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**STRUCTURED CERTIFICATES OF DEPOSIT  
AS AN EXAMPLE OF ALTERNATIVE INVESTMENTS  
ON THE FINANCIAL MARKET**

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Key words: alternative investment, structured products, structured certificates of deposit.

A b s t r a c t

The object of research has been the Structured Certificates of Deposit issued by a bank for which the reference index is the EUR/USD exchange rate. The research has been carried out on the basis of three hypothetical situations of the EUR/USD exchange rate on the foreign exchange market.

**STRUKTURYZOWANE CERTYFIKATY DEPOZYTOWE JAKO PRZYKŁAD INWESTYCJI  
ALTERNATYWNEJ NA RYNKU PIENIĘŻNYM**

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Słowa kluczowe: inwestycje alternatywne, strukturyzowane produkty, strukturyzowane certyfikaty depozytowe.

A b s t r a k t

Celem artykułu jest ocena opłacalności inwestowania w strukturyzowane instrumenty finansowe dostępne na polskim rynku pieniężnym. Przedmiotem badań jest Strukturyzowany Certyfikat Depozytowy (SCD) emitowany przez bank, którego indeksem odniesienia jest poziom kursu EUR/USD. Badania przeprowadzono na podstawie trzech hipotetycznych scenariuszy kształtowania się kursu EUR/USD na rynku walutowym w zależności od trzech kwot inwestycji.

## **Introduction**

Growth of new products that include structured certificates of deposit is observed in the Polish financial market. Those instruments represent investments alternative to traditional forms, such as bank deposits. They encompass a wide and diversified group of financial products and services. The alternative investments include, among others the hedge type funds, funds of funds, private equity/venture capital type funds, structured products, investments in works of art, real property and other.

Alternative investments are available mainly to institutional investors and wealthy individual investors as the investors intending to invest their cash surplus in hedging funds or private equity funds must usually invest the amount of several million zlotys. Conditions offered by those funds often eliminate small investors. Additionally, long-term character of alternative investments requires freezing the capital for a couple or even several years. As a consequence many retail investors are not ready to allocate their capital for such a long time, even if the award in a long-term perspective is to be a high rate of return.

### **The nature and notion of structured financial products (instruments)**

Structured financial instruments offered by banks and other financial institutions represent an alternative funds investment option for retail investors. Those instruments are innovative products targeted mainly at small clients participating in the financial market. Structured instruments combine “conservatism” of traditional deposits with investments in specific financial instruments. Structuring of the instrument represents the design of such a financial product where the level of interest paid can be dependent on the value of indexes such as: currency exchange rates, stock exchange indexes, interest rates, stock process and other. Depending on the type of reference index (indexes) the structured instruments are divided into the following groups (GUDASZEWSKI, HNATIUK 2004): Equity-Linked Notes (stock prices, stock exchange indexes are the reference indexes), Credit-Linked Notes (bank events, e.g. bankruptcy, change of credit spread are the reference indexes), Commodity-Linked Notes (prices of commodity instruments are the reference indexes), Currency-Linked Notes (currency exchange rates or baskets of currencies are the reference indexes), Interest-Rate-Linked Notes (market interest rates, e.g. WIBOR are the reference indexes) and Hedge-Fund-Linked Notes (measures of value of the hedge type funds units are the reference indexes).

When the criterion is the purpose for which the structured instrument was designed, we divide the instruments into Principal Protected Notes (PPN) and Yield Enhanced Notes (YEN). The first category covers products that do not offer the investor the possibility of participation in current revenues until maturity of the instrument. The basic objective for establishment of the instrument is to secure the capital invested against decrease in value. The main advantage of the Principal Protected Notes is that they guaranty the reimbursement of the entire invested principal and additional rate of return resulting from the change in the reference index for the investor. In that way the risk of loss of the invested capital is eliminated. The second category of products – Yield Enhanced Notes – covers the products that offer the investor systematic income. In this case the rate of return on investment is often higher than the average interest on fixed rate deposits. The investor who invested his capital bears the risk related to not receiving back a part of the amount of capital invested if the base instrument does not achieve the expected result.

Capital invested in a structured instrument consists of two basic parts. The first one – safe – is invested in risk free instruments, e.g. treasury securities while the second one – risk bearing – is invested in derivative instruments, in most cases the options. A typical structured instrument is a capital-guaranteed product the safe part of which consists of zero-coupon bond coupled with the option for purchase of the base instrument (index or basket of indexes). The total amount disbursed to the buyer of instrument structured in that way at the end of the investment period will depend on the change in price of the reference index. On maturity date of zero-coupon bond the investor will receive reimbursement of the entire capital invested (the nominal value of bonds). If the situation at the end of the investment period is favorable, the investor, in addition to reimbursement of capital invested, will also receive income resulting from the change in the base instrument (index) price. That situation is presented in Figure 1.

Although Polish market of structured instruments is small, products linked to the capital market appear in the offer of products, mainly offered by banks. Those products have been prepared mainly for medium size clients from private banking segment who want to invest their money in the market on their own. The typical products offered for some time for that group of customers include investment deposits. Those are instruments that offer increased interest rates than classic time deposits included in offers of banks coupled with limited risk. Banks offering such deposits usually guarantee fixed and strictly specified interest rate and achievement of additional profit depending on the situation on the capital markets. Limitation of the risk of loss of capital value by offering the investor the disbursement of 100% of the initial investment amount is the additional benefit for the investor. There are also deposits dependent on the results of investment funds. In that type of products

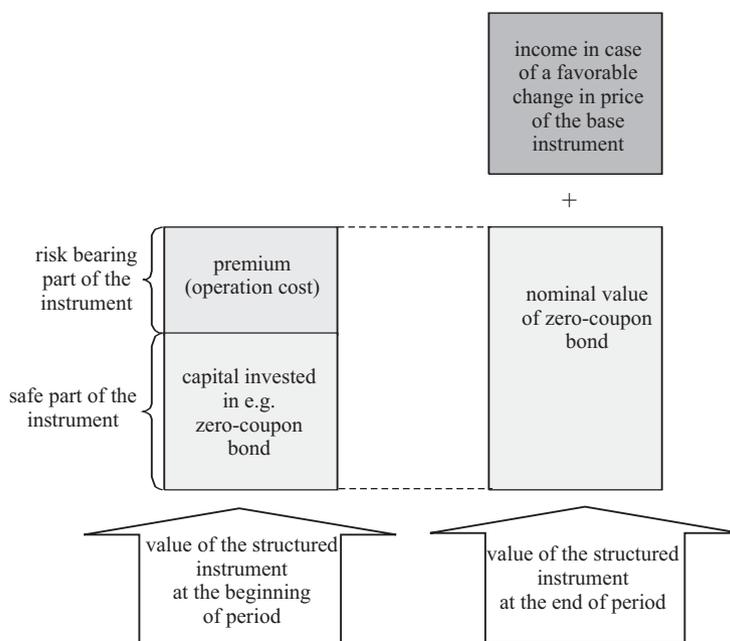


Fig. 1. Design and behavior over time of a structured financial instrument based on zero-coupon bond coupled with base instrument purchase option

Source: Own work.

the investor is given the possibility to decide which part of the money will remain on banking account and how much will be invested in funds. The investment deposits are usually established for 2 to 5 years and are not renewable.

The structured certificate of deposit (SCD) is another quite interesting structured product included in the offer of the major banks. That certificate is a short-term bearer securities issued by banks. At SCD maturity the issuing bank commits itself to disburse to the buyer the amount invested together with the interest due. The interest is dependent on the market variable selected, e.g. currency exchange rate, level of interest rates, stock exchange index, stocks purchase price, etc. The investment in SCD offers the possibility of achieving higher return than on bank deposits on conditions of fulfillment of the market assumptions made while it guarantees reimbursement of capital on investment maturity.

The bank selling that instrument guarantees that on the date of maturity of the investment it will purchase back the SCD from the client at a price equal to the purchase price determined at the beginning of the investment period. This means that on the date of maturity the investor will receive at least the

amount invested in the SCD. On any other day preceding the maturity date the bank does not guarantee 100% reimbursement of capital invested.

### Aim and methodology of studies

The study aims at determining the profitability of investment in structured certificate of deposit issued by a bank for which the reference index is the EUR/USD exchange rate. The instrument was issued on 12–21 November 2007 and targeted at clients who forecast strengthening of the USD against the EUR during the period of 6 months following the issuance date. According to the conditions of the investment the client will receive premium interest if the expectations of the clients concerning the changes in the EUR/USD exchange rate prove right. The conditions of investment and threshold profitability amounts depending on the amount invested in the SCD are presented in Table 1.

Conditions of investment in structured certificates of deposit

Table 1

Subscription period	12-21 November
Reference exchange rate	EUR/USD ECB fixing of 22 November 2007
Fixing date	23 May 2008
Settlement rate	EUR/USD rate computed according to the formula: fixing NBP EUR/PLN divided by fixing USD/PLN, of 22 November 2007
Investment period	24 November 2007 – 25 May 2008
Issuance date	24 November 2007
SCD buy back date	25 May 2008
Interest payment date	25 May 2008
Nominal value of 1 SCD	500 USD

Source: Prepared on the basis of bank SCD issuance conditions.

The interest on the investment will accrue according to the following formula:

$$(\text{reference exchange rate} - \text{settlement exchange rate}) \times \text{participation level} \times 360/182$$

The studies were conducted on the basis of three hypothetical scenarios (situations) of EUR/USD exchange rate development in the foreign exchange market on instrument maturity date. The actual profitability rate of the

studied instrument was computed for three ranges of amounts of investments in USD at specified participation levels. The ranges of investment amounts, participation levels and maximum investment profitability ranges for three groups of investors are presented in Table 2.

Table 2  
Maximum profitability amounts and participation levels depending on the investment amount

Investment amount in USD	Participation level (%)	Maximum investment profitability (%)
50 000	58.65	7.2
25 000 – 49 500	44.49	5.5
3 000 – 24 500	28.32	3.5

Source: Prepared on the basis of bank SCD issuance conditions.

If on the fixing date (23 May 2008) the settlement exchange rate will be equal or higher than the purchase exchange rate, the profitability of investment will be 0% per annum. The development of the certificate coupon interest level depending on the reference exchange rate is presented in Table 3.

Table 3  
Assumed values of EUR/USD ECB fixing and interest rate of the coupon within three ranges on the investment maturity date (22 November 2007)

EUR/USD ECB fixing of 22 November 2007	Coupon interest rate (% p.a.)
Under 1.4200	7.2/5.5/3.5
Lower than 1.4825, but over 1.4200	According to the formula: (1.4825 – <b>settlement exchange rate</b> ) x participation level in % x 360/182
Equal to or higher than 1.4825	0%

Source: Prepared on the basis of bank SCD issuance conditions.

According to hypothetical scenarios on the foreign exchange market on 23 May 2008 where depending on the three forms of investment (>50 000, 25 000 ÷ 49 500 and 3000 ÷ 24 500 USD) three situations occurred according to which the **settlement exchange rates** ( $K_{roz}$ ) were as follows:

1. 1.4300,
2. 1.4180,
3. 1.4900.

In the studies two exchange rates were assumed: the reference rate ( $K_{od}$ ) at 1.4825 EUR/USD and minimum rate ( $K_{min}$ ) at 1.4200 EUR/USD. If the

settlement exchange rate on the instrument maturity date is equal to or lower than  $K_{min}$ , then the investor will obtain the maximum profitability of the investment, i.e. 7.2/5.5/3.5% (depending on the amount of capital invested).

### Results of studies

The development of bank structured certificates of deposit depending on three forms of investment in that instrument is presented in Tables 4, 5 and 6, while the profiles of disbursements to investors in each of the three situations are presented in Figures 2-10.

#### Situation I

The settlement exchange rate is lower than the reference rate but higher than the minimum rate

$$K_{min} < K_{roz} < K_{od}$$

$$K_{roz} = 1.4300 \text{ EUR/USD}$$

Table 4  
Development of profitability depending on the capital amount of the investment (SCD) in situation I

Investment amount in USD	SCD profitability on instrument maturity data (%)	Maximum profitability of the investment guaranteed by the bank (%)	Actual profitability (%)
50 000 >	$(1.4825 - 1.4300) \times 58.65\% \times 360/182 = \mathbf{6.1}$	7.2	6.1
25 000 ÷ 49 500	$(1.4825 - 1.4300) \times 44.49\% \times 360/182 = \mathbf{4.6}$	5.5	4.6
3 000 ÷ 24 500	$(1.4825 - 1.4300) \times 28.32\% \times 360/182 = \mathbf{2.9}$	3.5	2.9

Source: Own work.

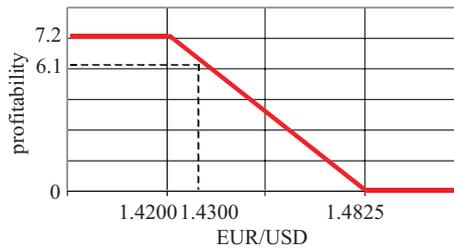


Fig. 2. Disbursement profile for the investor (>50 000 USD), if  $K_{roz} = 1.4300 \text{ EUR/USD}$   
Source: Own work.

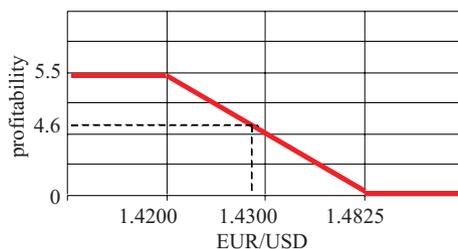


Fig. 3. Disbursement profile for the investor (25 000 ÷ 49 500 USD), if  $K_{roz} = 1.4300$  EUR/USD  
Source: Own work.

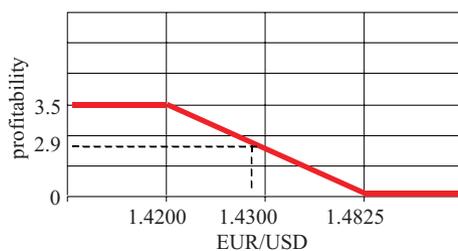


Fig. 4. Disbursement profile for the investor (3000 ÷ 24 500 USD), if  $K_{roz} = 1.4300$  EUR/USD  
Source: Own work.

## Situation II

Settlement exchange rate is lower than the minimum rate

$$K_{roz} < K_{min}$$

$$K_{roz} = 1.4180 \text{ EUR/USD}$$

Table 5  
Development of profitability depending on the capital amount of the investment (SCD) in situation II

Investment amount in USD	SCD profitability on instrument maturity data (%)	Maximum profitability of the investment guaranteed by the bank (%)	Actual profitability (%)
50 000 >	$(1.4825 - 1.4180) \times 58.65\% \times 360/182 = \mathbf{7.5}$	7.2	7.2
25 000 ÷ 49 500	$(1.4825 - 1.4180) \times 44.49\% \times 360/182 = \mathbf{5.7}$	5.5	5.5
3 000 ÷ 24 500	$(1.4825 - 1.4180) \times 28.32\% \times 360/182 = \mathbf{3.6}$	3.5	3.5

Source: Own work.

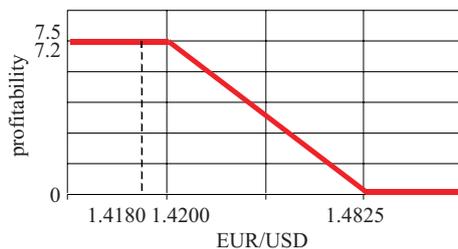


Fig. 5. Disbursement profile for the investor (>50 000 USD) if  $K_{roz} = 1.4180$  EUR/USD  
Source: Own work.

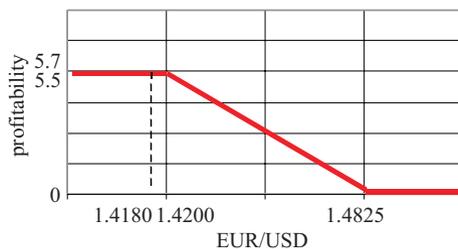


Fig. 6. Disbursement profile for the investor (25 000 ÷ 49 500 USD), if  $K_{roz} = 1.4180$  EUR/USD  
Source: Own work.

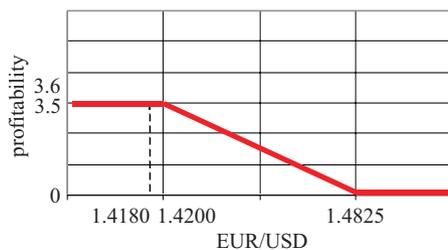


Fig. 7. Disbursement profile for the investor (3000 ÷ 24 500 USD), if  $K_{roz} = 1.4180$  EUR/USD  
Source: Own work.

**Situation III**

Settlement exchange rate is higher than the reference rate

$$K_{roz} > K_{od}$$

$$K_{roz} = 1.4900 \text{ EUR/USD}$$

Table 6

Development of profitability depending on the capital amount of the investment (SCD)  
in situation III

Investment amount in USD	SCD profitability on instrument maturity data (%)	Maximum profitability of the investment guaranteed by the bank (%)	Actual profitability (%)
50 000 >	$(1.4825 - 1.4900) \times 58.65\% \times 360/182 = -0.9$	7.2	0
25 000 ÷ 49 500	$(1.4825 - 1.4900) \times 44.49\% \times 360/182 = -0.7$	5.5	0
3 000 ÷ 24 500	$(1.4825 - 1.4900) \times 28.32\% \times 360/182 = -0.4$	3.5	0

Source: Own work.

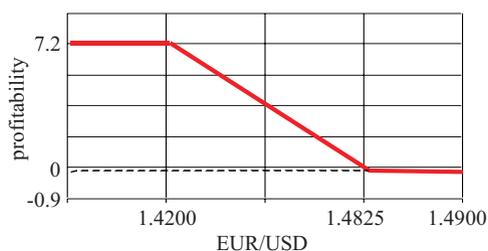


Fig. 8. Disbursement profile for the investor (>50 000 USD), if  $K_{roz} = 1.4900$  EUR/USD  
Source: Own work.

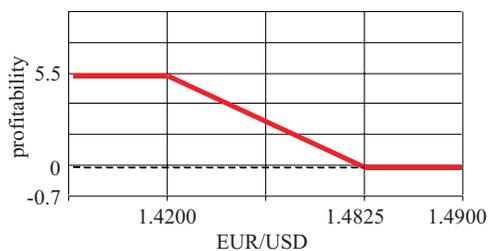


Fig. 9. Disbursement profile for the investor (25 000 ÷ 49 500 USD), if  $K_{roz} = 1.4900$  EUR/USD  
Source: Own work.

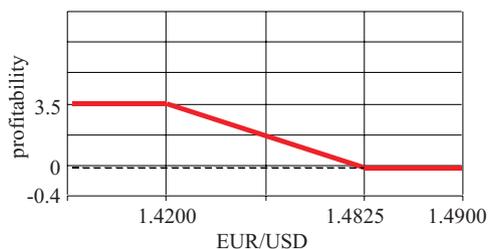


Fig. 10. Disbursement profile for the investor (3000 ÷ 24 500 USD), if  $K_{roz} = 1.4900$  EUR/USD  
Source: Own work.

On the basis of the development of reference exchange rate and settlement exchange rate on the date of maturity of the structured financial instrument it can be concluded that the investor will achieve the maximum profitability in situations I and II. In the first situation, when the settlement rate is higher than the reference rate but lower than the minimum rate, the investor will be able to achieve actual profitability at the level (depending on the value of investment amount) equal to: 6.1/4.6/2.9% respectively. In the second situation, when the value of settlement rate is lower than the value of the minimum rate the investor will be able to achieve the maximum value of interest stipulated in the agreement. In case of this scenario the actual profitability for the investor will be: 7.2/5.5/3.5% respectively. In case of the third situation, when the settlement rate is higher than the reference rate the investor will not achieve the positive rate of return, but he will receive 100% reimbursement of capital invested.

## **Conclusion**

In taking the investment decisions by people intending to invest their money in financial instruments including structured certificates of deposit available in the financial market attention should be paid to the current situation and market standing. Variability in prices of financial and commodity instruments, currency exchange rates and lack of stability of market exchange rates and other factors characterize the financial market. That is why taking an investment decision by the investor should result from the current economic situation in the financial market.

Summarizing the considerations presented so far it should be concluded that structured certificates of deposit are an alternative product to the classic bank deposit offered by the banks in the financial market. Those are instruments that offer the potential investors the opportunity of involvement in the financial markets as well as commodity markets while guaranteeing reimbursement of capital invested. Clients deciding to purchase such certificates should realize that the bank, besides guaranteeing reimbursement of capital invested, does not offer any guarantee of additional profit, which depends on the development of indexes in the market. On the other hand that type of investment allows limiting the risk of loss of the capital. Considering the benefits offered by the structured certificates of deposit an increased rate of development of the market for such instruments in Poland should be expected.

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