

## ***Methods of Analysis of the Net Position of Financial Instruments Held by a Bank***

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***Abstract:*** For a bank net position in each of the financial instruments held the surplus can be obtained by determining the long or short positions.

*The analysis takes into consideration comparisons with long or short positions recorded by the bank for each category of instruments held. Categories of financial instruments are considered such as: equity securities, debt securities, convertible bonds, financial futures contracts, options, warrants and covered warrants. In practice, the value of all net positions, irrespective of their signs, would be converted daily, before they aggregate, the reporting currency using the exchange rate spread on the spot market or quotations announced on that day in the inter – banking foreign exchange market.*

***Keywords:*** net position, margin requirement, qualifying items, calculation of equivalence, aggregate net positions

### **Introduction**

Special instruments, such as interest rate futures and forward commitments to buy or sell debt instruments, shall be treated by a bank as combinations of long and short positions. In this case, a long position in interest rate futures contract shall be treated as a combination loan maturity futures contract delivery date and hold a particular asset with a maturity equal to the instrument or notional position, representing support the futures contract in question.

### **1. Method of Treatment of Financial Instruments**

Interest rate options must be treated as if they were positions equal in value to the amount of the underlying instrument to which the option refers, multiplied by the corresponding delta<sup>1</sup> value. Thus, the positions derived may be offset against any opposite position by title support or similar derivatives. The delta used to be that of the exchange concerned or, where this is available is calculated by the bank itself, subject to approval by the supervisory authority. In these circumstances, the bank must have sufficient capital to cover risks characteristic options other than delta risk. [1]

For written options which are traded, it may be taken into account as capital requirement the stock exchange margin. Thus it is essential at any time to verify the equivalence between such margin requirements and capital requirements calculated under the law.

The requirement for a purchased option and traded, may be the same as that for the underlying, but not to exceed the market value of the option and the requirement, for a written option is determined by the instrument is its support. Just the same must be treated the covered warrants on debt and capital.

Swap interest rate for which the bank receives a variable interest rate and pays a fixed interest rate is treated as equivalent to a long position on a variable interest rate instrument with a maturity equal to the period until the next time fixing the interest rate and a short position on a fixed interest rate instrument with the same maturity as the swap itself.

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<sup>1</sup> Delta - price expected variation of an option in relation to a lower variation of the price of the instrument used as support of the option. The established calculation method established by the NBR Regulation no. 24/2009, regarding the liquidity of the credit institutions, published into the Romanian Official Gazette no. 618 from 18.12.2009

In order to calculate the capital requirement for market risk of the party assuming the credit risk it is used the notional value of credit derivative contained in the contract. Maturity of the credit derivative is considered part of the contract to replace due date specified in its obligation.

In practice, each bank should determine long or short positions and their coverage, as follows:

- for the case of total return swap instruments such - it is generated a long position General market risk of the reference obligation and a short position on the general market risk of a state title with a maturity equal to the period until the next time fixing interest rates;
- a credit default swap instrument type not normally generate a general market risk position, but only if the payments are due by way of premium or interest;
- for a tool such as credit derivatives – it is generated a position value equal to the notional amount in an obligation of each reference entity.

For the buyer of protection, positions should be determined by symmetry to those recorded by the protection seller. In these circumstances, banks should use other models to determine the positions on financial instruments or to fully compensate all positions in derivatives referred to, provided that they meet the following conditions:

- positions that have the same amount must be expressed in the same currency;
- reference rate value is close;
- fixing date or residual maturity rate next meets the following limits:
  - if it is less than one month: the same day;
  - the interval between one month and one year: within seven days;
  - more than one year: within 30 days.

In case the bank transfers the securities or the guaranteed rights relating to securities or property or lends them, these should be included in calculating the capital requirement.

## 2. Risks Associated to the Held Financial Instruments

The position risk on debt capital or transactional should be divided into two main components. The first component consists of specific risk - that is the risk of price instrument concerned due to factors related to its issuer. The second component shall cover its general risk - that is the change risk of the instrument price due to changes in the interest rates level.

In order to comply with current legal requirements<sup>2</sup>, banks must properly classify its net positions currency they are denominated and to calculate the capital requirement for covering the general and specific, separately for each individual currency. It should also be attributed to its net trading book the categories of risk associated. They are assigned according to the issuer or borrower, with an external or internal evaluation according to the loan, and by residual maturity, and then apply specific risk weights, as outlined in table 1:

**Table no. 1**

**Determining the position risk**

No.	Economic category	Value (equiv .in lei)	Net position	Risk category	Coefficient	Net amount (equiv. in lei)
1	Banking security letters	46.854.712	46.854.712	Secured by central companies	0%	-
2	Secured debts shares	66.852.471	56.156.076	Debts shares issued or secured by central companies	0,12	6.738.729

<sup>2</sup> NBR Regulation no. 18/2006, regarding the weights applied in standard methodology, published in Romania's Official Gazette no. 612 from 22.12.2008.

No.	Economic category	Value (equiv .in lei)	Net position	Risk category	Coefficient	Net amount (equiv. in lei)
3	Warrants	632.541	632.541	Exposures for which it is not available an evaluation of the debt made by a designated, external institution specialized in debt evaluation.	0,08	50.603
4	Commercial debts	11.852.417	9.126.361	Debts shares issued by regional companies	0,08	730.109
5	Incasoo documentary	6.325.412	6.198.904	Other eligible elements	1,00%	61.989
6	Unsecured debts (having a residual duration until a final maturity lower or equal to six months)	10.852.654	9.550.336	Other eligible elements	1,60%	152.805
7	Unsecured debts (with a residual residence until the final maturity greater than six months and lower or equal to 24 months)	14.156.241	14.156.241	Debts shares issued by central companies and international organizations.	0,25%	35.391
8	Unsecured debts (the residual duration until the final maturity greater than 24 months)	2.245.814	336.872	Debt shares issued by central companies and other firms.	1,00%	3.369
9	Secured debt shares	6.358.742	6.295.155	Debt shares issued by multilateral and development banks.	1,60%	100.722
	<b>Total</b>	<b>166.131.004</b>	<b>149.307.197</b>		<b>X</b>	<b>7.873.717</b>

Finally, by summing weighted positions, there can be determined the capital requirement against specific risk.

For the instruments issued by a non-qualifying issuer there is assigned a specific capital requirement for the specific risk of 8% or 12%, or it can be offset between such instruments and any other debt. In case of titles which present a particular risk because of the insufficient solvency of the issuer, the bank must apply the maximum weighting of 12%.

In banking practice, calculation of capital requirements covering general risk involves two basic steps, as follows:

- a) The coverage of all positions according to the maturity in order to calculate the capital requirement necessary to cover them;

- b) In case a weighted position is held alongside an opposite weighted position, capital requirements can be reduced in the same maturity band or if the opposite weighted positions fall into different maturity bands .

The obtained net positions are classified upon the appropriate maturity bands based on residual maturity or the remaining period until the next interest rate is set up. The classification in one of the columns is made distinctively on the debt shares according to the size of the coupon (threshold is of 3%) after that applying the weight corresponding to the maturity band in question. Thus, we obtain the sum of the weighted long positions and the sum of the weighted short positions in each maturity band.

For a comprehensive presentation of the information, the part corresponding to the two amounts in a maturity band represents the weighted position made in correlation in that band. Residual long position or short position residual represents the weighted position not made in correlation in that band. It is then calculated the total weighted positions mapped in all bands. A calculation method is presented in Table no 2:

**Table no 2**

<b>Representation of the models of the debt shares on bands according to their maturity</b>								
No.	Type of financial instruments	Area	Maturity line		Weight %	Gross value	The modification proposed for the interest rate (%)	Capital requirement
			3% coupon or more	Less 3% coupon				
0	1	2	3	4	5	6	7	8
1	Futures contracts based upon stock exchange indicators having a large diversity	One	0 <= 1 month		0	63.254.189	0	-
2	Capital shares having a large diversity traded on the stock exchange.		> 1 <= 3 months		0,2	25.412.635	1	254.126
3	Very divers liquidities and of good quality portfolios.		> 3 <= 6 months		0,4	85.412.632	1	854.126
4	Margin for futures and options traded on OTC (over-the-counter)		> 6 <= 12 months		0,7	88.425.632	1	884.256
5	Margin for futures and options traded on the stock exchange.	Two	> 1 <= 2 years	> 1,0 <= 1,9 years	1,25	74.185.263	0,9	667.667
6	Futures contracts based upon stock exchange indicators having a large diversity.		> 2 <= 3 years		1,75	224.156	0,8	1.793
7	Capital shares having a large diversity traded on the stock exchange.		> 2,8 <= 3,6 years		2,25	9.517.561	0,75	71.382
8	Margin for futures and options traded on the stock exchange.	Three	> 4 <= 5 years		2,75	1.284.563	0,75	9.634
9	Very divers liquid and of very good quality portfolios.		> 4,3 <= 5,7 years		3,25	55.741.852	0,7	390.193
10	Futures contracts traded on the stock exchange.		> 5,7 <= 7,3 years		3,75	22.174.321	0,65	144.133

No.	Type of financial instruments	Area	Maturity line		Weight %	Gross value	The modification proposed for the interest rate (%)	Capital requirement
			3% coupon or more	Less 3% coupon				
11	Margin for futures and options traded on OTC		> 10 <= 15 years		4,5	19.563.521	0,6	117.381
12	Margin for futures and options traded on the stock exchange.		> 15 <= 20 years		5,25	4.123.652	0,6	24.742
13	Very divers liquid and of very good quality portfolios.		> 20 years	> 10,6 <= 12,0 years	6	44.852.632	0,6	269.116
14	Capital shares having a large diversity traded on the stock exchange			> 12,0 <= 20,0 years	8	11.854.632	0,6	71.128
15	Capital shares of the type stock exchange futures contracts.			> 20 years	12,5	33.474.521	0,6	200.847
<b>TOTAL</b>						<b>539.501.762</b>		<b>3.960.525</b>

The residual position is obtained by adding the three balances resulting after matching the correspondence. Thus, the bank's capital requirement is calculated by adding the following: 10% of the weighted positions mapped in all maturity bands; 40% of the weighted position in zone one, 30% of the weighted position contained in zone two, 30% of the weighted position in zone three, 40% of the weighted position between zones one and two and between zones two and three, 150% of the weighted position matching the correspondence between zones one and three; 100 % of residual unmatched weighted positions.

In order to calculate the capital required to cover specific risk capital securities, the bank shall multiply its overall gross position by 4%.

Overall gross position of the bank is the total net long positions and the bank's total net short positions and the difference between the two amounts represent the total net position. Exception to this rule may be if equity portfolios held by institutions, which meet the following conditions:

- equity securities are issued by issuers other than those which have issued only debt securities;
- considered equity securities are considered highly liquid by the competent authority;
- all individual positions represent less than 5% of total portfolio equity.

When drawing up the risk analysis, one must calculate the price difference at which the bank is exposed when conducting transactions in debt, equity, currencies and commodities, in case they remain unsettled. To determine the risk level, the base is the difference between the agreed settlement price and current market value. This difference must be multiplied by the corresponding risk factor, determined according to the bank's trade history and mutations in market operation which results in the capital requirement necessary. A weighting model base according to risk factors pre-established proposed as a model is presented in Table no 3:

**Table no. 3**

**The weighting coefficients used for determining the risk of settlement**

No.	Elements to be discounted	Number of working days after the settled maturity date	Gross value	Weighting coefficient (%)	Net value
0	1	2	3	4	5
1	Receivable shares	15	6.528.412	8	522.273
2	Capital shares		45.956.241		3.676.499

No.	Elements to be discounted	Number of working days after the settled maturity date	Gross value	Weighting coefficient (%)	Net value
3	Given foreign exchange currency	16-30	215.462	50	17.237
4	Delivered merchandises		14.785.262		1.182.821
5	Receivable shares		11.745.236		939.619
6	Capital shares		241.562		19.325
7	Given foreign exchange currency		6.352.486		508.199
8	Delivered merchandises	31-45	22.845	75	1.828
9	Receivable shares		95.478.563		7.638.285
10	Capital shares		1.185.624		94.850
11	Given foreign exchange currency		3.518.462		281.477
12	Delivered merchandises		54.178.563		4.334.285
13	Receivable shares	More than 45	11.752.635	100	940.211
14	Capital shares		664.752		53.180
15	Given foreign exchange currency		228.456		18.276
16	Delivered merchandises		2.278.956		182.316

Operations should be considered incomplete transactions in the following situations:

- the bank has paid for securities, currencies or commodities in advance or made deliveries before receiving payment;
- cross-border transactions, the last one day or more of the bank made the payment or delivery.

In case those general dysfunctions appear in the discount or compensation settlement system, banks would be exempt from the calculation of capital requirements in real time, but only until the correction of the situation as temporary inability of counterparty to settle a transaction can not be considered defaults.

### Conclusions

In this way it can be provided relevant information for each user about the type of instruments held by the credit institution, their real value and the risks incurred by bank customers and shareholders.

### References

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