# 3 DECREE of the National Bank of Slovakia of 16 June 2009

# concerning the methods of establishing the value of assets in an open-ended fund

The National Bank of Slovakia, pursuant to Article 116(1)(d) of the Act No. 594/2003 Coll. on collective investment and amendments to certain laws stipulates the following:

# **General provisions**

# Article 1 Specification of terms

For the purposes of this Decree, the following terms shall be understood as indicated below

- a) management company: management company, 1
- b) fund: open-ended fund,<sup>2</sup>
- c) open-ended foreign collective investment undertaking: a European fund,<sup>3</sup> another open-ended foreign collective investment undertaking,<sup>4</sup>
- d) closed-ended foreign collective investment undertaking: a foreign collective investment undertaking whose investor is not entitled to the payout of an entire security issued by this foreign collective investment undertaking prior to the expiry of a predetermined period,
- e) real value of a financial instrument:<sup>5</sup> price that may be achieved in trading a financial instrument in an independent transaction between informed and voluntarily participating contractual parties; the real value of a financial instrument is the current market price of a financial instrument,
- f) market price of a financial instrument: the close rate of a financial instrument achieved on a principal market, published by the organizer of a principal regulated market or by an information system; where the close rate of a financial instrument does not include the aliquot interest yield, market price will be determined using a close rate increased by aliquot interest yield calculated according to the procedure specified in Appendix no.1,
- g) information system: a generally accepted information system publishing official market prices of financial instruments, which the management company uses to establish the value of financial instruments on the basis of an agreement with the fund depositary,

<sup>&</sup>lt;sup>1</sup> Article 3 of the Act No. 594/2003 Coll. on collective investment and on the amendments to certain acts, as amended

<sup>&</sup>lt;sup>2</sup> Article 4(1) of the Act No. 594/2003 Coll.

<sup>&</sup>lt;sup>3</sup> Article 4(8) of the Act No. 594/2003 Coll. as amended by the Act No. 213/2006 Coll.

<sup>&</sup>lt;sup>4</sup> Article 44(1) (e) of the Act No. 594/2003 Coll.

<sup>&</sup>lt;sup>5</sup> Article 5 of the Act No. 566/2001 Coll. on securities and investment services and on amendments to certain acts, as amended (Securities Act).

- h) theoretical price of a financial instrument: a qualified estimate of the price of a financial instrument specified in line with the procedure mentioned herein,
- i) business day: business day for a respective financial instrument on a principal market,
- j) equity security: a share, temporary certificate and other security which carries similar rights to those relating to shares issued by domestic or foreign trading companies in the Slovak Republic or abroad, or another tradable security issued in the Slovak Republic or abroad that carries the right to acquire these securities by means of subscription or exchange,
- k) yield curve: a curve representing yields to maturity of financial instruments in a relevant business day depending on their residual maturity and providing information on the time structure of interest rates.
- l) zero coupon yield curve: yield curve representing yields to maturity of zero coupon financial instruments,
- m) bootstrapping: the method of construction of a zero coupon bond yield curve for relevant financial instruments, derived from the yield curve,
- n) underlying asset: financial instruments and other values, especially interest rates, currency rates and financial indices, to which a financial derivative is related or from which it is derived.
- o) fixed term transaction: transaction whose fulfilment has been agreed in such a way that the period between the conclusion of a transaction and its settlement is longer than in the case of a spot transaction, whereas this transaction is binding for both parties,
- p) forward: fixed term transaction wherein a party undertakes to add or withdraw on an agreed day an agreed amount of a financial instrument for a price agreed in the transaction, or to pay a specified amount of money representing the difference between the agreed price and the market price of an underlying asset,
- q) FRA transaction: a fixed term transaction wherein a contractual party undertakes to pay within a future term agreed in the transaction the difference between the pre-agreed interest on an agreed principal for its agreed maturity period and the interest on this agreed principal for the same maturity period commencing on the day established in the transaction, which will be actually offered on this day,
- r) FX forward: a fixed term transaction wherein a contractual party undertakes to add or withdraw on an agreed day, when concluding a transaction, an agreed amount of foreign currency at the rate to domestic or other agreed currency, or to pay an agreed amount of funds in the domestic currency or another agreed currency determined by the difference between the agreed rate and the spot rate of that foreign currency against domestic currency or against another agreed currency,
- s) swap: a fixed term transaction wherein a contractual party undertakes to exchange an agreed amount of a financial instrument for another financial instrument on an agreed day and at a price agreed in the transaction
- t) IRS swap: a fixed term transaction wherein a party undertakes to swap on an agreed day the interest on a specified principal calculated using the floating interest rate for an interest on a specified principal calculated using the fixed interest rate, wherein both payments are denominated in the same currency,
- u) basis swap: a fixed term transaction wherein a party undertakes to swap on an agreed day
  the interest on a specified principal calculated using floating interest rate for an interest on
  a specified principal calculated using fixed interest rate, wherein both payments are
  denominated in the same currency,

- v) FX swap: a fixed term transaction wherein a party undertakes to swap on an agreed day one currency for another using the spot rate for such currency valid as at the day of the transaction, or a forward rate in this currency valid as at the date of executing the transaction, and to swap back the same currencies after the lapse of the agreed period using the agreed forward rate valid on the maturity date of the transaction,
- w) cross currency-interest rate swap: fixed term transaction wherein a contractual party undertakes to swap on an agreed day one currency for another currency according to a spot rate against that currency valid as of the transaction date or according to an agreed forward rate against this currency valid as of the commencement date of a transaction, and to swap back the same currencies after the lapse of the agreed period at an agreed forward rate valid as of the transaction's maturity date, while both parties pay each other interest in line with agreed interest rates from the swapped volumes of foreign currencies; swap and reverse swap of foreign currencies may also be notional,
- x) option: the right of one party to withdraw or add an underlying asset and the obligation of the other party, upon request by the former, to add or withdraw such underlying asset at a price agreed in the transaction; the period between the conclusion and the settlement of a transaction is longer than in the case of a spot transaction,
- y) CDS swap: a financial derivative wherein one party pays the other party regular payments within terms agreed on the transaction date, while the latter undertakes to provide the former with financial protection in the case of a pre-agreed credit event (default of the issuer of a respective financial instrument),
- z) CDS spread: annual payment expressed as a percentage share of the nominal value of a CDS swap whose amount depends on the credit quality of the issuer of the financial instrument from which a CDS swap is derived.

### **Determination of the value of deposits and financial instruments**

# Article 2 Determination of the value of deposits

Funds on a current account and on a deposit account<sup>6</sup> are valuated using the sum of the nominal value and the value of an aliquot interest yield falling to the valuation date of a deposit specified in accord with the procedure mentioned in Annex No. 2.

# Article 3 Determination of the value of transferable securities accepted for trading in a regulated market

- (1) Transferable securities<sup>7</sup> accepted for trading in a regulated market<sup>8</sup> are valuated using the market price of a transferable security published for the valuation day of a transferable security, unless specified otherwise herein.
- (2) Principal market shall mean a market specified as principal for a transferable security in the information system. Where it is not possible to unequivocally determine the principal market for a transferable security on the basis of data from the information system,

<sup>&</sup>lt;sup>6</sup> Article 44(1)(f) of the Act No. 594/2003 Coll.

<sup>&</sup>lt;sup>7</sup> Article 5(e) of the Act No. 594/2003 Coll.

<sup>&</sup>lt;sup>8</sup> Article 5(j) of the Act No. 594/2003 Coll. as amended by the Act No. 209/2007 Coll.

then the principal market shall mean a regulated market that is primary for such transferable security on the basis of the issuing conditions of this transferable security.<sup>9</sup>

- (3) If the market price of a transferable security is not published on the day when the price of a transferable security is determined, then the transferable security shall be valuated in the following manner:
- a) if it is a debt security<sup>10</sup>, by the theoretical price determined using the procedure mentioned in Annex No. 3,
- b) if it is an equity security
  - 1. by the last market price under paragraph (1), provided that this price is not older than ten business days including the valuation date of an equity security, and that no economic changes emerged on the financial market or in the issuer of this equity security,
  - 2. where the last market price is older than ten business days inclusive of the valuation date of an equity security and if no economic changes occurred on the financial market or in the issuer of this equity security, by the last market price pursuant to paragraph (1), uniformly decreased each working day throughout the subsequent 100 working days by a proportional part of the last market price, to no less than
    - 2a. the difference between the last market price and the annual decisive deviation of a market price; the annual decisive deviation of a market price is the decisive deviation of the market price of an equity security if such equity security had its market price published for at least 30 days in the last 365 days, or

2b. zero.

- 3. by the last market price pursuant to the first or second item less the expected impact of economic changes on its value in the case of economic changes in the financial market or in the issuer of an equity security; the scope of the expected impact on economic changes is determined upon agreement with the fund depositary.
- (4) Economic changes mean the emergence of changes in the financial market or in the issuer of a financial instrument that cause non-standard behaviour in the financial market, while it may be simultaneously assumed that due to their impact, the valuation determined by a standard procedure does not correspond to the real value of a respective financial instrument.
- (5) If the price of a transferable security under paragraph (1) has been published but, on the basis of a management company's decision and an agreement with the fund depositary, does not correspond with the price that may be achieved under standard conditions in a transaction with a transferable security, then the price of that transferable security shall be determined with due professional care upon agreement with the fund depositary.

# Article 4 Determination of the value of transferable securities from new issues

The value of a transferable security from a new issue is calculated using <sup>11</sup> Article 3(3) proportionally.

<sup>&</sup>lt;sup>9</sup> Article 3(4)(e) of the Act No. 429/2002 Coll. on on stock exchange, as amended.

<sup>&</sup>lt;sup>10</sup> Article 5(e)(2) of the Act No. 594/2003 Coll.

<sup>&</sup>lt;sup>11</sup> Article 44(1)(d) of the Act No. 594/2003 Coll.

# Article 5 Determination of the value of money market instruments

- (1) A money market instrument<sup>12</sup> accepted for trading in a regulated market is valuated in line with Article 3(1) in the same manner.
- (2) Where it is not possible to establish the price of a money market instrument accepted for trading in a regulated market on the day as of which the price of a money market instrument is determined, then that money market instrument accepted for trading in a regulated market shall be valuated following the procedure laid down in Annex No. 4. In the case of a different money market instrument such as a treasury bill or a certificate of deposit, the money market instrument shall be adequately valuated following the procedure laid down in Annex No. 3, unless specified otherwise herein.
- (3) A financial market instrument not accepted for trading in a regulated market shall be valuated using paragraph 2.

### Article 6

# Determination of the value of open-ended fund unit certificates and of securities of open-ended foreign collective investment undertakings

- (1) An open-ended fund unit certificate <sup>13</sup> is valuated using the product of units indicated in an open-ended fund unit certificate and the current unit price announced by a management company <sup>14</sup> for the day as at which the value of an open-ended fund unit certificate is determined. Where the current unit has not been announced as at the date of determination, an open-ended fund unit certificate shall be valuated using the most recently announced current unit price.
- (2) Where an application for the redemption of an open-ended fund unit certificate is submitted and the same is not redeemed as at the valuation date of that open-ended fund unit certificate, the value of such unit certificate shall be determined using the current unit price announced by a management company for the day on which it delivers the application for the redemption of an open-ended fund unit certificate.
- (3) Where the application for a redemption of a unit certificate is submitted and the redemption of unit certificates is halted prior to the redemption of that unit certificate <sup>15</sup>, the value of such unit certificate shall be determined using the most recently announced current unit price.
- (4) A security of an open-ended foreign collective investment undertaking accepted for trading in a regulated market shall be valuated following the procedure laid down by Article 4(1) and (3)(b). Where it is not possible to valuate a security of an open-ended foreign collective investment undertaking accepted for trading in a regulated market in line with the first sentence, or where such security was not accepted for trading in a regulated market, then such security of an open-ended foreign collective investment undertaking shall be valuated proportionally pursuant to paragraph (1).

<sup>&</sup>lt;sup>12</sup>Article 5(o) of the Act No. 594/2003 Coll.

<sup>&</sup>lt;sup>13</sup>Article 35 of the Act No. 594/2003 Coll.

<sup>&</sup>lt;sup>14</sup> Article 95(1)(a) of the Act No. 594/2003 Coll.

<sup>&</sup>lt;sup>15</sup> Article 43 of the Act No. 594/2003 Coll. as amended.

### Article 7

# Determination of the value of unit certificates of closed-ended funds and of securities of closed-ended foreign collective investment undertakings

- (1) A closed-ended fund unit certificate not accepted for trading in a regulated market is valuated using the product of units indicated in a closed-ended fund unit certificate and the current unit price announced by a management company for the day as at which the value of a closed-ended fund unit certificate is determined. Where the current unit is not announced for this day, a closed-ended fund unit certificate shall be valuated using the last announced current price of a unit in a closed-ended fund.
- (2) A closed-ended fund unit certificate accepted for trading in a regulated market is valuated in line with Article 3(1). Where it is not possible to valuate a closed-ended fund unit certificate pursuant to Article 3(1), it shall be valuated pursuant to paragraph (1).
- (3) A security of a closed-ended foreign collective investment undertaking is valuated proportionally pursuant to paragraphs (1) and (2).

# Article 8 Valuation of equity participations in real estate companies

- (1) Equity participations in real estate companies, <sup>16</sup> whose securities are accepted for trading in a regulated market are valuated using the product of the value of these securities determined using the procedure laid down in Article 3(1) and the number of securities in the assets of a special real estate open-ended fund.
- (2) The value of an equity participation in a real estate company whose shares are not accepted for trading in a regulated market or whose value cannot be determined using the procedure laid down in Article 3(1), is valuated using the product of the equity participation in a real estate company and the value of capital of that real estate company specified in the most recent final accounts of a real estate company, modified by the value of immovable assets owned by the real estate company and determined by experts.<sup>17</sup>

# Article 9 Determination of the value of financial derivatives

- (1) A financial derivative<sup>18</sup> accepted for trading in a regulated market is valuated in line with Article 3(1).
- (2) Where it is not possible to valuate a financial derivative accepted for trading in a regulated market in line with Article 3(1), the value of such financial derivative shall be determined using a theoretical price as laid down by paragraph (3) unless specified otherwise herein.

<sup>&</sup>lt;sup>16</sup> Articles 73a(2)(b) of the Act No. 594/2003 Coll. as amended.

<sup>&</sup>lt;sup>17</sup> Article 73g of the Act No. 594/2003 Coll. as amended.

<sup>&</sup>lt;sup>18</sup>Article 5(q) of the Act No. 594/2003 Coll.

- (3) The theoretical price of a financial derivative shall be determined, in the case of
- a) an FRA transaction, using the procedure laid down in the Annexes No. 5 and 6,
- b) an FX forward, using the procedure laid down in Annexes No. 5 and 7,
- c) forward purchase or sale of debt security and forward purchase or sale of equity security, using the procedure laid down in Annexes No. 5 and 8,
- d) an IRS swap, using the procedure laid down in Annexes No. 9 and 10,
- e) an FX swap, using the procedure laid down in Annexes No. 9 and 11,
- f) basis swap, using the procedure laid down in Annexes No. 9 and 12.,
- g) cross currency-interest rate swap, using the procedure laid down in Annex No. 13,
- h) European option, using the procedure laid down in Annex No.14.
- (4) The value of a financial derivative not accepted for trading in a regulated market is valuated using theoretical price determined in line with paragraph (3) in the same manner unless specified otherwise herein.
- (5) Along with the procedures laid down in the above Annexes, the theoretical price of a financial derivative may also be determined, upon agreement with the fund depositary provided professional care is taken, using other standard economic and mathematical models for the determination of the value of a financial instrument.

# Article 10 Determination of the value of precious metals and certificates representing precious metals

Precious metals and certificates representing precious metals are valuated using the procedure laid down in Article 3(1) and (3)(b).

### Article 11

- (1) A financial instrument whose value cannot be determined using the procedures laid down in Articles 2 to 9 shall be valuated using a theoretical price established by a management company upon agreement with the fund depositary. The theoretical price of such a financial instrument shall be determined as the difference between the current value of future money income and the current value of future money expenses arising from the financial instrument. Future money income and future money expenses are discounted to current value by a discount factor including the required interest income determined using the procedure laid down in Annex No. 15 and a risk premium determined using the procedure laid down in Annex No. 16 in the case of a debt security.
- (2) Where it is impossible to determine the price of a financial instrument using the procedure laid down in paragraph (1), theoretical price shall be determined in line with other standard economic and mathematical models for the determination of the value of a respective financial instrument upon agreement with the fund depositary.
- (3) The theoretical price of a financial instrument shall be determined with due professional care <sup>19</sup> so that the theoretical price corresponds to the price that may be achieved under standard conditions in a transaction with that financial instrument.

<sup>&</sup>lt;sup>19</sup> Article 20(3) of the Act No. 594/2003 Coll. as amended.

### **Article 12**

The value of yields from a financial instrument that are not included in the price of a respective financial instrument shall be determined using their value as of the day of their depositing on the fund current account with the fund depositary.

## **Common and final provisions**

# Article 13 Determination of the value of receivables and liabilities

- (1) Receivables and liabilities shall be valuated using their nominal value as of the valuation day of a respective receivable/liability.
  - (2) The value of a receivable determined as per paragraph (1) shall be reduced by
- a) 10 % of its nominal value in the case of a receivable after a maturity period of over ten days,
- b) 33 % of its nominal value in the case of a receivable after a maturity period of over 30 days,
- c) 66 % of its nominal value in the case of a receivable after a maturity period of over 60 days,
- d) 100 % of its nominal value in the case of a receivable after a maturity period of over 90 days.
- (3) The value of all receivables against a debtor whose assets are subject to bankruptcy or reorganization proceedings<sup>20</sup> or another similar proceeding under the law of the debtor's country of establishment, shall be determined with professional care on the basis of estimated proceeds from a receivable upon agreement with the fund depositary and the National Bank of Slovakia as of the day when a management company learned of these facts. The value of all receivables against a debtor under liquidation<sup>21</sup> or subject to a similar proceeding under the law of the debtor's country of establishment shall be determined in line with the first sentence.
- (4) The value of all receivables against a debtor whose assets were not accepted for a bankruptcy proceeding due insufficient funds, shall be lowered to zero value as of the day when a management company learned of this fact.

# Article 14

# Determination of the value of a financial instrument expressed in a foreign currency

(l) The value in euro of a financial instrument whose value is expressed in a foreign currency shall be recalculated using the reference exchange rate set and published by the European Central Bank<sup>22</sup> for the day when the value of that financial instrument is determined.

<sup>&</sup>lt;sup>20</sup> Act No. 7/2005 Coll. on bankruptcy and composition and on amendments to certain laws, as amended.

<sup>&</sup>lt;sup>21</sup> Articles 70 to 75a of the Commercial Core as amended.

<sup>&</sup>lt;sup>22</sup>Article 12 par. 12.1. of the Protocol of the Statute of the European System of Central Banks and of the European Central Bank (OJ C321E, 29/12/2006).

(2) The value in euro of a financial instrument whose value is expressed in a foreign currency whose reference exchange rate is not set and published by the European Central Bank<sup>22</sup>, shall be first recalculated using the exchange rate of US dollar against this currency published by the central bank of the country where that currency is legal tender, and the value thus obtained in US dollars shall then be recalculated to euro using the exchange rate mentioned in paragraph (1).

### **Article 15**

- (1) The value of a financial instrument issued by an issuer whose assets are subject to bankruptcy, reorganization or similar proceedings under the laws of the issuer's country of establishment shall be determined, as of the day when the management company learned of this fact, with professional care on the basis of estimated proceeds upon agreement with the fund depositary and the National Bank of Slovakia, unless specified otherwise herein. The value of a financial instrument issued by an issuer under liquidation or subject to a similar proceeding under the law of its country of establishment, shall be determined as per the first sentence.
- (2) If a government guarantee<sup>23</sup>, protection from the Investment Guarantee Fund<sup>24</sup>, from the Deposit Protection Fund<sup>25</sup> or a similar foreign investment and deposit protection system or a similar government guarantee apply to a financial instrument issued by an issuer under paragraph (1), the value of that financial instrument shall be determined in the amount of the guarantee provided, taking into account the guarantor's credit quality.
- (3) The value of a financial instrument issued by an issuer whose assets were not accepted for a bankruptcy proceeding due to insufficient funds, shall be lowered to zero value as at the day when a management company learned of this fact.

# Article 16 Cancellation provision

Decree of the Ministry of Finance of the Slovak Republic No. 611/2003 Coll. on the methods of valuation of securities, financial market instruments and derivatives owned by an open-ended fund is hereby declared null and void.

<sup>&</sup>lt;sup>23</sup> Act No. 386/2002 on state debt and state guarantees and on the amendment to the Act No. 291/2002 Coll. on the state treasury and the amendment to certain laws, as amended.

<sup>&</sup>lt;sup>24</sup> Article 80(1) of the Act No. 566/2001 Coll. as amended by the Act No. 594/2003 Coll.

<sup>&</sup>lt;sup>25</sup> Act of the National Council of the Slovak Republic No. 118/1996 Coll. on the protection of bank deposits and the amendment to certain laws, as amended.

# Article 17 Effect

This Decree shall become effective on 1 July 2009.

# Ivan Šramko Governor

represented by Viliam Ostrožlík m.p. Vice-Governor

Issued by: Regulatory and Risk Management Methodology Department

Drafted by: Collective Investment Regulatory Section

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Annex No. 1 to the Decree No. 3/2009

# Determination of aliquot interest yield value

Aliquot interest yield shall be calculated using the formula:

AIY = C.N.cont(t),

### where

AIY - aliquot interest yield as at the valuation day,

*C* - coupon rate for the current coupon period,

N - nominal value of a financial instrument,

- number of days since the last coupon payment or the number of days since the beginning of the first coupon period,

con() - the length of period calculated according to convention under the conditions of issue.

Annex No. 2 to the Decree No. 3/2009

# Determination of the value of funds on a current account and a deposit account

The value of funds on a current account and a deposit account shall be calculated using the following formula:

$$HV_{t} = \sum_{i} C_{i} (1 + r_{i}.con(t - t_{i}))$$

# where

 $C_i$  - cash flow over time  $t_i$ ,

 $r_i$  - interest rate at which a respective cash flow is paid interest on,

con() - the length of period calculated according to convention agreed in the deposit conditions.

Annex No. 3 to the Decree No. 3/2009

# Determination of the theoretical price of a debt security

(1) The theoretical price of a debt security with maturity of less than one year inclusive shall be calculated in the following manner:

$$P = \sum_{i=1}^{n} \frac{C_{i}}{(1 + (r_{i} + s).con(t_{i}))} + \frac{N}{(1 + (r_{n} + s).con(t_{n}))},$$

where

P - theoretical price of a debt security including aliquot interest yield,

 $r_i$  - required interest yield determined in line with Annex No.15,

s - risk premium determined in line with Annex No.16,

N - nominal value of a debt security,

*C<sub>i</sub>*- value of the i<sup>th</sup> coupon from a debt security; where the coupon rate is derived from the interbank market rate, future coupon rates shall be determined using the formula mentioned in Annex No. 6, par. (3) and an interbank market forward rate derived from the interbank market yield curve; where it is not possible to use the interbank market yield curve, future coupon rates shall be derived using the swap interest rate curve,

 $t_i$  - number of days to maturity of the i<sup>th</sup> coupon from a debt security, in days,

i - index of the future coupon from a debt security,

n - number of future coupons from a debt security,

 $t_n$  - number of days to maturity of a debt security, in days,

*con()* - the length of period calculated according to convention under the issue conditions of a respective debt security.

(2) The theoretical price of a debt security with maturity of more than one year shall be calculated in the following manner:

$$P = \sum_{i=1}^{n} \frac{C_{i}}{\left(1 + \left(r_{i} + s\right)\right)^{con(i_{t})}} + \frac{N}{\left(1 + \left(r_{n} + s\right)\right)^{con(t_{n})}},$$

where

P - theoretical price of a debt security including aliquot interest yield,

 $r_i$  - required interest yield determined in line with Annex No. 15,

s - risk premium determined in line with Annex No. 16,

N - nominal value of a debt security,

*C<sub>i</sub>*- value of the i<sup>th</sup> coupon from a debt security; where the coupon rate is derived from the interbank market rate, future coupon rates shall be determined using the formula mentioned in Annex No. 6, par. (3) and the interbank market forward rate derived from the interbank market yield curve; where it is not possible to use the interbank market yield curve, future coupon rates shall be derived using the swap interest rate curve,

 $t_i$  - number of days to maturity of the i<sup>th</sup> coupon from a debt security, in days,

i - index of the future coupon from a debt security,

n - number of future coupons from a debt security,

 $t_n$  - number of days to maturity of a debt security, in days,

Annex No. 4 to the Decree No. 3/2009

# Determination of the theoretical price of a money market instrument

(1) The theoretical price of a treasury bill shall be calculated using the following procedure:

$$P = \frac{N}{1 + r.con(t)},$$

where

P - theoretical price of a treasury bill,

- nominal value of a treasury bill,

*r* - required interest yield determined in line with Annex No.15,

t - the number of days to maturity of a treasury bill,

con() - the length of period calculated according to convention under the issue conditions.

- (2) The theoretical price of a certificate of deposit is calculated using the following procedure:
- a) theoretical price of a certificate of deposit with maturity of less than one year inclusive:

$$P = N \frac{(1 + r_{vl}.con(t))}{(1 + r.con(t^*))},$$

b) theoretical price of a certificate of deposit with maturity of more than one year:

$$P = N \frac{(1 + r_{vl})^{con(t)}}{(1 + r)^{con(t^*)}},$$

where

N - nominal value of a certificate of deposit,

- annual interest rate of a certificate of deposit valid for the current period, expressed as a percentage,

*r* - required interest yield determined in line with Annex No.15,

t - total maturity period of a certificate of deposit, in days

t\* - period to maturity of a certificate of deposit, in days as at the valuation date,

con() - the length of period calculated according to convention under the issue conditions.

Annex No. 5 to the Decree No. 3/2009

### Determination of the theoretical price of a forward

(1) Theoretical price of a forward with maturity of less than one year inclusive shall be calculated in the following manner:

$$\begin{split} P &= P_{poh} - P_{Zav} \,, \\ P_{poh} &= \frac{F_{poh}}{\left(1 + r.con(t)\right)}, \\ P_{zav} &= \frac{F_{zav}}{\left(1 + r.con(t)\right)}, \end{split}$$

where

P - theoretical price of a forward,

 $P_{poh}$  - value of discounted receivables from a forward,

 $P_{zav}$  - value of discounted liabilities from a forward,

 $F_{poh}$  - forward value of receivables from a forward,

 $F_{zav}$  - forward value of liabilities from a forward,

t - residual maturity period of a forward, in days

r - required interest yield determined in line with Annex No.15,

con() - the length of period calculated according to convention under the conditions of a respective derivative.

(2) Theoretical price of a forward with maturity of more than one year shall be calculated in the following manner:

$$P = P_{poh} - P_{Zav} ,$$

where

$$\begin{split} P_{poh} &= \frac{F_{poh}}{\left(1+r\right)^{con(t)}}, \\ P_{zav} &= \frac{F_{zav}}{\left(1+r\right)^{con(t)}}, \end{split}$$

where

P - theoretical price of a forward,

 $P_{poh}$  - value of discounted receivables from a forward,

 $P_{zav}$  - value of discounted liabilities from a forward,

 $F_{poh}$  - forward value of receivables from a forward,

 $F_{zav}$  - forward value of liabilities from a forward,

t - residual maturity period of a forward, in days

- required interest yield determined in line with Annex No.15,

Annex No. 6 to the Decree No. 3/2009

## Determination of the theoretical price of an FRA transaction

- (1) The theoretical price of an FRA transaction with maturity of up to one year including shall be calculated using the procedure laid down in Annex No. 5, whereas if financial settlement occurs
  - a) on day  $t_2$   $F_{poh} = N(1 + r_{fra}.con(t_{fra}))$  and  $F_{zav} = N(1 + r_{deal}.con(t_{fra}))$ , if the agreed forward interest rate is paid and the forward interest rate of a respective day is received

 $F_{poh} = N(1 + r_{deal}.con(t_{fra}))$  and  $F_{zav} = N(1 + r_{fra}.con(t_{fra}))$ , if the forward interest rate of a respective day is paid and the agreed forward interest rate is received,

b) on day  $t_1$   $Fpoh = N \text{ and } F_{zav} = N \frac{\left(1 + r_{deal} .con(t_{fra})\right)}{\left(1 + r_{deal} .con(t_{fra})\right)}, \text{ if the agreed forward interest rate is paid and the forward interest rate of a respective day is received of the solution of the solutio$ 

 $F_{poh} = N \frac{\left(1 + r_{deal}.con(t_{fra})\right)}{\left(1 + r_{fra}.con(t_{fra})\right)} \text{ and } F_{zav} = N, \text{ if the forward interest rate of a respective day is paid and the agreed forward interest rate is received,}$ 

where

*N* - agreed principal,

 $r_{ded}$  - agreed forward interest rate for the period from  $t_1$  until  $t_2$ ,

 $r_{fra}$  - forward interest rate of a respective day for the period from  $t_1$  until  $t_2$ ,

 $t_{fra} = t_2 - t_1$  - period of an FRA transaction, in days,

*con()* - the length of period calculated according to convention under the conditions of a respective derivative.

(2) The theoretical price of an FRA transaction with maturity of more than one year shall be calculated using the procedure laid down in Annex No. 5, whereas if financial settlement occurs

a) on day t2,  $F_{poh} = N(1 + r_{fra})^{con(t_{fra})} \text{ a } F_{zav} = N(1 + r_{deal})^{con(t_{fra})}, \text{ if the agreed forward interest rate is paid}$ and the forward interest rate of a respective day is received,

 $F_{poh} = N(1 + r_{deal})^{con(t_{fra})}$  a  $F_{zav} = N(1 + r_{fra})^{con(t_{fra})}$ , if the forward interest rate

of a respective day is paid and the agreed forward interest rate is received,

b) on day  $t_1$ 

$$F_{poh} = N \text{ a } F_{zav} = N \frac{\left(1 + r_{deal}\right)^{con(t_{fra})}}{\left(1 + r_{fra}\right)^{con(t_{fra})}},$$

if the agreed forward interest rate is paid and the forward interest rate of a respective day is received,

$$F_{poh} = N \frac{(1 + r_{deal})^{con(t_{fia})}}{(1 + r_{fia})^{con(t_{fia})}} \quad a \quad F_{zav} = N,$$

if the forward interest rate of a respective day is paid and the agreed forward interest rate is received

where

N - agreed principal,

 $r_{deal}$  - agreed forward interest rate for the period from  $t_1$  until  $t_2$ ,

 $r_{fra}$  - forward interest rate of a respective day for the period from  $t_1$  until  $t_2$ ,

 $t_{fra} = t_2 - t_1$  - period of an FRA transaction, in days,

*con()* - the length of period calculated according to convention under the conditions of a respective derivative.

(3) Where the forward interest rate of a respective day for the period from  $t_1$  until  $t_2$  is not available, it shall be determined using the following formula:

$$r_{fra} = \left(\frac{\left(1 + r_2\right)^{con(t_2)}}{\left(1 + r_1\right)^{con(t_1)}} - 1\right) \frac{1}{con(t_2 - t_1)},$$

where

 $r_{fra}$  - forward interest rate for the period  $(t_2 - t_1)$  valid from  $t_1$ ,

 $r_1$  - required interest yield determined in line with Annex 15 for the period  $t_1$ ,

 $r_2$  - required interest yield determined in line with Annex 15 for the period  $t_2$ ,

Annex No. 7 to the Decree No. 3/2009

# Determination of the theoretical price of an FX forward

(1) The theoretical price of an FX forward shall be calculated using the procedure laid down in Annex No.5, whereas:

$$egin{aligned} F_{poh} &= N_{poh}.FR_{poh} & ext{ and } \ F_{zav} &= N_{zav}.FR_{zav} \,, \end{aligned}$$

where

 $N_{poh}$  - agreed volume of purchased currency,

 $N_{zav}$  - agreed volume of sold currency,

 $FR_{pth}$  - forward rate of reference currency against purchased currency as of the transaction date,

 $FR_{xx}$  - forward rate of reference currency against sold currency as of the transaction date,

- (2) If the forward rate of a foreign currency against domestic currency or another determined currency is not available as at the valuation day of an FX forward, it shall be calculated using the following procedure:
  - a) for FX forwards with maturity of less than one year inclusive:

$$FR_{poh} = SR_{poh} \frac{\left(1 + r.con(t)\right)}{\left(1 + r_{poh}.con(t)\right)}, FR_{zav} = SR_{zav} \frac{\left(1 + r.con(t)\right)}{\left(1 + r_{zav}.con(t)\right)},$$

b) for FX forwards with maturity of more than one year:

$$FR_{poh} = SR_{poh} \frac{(1+r)^{con(t)}}{(1+r_{noh})^{con(t)}}, FR_{zav} = SR_{zav} \frac{(1+r)^{con(t)}}{(1+r_{zav})^{con(t)}},$$

where

 $FR_{poh}$  - forward rate of reference currency against purchased currency as of the valuation date of an FX forward,

 $FR_{zav}$  - forward rate of reference currency against sold currency as of the valuation date of an FX forward,

 $SR_{poh}$  - spot rate of reference currency against purchased currency as of the valuation date.

 $SR_{zav}$  - spot rate of reference currency against sold currency as of the valuation date,

- required interest yield for reference currency determined in line with Annex No. 15 for the period t,

- $r_{poh}$  required interest yield for purchased currency determined in line with Annex No. 15 for the period t,
- $r_{zav}$  required interest yield for sold currency determined in line with Annex No. 15 for the period t,
- con() the length of period calculated according to convention under the conditions of a respective derivative.

Annex No. 8 to the Decree No. 3/2009

# Determination of the theoretical price of a forward purchase or sale of a debt security and forward purchase or sale of an equity security

(l) Theoretical price of a forward purchase or sale of a debt security and equity security shall be calculated using the following procedure:  $P = P_{poh} - P_{zav}$ ,

where

 $P_{poh}$  - current value of forward receivables,

 $P_{zav}$  - current value of forward liabilities,

(2) Current value of receivables and liabilities from a forward purchase or sale of a debt security and an equity security with maturity of less than one year inclusive shall be calculated using the following procedures, in the case of

a) purchase of the subject of forward,

$$P_{poh} = S_0 \text{ and } P_{zav} = \frac{F_{deal}}{(1 + r.con(t))},$$

b) sale of the subject of forward,

$$P_{poh} = \frac{F_{deal}}{\left(1 + r\frac{t}{b}\right)}$$
 and  $P_{zav} = S_0$ ,

where

P - theoretical price of a forward,

- value of a debt security or equity security as of the valuation day in line with Article 3,

 $F_{deal}$  - agreed price of a debt security or an equity security,

t - residual maturity period of a forward, in days

*r* - required interest yield determined in line with Annex No.15,

con() - the length of period calculated according to convention under the conditions of a respective derivative.

- (3) Current value of a receivable and liability from a forward purchase or sale of a debt security and an equity security with maturity of more than one year shall be calculated using the following procedures, in the case of
- a) purchase of the subject of forward,

$$P_{poh} = S_0 \text{ a } P_{zav} = \frac{F_{deal}}{\left(1 + r\right)^{con(t)}},$$

$$P_{poh} = \frac{F_{deal}}{(1+r)^{con(t)}} \text{ a } P_{zav} = S_0,$$

b) the sale of the subject of forward,

### where

P - theoretical price of a forward,

 $S_0$  - value of a debt security or equity security as of the valuation day in line with Article 3,

 $F_{deal}$  - agreed price of a debt security or an equity security,

*t* - residual maturity period of a forward, in days

r - required interest yield determined in line with Annex No.15,

Annex No. 9 to the Decree No. 3/2009

# Determination of the theoretical price of a swap

(1) The theoretical price of a swap with maturity of less than one year inclusive shall be calculated in the following manner:

$$P = P_{poh} - P_{zav} ,$$

where

$$P_{poh} = \sum_{i=1}^{m} \left( \frac{F_{poh,i}}{1 + r_{i}.con(t_{i})} \right),$$

$$P_{zav} = \sum_{i=1}^{m} \left( \frac{F_{zav,i}}{1 + r_i \cdot con(t_i)} \right).$$

(2) The theoretical price of a swap with maturity of more than one year shall be calculated in the following manner:

$$P = P_{poh} - P_{zav}$$

where

$$P_{poh} = \sum_{i=1}^{m} \left( \frac{F_{poh,i}}{(1+r_i)^{con(t_i)}} \right),$$

$$P_{zav} = \sum_{i=1}^{m} \left( \frac{F_{zav,i}}{\left(1 + r_{i}\right)^{con(t_{i})}} \right),$$

where

P - theoretical price of a swap,

 $P_{ph}$  - value of discounted receivables from a swap,

 $P_{xav}$  - value of discounted liabilities from a swap,

 $F_{pohi}$  - forward price of a swap receivable for the i<sup>th</sup> payment on the valuation day of a swap,

 $F_{zabi}$  - forward price of a swap liability for the i<sup>th</sup> payment on the valuation day of a swap,

 $t_i$  - residual maturity period of the i<sup>th</sup> swap payment, in days,

 $r_i$  - required interest yield determined in line with Annex No. 15 for the period  $t_i$ ,

i - index of a future swap payment,

*n* - the number of future swap payments,

Annex No. 10 to the Decree No. 3/2009

### Determination of the theoretical price of an IRS swap

(1) The theoretical price of an IRS swap with maturity of less than one year inclusive shall be calculated using the procedure laid down in Annex No. 9, whereas:

 $F_{poh,i} = N.r_{swap,i}.con(t_{swap,i})$  a  $F_{zav,i} = N.r_{deal,i}.con(t_{swap,i})$ , if the agreed interest rate is purchased and the swap interest rate is sold,

 $F_{poh,i} = N.r_{deal,i}.con(t_{swap,i})$  a  $F_{zav,i} = N.r_{swap,i}.con(t_{swap,i})$ , if the agreed interest rate is sold and the swap interest rate is purchased,

#### where

N - agreed principal (notional value),

 $r_{swap,i}$  - swap interest rate of the i<sup>th</sup> swap payment on the valuation date of an IRS swap,

 $r_{deal,i}$  - agreed swap interest rate of the i<sup>th</sup> swap payment,

 $t_{swap,i}$  - length of the i<sup>th</sup> interest period, in days,

con() - the length of period calculated according to convention under the conditions of a respective derivative.

(2) Theoretical price of an IRS swap with maturity of more than one year shall be calculated using the procedure laid down in Annex No. 9, whereas:

 $F_{poh,i} = N[(1 + r_{swap,i})^{con(t_{swap,i})} - 1]$  **a**  $F_{zav,i} = N[(1 + r_{deal,i})^{con(v)} - 1]$ , if the agreed interest rate is purchased and the swap interest rate is sold,

 $F_{poh,i} = N[(1 + r_{deal,i})^{con(t_{swap,i})} - 1]$  a  $F_{zav,i} = N[(1 + r_{swap,i})^{con(t_{swap,i})} - 1]$ , if the agreed interest rate is sold and the swap interest rate is purchased,

#### where

N - agreed principal (notional value),

 $r_{\text{swm }i}$  - swap interest rate of the i<sup>th</sup> swap payment on the valuation day of an IRS swap,

 $r_{deal,i}$  - agreed swap interest rate of the i<sup>th</sup> swap payment,

 $t_{SWAD,i}$  - length of the i<sup>th</sup> interest period, in days,

(3) Where the swap interest rate of the i<sup>th</sup> swap payment is not available on the valuation day of an IRS swap, it shall be calculated using the following formula:

$$r_{swap,i} = \left(\frac{\left(1 + r_{i}\right)^{con(t_{i})}}{\left(1 + r_{i-1}\right)^{con(t_{i-1})}} - 1\right) \frac{1}{con(t_{i} - t_{i-1})},$$

Who of the period of the i-th swap payment, in days,

 $t_i$  - length of period until the i<sup>th</sup> swap payment, in days,

 $t_{i-1}$  - length of period until the i-1<sup>st</sup> swap payment, in days,

con() - length of period calculated according to convention under the conditions of a respective derivative,

- required interest yield determined in line with Annex No. 15 for the period  $t_i$ ,

 $r_{i-1}$  - required interest yield determined in line with Annex No. 15 for the period  $t_{i-1}$ .

Annex No. 11 to the Decree No. 3/2009

# Determination of the theoretical price of an FX swap

(1) The theoretical price of an FX swap shall be calculated using the procedure laid down in Annex No. 9, whereas:

$$F_{poh} = N_{poh}.FR_{poh}$$

$$F_{zav} = N_{zav}.FR_{zav},$$

where

-agreed volume of purchased currency,  $N_{poh}$ 

 $N_{zav}$  - agreed volume of sold currency,

 $FR_{poh}$  - forward rate of the i<sup>th</sup> exchange of reference currency against purchased currency on the valuation day of a swap,

 $FR_{zav}$  - forward rate of the i<sup>th</sup> exchange of reference currency against sold currency on the valuation day of a swap.

(2) If the forward rate of the ith exchange of reference currency against purchased or sold currency is not available on the valuation day of a swap, it shall be determined using the following procedure, in the case of

a) an FX swap with maturity of less than one year inclusive 
$$FR_{poh,i} = SR_{poh} \frac{(1 + r_i.con(t_i))}{(1 + r_{poh,i}.con(t_i))},$$

$$FR_{zav,i} = SR_{zav} \frac{\left(1 + r_i.con(t_i)\right)}{\left(1 + r_{zav,i}.con(t_i)\right)},$$

b) FX swap with maturity of more than one year,

$$FR_{poh,i} = SR_{poh} \frac{(1+r_i)^{con(t_i)}}{(1+r_{poh,i})^{con(t_i)}},$$

$$FR_{zav,i} = SR_{zav} \frac{(1+r_i)^{con(t_i)}}{(1+r_{zav,i})^{con(t_i)}},$$

$$FR_{zav,i} = SR_{zav} \frac{\left(1 + r_i\right)^{con(t_i)}}{\left(1 + r_{zav,i}\right)^{con(t_i)}},$$

where

 $SR_{poh}$  - spot rate of purchased currency against reference currency as of the valuation day of a swap,

 $SR_{zav}$  - spot rate of sold currency against reference currency as of the valuation day of a swap,

- required interest yield for reference currency determined in line with Annex No. 15  $r_i$ for the period  $t_i$ ,

- $r_{poh,i}$  required interest yield for purchased currency determined in line with Annex No. 15 for the period  $t_i$ ,
- $r_{zav,i}$  required interest yield for sold currency determined in line with Annex No. 15 for the period  $t_i$ ,
- con() length of period calculated according to convention under the conditions of a respective derivative.

Annex No. 12 to the Decree No. 3/2009

# Determination of the theoretical price of a basis swap

(l) The theoretical price of a basis swap with maturity of less than one year inclusive shall be calculated using the procedure laid down in Annex No. 9, whereas:

$$F_{poh,i} = N.r_{poh,i}.con(t_{swap,i})$$
 a  $F_{zav,i} = N.r_{zav,i}.con(t_{swap,i})$ ,

where

N - agreed principal (notional value),

 $r_{poh,i}$  - swap interest rate of a receivable of the i<sup>th</sup> swap payment on the valuation day of a swap,

- swap interest rate of a liability of the i<sup>th</sup> swap payment on the valuation day of a swap

 $t_{swap,i}$  - length of the i<sup>th</sup> interest period, in days,

*con()* - length of period calculated according to convention under the conditions of a respective derivative.

(2) Theoretical price of a basis swap with maturity of less than one year inclusive shall be calculated using the procedure laid down in Annex No. 9, whereas:

$$F_{poh,i} = N \Big[ \Big( 1 + r_{poh,i} \Big)^{con(t_{swap,i})} - 1 \Big] \text{ a } F_{zav,i} = N \Big[ \Big( 1 + r_{zav,i} \Big)^{con(t_{swap,i})} - 1 \Big],$$

where

N - agreed principal (notional value),

- swap interest rate of a receivable of the i<sup>th</sup> swap payment on the valuation day of a swap,

 $r_{avi}$  - swap interest rate of a liability of the i<sup>th</sup> swap payment on the valuation day of a swap

 $t_{swan i}$  - length of the i<sup>th</sup> interest period, in days,

Annex No. 13 to the Decree No. 3/2009

# Determination of the theoretical price of a cross currency-interest rate swap

(1) The theoretical price of a cross currency-interest rate swap with maturity of less than one year inclusive shall be calculated in the following manner:

$$\begin{split} P_{poh} &= \frac{N_{poh}FR_{poh,1}}{1 + r_{d,1}.con(t_1)} + \frac{N_{zav}FR_{zav,2}}{1 + r_{d,2}.con(t_2)} + \sum_{j=1}^{n} \left( \frac{N_{zav}.r_{poh,j}.con(t_{swap,j}).FR_{zav,j}}{1 + r_{d,j}.con(t_j)} \right), \\ P_{zav} &= \frac{N_{zav}FR_{zav,1}}{1 + r_{d,1}.con(t_1)} + \frac{N_{poh}FR_{poh,2}}{1 + r_{d,2}.con(t_2)} + \sum_{j=1}^{n} \left( \frac{N_{poh}.r_{zav,j}.con(t_{swap,j}).FR_{poh,j}}{1 + r_{d,j}.con(t_j)} \right). \end{split}$$

(2) The theoretical price of a cross currency-interest rate swap with maturity of more than one year shall be calculated in the following manner:

$$\begin{split} P_{poh} &= \frac{N_{poh}FR_{poh,1}}{\left(1 + r_{d,1}\right)^{con(t_1)}} + \frac{N_{zav}FR_{zav,2}}{\left(1 + r_{d,2}\right)^{con(t_2)}} + \sum_{j=1}^{n} \left(\frac{N_{zav}\left[\left(1 + r_{poh,j}\right)^{con(t_{swap,j})} - 1\right]FR_{poh,j}}{\left(1 + r_{d,j}\right)^{con(t_j)}}\right), \\ P_{zav} &= \frac{N_{zav}FR_{zav,1}}{\left(1 + r_{d,1}\right)^{con(t_1)}} + \frac{N_{poh}FR_{poh,2}}{\left(1 + r_{d,2}\right)^{con(t_2)}} + \sum_{j=1}^{n} \left(\frac{N_{poh}\left[\left(1 + r_{zav,j}\right)^{con(t_{swap,j})} - 1\right]FR_{zav,j}}{\left(1 + r_{d,j}\right)^{con(v)}}\right), \end{split}$$

where

 $P_{poh}$  - value of discounted receivables from a swap,

 $P_{zav}$  - value of discounted liabilities from a swap,

 $t_1$  - beginning of a cross currency-interest rate swap,

- end of a cross currency-interest rate swap,

 $t_i$  - residual maturity of the j<sup>th</sup> interest rate payment of a swap,

con() -length of period calculated according to convention under the conditions of a respective derivative,

- required interest yield for the reference currency determined in line with Annex No. 15 for the period  $t_1$ ,

- required interest yield for the reference currency determined in line with Annex No. 15 for the period  $t_2$ ,

- required interest yield for the reference currency determined in line with Annex No. 15 for the period  $t_i$ ,

 $N_{poh}$  - volume of purchased currency bought over time  $t_1$  and sold back over time  $t_2$ ,

 $N_{zav}$  - volume of sold currency sold over time  $t_1$  and repurchased over time  $t_2$ ,

 $FR_{poh,i}$  - forward rate of the reference currency against purchased currency to the i<sup>th</sup> exchange of the volume of foreign currency as of the valuation day of a swap,

- $FR_{zav,i}$  forward rate of the reference currency against sold currency to the i<sup>th</sup> exchange of the volume of foreign currency as of the valuation day of a swap,  $r_{poh,j}$  swap interest rate of a receivable of the j<sup>th</sup> swap payment as at the valuation day of a
- $r_{zav,j}$  swap interest rate of a liability of the j<sup>th</sup> swap payment on the valuation day of a swap.

Annex No. 14 to the Decree No. 3/2009

# Determination of the theoretical price of a European option

(1) The theoretical price of a European call option on an equity security from which no dividend is paid shall be calculated in the following manner:

$$P = S_0 N(d_1) - E e^{-r\frac{t}{b}} N(d_2), \text{ whereas}$$

$$d_1 = \frac{\left(r + \frac{\sigma^2}{2}\right) \frac{t}{b} + \ln \frac{S}{E}}{\sigma \sqrt{\frac{t}{b}}},$$

$$d_2 = d_1 - \sigma \sqrt{\frac{t}{b}},$$

where

P - theoretical price of a European call option,

 $S_0$  - price of an equity security on the valuation day of an option,

*E* - expiry price of an equity security,

t - residual maturity period of an option until expiry, in days,

b - basis of the number of days in a year,

 $\sigma$  - historical volatility of an equity security expressed in years,

r - required continuous interest yield for the period t,

N() - cumulative distribution function of normal distribution with the medium value of 0 and variance 1.

(2) The theoretical price of a European put option on an equity security from which no dividend is paid shall be calculated in the following manner:

$$P = Ee^{-r\frac{t}{b}}N(-d_2) - S_0N(-d_1), \text{ whereas}$$

$$d_1 = \frac{\left(r + \frac{\sigma^2}{2}\right)\frac{t}{b} + \ln\frac{S}{E}}{\sigma\sqrt{\frac{t}{b}}},$$

$$d_2 = d_1 - \sigma\sqrt{\frac{t}{b}},$$

where

P - theoretical price of a European put option,

 $S_0$  - price of an equity security on the valuation day of an option,

E - expiry price of an equity security,

t - residual maturity period of an option, in days

b - basis of the number of days in a year,

- $\sigma$  historical volatility of an equity security expressed in years,
- r required continuous interest yield for the period t,
- N() cumulative distribution function of normal distribution with the medium value of 0 and variance 1.
- (3) Where continuous interest yield is not available, it shall be calculated in the following manner:

$$r = \ln(1 + r_d),$$

where

- $r_d$  required interest yield determined in line with Annex No. 15 for the period t.
- (4) Where historical volatility of a respective equity security is not available, it shall be calculated in the following manner:

$$\sigma = \sigma_d \sqrt{250}$$
,

whereas

$$\sigma_d^2 = \frac{1}{n-2} \sum_{i=2}^n \left( X_i - \overline{X} \right)^2,$$

$$X_i = \ln \frac{S_i}{S_{i-1}},$$

$$\overline{X} = \frac{1}{n-1} \sum_{i=2}^{n} X_i ,$$

where

- $\sigma$  historical volatility of an equity security expressed in years,
- $\sigma_d$  historical volatility of an equity security expressed in days,
- $S_i$  price of a respective equity security on day i,
- number of business days from the beginning of the quotation of the price of an equity security; number of days for which the historical volatility of an equity security is calculated,
- i = 1,2,3 index of business days from the beginning of the price quotation of an equity security.

Annex No. 15 to the Decree No. 3/2009

# Determination of the required interest yield of cash flows arising from a financial instrument

(1) Required interest yield of cash flows arising from a financial instrument (hereinafter referred to as "required interest yield") shall be determined using the method of linear interpolation from the yield curve of a zero coupon bond, using the following formula:

$$r = \frac{t^+ - t}{t^+ - t^-} r^- + \frac{t - t^-}{t^+ - t^-} r^+,$$

where

r - required interest yield,

- maturity period of the cash flow from a financial instrument,

 $t^{+}$  - the closest longer maturity period available on the yield curve of a zero coupon bond,

- the closest shorter maturity period available on the yield curve of a zero coupon bond,

 $r^{+}$  - value of the interest rate on the yield curve of a zero coupon bond belonging to the closest longer maturity period available on the yield curve of a zero coupon bond,

- value of interest rate on the yield curve of a zero coupon bond belonging to the closest shorter maturity period available on the yield curve of a zero coupon bond.

- (2) Unless stated otherwise, all interest rates are expressed as an annual percentage rate.
- (3) The yield curve of a zero coupon bond is composed using bootstrapping, in the case of financial instruments with maturity
  - a) shorter than one year inclusive, from interbank market interest rates, for the currency in which the respective financial instrument is denominated,
  - b) longer than one year, from interbank market swap interest rates in the currency in which a respective financial instrument is denominated.

Annex No. 16 to the Decree No. 3/2009

# Determination of the risk premium of a debt security

- (1) The risk premium of a debt security represents a positive or a negative premium against required interest yield or yield to maturity of a respective debt security determined in line with the procedure laid down in Annex 15. The sum of these values represents the total required interest yield or total yield to maturity.
- (2) Where the measure of premium is not available for a debt security, risk premium of a debt security shall be calculated using the average premium of a debt security from the same issuer, in the same currency, with the closest shorter and closest longer maturity period (hereinafter referred to as "comparable debt security").
- (3) The risk premium of a debt security shall be determined as an arithmetical average of the risk premiums of comparable debt securities. Risk premiums of comparable securities shall be determined from the prices of comparable debt securities determined in line with Article 3(1), in the case of a comparable debt security with maturity
  - a) of less than one year inclusive, using the procedure laid down in Annex 3, paragraph 1,
  - b) longer than one year, using the procedure laid down in Annex No. 3, paragraph 2.
- (4) Where no comparable debt security exists or where its price as per Article 3(1), not older than ten business days, is not available, the risk premium of a debt security shall be determined as an arithmetic average of the risk premiums of debt securities of the parent company of the issuer of a respective debt security with the closest shorter and closest longer maturity period. Risk premiums in the above example shall be calculated using the procedure laid down in paragraph 3 in the same manner.
- (5) Where it is not possible to determine the risk premium of a debt security in line with paragraphs (1) to (4), the risk premium of a debt security shall be determined by the administrator upon agreement with the fund depositary, taking into account the issuer's credit quality, the amount and nature of a possible guarantee and the guarantor's credit quality, the risk margins of debt securities of the same issuer or a parent company in different currencies taking into account the different interest rates, current CDS spreads, the length of maturity of a debt security and the currency in which a debt security is denominated.
- (6) Where the conditions of the payout of yields or principal of a debt security for which a risk premium is determined are different from those of comparable debt securities, procedure laid down in paragraph (5) shall be used proportionally.