

RESOLUTION OF THE REPUBLIC OF ARMENIA CENTRAL BANK BOARD ON APPROVAL OF REGULATION 8/02
“ON THE CALCULATION OF ANNUAL PERCENTAGE YIELD OF BANK DEPOSITS”

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**CENTRAL BANK OF THE REPUBLIC OF ARMENIA
BOARD RESOLUTION No 165-N**

Approved June 2, 2009

**ON APPROVAL OF REGULATION 8/02 “ON THE CALCULATION OF ANNUAL PERCENTAGE
YIELD OF BANK DEPOSITS”**

By the virtue of the Law of the Republic of Armenia “On attraction of bank deposits” Article 2.1, (6), Law of the Republic of Armenia “On Central Bank of the Republic of Armenia” Article 20, the Board of the Central Bank of Armenia, hereby decides:

1. To approve Regulation 8/02 “On the Calculation of Annual Percentage Yield of Bank Deposits” pursuant to Appendix (attached).
2. This Resolution shall enter into force on January 1, 2010.

**Chairman of the Central Bank of Armenia
A. Javadyan**

**June 10, 2009
Yerevan**

REGULATION 8/02

THE CALCULATION OF ANNUAL PERCENTAGE YIELD OF BANK DEPOSITS

CHAPTER 1.

SUBJECT OF REGULATION

1. This Regulation defines the method of calculation of annual percentage yield carried out by banks and branches of foreign banks operating on the territory of the Republic of Armenia regarding the attraction of bank deposits (hereinafter referred to as deposits) or subject to inclusion in any advertisement, announcement, proposal, offer or an invitation to make an offer, information summary placed in internet in the cases defined by the Law of the Republic of Armenia “ On Attraction of Bank Deposits” (hereinafter, Law).

CHAPTER 2.

CONCEPTS

2. For the purposes of this Regulation following definitions shall apply.

1) “deposit” means a bank deposit or funds available in the bank account;
2) “Bank” means a bank or a branch of a foreign bank that has obtained banking license from the Central Bank of the Republic of Armenia (hereinafter referred to as Central Bank),

3) “Annual simple interest rate” means interest rate defined annually in the deposit contract on the basis of which bank calculates interest payable to the depositor;

4) “APY” (hereinafter referred to as APY) means annual percentage yield calculated for the respective type of deposit. APY indicates the amount of annual percentage yield calculated based on the payments of mandatory fees related to the deposit opened by the client and accumulation of the received interest on principal amount (capitalization);

5) “capitalization” means payment of interest accumulated on deposit. The payment of interest is the direct accumulation of interest on deposit amount or direct payment of interest to the depositor. The more often interest capitalization takes place, the higher annual percentage yield will be;

6) “Monetary flows” mean mutual payments (deposit amount, interest and mandatory fees) made by the bank and the depositor for the respective type of deposit, taking into consideration the principles defined in paragraph 4 of this Regulation;

7) “mandatory fees” mean all the fees that must be paid by the depositor to the bank against the respective type of deposit before conclusion of the deposit contract and during the effective period of the contract (i.e. fees for opening then account, account service or withdrawals), excluding taxes and other fees, which are not

mandatory for the given type of deposit;

8) "deposit type" means all the deposits, which are essentially similar.

CHAPTER 3.

GENERAL PRINCIPLES FOR CALCULATION OF ANNUAL PERCENTAGE YIELD OF DEPOSITS

3. The following general principles shall apply for the calculation of annual percentage yield of deposits:

1) In the event mandatory fees are established for the respective type of deposit, mandatory fees shall be included in the calculation of annual percentage yield;

2) The formula defined in chapter 4 of this Regulation shall apply to all types of deposits (hereinafter referred to as Formula No 1);

3) In the event interest capitalization of deposits takes place on a regular basis (has clearly fixed periodicity) at the end of the period determined under the fixed frequency, as well as in cases where mandatory fees are not paid for opening or managing deposit account, the formula defined in Chapter 5 of this Regulation shall apply (hereinafter referred to as Formula No 2);

4) In the event annual percentage yield of deposit is calculated in accordance with Formula No 2 and the term of the respective type of deposit exceeds one year, annual percentage yield shall be calculated based on calculation of the geometric mean;

5) One year shall be equal to 365 days;

6) According to this Regulation, annual percentage yield of calculated deposits shall be rounded at least to one hundredth and multiplied by 100, in order to receive interest value.

4. In the event interest is not capitalized on a regular basis, the following principles shall apply to calculation of annual percentage yield:

1) if no deposit amount is defined for the respective type of deposit, one hundred thousand drams shall be assumed as a deposit amount for the calculation of annual percentage yield;

2) if a minimum mandatory balance or a floor is established for the respective type of deposit whereas the deposit ceiling is not established, calculation of the annual percentage yield shall include ceiling of the minimum mandatory balance or floor;

3) if for the respective type of deposit floor and ceiling thresholds are established, calculation of the annual percentage yield shall include the mean arithmetic of floor and ceiling thresholds;

4) in the event the option of increasing (decreasing) of deposit amount is envisaged, but the size of the increase (decrease) of the deposit amount is not defined, it is assumed that the deposit amount shall not be revised until the end of the effective period of deposit;

5) in the event the option of revision of the amount is envisaged for the respective type of deposit, but the period when such revision can take place term is not determined as a fixed date, but as a certain period of time, it is assumed that the date of introduction of the amendment in the deposit amount is the last day of such period;

6) in the event the option of revision of simple annual percentage yield of the respective type of deposit is envisaged, but the size of revision is not established, it is assumed that simple annual percentage yield of the respective type of deposit shall remain unchanged till expiration of the effective period of the respective type

of deposit;

7) in the event simple annual percentage yield of the respective type of deposit is defined for a certain period while percentage rate can be revised during the other periods, calculation of annual percentage yield shall include both the percentage rate established for the respective period and the revised percentage rate, whereas percentage rate effective in the respective period shall be considered as revised percentage rate;

8) where a fixed period for the respective deposit type is not established, effective period of the deposit shall be equal to one year.

CHAPTER 4.

CALCULATION OF ANNUAL PERCENTAGE YIELD OF DEPOSITS

5. Annual percentage yield shall be calculated using the formula provided below:

$$A = \sum_{n=1}^N \frac{K_n}{(1+APY)^{\frac{Dn}{365}}} \quad (1)$$

where:

- 1) “A” is the initial deposit amount;
- 2) “n” is the subsequent number of the deposit related monetary flows;
- 3) “N” is the last number of the deposit related monetary flows (including monetary flow as of the date of putting the), after which the period of deposit contract term is deemed expired;
- 4) “Kn” are the flows of mandatory payments, i.e. principle and interest paid invested at the moment of opening deposit account, and/or amounts capitalized during the effective period of deposit, as available;
- 5) “Dn” is the number that indicates how many days have passed since the date when deposit has been opened till the next “n”-th deposit related monetary flow, inclusive. In the event payments were made on the date of opening deposit account, D1 = 0.

6. Paragraphs 7-9 of this Regulation provide examples on calculation of annual percentage yield by using Formula No 1.

7. Example 1. “Term deposit with payment of interest on opening deposit account”:

- 1) We assume that deposit account is opened on the following terms:
 - a. deposit amount – AMD 100,000;
 - b. term of deposit - 1 year (365 days);
 - c. annual percentage yield - 7%;
 - d. interest payment – on opening deposit account.

Consecutive monetary flow number on deposit - n	Number of days from opening deposit account till the next interest payment - Dn	Paid interest	Deposit amount paid	Aggregate amount due to be paid on deposit - Kn
1	0	7000		7000
2	365		100 000	100 000
Total		7000	100 000	107 000

2) In accordance with the aforementioned terms, the following interest payment schedule is obtained:

3) amount of interest subject to payment on the moment of opening deposit account will be equal to:

$$k_1 = 100000 * 0.07 = 7,000 \text{ Armenian drams.}$$

4) As a result of using the abovementioned parameters and applying Formula No 1, the following annual percentage yield is obtained:

$$100000 = \frac{7000}{(1+APY)_{365}^0} + \frac{100000}{(1+APY)_{365}^{365}}$$

$$100000 - 7000 = \frac{100000}{(1+APY)_{365}^{365}}, \text{ where}$$

$$APY = 0.075269 * 100 = 7.53\%$$

8. Example 2. "Term deposit with payment of interest in 4 months after opening deposit account". Term of the deposit are the same as in example 1, excluding payment of interest, which is paid at the end of the 4-th month of the effective period of deposit contract:

1) In this case, the following interest payment schedule is derived:

Consecutive monetary flow number on deposit - n	Number of days from opening deposit account till the next interest payment - Dn	Paid interest	Deposit amount paid	Aggregate amount due to be paid on deposit - Kn
1	120	7000		7000
2	365		100 000	100 000
Total		7000	100 000	107 000

2) Interest due in 4 months, after opening deposit account, will be equal to:

$$k_4 = 100000 * 0.07 = 7,000 \text{ Armenian drams.}$$

3) As a result of using the abovementioned parameters and applying Formula No 1, the following annual percentage yield is obtained:

$$100000 = \frac{7000}{(1+APY)_{365}^{120}} + \frac{100000}{(1+APY)_{365}^{365}}, \text{ subsequently:}$$

$$APY = 0.073409 * 100 = 7.34\%$$

9. Example 3. “Term deposit with mandatory full contribution on opening deposit account”

1) We assume that deposit account is opened on the following terms:

a. deposit amount – 100,000 Armenian drams;

b. term of deposit - 1 year (365 days);

c. annual interest rate - 7%;

d. interest payment – at the end of the deposit term;

e. mandatory payments of the depositor on the day of receiving the deposit: commission fee for servicing deposit– 1,000 Armenian drams.

2) In this case, the following interest payment schedule is derived:

Consecutive monetary flow number on deposit - n	Number of days from opening deposit account till the next interest payment - Dn	Paid interest	Deposit amount paid	Aggregate amount due to be paid on deposit - Kn	Consecutive monetary flow number on deposit - n
1	0	-1000			-1000
2	365		7000	100000	107000
Total		-1000	7000	100000	106000

3) At the end of deposit contract period, interest due will be equal to:

$$k_2 = 100000 * 0.07 = 7,000 \text{ Armenian drams.}$$

4) As a result of using the abovementioned parameters and applying Formula No 1, the following annual percentage yield is obtained:

$$100000 = \frac{-1000}{(1+APY)_{365}^0} \dots + \frac{107000}{(1+APY)_{365}^{365}}$$

$$101000 = \frac{107000}{(1+APY)_{365}^{365}}, \text{ subsequently:}$$

$$APY = 0.059406 * 100 = 5.94\%$$

5) If, subject to terms of Example 3, the amount of deposit is equal to AMD 1,000, APY= (-2.73%), whereas if the amount of deposit is equal to AMD 1,000,000, APY= 6.89%.

CHAPTER 5.

CALCULATION EXAMPLE OF ANNUAL PERCENTAGE YIELD OF DEPOSITS WITH REGULAR INTEREST PAYMENT

10. Annual percentage yield of deposits with regular interest capitalization is calculated using the following formula:

$$APY=(1+r/n)^n-1, \quad (2)$$

where:

- 1) APY – annual percentage yield;
- 2) r – simple annual percentage rate;
- 3) n – number of interest capitalization operations during one year;

11. Example 1. “Term deposit with monthly interest capitalization”.

1) We assume that deposit account is opened on the following terms:

- a. term of deposit - 1 year (365 days);
- b. simple annual percentage rate - 7%;
- c. interest capitalization – monthly, 12 times during the year, at the end of each month.

2) As a result of using the abovementioned parameters and applying Formula No 2, the following annual percentage yield is obtained:

$$APY = (1 + 0.07/12)^{12} - 1, \text{ subsequently:}$$

$$APY = 0.072290 * 100 = 7.23\%$$

12. Example 5. “Term deposit with interest capitalization at the end of the effective period of the contract”.

Terms of the deposit are the same as in Example 4, except the frequency of interest capitalization, which is made at the end of the effective period of the deposit contract:

As a result of using the abovementioned parameters and applying Formula No 2, the following annual percentage yield is obtained:

$$APY = (1 + 0.07/1)^1 - 1,$$

$$APY = 0.07 * 100 = 7\%$$

13. Example 6. “Term deposit with quarterly interest capitalization”. Terms of the deposit are the same as in Example 4, except the frequency of interest capitalization, which is made at the end of each quarter (number of capitalizations – 4).

As a result of using the abovementioned parameters and applying Formula No 2, the following annual percentage yield is obtained:

$$APY = (1 + 0.07/4)^4 - 1, \text{ subsequently:}$$

$$APY = 0.071859 * 100 = 7.19\%$$

14. Example 7. “Term deposit with semi-annual interest capitalization”. Terms of the deposit are the same as in Example 4, except the frequency of interest capitalization, which is made at the end of each semester (number of capitalizations – 2).

As a result of using the abovementioned parameters and applying Formula No 2, the following annual percentage yield is obtained:

$$APY = (1 + 0.07/2)^2 - 1, \text{ subsequently:}$$

$$APY = 0.071225 * 100 = 7.12\%$$

15. Example 8. “Deposit with daily interest capitalization”. Terms of the deposit are the same as in Example 4, except the frequency of interest capitalization, which is made on a daily basis (number of

capitalizations – 365).

As a result of using the abovementioned parameters and applying Formula No 2, the following annual percentage yield is obtained:

$$APY = (1 + 0.07/365)^{365} - 1, \text{ subsequently:}$$

$$APY = 0.072501 * 100 = 7.25\%$$

16. Example 9. “Long-term deposit with revision of simple annual percentage rate and frequency of capitalization”.

1) We assume that deposit account is opened on the following terms:

a. term of deposit - 2 years (730 days);

b. simple annual percentage rate for the first year is equal to 5%, and for the second year 6%;

c. interest capitalization for the first year is on a monthly basis, 12 times during a year, and for the second year – on a semi-annual basis, two times during a year, at the end of each period.

2) As a result of using the abovementioned parameters, applying Formula No 2 and performing geometric mean calculations, the following annual percentage yield is obtained:

$$APY = \sqrt[2]{(1 + 0.05 / 12)^{12} * (1 + 0.06 / 2)^2} - 1, \text{ որստեղից}$$

$$APY = 0.056019 * 100 = 5.60\%$$

17. Example 10. “Long-term deposit with one-time interest capitalization and revision of simple annual percentage rate”.

1) We assume that deposit account is opened on the following terms:

a. term of deposit - 3 years (1,095 days);

b. simple annual percentage rate for the first year is equal to 5%, for the second year 6%, and for the third year 7%.

c. interest capitalization is made on an annual basis.

2) As a result of using the abovementioned parameters, applying Formula No 2 and performing geometric mean calculations, the following annual percentage yield is obtained:

$$APY = \sqrt[3]{(1 + 0.05 / 1)^1 * (1 + 0.06 / 1)^1 * (1 + 0.07 / 1)^1} - 1, \text{ որստեղից}$$

$$APY = 0.059969 * 100 = 6\%$$