Based on Articles 4 and 11 of Law on Banking Agency of the Federation of Bosnia and Herzegovina ("Official Gazette of the Federation of BiH", number 9/96 and 27/98, 20/00, 45/00, 58/02, 13/03, 19/03, 28/03, 47/06 and 59/06), Article 22 of Charter of the Banking Agency of the Federation of BiH ("Official Gazette of the Federation of BiH", number 42/04) and Article 41 of Decision on Minimum Standards for Market Risks Management in Banks ("Official Gazette of the Federation of BiH", number 55/07, 81/07 and 6/08), dated of February 11, 2008 Director of the Agency issued

GUIDELINES

FOR IMPLEMENTATION OF DECISION ON MINIMUM STANDARDS FOR MARKET RISKS MANAGEMENT IN BANKS

1. GENERAL PROVISIONS

These Guidelines more closely determine implementation of the Decision on Minimum Standards for Market Risks Management in Banks (hereinafter: Decision).

2. TERMS

The new terms used in the Decision have the following meaning:

- **„financial instrument"** is any contract that gives rise to both a financial asset of one entity and a financial liability or equity instrument of another entity. Financial instruments include both primary financial instruments (such as cash, financial assets and financial liabilities) and derivative financial instruments;
- **„securities"**are written certificates evidencing right to ownership implied by such certificate. There are ownership (e.g. stocks) and debt securities (e.g. treasury note, commercial note, bonds);
- **„derivative"** is a financial instrument whose value depends upon the value of some other instrument, that is, whose value is derived from some other instrument - derivative (futures agreement, option agreement, forward agreement, swop agreement, etc.);
- **„foreign exchange forward agreement" (fx forward agreement)** is an agreement to purchase or sell an amount of foreign currency at a future date (more than two working days) at a predetermined price. It is not required to pay the price from the forward agreement at the moment of negotiation (premium). However, the liability has to be fulfilled at the execution date, no matter whether the market price is more favorable than the agreed forward price;
- **„forward rate agreement"** is an agreement at fixed interest rate upon predetermined date (more than two working days) or agreement about deposit starting from more than two working days to regular maturity of 3, 6, 9 or 12 months;
- **„futures agreement"** represents a right or commitment to buy or sell specific instrument upon predetermined date (e.g. foreign currency futures, interest rate futures, stock index futures, bond futures, gold futures, agriculture products futures, etc.);
- **„swap agreement"** is an agreement between two parties about exchange of cash flows in same or different currencies;
- **„foreign exchange swap" (fx swap)** is an agreement in which two parties agree to exchange values (principle and interest) in different currencies upon predetermined exchange rates;
- **„interest rate swap"** is an agreement in which two parties agreed to exchange periodic interest payments. It represents hedging against interest rate risk. The exchange of interest rates represents

the exchange of floating interest rates for fixed interest rates and vise versa. This instrument serves to match interest rate mismatch between assets and liabilities of a company, hedging against interest rate increase (exchange of floating interest rate of long term loans for the fixed one), as well as a possibility to decrease interest rate expenses (exchange of fixed interest rate of long term loans for the floating one) in case of lower reference interest rates (LIBOR, EURIBOR);

- **„option agreement“** grants the right, and not the obligation, to purchase (call option) or to sell (put option) some assets at or before the predetermined maturity at an agreed upon price. There are options as independent instruments or as built-in in some other financial instruments. Call option will be performed if a market price exceeds the sum of the exercise price and premium paid, that is, put option will be performed if a market price is below the exercise price and premium paid. There are the following types of options: „in-the-money“option (exercise price is below market price of a call option, or exercise price is above market price of a put option), „out-of-the money“option (exercise price is above market price of a call option, or exercise price is below market price of a put option) and „at-the money“option (exercise price equals market price). Option holder maintains right, and not the obligation to use it (they are allowed to expire unexercised, they can be used or take opposite position);
- **„foreign exchange option“ (fx option)** represents the right to purchase or sale some currencies upon predetermined price at or before predetermined maturity date;
- **„caps“ –** refer to agreed upon limits on interest rates. The cap buyer protects against rising interest rates. The cap seller reimburses the cap buyer if the difference between the agreed maximum limit of the interest rate and floating reference interest rate (e.g. quarterly LIBOR) is above the agreed maximum limit (e.g. caps represent a series of the European call options on interest rates used as hedging against rising interest rates above the agreed maximum limit of the option exercised);
- **„floors“** ,similar to caps, floors also represent agreed upon limits on interest rates. The floor buyer protects against falling interest rates. The floor buyer reimburses for the difference if reference interest rates falls bellow the agreed maximum limit (e.g. floors represent a series of the European put options on interest rates used as heading against falling interest rates bellow the agreed exercise price);
- **„interest rate collar“** represents the simultaneous purchase of an interest rate caps and floors on the same index for the same maturity and notional principal amount. Purchase of collar represents a protection against rising interest rates. The cap increase is determined by earnings gained through sale of floors. Collars are constantly designed in the way that the cap price equals the floor price (the collar expenses equal zero);
- **„warrants“** are derivative securities or long term options for purchase of stocks which give their owners the right to purchase stocks or bonds of future issues of warrant issuers at specified date or within specified period at predetermined price. They contain certain benefits offered along with the issue of securities, as they cause profit increase or expense decrease in collecting capital. They are usually issued as attached to corporation bonds and preferred stocks. There are the purchase warrants which give their owners the right to purchase or the selling warrants which give their owners the right to sell. Warrants are tradable at stock exchange, so they have their price which depends on the following: price of securities, time frame in which the warrant is defined, volatility, dividend, interest rate. Warrants are an integrated part of securities, they can be separated from securities and sell individually at the stock exchange, and they can also be issued as independent securities.
- **„market risk“** is the possibility of losses from financial instruments recorded in bank's balance sheet and off-balance sheet, caused by: changes of interest rates, exchange rates and prices; risks associated with the financial instruments trading in the market, such as: counterparty risk, issuer risk and placement risk; and changes in other market factors influencing the value of financial instruments;
- **„interest rate risk“** is the possibility of losses due to changes of interest rates, which can be:

a) «general interest rate risk » (risk of repeated determination of prices) – risk exposure due to price changes of debt instruments due to interest rate changes or bigger changes in the market not related to any specific characteristics of the subject instrument,
b) «specific interest rate risk» - risk exposure due to price changes of debt instruments due to the reasons related to the issuer (or in case of derivatives, related to the issuer of specific instrument);

- **„foreign exchange risk“** is the possibility of loss due to changes in the exchange relationships and/or mismatch in the levels of assets, liabilities and off-balance sheet items of the same currency;
- **„price risk“** is the probability of losses due to changes in prices of financial instruments and commodities;
- **„counterparty risk“** is the probability of loss in all outstanding items in trading books due to changes in financial condition of the counterparty which is why the counterparty may not live up to its contractual obligation;
- **„issuer risk“** is the probability of loss due to changes in value of financial instruments as a result of changes in financial condition of the issuer of that specific instrument;
- **„delivery risk“** is the risk of loss occurring when transactions related to debt, ownership and commodity instruments (except for repo and reverse repo contracts) are not performed after the anticipated delivery date;
- **„delivery date“** is the date set by the contract between a bank and a counterparty;
- **„placement risk“** is the probability of loss due to delinquency or deteriorated financial condition of other financial institution where the bank maintains its deposits, that is, funds;
- **„hedging“ (hedging)** is financial technique to offset the risk of loss from price fluctuation in the market. Hedgers employ a variety of techniques, including futures contracts, options on futures, and interest rate swaps;
- **“margin account”** is an account offered by financial intermediaries with purpose to purchase securities for a bank or to lend money;
- **„interest rate spread“** is the difference between interest rate earned on bank's balance sheet positions in the assets and interest rate paid as bank's cost of funds;
- **“interest rate index”** is the reference base rate in pricing money, as significant EURIBOR and LIBOR;
- **„stock exchange“** is the place where offers and demands meet (e.g. Sarajevo and Banja Luka stock exchange). Securities stock exchange is the place for trading with securities. This can be a location where stock brokers are physically present and mutually conclude transactions, and it can be a virtual place with trading over an electronic system;
- **„stock exchange index“** is a numerical indicator of price changes in the securities stock exchange (e.g. in BiH, Sarajevo stock exchange indexes are BIFX and SASX-10 and Banja Luka stock exchange indexes are BIRS, FIRS and ERS 10). They are calculated as combination of the indicators of the most liquid stocks of the largest and the best companies listed in the stock exchange. There are indexes that apply on the overall market, that is, the indexes for specific segments: bond index, technical company index, industrial index, etc.;
- “**factor risk marked with Greek alphabet letters“** is the risk of derivative exposure, especially the following:
  a) Delta (δ) – represents sensitivity of the option price to changes in the price of the underlying financial instrument (factor);
  b) gama (γ) – represents sensitivity of the Delta option to the marginal changes in the price of the underlying financial instrument;
  c) vega (*Λ*) – represents sensitivity of the option price to the changes of fluctuating price of the underlying financial instrument;
- **„repurchase deals“ –** At the time of negotiating transaction, there can be simultaneous negotiation of purchase and sale of securities at a specified date and price. This is the way for securities holder to get short term liquidity, and not to permanently sell securities, while the party with excess funds gets a chance to place funds and makes profit based on repo interest. Repo deals

enable maintenance of high level of liquidity with decreased transaction costs related to securities trading;

- **„repurchase agreement“** is the contract by which the seller accepts obligation to subsequently repurchase securities at a specified date and price;
- **„reverse repurchase agreement“** is the contract by which the buyer of securities maintains right to resell the securities back to the seller at a specified date and at higher price, whereas this contract essentially represents origination of a loan with specific price, while the borrowing is collateralized by a pledge of securities;
- **„value-at-risk“** is a technique which uses the statistical analysis of historical market trends and volatilities to estimate the likelihood that a given portfolio's losses will exceed a certain amount;
- **„trading book“** represents a bank's portfolio, as defined by its internal criteria, including positions of financial instruments and commodities held by a bank for trading or hedging with other elements, while their value has to be frequently and accurately determined upon market prices;
- **„bonds“** are debt securities granting right to the holder to return the invested funds with corresponding interest (return). The main bond issuers are: states, cities, local administration and self-administration units, and companies. Debt principal could be paid out in annuities or as one-off payment upon maturity, and, in the meantime, only corresponding interest is paid out, annually or semiannually.

3. EXPLANATION OF THE WAY TO FILL OUT THE FORMS PRESCRIBED

Amounts in the prescribed forms are expressed in thousands of KM (including Form 8- Tables A, B and C, which are prepared separate for the currencies in the countervalue of KM).

In the part of the Guidelines referring to the examples of capital requirement calculations for market risks, the numbers are presented in absolute amounts for better understanding of the calculation methodology.

3.1. Trading book

All positions in the trading book of a bank are expressed daily and upon their market values based on the prices and other market factors published by an independent source. Positions held with trading intent are those held by a bank for short-term resale and/or with the intent to generate profit from short-term actual or expected difference between their purchase and sale price or other price or interest rate movements. In the process of determining values of trading book positions, banks have to apply provisions of the International Accounting Standard 39.

Organizational segment of a bank responsible for position value fixing in the trading book should be independent from the organizational segment of a bank responsible for active position management in the trading book. A bank should establish an organizational structure in such way that the organizational segments represent responsibility of different management members of a bank.

A bank, pursuant to the adopted investment and trading strategy, should also adopt a written policy containing general criteria for allocating financial instruments and other items in the trading book. The policy should be adhered consistently. The mentioned policy should, at minimum, address the following:

- The extent of the trading book with precise description of the transactions considered to the trading, that is, the list of financial instruments to be included in the trading book and recommended methods for risk management of individual instruments,

- Related to the position value fixing in the trading book, there should be clearly defined responsibilities of the organizational segments of a bank included in such process, value fixing methods for individual positions, procedure and frequency of tests for their eligibility, market factors sources used in the value fixing process and other items as determined by a bank,
- Position limits and schedule for their revision,
- Name of the organizational segment in charge of control over the allocation system of the items in the trading book and schedule of their control,
- Positions monitoring process against the prescribed investment and trading strategy, possibility for assessment of their marketability or position hedging,
- Information and reporting system about trading positions, etc.

3.2. Form No. 7 – Detailed trading book

The Form consists of two parts: first part of the Form refers to the trading book of a bank, while second part refers to the trading extent in the trading book.

A bank shows in this Form individual financial instruments participating in the trading book with nominal value over 1%. The instruments participating in the trading book below 1% are shown under the item „Other" (e.g. Other stocks, Other debt securities, etc.).

Under the column „Name of Instrument" you should specify a descriptive name of the financial instrument.

Related to Item 1 „Stocks and stockholdings in trading companies", under the sub-items a bank should specify the portfolio of stocks with trading intent, e.g. stocks of BH Telecom dd Sarajevo; stocks of PIF MI-GROUP Sarajevo, etc. Sub-items of ordinal number 2 of the Form - „Debt securities" include long-term debt securities, such as bonds; Ordinal number 3 - „Other negotiable securities" includes negotiable securities with characteristics of the trading book items, which are not envisioned by other positions of this Form, and Ordinal number 4 - „Money market instruments" includes short-term securities, such as treasury bills, commercial bills, etc.

Related to the items of the Form referring to derivatives, under the sub-items referring to derivatives, in the following cases a bank should include the following:

- Financial futures agreements (Ordinal number 5 of the Form) futures rate agreements, futures agreements on debt securities, fx futures, futures on index stocks, etc.;
- Forward agreements (Ordinal number 6 of the Form) forward rate agreement, fx forward agreement, etc.;
- Swap agreements (Ordinal number 7 of the Form) interest rate swap agreements, fx swaps, cross-currency interest rate swap agreement, etc. and
- Options (Ordinal number 8 of the Form) fx options, bond options, interest rate options, stock exchange index options, options combination, etc.

Sub-item under Ordinal number 9 of the Form – „Commodities – physical products" includes physical products with trading intent or secondary market trading intent, such as agricultural products, minerals (including oil), precious metals (including gold), etc.

Sub-items under Ordinal number 10 of the Form – „Commodity derivatives" include derivative financial instruments associated with commodities, such as commodity futures, commodity options, etc.

Contract referring to borrowing of securities or commodities from counterparty and contract referring to lending of securities or commodities to counterparty (Ordinal numbers 12 and 13 of the

Form) includes any contract based on which a bank or its counterparty shall transfer securities or commodities in exchange for adequate collateral, along with commitment that the counterparty which has borrowed securities or commodities will return equivalent securities or commodities in some future date or when requested by the negotiating party.

Sub-items under Ordinal number 14 of the Form include fees, provisions, interest rates, dividends and margins for future and forward agreements, options, etc. to be traded at stock exchange, which are directly referred to the items included in the trading book, but have not been included in the capital requirement calculation for other market risks.

Securities issuance backing (Ordinal number 15 of the Form) means any contract, by which a bank has initiated commitment towards the issuer to organize, prepare and execute issuance of securities, along with registration and payment of all securities or only those remaining unregistered, with purpose of further sale to potential investors.

Column of nominal value in the currency, that is KM, includes the trading book items in nominal value, excluding derivative instruments that are expressed upon the envisioned value of the underlying instrument, currency or commodity. The envisioned derivative value means the contracted value of an instrument, amount of currency or commodity on which the derivative is based, e.g. in case of forward agreements that is the amount of the currency that is not exchanged through the entire duration of the contract.

Market value of debt securities means the value without accrued outstanding interest rates, which are in the trading book for debt securities specified under ordinal number 14 of the Form. Market value of adequate items/instruments is specified in the column of market values in currency, that is, in KM.

A bank fills out the row „Total“ (sub-totals of items from 1 to 15) and the last row of the Form „Total (1-15)“ (the sum of sub-totals), only for the columns „Nominal value in KM“, that is, „Market value in KM“.

Data expressed in thousands of KM are specified in the second part of the table, referring to trading extent in the trading book.

The data under Ordinal number 1 „Total market value“ are specified in the following way:

- In column „Balance as of“ you should enter the balance as of the last working day at the end of the month as total market value in KM of all trading items from the Form – Detailed trading book;
- In column „Average monthly balance“ you should enter an average balance during the month as total market value of all trading items from the Detailed trading book of a bank and
- In column „% of total risk assets“ you should enter numerical percentage of participation of total market value of all trading items of the trading book with balance as of the last working day at the end of the month against total risk assets as specified under Article 2 of Decision on Minimum Standards for Credit Risk Management and Assets Classification in Banks („Official Gazette of the F BiH“ number: 3/03, 54/04 and 68/05).

The data under Ordinal number 2 „Total nominal value“ are specified in the following way:

- In column „Balance as of“ you should enter the balance as of the last working day at the end of the month as total nominal value in KM of all trading items from the Form – Detailed trading book;
- In column „Average monthly balance“ you should enter an average balance during the month as total nominal value of all trading items from the Detailed trading book of a bank and

- In column „% of total risk assets“ you should enter numerical percentage of participation of total nominal values of all trading items of the trading book as of the last working day at the end of the months against total risk assets as specified under Article 2 of Decision on Minimum Standards for Credit Risk Management and Assets Classification in Banks („Official Gazette of the F BiH“ number: 3/03, 54/04 and 68/05).

Under Ordinal number 3 „Total risk assets“, you should fill out the row referring to column „Balance as of“ in which you should enter the balance of total risk assets as specified under Article 2 of Decision on Minimum Standards for Credit Risk Management and Assets Classification in Banks („Official Gazette of the F BiH“ number: 3/03, 54/04 and 68/05) at the end of the last quarter. Columns „Average monthly balance“ and „% of total risk assets“ should not be filled out.

3.3. Form No. 8 - Table A – Specific interest rate risk per individual currency

This Form refers to the calculation of specific interest rate risk for debt securities maintained in the trading book, filled out separately by currencies in the countervalue of KM.

In all rows a bank should fill out the amount of market value of all positions corresponding with the description of the row. In the part of the Form under I – „No risk bearing items“, Item 5 – „Other no risk bearing items“, include, among other things, the positions in state bonds created by decomposing derivative instruments.

Credit rating agencies (such as Moody's Investment Service or Standard&Poors) perform rating of debt securities. E.g. credit rating agencies perform rating of bonds according to the credit capability of the issuer or according to the degree of speculation (investment ratings could be: the best quality bonds with the lowest risk level, high quality bonds, medium quality bonds, etc.). Concerning debt securities issued by international banks without proper credit rating, the mentioned items should be specified in the part of the Form under V - „Other items“, under Item 21.

All debt securities held by banks are considered to be long position. All debt securities sold by banks, but not owned by banks, are considered to be short positions (eng. short selling). Short selling is the situation when a bank borrows securities, and then sells them, but it does not own them, expecting fall of their price and profit as a result of such sale. The bank will, at certain point of time when it needs to return the borrowed securities, have to purchase the same securities in the market (at the price lower than the price at which it has sold them) and return them to the contracting party from which it has borrowed the very same securities. During the term of the contract for borrowing, the bank will have a short position. Short positions are entered in absolute amount (as if they were positive numbers).

Net position represents a difference between the value of long and short position for each row. If such difference is negative, a bank needs to specify absolute value of the difference (as if they were positive numbers).

In the column „risk weighted position“ you should enter a net position for each row that is multiplied by corresponding risk weight for the category of the item.

Capital requirement for specific interest rate risk represents the sum of all risk weighted positions (regardless whether they are long or short).

3.4. Form No. 8 - Table B – General interest rate risk per individual currency (Maturity based approach)

This Form is filled out by a bank that applies maturity-based approach separately for each currency, expressed in the countervalue of KM.

Value of the positions is calculated by discounting future cash flows of individual instruments by using no risk interest rates for certain currency. In case when the remaining maturity of the instrument is shorter than a year, a bank performs discounting, that is, it includes the market value of the instrument (increased by potential accrual of outstanding interest).

A bank allocates its position values, depending on interest rates and remaining maturity, through adequate rows and columns of long and short positions; risk weights them with adequate risk weight and performs adjustment of the risk weighted positions.

In the column of the not-adjusted risk weighted positions by maturity grades and by zones, you should enter amounts with the indicators, while the other positions should be entered without the indicators (as if they were positive numbers). If the amount of longer position is higher than the amount of short position by adequate maturity grade or zone, then the not-adjusted risk weighted position should have a positive indicator (which should not be entered). If the amount of short position is higher than the amount of long position by adequate maturity grade or zone, then the not-adjusted risk weighted positions should have a negative indicator (which should be entered in front of the amount).

Total capital requirement for general maturity-based interest rate risk is the sum of the percentages determined: of the sum of adjusted risk weighted positions by maturity time grades, adjusted risk weighted positions inside the individual ones and between the zones, as well as remaining not-adjusted risk weighted positions.

3.5. Form No. 8 - Table C – General interest rate risk per individual currency (Duration based approach)

If it has received the approval by the FBA to use duration-based approach, a bank should submit this Form instead of the prior one. The form is filled out separately for each currency in the countervalue of KM.

Modified duration is calculated by the formula specified in the Decision, where factor ***t*** represents remaining maturity.
Bank should specify the instruments by columns of long and short opened position according to the modified duration by years. However, a bank should present each position with different modified duration in years by individual zones (zone 1 – modified duration up to 1 year; zone 2 – modified duration from 1 to 3 years and 6 months and zone 3 – modified duration over 3 years and 6 months).

In the column of the risk weighted opened position (long and short) you should enter the amount received after you multiply the position value (market value) with modified duration and anticipated movement of interest rate for that zone specified as percentage in the Decision (1,00%, 0,85% or 0,70%), while the result should be multiplied by 100.

Further risk weighting of positions is adjusted by zones. Lower amount, no matter whether it is risk weighted long or short positions, should represent the adjusted position of that zone. The difference between long and short risk weighted position makes the not-adjusted (long or short) risk weighted

position of that zone. Only in the column of the not-adjusted risk weighted positions by zones the amounts are entered with indicator, e.g. if the amount of short position is higher than the amount of long position for that zone, then the not-adjusted risk weighted position has negative indicator, which is entered in front of the amount. On contrary, a positive indicator should not be entered.

The next step is comparison of the not-adjusted long and short risk weighted positions between the zones, where lower amount of long or short not-adjusted risk weighted position, as a result of prior procedure, should represent the adjusted risk weighted positions of different maturity zone comparisons. The rest should represent the not-adjusted risk weighted position.

Capital requirement for general duration-based interest rate risk is the sum of percentages determined: adjusted positions for each zone, adjusted risk weighted positions between zones and remaining not-adjusted risk weighted positions.

3.6. Form No. 5 - Tables A and B

3.6.1. Form No. 5 - Table A (Foreign exchange matching of financial assets and financial liabilities – Foreign exchange position)

Form No. 5 - Table A (Foreign exchange matching of financial assets and financial liabilities – Foreign exchange position) represents the modified Form No. 5 concerning:

- Adding up to the foreign exchange position and movements in gold values and
- Adding up to the off-balance sheet position of the net position (with indicator + or -) forward currency contracts or gold forward contracts and currency options or gold options.

Net position is calculated individually for each currency forward, future and option, depending on the indicator (+ or -), and it is added up to the off-balance sheet position with the indicator + or -. Detailed instructions to fill out Form No. 5 are presented in the Guidelines for Implementation of Decision on Minimum Standards for Foreign Exchange Risk Management in Banks.

Delta equivalent of nominal value of option is included in the position referring to the currency option. Delta equivalent of each option is the result of nominal value of option multiplied by its Delta ratio. Delta equivalents of individual options by each currency have the following indicators:

	PURCHASED	**SOLD**
„CALL“ OPTION	+	-
„PUT“ OPTION	-	+

„Call“ option for certain foreign currency represents an opportunity to purchase such foreign currency in exchange for KM. „Put“ option for certain foreign currency represents an opportunity to sell foreign currency in exchange for KM.

3.6.2. Form No. 5 - Table B – Capital requirement for foreign exchange risk

Under ordinal number 1 of the Form – Total long foreign currency position of banks, you should include the amount (without indicator) representing the sum of all long foreign currency positions of a bank in individual currencies (excluding gold).

Under ordinal number 2 of the Form – Total short-term foreign currency position of banks, you should include the amount (without indicator) that represents the sum of all short-term foreign currency positions of a bank in individual currencies (excluding gold).

Under ordinal number 3 of the Form, you should include the amount (without indicator) that represents net opened position in gold.

Total opened foreign currency position of banks (ordinal number 4 of the Form) represents the amount higher than the amount filled out under ordinal numbers 1 and 2, increased by the position in gold.

Capital requirement for foreign exchange risk is the result received after the total opened foreign currency position of a bank (ordinal number 4 of the Form) is multiplied by 12%.

Example: *A bank has the following foreign currency positions in individual currencies, including gold (indicators + and – represent long, that is, short position):*

YEN	EUR	GBP	CAD	USD	GOLD
+50	+100	+150	-20	-180	-35

The capital requirement calculation should be the following:

ORD. NO.	DESCRIPTION	AMOUNT
1.	Total long foreign currency position of a bank	300
2.	Total short-term foreign currency position of a bank	200
3.	Position in gold	35
4.	Total opened foreign currency position of a bank	335
5.	**Capital requirement for foreign exchange risk (x12%)**	**40,2**

3.7. Form No. 9 - Table A – Capital requirement for investment risk in equity securities

This Form consists of two parts. First part refers to capital requirement for interest rate risk built in the equity derivatives. Position in treasury bonds without coupon resulting from the breakdown into equity derivatives (e.g. forward and future agreements into stock exchange indexes, swap agreements into equity instruments – equity swaps, etc.) should not be included into Form No. 8, Tables B and C, that is, capital requirement for interest rate risk built in the equity derivatives is calculated in this part of the Form.

A bank determines market value of the underlying equity security on which the derivative is based for all equity derivatives owned. A bank should allocate such values in the column of market values according to the remaining term to the maturity of the derivative in absolute value. Market value should be multiplied with the percentage of the envisioned positions to get the capital requirement for the first part of the Form (e.g. capital requirement for interest rate built in all equity derivatives with the remaining maturity up to 3 months is generated by multiplying the sum of market values of their underlying instruments with 0,2%, that is, with 0,002).

Second part of the Form refers to the capital requirement for investment risk in equity securities and it is filled out in the way that net positions determined for individual securities should be allocated in the rows according to the national markets, according to the form of the securities.

Long net positions in individual forms of securities should be added up and entered into column „Long net position“. Short positions should be treated in the same way, and their total should be entered in column „Short net position“ (you should enter numbers without indicators, as if they were positive numbers). Column „Gross position“ represents the sum of the amounts from the columns of long and short net positions for the row of total allocated for national market. Net position for each national market is the difference between total long and short net positions by each national market.

Total capital requirement for investment risk in equity securities represents the sum of: total capital requirement for part I of the table, total gross positions of part II of the table multiplied by 6% and total net positions of part II of the table multiplied by 12%.

3.8. Form No. 9 - Table B - Capital requirement for commodity risk

Capital requirement for commodity risk is calculated for the overall bank's operations, and not just for the positions in trading book.

If there is at least one commodity position, a bank is required to calculate the capital requirement for such commodity.

In the column „commodity“ you should enter all types of commodities in which a bank has the position. Each commodity position should be expressed in standard measurement units (barrel, ton, and kilogram).

Commodity positions in standard measurement units should be entered by a bank in the column anticipated for that, depending on whether the position is long or short.

Net position of certain commodity represents an absolute value of difference between long and short positions.
As for commodity instruments, they are considered to be equal when there is the same commodity, expressed in the same currency and with the same maturity. As for commodity derivatives, they are considered to be equal if they are issued by the same issuer.

In the column „Market value of net position“ of certain commodities, a bank should enter the amount generated by multiplying the amount from column „Market price“ with the amount in the column „Net position“ of such commodity expressed in the standard measurement units.

Bank's gross commodity position is the sum of the values of long and short commodity positions.

Capital requirement for net commodity position is 15% of the net position multiplied by market price of the commodity.

Capital requirement for gross commodity position is 3% of the gross position multiplied by market price of the commodity.

3.9. Form No. 10 - Table A - Capital requirement for delivery risk

In process of filling out this Form in the part referring to „Version A“ a bank should enter total value of transactions with certain instruments, allocated by rows, depending on the number of delivery delinquency days where the difference between market value of such instrument and its

contracted value is negative for the bank. It means that here the bank shows only the transactions where the value of the instrument has changed after the anticipated delivery date, so it is unfavorable for the bank.

In the column „Contracted price“ you should enter the contracted value of the instrument; in the column „Market price“ you should enter their market values; while in the column „Difference“ you should enter an absolute value of difference between the contracted and market value of the specified instrument, if it is unfavorable for the bank.

Capital requirement for delivery risk upon Version A is calculated in the way that value of the difference is multiplied by adequate ratio, depending on the number of delivery delinquency days.

If a bank has received approval from the FBA to calculate delivery risk upon Version B, then it should fill out only the second part of the Form in the part referring to the „Version B“. Only the version that is used by the bank should be submitted to the FBA.

In the part of the Form referring to the „Version B“, a bank should show all transactions upon the contracted values allocated by rows, depending on the number of delivery delinquency days, regardless of the fact whether value of the instrument has changed in favorable or unfavorable way for the bank.

Capital requirement for this part of the Form is calculated in the way that contracted value of the instrument is multiplied by adequate ratio B for delivery delinquency days up to 45 days, and for delivery delinquency days of or over 46 days in the amount of 100% difference in the price in which it has been exposed to (difference between the contracted and market values), that is, in the same way as in the first part of the Form upon „Version A“.

3.10. Form No. 10 - Table B - Capital requirement for counterparty risk

3.10.1. Free deliveries

In process of calculating capital requirement in the part of the Form referring to free deliveries in the column – “Difference/Value of Claims”, you should enter the value of claims from the counterparty.

If a bank is a buyer of certain securities or commodities, a bank should show the value of such security, commodity or cash owed to the bank (the contracted value of the instrument it is buying). On contrary, if a bank is a seller of certain security or commodity, it should show the market value of such security or commodity.

The resulting value should be multiplied by adequate risk weight of credit risk (0%, 20%, 50% or 100%) specified in Decision on Minimum Standards for Capital Management in Banks. Capital requirement for counterparty risk is 12% of the risk weighted value.

3.10.2. Repo and reverse repo contracts for securities or commodities lending

In part of the Form referring to „repo contracts“ and „reverse repo contracts“ a bank should calculate the current value of excessive collateral and fill out the column of the Form „Difference/Claim value“, if it is positive.

With „repo contract“, current value of the excessive collateral is the difference between the current market value of the securities landed to the contracting party and amount of the received money or the current value of the received collateral.

The current value of the excessive collateral of „reverse repo contracts“ is the difference between the amounts of the money landed to the contracting party or given collateral and the current market value of the securities received.

In calculating the market value of securities, commodities and collateral, a bank should include and accrue interest. If any amount is negative then such item should not be included in calculation of capital requirement for the counterparty risk.

If the current amount of excessive collateral is positive it is then multiplied by adequate risk weight of credit risk (0%, 20%, 50% or 100%) as specified in Decision on Minimum Standards for Capital Management in Banks. Capital requirement for counterparty risk is 12% of the risk weighted value.

3.10.3. Other counterparty risks

In part of the Form referring to „Other counterparty risks“ capital requirement is calculated for exposures in form of fees, provisions, interests, dividends and margins for futures agreements and options traded at stock exchanges, directly referring to the items included in the trading book, which were not included in calculation of capital requirement for position risks or counterparty risks.

In process of calculating capital requirement a bank should enter in the column of the Form „Difference/Value of claims“ the value of the counterparty claims and such value should be multiplied by adequate risk weight of credit risk (0%, 20%, 50% or 100%) as specified in Decision on Minimum Standards for Capital Management in Banks. Capital requirement for counterparty risk is 12% of the risk weighted value.

Total capital requirement for counterparty risk represents the sum of capital requirements for: free deliveries, repo contracts and contracts on securities or commodity lending, reverse repo contracts and contracts on borrowing securities or commodities from counterparty and other counterparty risks.

3.11. Form No. 11 - Capital requirement for position risk in options

First part of the Form refers to calculation of capital requirement for position risk in options based on simplified method, and the second part based on Delta-plus method. Depending on the method it is going to apply, a bank should fill out such part of the Form referring to the method selected, filling out zeroes in the second part of the Form.

3.11.1. Simplified method

In this method, in the column „Description“ you should enter a description of the activity, that is, type of option (e.g. call/currency, put/stock, call/bond, etc.). In the column „Capital requirement for underlying variable“ you should enter the market value of the underlying variable (of the underlying security) multiplied by the sum of factors for specific and general risk for the underlying variable.

Capital requirement for the purchased „call“ and „put“ options is lower than the capital requirement for the underlying variable and market value of the option.

In combination of the options purchased and underlying securities or foreign currencies, capital requirement represents a difference between the amount of capital requirement for the underlying currency and the income bearing option of the buyer („in the money“). If the difference is negative, the capital requirement for such option equals zero.
Total capital requirement based on the simplified method represents the sum of all capital requirements for each option.

3.11.2. Method Delta-plus

Second part of the Form refers to calculation of capital requirement for position risk in options based on the method Delta-plus. In accordance with the mentioned method, options and products similar to options (warrants, upper limit option, lower limit option, etc.) are treated as options equal to the underlying instrument and multiplied by its Delta ratio (calculated by stock exchange if options are quoted at the stock exchange). The Delta equivalent received should be included in calculation of foreign exchange risk (currency option Delta equivalent) or in calculation of interest rate risk and price risk (e.g. interest rate option equivalent in calculation of general interest rate risk).

Since the Delta does not cover total risk associated with options, a bank is required to calculate additional capital requirement for Gama and Vega risk, that is, Gama and Vega impact for options (a bank should use Gama and Vega ratios calculated at stock exchange). Individual option positions should be grouped according to the risk categories, so they can be added up within individual risk categories of Gama and Vega impact of option positions.

Groups of risk categories include options associated with:

- Currencies or gold (each currency pair or gold represents a separate risk category);
- Equity securities or their indexes, where each national market represents a separate risk category. If equity security is quoted in several national markets, the underlying market should be the one in the country where is the headquarter of the equity security's issuer;
- Bonds or interest rates, each time range in maturity based approach or each zone in duration based approach represents a separate risk category and
- Commodities where individual commodities represent separate risk category.

a) Gama impact for options

Gama ratio for options is a relative change of Delta ratio resulting from a minor change in the price of the underlying instrument. Prior to the calculation of Gama risk, you should calculate the Gama impact for individual options by approximating the option price in Taylor's series as follows:

$$\text{Gama impact} = \tfrac{1}{2}\ \text{Gama} \times N \times (VU)^2$$

VU – price variation of the underlying option instrument
N – quantity of the underlying instrument

Price variation of the underlying option instrument (VU) is calculated as follows:

- with bond or interest rate options, market value of the underlying instrument is multiplied by adequate risk weight as specified in Article 13 of the Decision (in maturity based approach) or

adequate anticipated movement of the interest rate as specified in Article 14 of the Decision (in duration based approach);
- with equity securities or their index options, market value of the underlying instrument is multiplied by 12%;
- with currency or gold options, market value of the referent currency or gold is multiplied by 12% and
- with commodity options, market value of the referent commodity is multiplied by 15%.

In order to calculate Gama risk for options, you should add up individual Gama impacts within separate risk categories, which could have positive or negative value. The sum of absolute value of all negative Gama impacts represents capital requirement for Gama risk for positions in options.

b) Vega impact for options

Vega ratio for options is a change of option price resulting from a minor change of volatility of the underlying instrument. Prior to the calculation of Vega risk, it is necessary to calculate Vega impact for each option by approximating option price as specified in the Taylor's series:

$$\text{Vega impact} = \text{Vega} \times N \times \frac{\text{volatility}}{4}$$

N – quantity of the underlying instrument

Volatility change represents a proportional movement of volatility by 25%.

In order to calculate Vega risk for positions in options, individual Vega impacts are added up within separate risk categories, which could have positive or negative values. The sum of absolute values of all Vega impacts represents the capital requirement for Vega risk for positions in options.

Total capital requirement for option risk based on Delta-plus method represents the sum of capital requirements for Gama and Vega risk. Column of the Form „Capital requirement for the underlying variable“ and „Market value of option /In the money amount“ referring to this method should not be filled out.

4. EXPLANATION OF THE PART OF THE DECISION REFERING TO DEALING WITH DERIVATIVES

When calculating the capital requirement for general and specific position risk, a bank should first determine net position in all debt securities in the trading book.

Positions in derivatives should be decomposed in positions of the underlying financial instrument, that is, they should represent a combination of hypothetical long and short positions. Position in zero coupon treasury bond is the result of derivative decomposing.

4.1. Forward Rate Agreement - FRA

Forward rate agreement is a contract where parties agree that an interest rate will apply to certain notional principal during a specific future period of time. For example, a „6 x 9“ FRA is when

contracting parties determine interest rate to be applied during the three month period that will commence in 6 months as of the date when the contract is signed. The settlement is applied after the 6 month period. The FRA buyers tend to hedge against raising interest rates, since as of the settlement date in case of raising interest rates they will receive in the market the difference between contracted and market interest rates applied on the notional amount of principal. In case of interest rates falling in the market, the FBA buyers will have to pay the difference between contracted and market interest rates applied on the notional amount of principal.

Since the FRA purchased responds with the future funding sources, and the FRA sold responds with the future fund investing, that is how decomposing for purpose of the capital requirement calculation is performed. The FRA purchase is decomposed in two notional positions in zero coupon treasury bonds (with 0% interest rate) as it follows:

- Short position with maturity to the FRA expiration date (in the example of nine months) and
- Long position with maturity to the FRA delivery date (in the example of six months).

Example: *A bank has purchased a „3 x 6" FRA on principal of KM 10.000.000, and interest rate of 5%.*

The purchased FRA is decomposed in two notional positions in zero coupon treasury bonds (with 0% interest rate) as it follows:

- Short position with maturity to the FRA expiration date (in the example of 6 months) and
- Long position with maturity to the FRA delivery date (in the example of 3 months).

Prior to calculation of capital requirement for interest rate risk, this instrument is decomposed in long position in zero coupon treasury bonds with 3 month maturity and short position in zero coupon treasury bond with 6 month maturity. The amount allocated in corresponding maturity classes in process of calculating interest rate risk represents a discounted value of the notional amount. The following represents calculation of a discounting factor:

$$df = \frac{1}{(1+r)^t}$$

df- discounting factor
t-time
r-return

Discounting is performed when a no risk interest rate is applied. With contracts signed with maturity up to a year, it is not necessary to perform a discounting (as it is the case with this example). In this example, in process of the capital requirement calculation for interest rate risk a bank is using long position in zero coupon treasury bonds of KM 10.000.000 with maturity of 3 months and short position with zero coupon treasury bonds of KM 10.125.000 (KM 10.000.000 of principal + KM 125.000 of interest) with maturity of 6 months.

4.2. Interest Rate Futures - IRF

The characteristics of interest rate futures are identical to the FRA. The only difference is that the IRF represents standardized agreements traded at private stock exchange. The IRF buyers are hedged against interest rate falling. The IRF purchased are decomposed in long position in zero

coupon treasury bonds and short position in zero coupon treasury bonds with maturity date up to their execution.

Example: *A bank has purchased IRF on quarterly LIBOR in January with execution date in March.*

When calculating the capital requirement for interest rate risk, a bank should decompose the IRF purchased into:

- Long position in zero coupon treasury bond with maturity of 5 months (two months up to execution date and contracted duration of IRF) and
- Short position in zero coupon treasury bond with maturity of two months.

Since positions in zero coupon treasury bonds are no specific interest rate risk bearing, general interest rate risk should be calculated, then classified into corresponding maturity classes in the column of debt securities with interest rate below 3% (regardless of the interest rate the IRF is referring to – in this example that is LIBOR).
The amounts allocated into corresponding maturity classes in process of calculating capital requirement for interest rate risk represent discounted value of notional principal (except in case of short term instruments when bank is not liable of performing the discounting).

4.3. Bond Futures - BF

Bond futures are decomposed into long position in the underlying bond with maturity of the bond and short position in zero coupon treasury bonds with maturity as determined in the agreement. When bond futures refer to long term bonds (over 10 years), a bank has to use the cheapest to delivery (CTD) bonds.
Identical approach is used in case of other futures agreements on debt securities.

Example: *A bank purchased the BF on ten-year bond of XY company in December (principal amount of KM 10.000.000) with the BF maturity in June of the same year.*

A bank will decompose the mentioned instrument in process of calculating the capital requirement for interest rate risk into long position in ten-year CTD bond and short position in zero coupon treasury bond with maturity of 6 months. If the underlying bond (bond of the XY company) brings coupon in February of the same year, a bank has to create an additional short position in two-month zero coupon treasury bond in the amount of the coupon interest it will receive. It means, in that case a bank should through decomposing receive three positions:

- Long position in the underlying bond up to the level of its present value (present value or dirty price), that is, up to the amount of the present value of discounted future cash flows, taking into account the existing yield curve (published by the respectable stock exchange where the mentioned instrument is traded);
- Short position in two-month zero coupon treasury bond up to the level of the bond coupon, discounted to the present value, taking into account the existing yield curve and
- Short position in six-month zero coupon treasury bond up to the level of principal agreed and multiplied by the exchange rate agreed and discounted to the present value by applying the existing yield curve.

4.4. Interest Rate Swap

Interest rate swap is a contractual agreement under which a fixed rate liability is exchange for a floating rate liability between the two parties (plain vanilla swap). Buyer of the interest rate swap agreement pays a fixed rate and receives a floating rate (payer swap). Seller of the interest rate swap agreement pays a floating rate and receives a fixed rate (receiver swap). When calculation the capital requirement for interest rate risk, a bank should decompose the purchased interest rate swap agreement into:

- Short position in treasury bond with contracted fixed interest rate and maturity date equal to the swap duration date and
- Long position in treasury bond with floating interest rate and maturity date equal to the maturity of the following interest rate change.

4.5. Basis Swap

Basis swap represents a contractual agreement by which the basis of floating interest rates is exchanged between the two parties (e.g. quarterly LIBOR for six month LIBOR or LIBOR for EURIBOR, etc.).

If a bank has purchased the basis swap, when calculating capital requirement for interest rate risk, this instrument should be decomposed into:

- Short position in treasury bond with the interest rate paid by a bank based on the swap and maturity date equal to the duration date of the swap and
- Long position in treasury bond with the interest rate received by a bank and maturity date equal to the duration date of the swap.

4.6. Forward swap

Forward swap represents swap agreement whereby the terms of interest rate are agreed today to be performed at the contracted date in future. For purpose of calculating capital requirement for interest rate risk, a bank should decompose the forward swap into short position in treasury bonds with fixed interest rate and maturity date equal to the maturity date of the swap and long position in treasury bond with fixed interest rate and maturity date equal to the following interest rate change.

Example: *A bank has purchased 5-year interest rate swap (payer swap) with contracted interest rate of 6% to be performed in two years.*

Decomposing from this example refers to the following:

- Short position in treasury bonds with fixed interest rate of 6% and maturity date of 7 years and
- Long position in treasury bonds with fixed interest rate of 6% and maturity date of 2 years.

These values are discounted to the present value, taking into account the present yield curve. After two years, for purpose of decomposing, this agreement will be treated as common interest rate swap agreement.

4.7. Cross-currency interest rate swap

Cross-currency interest rate swap represents an exchange of liabilities with difference interest rates and difference currencies. For purpose of calculating capital requirement of interest rate risk, these agreements are decomposed into positions in treasury bonds nominated in different currencies with fixed/floating interest rate and difference maturities.

4.8. Currency forwards

Currency forward agreement represents a currency swap agreement whereby its implementation should start at specified date in future upon the exchange rate that is agreed as soon as at the signing of the agreement. The main risk coming from this agreement is currency risk. There is also interest rate risk, which should be included in the standardized approach. For purpose of calculating capital requirement, currency forward agreement should be decomposed as follows:

- Long position in treasury bonds nominated in the zero coupon currency purchased and
- Short position in treasury bonds nominated in the zero coupon currency sold, with the maturities for both positions equal to the deadlines up to the next change in interest rates.

Example: *Currency "forward" agreement about purchase of 5.000.000 EUR for USD with maturity in 6 months with forward rate of 1.05.*

In this case, currency forward is decomposed into:

- long position in zero coupon treasury bonds in EUR with maturity up to 6 months (the value of EUR 5.000.000 is discounted to the current 6-month EUR interest rate) and
- short position in zero coupon treasury bonds in USD with the same maturity (the value of USD 5.250.000 is discounted to the current 6-month USD interest rate).

4.9. Options

Banks purchasing or issuing options on debt financial instruments should calculate capital requirements for risks associated with options using a Delta-plus method. With options on debt instruments, one party holds right and the other party has commitment to implement the agreement. Decomposing of this derivative is also performed in two positions, long and short, whereby one position has maturity equal to the maturity of the underlying instrument (to which the option refers to), while the other position has maturity to the execution of the option.

In process of calculating capital requirement, there is no difference in treatment of the European and American options.

Delta ratio indicates changes in the value of options as a result of changes in the value of the underlying instrument. When the positions are adjusted according to the Delta ratios, it is important to determine the indicators correctly (short or long positions):

POSITION IN OPTION	DELTA	UNDERLAYING VARIABLE
Call purchased	Positive	Long position
Call sold	Negative	Short position
Put purchased	Negative	Short position
Put sold	Positive	Long position

4.9.1. Bond option

Bond option grants buyer a right to purchase or sell bonds at specified date in future or at specified date up to the maturity of the bond upon the predetermined price. Such option is decomposed into position in zero coupon treasury bonds with maturity up to the execution of the option and position with opposite indicator in bonds with corresponding maturity. In process of calculating capital requirement such positions should be valued up to the level of their Delta equivalent.

Example: *In its portfolio a bank has long position in the European put bond option to be performed in 3 months. The execution price determined is KM 99 (the assumption is that such price already includes the interest accrued). The bond that is the underlying variable of this option is 8% treasury bond with remaining maturity of 8,2 years. The current market price (including interest generated) of the bond is KM 98 KM. Principal amount is KM 10.000.000, and Delta is -0,4*[1].

Put option is decomposed into the following positions up to the level of Delta equivalent:
- Short position in bond with maturity of 8,2 years and
- Long position in zero coupon treasury bonds with maturity up to 3 months.

Since coupon payment with this bond is 8% before execution date of the option, the existing long position should also include the long position in zero coupon treasury bond with remaining maturity (in Delta equivalent). For purpose of calculating capital requirement for specific position risks, positions in zero coupon treasury bonds should be included in the category of items without specific risk (0%), while position in bonds is included in the category of items according to the risk weight of their issuer.

For purpose of calculating capital requirement for general position risk, decomposed positions are distributed in the columns in the following way:

Maturity class	1 to 3 months	3.960.000 KM-long position 320.000 KM-long position
	7 to 10 years	3.920.000 KM-short position

$$\frac{10.000.000 \times 99}{100} = 9.900.000 \times 0,4 = 3.960.000 \text{ KM}$$

8% of 10.000.000 = 800.000 x 0,4 = 320.000 KM

$$\frac{10.000.000 \times 98}{100} = 9.800.000 \times 0,4 = 3.920.000 \text{ KM}$$

A bank may discount the amounts of KM 3.960.000 and KM 320.000 to their present values, while the amount of KM 3.920.000 represents a present value of discounted cash flows already multiplied by Delta.

4.9.2. Forward rate agreement option

Forward rate agreement option grants right to the option buyer at the time when the option is executed (or at the date when the option is executed depending on the option type) to generate

[1] *Delta put option is negative if under price raising of the underlaying variable the option value starts falling.*

position in the forward rate agreements. For purpose of calculating general position risk of debt instruments, the option is decomposed in the way which would be applied in the underlying variable (in forward rate agreements), and the positions are included in the level of their Delta equivalents.

Example: *Purchase of call option in January based on forward rate agreement on quarterly LIBOR with maturity in March.*

Call option is decomposed into:
- Long position in the level of Delta equivalent of zero coupon treasury bond with maturity of 5 months (time to the maturity is increased by the duration time of the forward rate agreement) and
- Short position in the level of Delta equivalent of zero coupon treasury bond with maturity of 2 months (time to the option maturity date).

4.9.3. FX option

FX option grants right to the buyer, but not the commitment, at the execution date (or the time before the execution date) to exchange the determined amount of one currency for the other currency based on the agreed exchange rate. For purpose of calculating capital requirement for position risks and currency risk such option is decomposed in the same way as forward rate agreements would decompose, where the positions are multiplied by Delta ratio.

Example: *Purchase of call option GBP for USD in the amount of GBP 5.000.000 with the exchange rate of 1,6 USD/GBP, with execution in 6 months and Delta ratio of 0,535.*

The call option purchased should be decomposed into:
- Long position in zero coupon treasury bonds in Delta equivalent amount of GBP 2.675.000 with maturity of 6 months (the amount of GBP 5.000.000 should be multiplied by Delta option ratio) and
- Short position in zero coupon treasury bonds in the amount of USD 4.280.000 (Delta value of USD 4.280.000 = GBP 5.000.000 x 1,6 USD/GBP x 0,535) with maturity of 6 months.

5. EXAMPLE OF CAPITAL REQUIREMENT CALCULATION FOR SPECIFIC INTEREST RATE RISK (FORM NO. 8-TABLE A)

Example: *In its portfolio of debt securities in EUR in the trading book a bank has the following positions of the countervalue in KM allocated by no risk bearing items, qualifying items with different maturities and other items:*

- in KM-

ORD. NO.	DESCRIPTION	LONG POSITION	SHORT POSITION
I	**No risk bearing items**		
1.	Debt securities issued by the CBBiH	100.000	-
2.	Debt securities issued by the central banks of the zone A countries	300.000	-
3.	Debt securities issued by the governments of the zone A countries	150.000	100.000
4.	Other no risk bearing items (positions in treasury bonds resulting from decomposing of derivative instruments)	200.000	350.000
II	**Qualifying items with maturity up to 6 months**		
1.	Debt securities issued by the international development banks	200.000	100.000
2.	Debt securities issued by the regional governments below the governments of the zone A countries	100.000	150.000
II	**Qualifying items with maturity from 6 to 24 months**		
1.	Debt securities issued by the international development banks	50.000	-
III	**Qualifying items with maturity over 24 months**		
1.	Debt securities issued by the regional governments below the governments of the zone A countries	350.000	200.000
IV	**Other items**		
1.	Debt securities issued by the international banks without proper credit rating	50.000	-

Capital requirement calculation for specific interest rate risk is presented in the following table:

		Currency	Long position	Short position	Net position	Risk weighted position
I No risk bearing items		**EUR**				
1.	Debt securities issued by the Central Bank of BiH		100.000	0	100.000	0
2.	Debt securities issued by the central banks of the zone A countries		300.000	0	300.000	0
3.	Debt securities issued by the Government of the FBiH		0	0	0	0
4.	Debt securities issued by the governments of the zone A countries		150.000	100.000	50.000	0
5.	Other no risk bearing items		200.000	350.000	150.000	0
Total absolute value of net positions of the no risk bearing items (0% risk weight)			**750.000**	**450.000**	**600.000**	**0**
II Qualifying items with maturity up to 6 months		**EUR**				
6.	Debt securities issued by the international development banks		200.000	100.000	100.000	250
7.	Debt securities issued by the international banks with proper credit rating		0	0	0	0
8.	Debt securities issued by the regional governments below the governments of the zone A countries		100.000	150.000	50.000	125
9.	Debt securities issued by the institutions financed through the budget of the FBiH/BiH		0	0	0	0
10.	Other qualifying items with maturity up to 6 months		0	0	0	0
Total absolute value of net positions of the qualifying items (maturity up to 6 months- 0,25% risk weight)			**300.000**	**250.000**	**150.000**	**375**
III Qualifying items with maturity from 6 to 24 months		**EUR**				
11.	Debt securities issued by the international development banks		50.000	0	50.000	500
12.	Debt securities issued by the international banks with proper credit rating		0	0	0	0
13.	Debt securities issued by the regional governments below the governments of the zone A countries		0	0	0	0
14.	Debt securities issued by the institutions financed through the budget of the FBiH/BiH		0	0	0	0
15.	Other qualifying items with maturity from 6 to 24 months		0	0	0	0
Total absolute value of net positions of the qualifying items (maturity 6-24 months- 1,00% risk weight)			**50.000**	**0**	**50.000**	**500**
IV Qualifying items with maturity over 24 months		**EUR**				
16.	Debt securities issued by the international development banks		0	0	0	0
17.	Debt securities issued by the international banks with proper credit rating		0	0	0	0
18.	Debt securities issued by the regional governments below the governments of the zone A countries		350.000	200.000	150.000	2.400
19.	Debt securities issued by the institutions financed through the budget of the FBiH/BiH		0	0	0	0
20.	Other qualifying items with maturity over 24 months		0	0	0	0
Total absolute value of net positions of the qualifying items (maturity over 24 months- 1,60% risk weight)			**350.000**	**200.000**	**150.000**	**2.400**
V Other items		**EUR**				
21.	Debt securities issued by the international banks without proper credit rating		50.000	0	50.000	6.000
22.	Debt securities of other issuers		0	0	0	0
Total absolute value of net positions of other items (12% risk weight)			**50.000**	**0**	**50.000**	**6.000**
Capital requirement for specific interest rate risk (The sum of all risk weighted positions under I+II+III+IV+V):						**9.275**

6. EXAMPLE OF CAPITAL REQUIREMENT CALCULATION FOR GENERAL INTEREST RATE RISK (FORM NO. 8-TABLES B AND C)

Example: *Capital requirement calculation is presented in the example of bank's portfolio in EUR, expressed as countervalue of KM, intended for trading as part of the following:*

1. *A bank owns treasury bonds with remaining maturity of 8,5 years. The bond holds a coupon of 7%. Interest is paid out annually. Nominal value of the bond is KM 10.000.000 KM. Current price (including accrued interest) is 106,71 (**BOND**).*
2. *A bank owns forward agreement on treasury bonds with maturity in 6 months. Bond principal is KM 50.000.000 KM, and the agreed forward rate is 118,50 (including accrued interest). The bond holds a coupon of 8% with remaining maturity of 6,25 years. Market rate on this bond is 115,96 (including accrued interest (**FORWARD BOND PURCHASE**).*
3. *A bank has purchased FRA 3/6 to the amount of KM 100.000.000. Interest rate is 5% (**FRA PURCHASED**).*
4. *A bank owns forward agreement by which it has purchased yen, countervalue of KM 10.000.000, for EUR, countervalue of KM 74.000.000. Delivery date in 90 days (**CURRENCY FORWARD**).*
5. *A bank has purchased "payer swap" to the amount of KM 10.000.000 with interest rate of 6%. Swop maturity is 5 years. At the last interest accrual, the six month LIBOR was 5%, and the next interest accrual was in six months (**INTEREST SWAP PURCHASED**).*

6. 1. Bonds

Since this is a long term bond, a bank has to discount cash flows based on such bond in order to receive the value to be used in process of calculation of capital requirement for interest rate risk. For this purpose, let us assume that the data of the market yield curve on no risk debt securities are the following:

Year	Yield to maturity	Discount factor
T	r	$df = \frac{1}{(1+r)^t}$
1	5,00	0,9524
2	5,21	0,9034
3	5,41	0,8538
4	5,63	0,8033
5	5,85	0,7526
6	6,08	0,7018
7	6,31	0,6516
8	6,55	0,6020
9	6,81	0,5527
10	7,07	0,5050

$$df = \frac{1}{(1+0,05)} = 0,9524$$

$$df = \frac{1}{(1+0,0521)^2} = 0,9034 \text{ etc.}$$

Calculation of a bond discounted value should be the following:

Year	Annual yield	Discounted factor	Cash flows	Discounted cash flows
t	r^2	$df = \frac{1}{(1+r)^t}$		
0,5	5,00	0,9759	700.000	683.130
1,5	5,105	0,9280	700.000	649.600
2,5	5,31	0,8787	700.000	615.090
3,5	5,52	0,8286	700.000	580.020
4,5	5,74	0,7779	700.000	544.530
5,5	5,965	0,7271	700.000	508.970
6,5	6,195	0,6766	700.000	473.620
7,5	6,43	0,6266	700.000	438.620
8,5	6,68	0,5772	10.700.000	6.176.040
				10.669.620

$df = \frac{1}{(1+0,05)^{0,5}} = 0,9759$, etc. for other periods.

A bank has long position in treasury bond of KM 10.669.620 KM, which is classified in maturity grade 7-10 years in the column of interest rates exceeding 3%. Specific interest rate risk is 0, since these are treasury bonds.

6.2. Forward purchase of bonds

In process of calculating capital requirement for interest rate risk, a bank should decompose this item into the following positions:

• long position in treasury bond which is classified in maturity grade 5-7 years in the column of interest rates exceeding 3% in the amount of KM 57.980.000.

The amount of KM 57.980.000 is the result of the bond that has been discounted in the following way:

Year	Adjusted Yield	Discounted factor	Cash flows	Discounted cash flows
t	r^3	$df = \frac{1}{(1+r)^t}$		
0,25	5,0000	0,9879	4.000.000	3.951.600
1,25	5,0525	0,9402	4.000.000	3.760.800
2,25	5,2600	0,8911	4.000.000	3.564.400
3,25	5,4650	0,8412	4.000.000	3.364.800
4,25	5,6850	0,7906	4.000.000	3.162.400
5,25	5,9075	0,7398	4.000.000	2.959.200
6,25	6,1375	0,6892	54.000.000	37.216.800
				57.980.000

[2] *Since there is 6 more months to go to the full year of maturity of the bond, it is necessary to correct the r in the process of calculating a discounting factor as follows: r = (1-0,5)x 5,00 + 0,5 x 5,21=5,105%; r = (2-1,5) x 5,21 + 0,5 x 5,41 = 5,31% , etc. The same procedure should be applied in all other periods.*

[3] *Since there is 0,75 years to go to the first year of maturity of the bond, it is necessary to adjust the r as follows: r stands for time period of 1,25 years = (1-0,25) x 5 + 0,25 x 5,21 =5,0525%, for time period of 2,25 years = (2-1,25) x 5,21 + 0,25 x 5,41 =5,26% and in the same way for remaining time periods.*

• short position in zero coupon treasury bond, which is classified in the maturity grade 3-6 months in the column of interest rates bellow 3% in the amount of KM 57.822.075. The amount of KM 57.822.075 is the result of principle with the agreed forward rate (118,50/100) multiplied by a discounting factor for six months:

$$0{,}9759 = \frac{1}{(1 + 0{,}05)}^{0{,}5}$$

50.000.000 x 1,185 x 0,9759 = 57.822.075

• short position in zero coupon treasury bond is classified in the maturity grade 1-3 months and in the column of interest rates bellow 3% in the amount of KM 3.951.600. The mentioned amount is the result of principle with coupon interest rate (8/100) multiplied by a discounting factor for three months:

$$0{,}9879 = \frac{1}{(1+ 0{,}05)}^{0{,}25}$$

50.000.000 x 0,08 x 0,9879 = 3.951.600

6.3. FRA purchased

In process of calculating capital requirement for interest rate risk, a bank should decompose this FRA in the following positions:

• short position in zero coupon treasury bond is classified in the maturity grade from 3-6 months in the column of interest rates bellow 3% in the amount of KM 98.809.875 which is generated when principal (100.000.000 KM) with quarterly interest rate - 1,0125 (1+5/100/4) is multiplied by a discounting factor for 6 months (0,9759) and

• long position in zero coupon treasury bond is classified in the maturity grade 1-3 months in the column of interest rates bellow 3% in the amount of KM 98.790.000. The mentioned amount is generated when principal (100.000.000 KM) is multiplied by a discounting factor for 3 months (0,9879).

6.4. Currency forward

In process of calculation capital requirement for interest rate risk, a bank should decompose the mentioned position in the following positions:

• short position in zero coupon treasury bond is classified in the maturity grade from 1-3 months in the column of interest rates bellow 3% in the amount of KM 73.104.600. The mentioned amount is generated when KM 74.000.000 KM (EUR) is multiplied by a discounting factor for three months (0,9879) and

• long position in zero coupon treasury bond is classified in the maturity grade from 1-3 months in the column of interest rates bellow 3% in the amount of KM 9.879.000. The mentioned amount is generated when KM 10.000.000 (yen) is multiplied by a discounting factor for three months (the assumption is that yield to maturity for yen is the same as for EUR, so the discounting factor is the same 0,9879).

6. 5. Interest rate swap purchased

In process of calculating interest rate risk, a bank should decompose this instrument in the following positions:
• short position in treasury bond with interest rate of 6%, which is classified in the maturity grade 4-5 years in the column of interest rates exceeding 3% in the amount of KM 10.085.300, which is generated when cash flows are discounted as presented in the following table:

Year	Yield	Discounting factor	Cash flows	Discounted cash flows
t	R	$df = \frac{1}{(1+r)^t}$		
1	5,00	0,9524	600.000	571.440
2	5,21	0,9034	600.000	542.040
3	5,41	0,8538	600.000	512.280
4	5,63	0,8033	600.000	481.980
5	5,85	0,7526	10.600.000	7.977.560
				10.085.300

• long position in treasury bond which is classified in the maturity grade from 3-6 months in the column of interest rates exceeding 3% in the amount of KM 10.002.975. The mentioned amount is generated when the agreed amount of KM 10.000.000, interest rate (1,025), is multiplied by a discounting factor for six months (0,9759).

6. 6. Calculation of capital requirement

The results of decomposing bank's portfolio intended for trading in this example are presented in the following table (indicator + stands for a long, and minus – short position):

Basis	Component	Amount in KM	Maturity Grade	Column
Bond	Treasury Bond	+10.669.620	7-10 years	Exceeding 3%
Forward purchase of bonds	Treasury Bond	+57.980.000	5-7 years	Exceeding 3%
	Treasury Bond	-57.822.075	3-6 months	Bellow 3%
	Treasury Bond	-3.951.600	1-3 months	Bellow 3%
FRA Purchased	Treasury Bond	-98.809.875	3-6 months	Bellow 3%
	Treasury Bond	+98.790.000	1-3 months	Bellow 3%
Currency forward	Treasury Bond	-73.104.600	1-3 months	Bellow 3%
	Treasury Bond	+9.879.000 (refers to yen)	1-3 months	Bellow 3%
Interest rate swap	Treasury Bond	-10.085.300	4-5 years	Exceeding 3%
	Treasury Bond	+10.002.975	3-6 months	Exceeding 3%

In the example, we will calculate the capital requirement for interest rate risk for the portfolio in EUR, which is why we will not take into account the position of currency forward referring to

yen. Since all the items this bank has in its portfolio are decomposed in treasury bonds, the amount of capital requirement for specific interest rate risk is zero.

6.6.1. Calculation of capital requirement for general interest rate risk – Maturity based approach

Maturity grade	Currency	Opened position Long	Opened position Short	Risk weighted opened position Long	Risk weighted opened position Short	Adjusted positions by grades	Not adjusted Risk weighted Position by grades	Adjusted Risk weighted position by zones	Not adjusted Risk weighted Position by Zones
0-1 month (>3%) or 0-1 month (<3%) **0,00%**	EUR								
1-3 months (>3%) or 1-3 months (<3%) **0,20%**	EUR	98.790.000	77.056.200	197.580	154.112,40	154.112,40	43.467,60		
3-6 months (>3%) or 3-6 months (<3%) **0,40%**	EUR	10.002.975	156.631.950	40.011,90	626.527,80	40.011,90	-586.515,90		
6-12 months (>3%) or 6-12 months (<3%) **0,70%**	EUR								
B) Adjusted risk weighted position in zone one 40%								**43.467,60**	**-543.048,30**
1-2 years (>3%) or 1-1,9 years (<3%) **1,25%**	EUR								
2-3 years (>3%) or 1,9-2,8 years (<3%) **1,75%**	EUR								
3-4 years (>3%) or 2,8-3,6 year (<3%) **2,25%**	EUR								
C) Adjusted risk weighted position in zone two 30%									
4-5 years (>3%) or 3,6-4,3 years (<3%) **2,75%**	EUR		10.085.300		277.345,75		-277.345,75		
5-7 years (>3%) or 4,3-5,7 years (<3%) **3,25%**	EUR	57.980.000		1.884.350			1.884.350,00		
7-10 years (>3%) or 5,7-7,3 years (<3%) **3,75%**	EUR	10.669.620		400.110,75			400.110,75		
10-15 years (>3%) or 7,3-9,3 years (<3%) **4,50%**	EUR								
15-20 years (>3%) or 9,3-10,6 years (<3%) **5,25%**	EUR								
over 20 years (>3%) or 10,6-12 years (<3%) **6,00%**	EUR								
12-20 years (<3%) **8,00%**	EUR								
over 20 years (<3%) **12,5%**	EUR								
D) Adjusted risk weighted position in zone three 30%								**277.345,75**	**2.007.115**
A) Total adjusted risk weighted position by all maturity grades 10%						**194.124,30**			
E) Adjusted risk weighted position between zone one and zone two 40%									
F) Adjusted risk weighted position between zone two and zone three 40%									
G) Adjusted risk weighted position between zone one and zone three 100%								**543.048,30**	
H) Remaining not adjusted risk weighted position 100%								**1.464.066,70**	
Capital requirement for general interest rate risk (10% of A+40% of B+30% of C+30% of D+40% of E+40% of F+100% of G+100% of H)								**2.127.118,20**	

The way of calculating capital requirement for general interest rate risk upon maturity based approach is presented in the following table:

- in KM-

Basis	Risk weight	Amount	Capital requirement
Position adjusted by grades	0,1	194.124,30	19.412,43
Position adjusted in zone 1	0,4	43.467,60	17.387,04
Position adjusted in zone 3	0,3	277.345,75	83.203,73
Position adjusted between zone 1 and 3	1	543.048,30	543.048,30
Not adjusted position	1	1.464.066,70	1.464.066,70
Total capital requirement			**2.127.118,20**

6.6.2. Calculation of capital requirement for general interest rate risk – Duration based approach

If capital requirement for general interest rate risk is calculated by a bank upon duration based approach, a modified duration for each instrument is calculated first and then, based on the modified duration calculated, the items should be allocated by duration grades.

In the example of the bond under Item 5.1. of this example, a modified duration should be calculated first. It is calculated in the way that based on the discounted bond (KM 10.669.620) continuous annual yield is calculated (eng. flat yield curve) for the entire period to the maturity. Interest rate, if not changed during the period of instrument duration (8,5 years), is 6,49036%. By applying this flat yield curve we calculate the discounting factors as follows:

Year	Yield	Discounting factor	Cash flows	Discounting cash flows	D
t	r	$df = \frac{1}{(1+r)^t}$			
(1)	(2)	(3)	(4)	(5)	(1) x (3) x (4) /10.669.620
0,5	6,49036	0,9690	700.000	678.332,92	0,032
1,5	6,49036	0,9100	700.000	636.989,97	0,090
2,5	6,49036	0,8545	700.000	598.166,80	0,140
3,5	6,49036	0,8024	700.000	561.709,81	0,184
4,5	6,49036	0,7535	700.000	527.474,79	0,222
5,5	6,49036	0,7076	700.000	495.326,33	0,255
6,5	6,49036	0,6645	700.000	465.137,25	0,283
7,5	6,49036	0,6240	700.000	436.788,13	0,307
8,5	6,49036	0,5860	10.700.000	6.269.692,89	4,995
				10.669.620	**6,509**

By applying formula specified in the Decision we calculate modified duration of this bond as follows:

$$\text{D for 0,5 year} = \frac{0{,}5 \times 0{,}9690 \times 700.000}{10.669.620} = 0{,}032$$

$$\text{D for 1,5 year} = \frac{1{,}5 \times 0{,}9100 \times 700.000}{10.669.620} = 0{,}090 \text{ etc. separately by periods.}$$

$$\text{Dmod} = \frac{D}{(1+r)} = \frac{6{,}509}{1+ 6{,}49036/100} = 6{,}112$$

The modified duration of other items is calculated in the same way, amounting to:

BASIS	COMPONENT	AMOUNT	ROW	MODIFIED DURATION
Bond	Treasury Bond	+10.669.620	Exceeding 3%	6,112
Forward purchase of bonds	Treasury Bond	+57.980.000	Exceeding 3%	4,669
	Treasury Bond	-57.822.075	Bellow 3%	0,488
	Treasury Bond	-3.951.600	Bellow 3%	0,247
FRA Purchased	Treasury Bond	-98.809.875	Bellow 3%	0,488
	Treasury Bond	+98.790.000	bellow 3%	0,247
Currency forward	Treasury Bond	-73.104.600	Bellow 3%	0,247
	Treasury Bond	-10.085.300	Exceeding 3%	4,222
Interest rate swap	Treasury Bond	+10.002.975	Exceeding 3%	0,488

Based on such modified duration, a bank should allocate individual items in grades to maturity, multiplies them by modified duration and anticipated change of interest rate, and based on the resulting values it calculates capital requirement for general interest rate risk which in this case is the following:

- in KM –

BASIS	RISK WEIGTH	AMOUNT	CAPITAL REQUIREMENT
Position adjusted by zones	0,02	590.886,78	11.817,74
Position adjusted between zones 1 and 3	1,00	661.866,91	661.866,91
Not adjusted position	1,00	1.391.521,49	1.391.521,49
Total capital requirement			**2.065.206,14**

Zone		Currency	Opened position		Modified duration	Risk weighted opened position		Adjusted risk weighted position by zones	Not adjusted risk weighted position by zones
			Long	Short		Long	Short		
Zone 1 (up to 1 year)									
Instrument 1 –(Treasury bonds -1-3months)		EUR	98.790.000	77.056.200	0,247	244.011,30	190.328,81		
Instrument 2 – (Treasury bonds 3-6months)		EUR	10.002.975	156.631.950	0,488	48.814,52	764.363,92		
Total zone 1 (anticipated change of interest rate -1%)						**292.825,82**	**954.692,73**	**292.825,82**	**-661.866,91**
Zone 2 (from 1 to 3 years and 6 months)		EUR							
Total zone 2 (anticipated change of interest rate -0,85%)									
Zone 3 (over 3 years and 6 months)									
Instrument 1 –(Treasury bonds -4-5years)		EUR		10.085.300	4,222		298.060,96		
Instrument 2–(Treasury bonds-5-7years)		EUR	57.980.000		4,669	1.894.960,34			
Instrument 3–(Treasury bonds -7-10years)		EUR	10.669.620		6,112	456.489,02			
Total zone 3 (anticipated change of interest rate -0,70%)						**2.351.449,36**	**298.060,96**	**298.060,96**	**2.053.388,4**
A) Adjusted position of risk weighted duration by all zones -2%								**590.886,78**	
B) Adjusted position of risk weighted duration between zone 1 and zone 2-40%									
C) Adjusted position of risk weighted duration between zone 2 and zone 3 - 40%									
D) Adjusted position of risk weighted duration between zone 1 and zone 3 -100%								**661.866,91**	
E) Not adjusted positions of risk weighted duration -100%								**1.391.521,49**	
Capital requirement for general interest rate risk (2% of A+40% of B+40% of C+100% of D+100% of E)								**2.065.206,14**	

7. EXAMPLE OF CAPITAL REQUIREMENT CALCULATION FOR INVESTMENT RISK IN EQUITY SECURITIES (FORM NO. 9-TABLE A)

Example: *A bank has the following positions in its securities portfolio, which are included in the trading book for national market of BiH:*

- in KM-

Stocks issued by the same issuer	Position	Number of stocks	Market price	Market value
Company A	Long	10.000	35	350.000
Company A	Short	20.000	25	500.000
Company A	Short	5.000	50	250.000
Company A	Long	15.000	20	300.000
Company A	Short	2.000	60	120.000

In order to calculate total capital requirement for investment risk in equity securities (stocks in this case), it is necessary to first calculate capital requirements for general and specific risks. The assumption is that these are identical stocks (issued by the same issuer, have the same treatment, and are expressed in KM), and it is necessary to perform netting of long and short positions.

a) Specifying capital requirement for general investment risk in equity securities

Market value of all net long positions is KM 650.000 (350.000 + 300.000).

Market value of all net short positions is KM 870.000 (500.000 + 250.000 + 120.000).

Net opened position is KM 220.000 (870.000 - 650.000).

Capital requirement for general investment risk in equity securities is calculated as follows:

220.000 x 12% = 26.400 KM

b) Specifying capital requirement for specific investment risk in equity securities

Total gross position of a bank in the mentioned stocks is KM 1.520.000 (the sum of all values of net long and net short positions).

Capital requirement for specific investment risk in equity instruments is calculated as follows:

1.520.000 x 6% = 91.200 KM

c) Specifying overall capital requirement for investment risk in equity securities

Total capital requirement for investment risk in equity securities is presented in the following review:

- in KM-

Description	Amount
Capital requirement for general risk	26.400
Capital requirement for specific risk	91.200
Total capital requirement for investment risk in equity securities	**117.600**

8. EXAMPLE OF CAPITAL REQUIREMENT CALCULATION FOR COMMODITY RISK (FORM NO. 9-TABLE B)

Example: *Bank A has the following positions in commodity in EUR with market price of EUR 100 EUR per kilogram (the assumption is that the commodities are identical):*

Position	Standard measure unit (kg)	Market price	Market value in EUR	Market value in KM
Long	+128	100	+12.800	+25.035
Short	-160	100	-16.000	-31.293
Long	+96	100	+9.600	+18.776
Short	-96	100	-9.600	-18.776

Total long position amounts to KM 43.811.

Total short position amounts to KM 50.069.

Net opened position (net short position) amounts to KM 6.258.

Capital requirement for net position in commodity is:

6.258 x 15% = 939 KM.

Gross position in commodity is KM 93.880 KM (43.811 + 50.069).

Capital requirement for gross position in commodity is:

93.880 x 3% = 2.816 KM.

Total capital requirement for commodity risk is presented in the following review:

- in KM -

Description	Amount
Capital requirement for net position in commodity	939
Capital requirement for gross position in commodity	2.816
Total capital requirement for commodities	**3.755**

9. EXAMPLE OF CAPITAL REQUIREMENT CALCULATION FOR DELIVERY RISK (FORM NO. 10-TABLE A)

Example: *A bank has purchased 500 stocks of company A, KM 200 per stock, 1.000 stocks of company B, KM 180 per stock, by August 3, 2006 and bonds A, nominal value of KM 1.000.000 and price of 102,32 (including corresponding interest) by August 15, 2006. A bank has acquired 500 stocks of company C, price of KM 145 by May 5, 2006 and bonds B of nominal value of KM 2.000.000, price of KM 99,78 (including corresponding interest) by July 15, 2006.*
Business partners have not met their commitments regarding the agreed delivery date.
As of August 24, stocks A had market value of KM 180, stocks B had market value of KM 220, stocks C had market value of KM 170, bonds A had the price of 103,78 (including corresponding interest), and bonds B had the price of 98,24 (including corresponding interest).

Capital requirements for delivery risk caused by delinquency in delivery of securities as calculated based on the versions A and B are presented in the following tables:

9.1. Capital requirement for delivery risk as set in the version A ([4])

Securities	Delivery price agreed	Delivery date agreed	Current market price as of 24.8.06.	Potential loss/ profit (price difference)	Factor	Capital requirement
500 stocks of company A	200	03.08.2006.	180	10.000	0,5	0
1.000 stocks of company B	180	03.08.2006.	220	-40.000	0,5	20.000
500 stocks of company C	145	05.05.2006.	170	-12.500	1	12.500
1.000.000 bonds A	102,32	15.08.2006.	103,78	-14.600	0,1	1.460
2.000.000 bonds B	99,78	15.07.2006.	98,24	30.800	0,75	0
Total capital requirement						**33.960**

[4] *- Delinquency days are calculated as of the agreed delivery date to 24.8.2006., based on which the factor is being determined;*
- In two cases where the difference between the agreed and market price did not cause loss for a bank, capital requirement was not calculated;
- Capital requirement is the result of price difference (agreed and market price) multiplied by corresponding factor.

9.2.Capital requirement for delivery risk as set in the version B ([5])

Securities	Delivery price agreed	Delivery date agreed	Current market price as of 24.08.06.	Potential loss/ profit (price difference)	Factor	Capital requirement
500 stocks of company A	200	03.08.2006.	180	10.000	0,04	4.000
1.000 stocks of company B	180	03.08.2006.	220	-40.000	0,04	7.200
500 stocks of company C	145	05.05.2006.	170	-12.500	1 (version A)	12.500
1.000.000 bonds A	102,32	15.08.2006.	103,78	-14.600	0,005	5.116
2.000.000 Bonds B	99,78	15.07.2006.	98,24	30.800	0,09	179.604
Total capital requirement						**208.420**

EXAMPLE OF CAPITAL REQUIREMENT CALCULATION FOR COUNTERPARTY RISK (FORM NO. 10-TABLE B)

10.1. Free delivery

Risk associated with free delivery differs from delivery risk, and it refers to trading activities when a bank has made payment or delivery, but the delivery or payment by the counterparty has still not matured. Then the risk is increasing in case that the counterparty does not meet its commitments, which is why free deliveries are subject to calculation of the counterparty risk.

Free deliveries appear at the very moment when a bank pays for securities, which has not received yet, passing one or two days from the payment or delivery. In order to calculate the days that have passed, you should start from the date when the transaction started showing the value. Capital requirement is 12% of the multiplied current market value of the delivered securities or payment performed and corresponding risk weight of the credit risk as specified in Decision on Minimum Standards for Capital Management in Banks (0%, 20%, 50% and 100%).
Delivery risk and free delivery risk could appear simultaneously. This is the case when the transaction is not paid within the agreed time, and one of the two counterparties has

[5] - *Delinquency days are calculated as of the agreed delivery date to 24.8.2006., based on which the factor is being determined;*
- *For delinquency days of 46 days and more in process of the capital requirement calculation, you should take 100% price difference (factor 1), the same as applied in version A;*
- *For remaining delinquency days, capital requirement is the result of the agreed price multiplied with corresponding factor*.

performed its free delivery. In that case, capital requirements are calculated for both delivery risk (starting from the fifth day forward) and for free delivery risk.

Example of a free delivery: *As of August 1st a bank A has purchased 3.000 stocks, KM 500 per stock, from bank B (foreign bank with headquarter in the zone B country). The assessment date is August 3rd. As of August 3rd, the bank A makes payment as agreed. However, the bank B does not deliver the stocks. As of August 6th, the delivery has still not arrived, and the stock price jumped to KM 560 KM.*
Interest rate on loans with term to recall is 3%.

In this case, three days have passed from the date when the bank A paid the stocks it had purchased but not received from the foreign bank B. Capital requirement in calculated in the way that market value of the stocks (at the moment of purchase) is multiplied by the three-day interest rate, corresponding risk weight of the credit risk of 20% (0,2) and 12% (0,12).

3.000 x 500 x (1+0,03×3/360) x 0,2 x 0,12 = 36.009 KM

Example of a free delivery: *As of August 1st, a bank A has sold bonds of nominal value of KM 1.000.000, 101.12 per bond (including corresponding interest) to a trading company B. The assessment date is August 3rd. As of August 3rd the bank A delivered the bonds as agreed, however the trading company B did not manage to pay the agreed amount. As of August 6th, the payment has still not been made; the bond price is 100.89 (including corresponding interest) as of that date.*

In this example, three days have passed from the date when the bank A delivered the bonds sold, and the payment from the trading company B was not performed. Capital requirement is calculated in the way that market value of the bonds (as of August 6th) is multiplied by corresponding risk weight of credit risk 100% (1,00) and 12% (0,12).

1.000.000 x 1,0089(100,89/100) x 1,00 x 0,12 = 121.068 KM

In previous examples, the capital requirement was not calculated for delivery risk, since there was less than 5 days passed from the date of the delivery agreed.

Example of a delivery risk and cumulated free deliveries risk: *As of August 1st, a bank A has purchased 3.000 stocks, KM 500 per stock, from a bank B (foreign bank with headquarter in the zone B country).*
The assessment date is August 3rd. As of August 3rd, the bank A makes payment as agreed, however the bank B does not manage to deliver the stocks. As of August 29th, the delivery has still not been made, and the stock price jumped to KM 590.
Interest rate on loans with maturity to recall is 3%.

Capital requirement calculation is performed as follows:

a) for a free delivery:

3.000 x 500 x (1+0,03×26/360) x 0,2 x 0,12 = 36.078 KM.

b) for delivery risk based on version A:

3.000 x (590-500) x 0,5 = 135.000 KM

Or for delivery risk based on version B:

3.000 x 500 x 0,04 = 60.000 KM.

Cumulative capital requirement for this example is KM 171.078 or KM 96.078, depending on whether the delivery risk is calculated based on version A or version B.

Example of delivery risk and cumulated free deliveries risk: *As of August 1st, a bank A has sold bonds of nominal value of KM 1.000.000, 101.12 per bond (including corresponding interest) to a trading company B. The assessment date is August 3rd. As of August 3rd, the bank A delivered the bonds, as agreed, however the trading company B did not manage to pay the agreed amount. As of August 29th, the payment has still not been made; the bond price as of that date was 99.89 (including corresponding interest).*

Capital requirement calculation is performed as follows:

a) for a free delivery:

1.000.000 x 0,9989(99,89/100) x 1,00 x 0,12 = 119.868 KM

b) for delivery risk based on version A:

1.000.000 x ((101,12-99,89)/100) x 0,5 = 6.150 KM

or delivery risk based on version B:

1.000.000 x 1,0112 (101,12/100) x 0,04 = 40.448 KM

Cumulative capital requirement for this example is KM 126.018 or KM 160.316, depending on whether the delivery risk is calculated based on version A or version B.

10.2. Repo and reverse repo contracts/securities lending

In case of calculating capital requirement for counterparty risk from transactions that are result of repo contracts or reverse repo or securities lending contracts, it is not necessary to differ between repo and reverse repo transactions and securities lending transactions (securities lending and borrowing), since the risky situation is quite similar between these two types.

In case of repo contracts, specific type of the counterparty risk depends on whether that is actual sale or repo transaction or the transaction refers to sale with repo option.

In case of the actual sale and repo contract (transfer receiver performs actions in order to return the funds received from the transfer sender and in order not to make payment of the specified sum of money), counterparty risk exists for both the transfer receiver and the transfer sender: for the institution that transfers the funds, the counterparty risk is a possibility that the counterparty may not return the money as agreed to value of the money or value of the collateral received could not cover market value of the funds. For the institution to which

the funds have been transferred, the counterparty risk is a possibility that the transfer sender may not succeed to make payment of the agreed sum of money due to the retransfer of the funds or may not succeed to return collateral or value of the assets retained by the institutions may not have full coverage.

In case of sale with repo option (receiver of the transfer is listed, but not liable to retransfer the funds transferred to him with purpose to make payment of the specified amount), opposite from the above mentioned, only the counterparty risk that occurs with the transfer received has to be taken into account. The transaction sender in this case is subject to price movement risk (risk of the funds price loss which has to be accepted by the transfer sender upon request of the transfer receiver), and not the counterparty risk.

Example: *Bank A signs the following contract with a bank B:*
- repo contract with maturity of 7 days;
- sender - Bank A;
- receiver - Bank B.

As of August 1st, the bank A has landed the bond with nominal value of KM 10.000.000 (6,875% coupon, term to maturity 6,2 years) to the bank B, and in return it is going to receive the cash payment of KM 10.000.000. As of August 1st, the bond price (net) was KM 102,34. Until August 4th, market value of the bond has increased to 102,65, and accrued interest is KM 250.000. Corresponding interest for the funds received as of that date is KM 84.000.

Capital requirement for coverage of the counterparty risk for each of the two banks until August 4th is presented in the following tables:

a) Capital requirements for repo contracts and securities lending (Bank A)

	Market value of collateral	**Market value of claims**	**Current surplus**	**Capital requirement for counterparty risk**
Actual sale and repo contracts	10.515.000	10.084.000	431.000	43.100

Market value of claims is generated when multiplied by the nominal value of bonds with their market value until August 4th, and increased by the interest accrued (10.000.000 x 1,0265 + 250.000).

In this example, market value of collateral represents the amount of money received and increased by the corresponding interest for the funds received (10.000.000+84.000).

b) Capital requirements for repo contracts and securities lending (Bank B)

	Market value of collateral	**Market value of claims**	**Current surplus**	**Capital requirement for counterparty risk**
Actual sale and repo contracts	10.515.000	10.084.000	-431.000	0

10.3. Other counterparty risks

Bank should calculate capital requirement for the counterparty risk and for other positions in trading book. Other positions in trading book represent exposures in form of fees, charges, interests, dividends and margins for futures agreements, option agreements, etc.

Example: *Bank has claim in form of margin based on forward agreements and options in the amount of KM 100.000 from the recognized stock exchange.*

Capital requirement in the above example is calculated in the way that the claim in form of margin based on forward agreements and options is multiplied by corresponding risk weight of credit risk of 1,00 (100%) and of 0,12 (12%).

100.000 x 1,00 x 0,12 = 12.000 KM

EXAMPLE OF CAPITAL REQUIREMENT CALCULATION FOR POSITION RISK IN OPTIONS (FORM NO. 11)

9.1. Capital requirement calculation based on Simplified Method

Example: *If owner of 100 stocks of market value of KM 10 per stock has equivalent in put option with executive price of KM 11 per stock, capital requirement would be the following:*

1.000 KM (100 x 10 KM) x 18% (6% specific + 12% general risk) = 180 KM.

This option is „in the money“, because in put options executive price exceeds market price. „In the money“ amount would be the following:

(11 KM – 10 KM) x 100 = 100 KM

Capital requirement for the above case is the difference between market value of stocks multiplied by the sum of factors for specific and general risk and „in the money“ amount, that is, capital requirement amounts to KM 80.

Similar methodology should also apply on options with the underlying instrument (or variable) expressed in foreign currency, interest rate of the underlying instrument or commodity. E.g. capital requirement for the underlying variable for foreign exchange option would be 12% or 15% for commodity option.

9.2. Capital requirement calculation based on Method Delta-Plus

Example:
a) *A bank has issued EUR call commodity option with executive price of 490 and market price of 500 and the following characteristics:*

- *Quantity: 1.000 units;*
- *Volatility 20%;*
- *Gama -0,0034 and*
- *Vega -168.*

Gama effect on options is calculated as follows:

Gama effect = ½ Gama x N x $(VU)^2$

In this case, price variation of the underlying instrument of the option (VU), since this is a commodity option, is calculated in the way that market value of the commodity is multiplied by 0,15 (15%).

½ x (-0,0034) x $(500 \times 0,15)^2$ = - 0,0017 x 5.625 = -9,5625 x 1.000 = -9.562,5 (rounded value -9.563 KM).

Vega option effect is calculated as follows:

$$\text{Vega effect} = \text{Vega} \times N \times \frac{\text{volatility}}{4}$$

$$-168 \times \frac{0,2}{4} = -168 \times 0,05 = -8,4 \times 1.000 = -8.400 \text{ KM}.$$

b) Let us assume that we have option on some other commodity, as a separate risk category, where Gama and Vega effects are already calculated as KM 5.000 and KM 4.000 (positive figures).

c*) A bank has short position in EUR call stock option, executive price is EUR 30, and market price is EUR 32 with the following characteristics:*

- *Quantity1.000 units;*
- *Volatility 0,30;*
- *Gama -0,0434 and*
- *Vega -10,0024.*

In this case, price variation of the underlying instrument of the option, since this is a stock option, is calculated in the way that market value of the option is multiplied by 0,12 (12%).

Gama option effect = ½ x (-0,0434) x $(32 \times 0,12)^2$ = -0,31998 x 1.000 = -319,98 EUR-a (-626 KM).

$$\text{Vega option effect} = -10,0024 \times \frac{0,3}{4} = -0,75 \text{ EUR-a} \times 1.000 = -750 \text{ EUR-a} \ (-1.467 \text{ KM}).$$

d) In addition, we have option on USD stocks, as a separate risk category, where Gama and Vega effects are already calculated as KM 1.000 and KM 2.000 (positive figures).

In the examples under b) and d), Gama and Vega effects have already been calculated for better understanding of determination of capital requirement for Gama and Vega risk, since the mentioned effects were positive numbers.

Review of Gama and Vega effect, grouped by risk categories, capital requirement for Gama and Vega risk, as well as total capital requirement for option risk using Delta plus method for the mentioned example is presented in the following table:

RISK CATEGORY	GAMA EFFECT IN KM	VEGA EFFECT IN KM
Commodity 1	-9.563	-8.400
Commodity 2	5.000	4.000
Stocks EUR	-626	-1.467
Stocks USD	1.000	2.000
Capital requirement for Gama risk	**10.189**	**-**
Capital requirement for Vega risk		**15.867**
Capital requirement for option risk		**26.056**

12. FINAL PROVISIONS

These Guidelines become effective as of the date of their adoption.

Number: 01-5-224/08
Sarajevo, 11.02.2008.

DIRECTOR

Zlatko Barš