-12800}{(1+i_{ef})^3} + \frac{-12800}{(1+i_{ef})^4} + \frac{-512800}{(1+i_{ef})^5}, \quad i_{ef} = 2,824 \% \text{ semi-annually or } 5,648 \% \text{ annually. The calculated duration of the issued financial liability equals } 4,755 \text{ periods (Table 1).}$$

Table 1

Duration of the financial liability

Period, T	Cash flows, cu	Present value of cash flows, cu	Weight	Duration, periods
<i>1</i>	<i>2</i>	<i>3</i>	<i>4 = PV_n/ΣPV</i>	<i>5 = 1 × 4</i>
31.12.20X1	12800	12449	0,025	0,025
30.06.20X2	12800	12108	0,025	0,049
31.12.20X2	12800	11775	0,024	0,072
30.06.20X3	12800	11452	0,023	0,093
31.12.20X3	512800	446231	0,903	4,516
Total		494000	1	4,755

Note: built and calculated by the author

The swap duration is calculated using the bond value approach as the difference between durations of bonds with fixed and floating interest rates. It should be noted that the duration of a floating-rate bond is calculated only for the first period, so far as further fluctuations of the interest rate are not determined (Table 2).

Duration of the interest rate swap

Period, T	Fixed-rate cash flows				Fixed-rate cash flows			
	cash flows, cu	present value of cash flows, cu	weight	duration	cash flows, cu	present value of cash flows, cu	weight	duration
<i>1</i>	<i>2</i>	<i>3</i>	$4=PV_n/\Sigma PV$	$5=1 \times 4$	<i>6</i>	<i>7</i>	$8 = PV_n/\Sigma PV$	$9=1 \times 8$
31.12.20X1	15450	15026	0,030	0,030	515250	501119	1	1
30.06.20X2	15450	14614	0,029	0,058	-	-	-	-
31.12.20X2	15450	14213	0,028	0,084	-	-	-	-
30.06.20X3	15450	13824	0,027	0,109	-	-	-	-
31.12.20X3	515450	448537	0,886	4,430	-	-	-	-
Total		506215	1,00	4,71		501119	1	1

Note: built and calculated by the author

The calculated duration of the swap is $D_{swap} = D_{fix} - D_{float} = 4,71 - 1 = 3,71$ periods or 1,855 years. Therefore, the hedge ratio equals 1,28, while the principal of the interest rate swap is $500000 \times 1.28 = 640000$ cu.

At initial recognition, the fair value of the interest rate swap is nil, which means that the present value of the fixed-rate cash flows equals the present value of the floating-rate cash flows. In the example, the fixed swap rate equals 6,18 % annual, floating rate in the first period – 4,70 %, discount rate – 6-month LIBOR at the agreement date – 5,15 % (Table 3).

Table 3

The fair value of the interest rate swap at initial recognition

Period, T	Fixed-rate cash flows	Floating-rate cash flows	Present value of fixed-rate cash flows	Present value of floating-rate cash flows
31.12.20X1	19776	655040	19280	638596
30.06.20X2	19776	-	18781	-
31.12.20X2	19776	-	18182	-
30.06.20X3	19776	-	17581	-
31.12.20X3	659789	-	564740	-
Total			638564	638596

Note: built and calculated by the author

The difference between the fixed and floating cash flows is 32 cu, which is explained by a counterparty credit risk.

Under the terms of the example, in three month LIBOR interest rates have decreased as follows: the 3-month Libor – 5,3 %, the 9-month Libor – 5,17 %, the 15-month Libor – 5,36 %, the 21-month Libor – 5,48 %, the 27-month Libor – 6,48 %. Consequently, the LIBOR swap rate equals:

$$i_{swap} = \frac{1 - \frac{1}{(1+0,0682)^{2,25}}}{(1+0,053)^{0,25} + (1+0,0517)^{0,75} + (1+0,0536)^{1,25} + (1+0,0548)^{1,75} + (1+0,0682)^{2,25}} \times 2 \times 100 \% = 5,921 \%$$

Taking into consideration that the fair value of the swap at initial recognition is nil, the change in the fair value at the remeasurement date is calculated as the difference between the present value of fixed-rate cash flows and the present value of floating-rate cash flows:

$$FV_{swap} = \frac{19776}{(1+0,0265)^{0,5}} + \frac{19776}{(1+0,02585)^{1,5}} + \frac{19776}{(1+0,0268)^{2,5}} + \frac{19776}{(1+0,0274)^{3,5}} + \frac{659776}{(1+0,0341)^{4,5}} - \frac{647520}{(1+0,0265)^{0,5}} = 4107 \text{ cu.}$$

Fair value change of the financial liability is recognized in profit or loss and calculated as the difference between the fair values at initial recognition and the remeasurement date:

$$FV_{debt} = \frac{12800}{(1+0,0296)^{0,5}} + \frac{12800}{(1+0,0296)^{1,5}} + \frac{12800}{(1+0,0296)^{2,5}} + \frac{12800}{(1+0,0296)^{3,5}} + \frac{512800}{(1+0,0296)^{4,5}} - 494000 = 4016 \text{ cu.}$$

Thus, the fair value movement of the hedging instrument compensated the fair value movement of the financial liability caused by the change of the benchmark interest rate. The positive difference between swap inflows and outflows are recognized as a swap asset. The excess of the fair value of the financial liability over the fair value of the interest rate swap (91 cu) is classified as an over-hedge and is recognized in profit or losses.

Accounting treatment for fair value hedge is as follows:

Dr	Profit/Loss	4016
Cr	Financial liability	4016
Dr	Interest rate swap asset	4107
Cr	Profit/Loss	4107

In order to hedge fair value of financial instruments banks also use currency swaps – an agreement between two parties to exchange cash flows in two different currencies. Commonly, principals in different currencies are equal if converted into the same currency. Principals are exchanged at the beginning or at the end of the swap agreement. The currency swap enables to reduce or totally eliminate both interest rate and currency risks. The currency swap is used as a hedging instrument in fair value hedges of fixed-rate financial liabilities denominated in foreign currency.

As an example, a Bank with the functional currency A on 01.01.20X1 borrows 6 000 000 cu in currency B from a foreign bank for 2 years. An interest rate is 2,9 % annual with semi-annual interest payments (Figure 1). To hedge both the risk of fair value change and the foreign exchange risk, the bank enters a currency swap. Under the terms of the contract, the bank receives the currency B at a rate 2,9 % on 6 000 000 cu and pays the currency A at a LIBOR rate on 6 120 000 cu. Principals are exchanged at the end of the agreement. An official cross-currency rate is 1.02 B/A, which means that the principal in the currency A equals to the principal in the currency B at the agreement date.

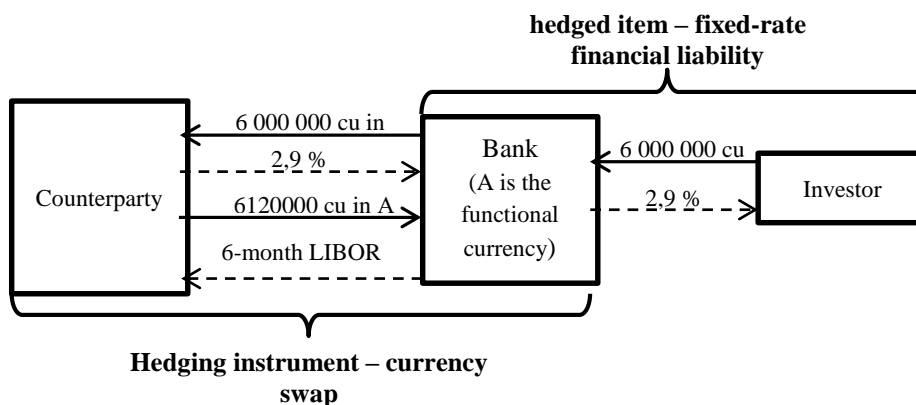


Figure 1. Fair value hedge of the financial liability with the currency swap

The financial liability is remeasured at the end of each payment period. The fair value of the financial liability changes due to fluctuation of the benchmark interest rate. As mentioned above, the benchmark interest rate is used as a LIBOR swap rate (the same as a fixed swap rate). Thereby, the benchmark interest rate is calculated using data on the LIBOR spot rate at each reassessment date (Table 4).

Table 4

LIBOR spot rates and calculated benchmark interest rates (LIBOR swap rates)

Period	LIBOR spot rates									
	01.01.20X1		30.06.20X1		31.12.20X1		30.06.20X2		31.12.20X2	
	ccy A	ccy B	ccy A	ccy B	ccy A	ccy B	ccy A	ccy B	ccy A	ccy B
01.01.20X1	5,6	4,57	-	-	-	-	-	-	-	-
30.06.20X1	5,42	4,46	6,15	4,55	-	-	-	-	-	-
31.12.20X1	5,38	4,38	5,61	4,45	6,15	5,39	-	-	-	-
30.06.20X2	5,09	3,98	4,89	4,33	5,41	5,28	5,89	5,48	-	-
31.12.20X2	4,54	4,16	4,34	4,31	5,05	5,36	4,99	5,24	4,15	4,12
Benchmark interest rate	4,51	4,12	4,31	4,27	4,99	5,29	4,93	5,17	-	-

Note: built by the author

The Financial liability is remeasured at the end of each period. Thus, on 30.06.20X1, the fair value is $PV_{30.06.20X1} = \frac{87000}{(1+0,02135)^{0,5}} + \frac{87000}{(1+0,02135)^1} + \frac{6087000}{(1+0,02135)^{1,5}} = 6068592,29$ cu. Consequently, on 31.12.20X1, the fair value of the financial liability is 6016047,84 cu, on 30.06.20X2 – 6009773,33 cu.

The change in the fair value of the financial liability is calculated in its functional currency A (Table 5).

Table 5

The fair value change of the financial liability

№	Period	01.01.20X1	30.06.20X1	31.12.20X1	30.06.20X2	31.12.20X2
1	Spot foreign exchange cross rate (B/A)	1,02	1,0185	1,024	1,027	1,043
2	Fair value of the financial liability, currency B	6000000	6068592	6016048	6009773	0
3	Fair value of the financial liability, currency A	6120000	6180861	6160433	6172037	-
4	Gross fair value movement	-	60861	-20428	11604	-
5	Basis fair value movement	-	60861	40433	52037	-

Note: built and calculated by the author

In the given example, the fair value movement is hedged with the currency swap. Consequently, the fair value increase of the hedged item must be offset by the fair value decrease of the hedging instrument. The fair value of the currency swap is calculated in terms of bond prices. The fair value of the currency swap is nil at initial recognition (Table 6).

Table 6

The fair value of the currency swap at initial recognition

Period, T	Cash inflows at fixed interest rate, currency B	Cash outflows at floating interest rate, currency A	Present value of cash inflows, currency B	Present value of cash outflows, currency A
30.06.20X1	87000	6291360	86118	6221567
31.12.20X1	87000	-	85245	-
30.06.20X2	87000	-	84380	-
31.12.20X2	6087000	-	5843833	-
Total			6099575	6221567

Note: built and calculated by the author

The fair value of the currency swap is calculated as the difference between cash inflows and outflows in the currency A:

$$FV_{swap0} = PV_{cash\ inflows} \times Spot\ FX\ rate_{\frac{B}{A}} - PV_{cash\ outflows} = 6099575.17 \times 1.02 - 6221567.23 = 0\ cu.$$

At the end of each following period, the currency swap is remeasured. On 30.06.20X1, 1,5 periods are left, spot cross currency rate is 1,0185 (see Table 5). The present value of swap legs is calculated by discounting cash flows at benchmark interest rates: 4,27 % for cash flows in the currency B and 4,31 % in the currency A (see Table 4). On 30.06.20X1, the fair value of the currency swap is as follows:

$FV = \left(\frac{87000}{(1+0,02135)^{0,5}} + \frac{87000}{(1+0,02135)^1} + \frac{6087000}{(1+0,02135)^{1,5}} \right) \times 1,0185 - \frac{6308190}{(1+0,02155)^{0,5}} = -60433$ cu. On 31.12.20X1, the fair value is -39833 cu, on 30.06.20X2 – -51964 cu. Therefore, the currency swap almost totally offsets the fair value movement of the financial liability.

Accounting entries on the fair value hedge are as follows:

- On 30.06.20X1:

Dr	Profit/Loss	60861
Cr	Financial liability (remeasurement)	60861

	Dr	Swap asset	60432
	Cr	Profit/Loss	60432
2.	On 31.12.20X1:		
	Dr	Financial liability (remeasurement)	20428
	Cr	Profit/Loss	20428
	Dr	Profit/Loss	20599
	Cr	Актив (переоцінка свопу)	20599
3.	On 30.06.20X2:		
	Dr	Profit/Loss	11604
	Cr	Financial liability (remeasurement)	11604
	Dr	Swap asset	12131
	Cr	Profit/Loss	12131

Conclusions. The research has resulted in the development of the accounting treatment for the fair value hedge of financial liabilities with swaps. The author has considered the meaning of hedging transactions as the leverage of the banking risks reduction. The paper discloses IFRS recommendations on hedge accounting and presentation of information in financial reports. The Illustrative example introduces the accounting treatment for the fair value hedges of fixed-rate financial liabilities with the interest rate swap. The calculations of the fair value movement of both the hedging instrument and the hedged item explain the mechanism of the fair value hedge relationship: the inverse relation between the fair value movement of the hedging instrument and the hedged item enables to offset change in the fair value of the financial liability by the inverse change of the fair value of the interest rate swap. Besides, the paper covers the fair value hedge accounting for financial liabilities denominated in foreign currencies with the currency swaps. The results of the research are extremely essential for domestic banks as well as for other business entities in the context of implementing IFRS recommendations on hedge accounting.

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