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CREDIT SWAPS AS INSTRUMENTS SECURING FROM THE RISK

Abstract. The interest in the problem of credit risk has significantly increased within the last few dozen years. Scientific literature presents a lot of methods of the credit risk limitation whereas banks try, with various results, to bring proposed methods into effect. Credit derivatives have been ones of the most important innovations of the last years in the world financial system. Their innovation causes that they become objects of the interest of researchers as well as business entities. This paper pays attention to the definition and types of credit derivatives. The author makes also an attempt at indicating the application of these instruments.

Key words: swaps, risk, derivatives.

1. DEFINITION OF CREDIT DERIVATIVES

Credit derivatives are recognized as the most important financial innovations, which have appeared within the last few years. They came into being as the response to the banks' needs concerning the managing and keeping the capital required by the regulating authorities as well as securing from the credit risk. It is necessary to add that they enable the improvement of the risk proportion and the profitability of loans portfolio without any detriments to relations with clients. In professional literature we can come across many definitions of credit derivatives. That is why the most often quoted ones are worth presenting.

J. B. Caouette, E. J. Altman, I. P. Naryman and D. N. Chorafas unanimously claim that credit derivatives enable the credit risk turnover which is different from the other types of the risk and features of the particular financial instrument (Jackowicz 2001). J. T. Moser in his deliberations about credit derivatives and the credit risk seems to be convinced that credit derivatives are the mechanism of the credit risk management

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(Jackowicz 2001). J. T. Miser pays attention to the possibility of debtor's default on particular obligations and the lack of the ability to service the debt. R. S. Neal also deals with the problem of credit derivatives. He notices that the credit risk can be defined in absolute categories as the probability of debtor's default on obligations or only as the variability of the probability of default on obligations around the expected value of this probability. R. S. Neal claims in his papers that the effects of the credit risk are experienced by both the parties, that is the entities making the capital available as well as the ones, who gain it. In his final deliberations Neal is convinced that credit derivatives are contracts which deliver security from losses connected with the credit risk.

It is also necessary to mention the names of D. Gaines and K. Kane who define credit derivatives as financial contracts providing the exchange of money flows with the reservation that payments of one of the parties depend on developing of the credit risk of the base instrument (Jackowicz 2001).

J. Nelken giving the definition of credit derivatives clearly highlights the fact that their value mainly depends on the credit risk of the base instrument. What is more, he thinks that with the credit risk transfer, other types of the risk can be transported on the entity offering security.

K. Jajuga gives his opinion about credit derivatives, too. He claims that their value depends on the appearance of the event which changes the level of the credit risk of one of the contract's parties (Jajuga 1999). Jajuga distinguishes two basic groups of credit derivatives:

- credit spread instruments,
- credit default instruments.

In the first of the above mentioned groups, the value of the basic instrument makes the difference between required return rate from realized investments and the risk-free rate. The increase of this value denotes the increase of the credit risk. We can secure ourselves from that risk by buying appropriate derivatives (Jajuga 1999).

In the second group, the derivatives value depends on the probability of non-fulfilment of conditions by the second party. The increase of this value means the increase of the credit risk from which we can secure ourselves by buying appropriate derivatives (Jajuga 1999).

Concluding deliberations about the credit derivatives definition, it is necessary to note that the construction of each of them contains the mechanism of the results compensation of defined in advance symptoms of the credit risk appearing.

2. TYPES OF CREDIT DERIVATIVES

Credit derivatives separate and isolate the credit risk allowing for its turnover in order to (Kasapi 2002):

- the credit risk reversion,
- the credit risk transfer,
- secure from the credit risk.

Credit derivatives market is divided into the following sectors (Kasapi 2002):

- endangered credit assets,
- credits on the rising markets.

Credit derivatives are used by three groups of users: financial institutions, individual investors and corporations. Financial institutions use credit derivatives in order to secure themselves from the credit risk, improve the

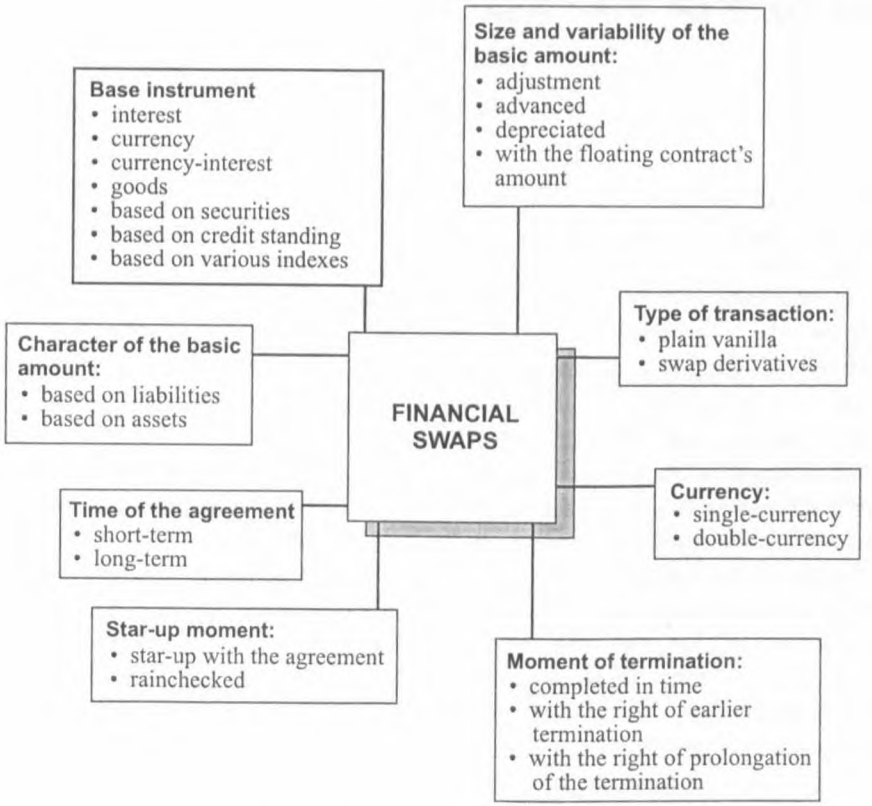

Fig. 1. Typology of financial swaps
Source: own study on the ground of Tymuła (2000)

diversification of the credit portfolio and increase the income from available credits. Individual investors aim at improving the investment profitability and decreasing the credit risk. The last group uses credit derivatives in order to manage the credit risk resulting from their normal activity.

The basic types of credit derivatives are as follows (Kasapi 2002):

- instruments of the credit default type – swaps, credit options, indemnity agreements,
- income swaps (known as loan swaps),
- spread credit products – spread credit options, forward contracts.

We cannot omit defining, at least in a few words, the above mentioned instruments but it is worth drawing attention to swaps which are one of the most important contracts. There exists a fairly well developed market of the classical swap contracts in Poland, that is currency swap, interest swap and currency-interest swap. However, there is a lack of the market segment of the second-generation swaps. Swaps contracts can be classified considering various criteria (Figure 1):

2.1. Credit Swaps

Declining economic growth in Poland in the last few years has caused exacerbating of the quality of banks' credit portfolio. Under such circumstances banks, as well as the other financial entities, are forced to look for better methods of the credit risk managing. These entities develop and improve the instrumentation of the credit estimation in the first place however, transactions securing from the credit risk are made sparsely. First of all, it results from the fact that for many investors these transactions seem to be too complicated and secondly, the market of credit derivatives is the foreign one, and a big part of Polish investors do not have any access to it. A few Polish banks participate actively in the credit derivatives market. This activity has been increasing year in, year out.

Swap credit contracts are one of the simplest forms of credit derivatives. The parties of these contracts are: the entity looking for the security from the credit risk i.e. the one who sells the risk and the entity taking the credit risk for the remuneration i.e. the one who offers security. The significant element in the construction of the swap credit contract is a definition of the height of the commission for taking the credit risk and the size, or the mechanism of payment calculating which will compensate appearance of the credit risk (Jackowicz 2001). It is necessary to add that the payment got by the seller can depend on the following (Kasapi 2002):

- the period of the contract maturity,
- the probability of the borrower's loss of the solvency,
- the credit rating of the partner in the swap transaction,
- relations between the borrower and the other party of the swap transaction,
- the expected value retaken for the base assets.

The credit default swap is the dominant product on this market. For the first time it was launched in 1993, however, it became the frequently made transaction only after the financial crisis which took place in years 1997–1998.

The default means an insolvency. It is the borrower's (a country or economic entity) suspension of the service of one's indebtedness. The credit default swap is the contract between two parties according to which, one of them (securing oneself from the credit risk) commit oneself to making particular interest payments calculated from appointed capital amount. In exchange, the second one (taking over the credit risk) is committed to repaying the capital negotiated in the contract if the particular debtor's (called the referential entity in the contract) insolvency occurs. The party securing oneself from the credit risk is defined as the swap seller while the party taking over the risk is the swap buyer (Figure 2).

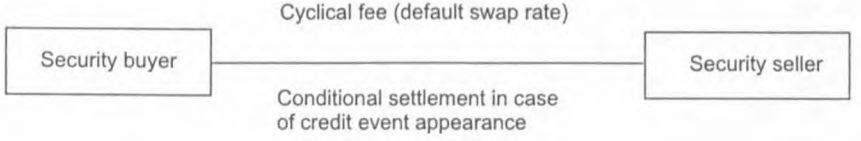

Fig. 2. Credit default swap
Source: Woźniak (2001)

On the day of the transaction opening there are no financial flows unless parties decide differently. The default swap rate also called an interest premium or a spread is paid at regular intervals for the whole period of the contract, most often once a quarter or once a half a year. The rate height is the difference between the profitability of particular referential bond and the LIBOR rate (for contracts in USD) or EURIBOR (contracts in EUR). Since the premium reflects the credit risk borne by the swap seller its height is also influenced by the following factors:

- demand and supply for the concrete credit risk,
- contract duration,
- credit quality of the security seller,
- correlation between referential entity and the security seller.

Taking into consideration settlements, payments owed by the swap seller are calculated by multiplying the contract's face value and the difference

between nominal price of the referential bond and its market price after the default occurs. Physical delivery (most often used form of the settlement) consists in the fact that the party who takes over the credit risk from the counter-partner of the transaction buys the fixed face value of the referential bond at a nominal price of 100.

The main advantage of these transformations is the fact that they can be easily adjusted to the concrete investor's demands. Swaps credit default sellers are especially banks and funds which, entering into a contract, gain the possibility of the credit risk diversification and circumvent of the standards of this risk concentration. The fact that investors can make much bigger profit than in case of comparable transactions on the bonds market and additionally they do not have to involve any capital inclines them to buying this instrument. The credit swap market is a very big and a fast developing world segment of the swap contracts market. That is why we can expect that this market is going to develop within the next few years also in Poland. The following facts will be conductive to it:

- firstly, the increase of the significance of the credit risk connected with financing the investments by the debt. It is estimated that within the next five years the bonds market of corporations and the commercial papers market will become the biggest source of investments financing.
- secondly, the credit risk trade will become an additional source of profits for some entities.

Swaps are, by nature, an instrument of OTC (over the counter) which are non-quoted in the stock-exchange turnover. It is because of their variety and specific demand of clients. However, in 1991 there were attempts at launching swap contracts on the stock exchange turnover. It was the CBOT stock exchange (Chicago Board of Trade) that made it on the standarized swap contracts accessible in the stock exchange turnover. In 2001 CBOT tried again to launch swap contracts on the stock exchange turnover.

3. SIGNIFICANCE OF CREDIT DERIVATIVES

The application of derivatives brings a lot of advantages. Generally speaking, one of the most important ones are: the possibility of effective risk managing, risk reduction and the increase of financial market efficiency. We can talk about the credit risk eliminating in a situation of using instruments acting like bonds with the credit option that is, those which provide for the possibility of transferring amounts secured from the credit risk in advance before its symptoms occur.

Analyzing application areas of credit derivatives it is easy to notice that the changes in the scale of involved economic capital, profitability rates of assets and economic and regulative capital as well as in the rating estimation of the assets credit quality go along with the credit risk reduction. These changes can be described by means of the following example (Jackowicz 2001). Let us assume that the bank granted a credit, which is interest bearing according to floating rate appointed as the sum of values of interest rates index I and permanent premium of the credit risk which is 1%. The cost of the bank's outside capital gaining equals: I – 0.2%. For the sake of the risk scale of the analyzed credit due the bank decided that in order to cover unforeseen losses with the particular tolerance level of the risk it is necessary to finance 12% of it with the company capital. Under such circumstances, the assets profitability (*RA*), and to be precise, the profitability of the credit due is calculated as the quotient of the result in recognition of interests connected with particular due and its value (*A*), is:

$$RA = \frac{(I + 1\%) \cdot A - (I - 0.2\%) \cdot (1 - 0.12) \cdot A}{A} = 0.12 \cdot I + 1.176\%.$$

Assuming that the interest rates index is running at 10% at the moment of the analysis, we get the profitability of assets connected with investigated investment action equal to 2.376%. Taking into consideration the fact that 12% of the due is financed by means of the economic capital, we also have its profitability (*RKE*):

$$RKE = \frac{2.376\%}{0.12} = 19.8\%.$$

Assuming further that for the sake of excessive concentration of receivables towards particular entity or trade, the bank decides to secure investigated credit by means of the credit contract swap. The commission which is going to be paid to the security offerer is 05% of the due denomination a year. As the result of the undertaken action the assets profitability decreases:

$$RA = \frac{(I + 1\%) \cdot A - (I - 0.2\%) \cdot (1 - 0.12) \cdot A - 0.5\% \cdot A}{A} = 1.876\%.$$

However, additionally gained security allows to reduce significantly the amount of economic capital attributed to this investment action. Let us carefully assume that the above mentioned reduction is only double. It gives a new profitability of the economic capital:

$$RKE = \frac{1.876\%}{0.06} = 31.27\%$$

bigger than the previously observed one.

If the bank supervision authorities accept the security by means of credit derivatives then we can gain advantages within the scope of required regulative capital and its profitability. Before the credit contract swap of the credit due is entered if it comes from the non-bank economic entity we should attribute the risk weight to 100%. Under such circumstances, taking into consideration the minimal required level of the solvency ratio, the regulative capital profitability ratio (*RKR*) equals:

$$RKR = \frac{2.376\%}{0.08} = 29.7\%.$$

After bank's securisation of dues among countries of the zone *A*, the reduction of the risk weight to 20% attributed to it is possible. It gives the new profitability value of the regulative capital:

$$RKR = \frac{1.876\%}{0.016} = 117.25\%.$$

Advantages of the foregoing example in the credit risk of the single instrument managing are complemented with two more features of security gaining by means of credit derivatives. Firstly, credit derivatives allow to confidentially limit or even eliminate the credit risk without the necessity of the borrower notifying. Using them does not pose a threat for the durability of contact with clients. The threat is connected, for example, with the application of direct selling of credit dues or their securization. Notifying the borrower of the securization by means of the credit derivative becomes necessary only if the event of the credit risk occurs and the chosen way of the settlement is the physical delivery of the assets component which is affected by that event. Secondly, credit derivatives allow to secure the credit risk of the assets component for the shorter time than its maturity term. This feature is particularly significant if the bank is afraid that after selling particular assets component it will have some problems with the regaining of the instrument with the similar features.

Credit derivatives can also be applied in liquidity reserves maintaining. Moser indicates the possibility of the use of credit derivatives. To compare

two ways of the financial liquidity maintaining he builds a very simple two-scenario model.

The more favourable scenario assumes that after a lapse of the first period the bank's client repays the credit whose value is L at the moment zero. At the moment 1 it will allow the bank to collect the money flow which equals uL. In case of the worse turn of events the borrower is insolvent after the period of the analysis and as a result of the recovery process it is possible to regain the amount equal to dL. It follows that the insolvency means the capital loss with the height of $(1-d)L$ for the bank. We also assume that the sum regained after the recovery is smaller than the initial credit value, and next it is smaller than its final value in the favourable version of the turn of events, that is the inequality: $dL < L < uL$ is satisfied.

To protect itself from the symptoms of the credit risk bank has two strategies at choice. The first one amounts to safe securities. In the worse scenario the bank bears a loss $(1-d)L$. It means that to cover a loss with the safe securities it has to make an investment with the value of $\frac{(1-d)L}{r}$ at the zero moment, where r denotes single-periodical rate of the derivatives income without the risk. The second strategy consists in buying the credit derivative (for example swap credit contract with the commission paid in advance for the whole period) whose price is K at the initial moment. This derivative contains the drawer's obligation to equalize losses occurred after symptoms of the credit risk appear, that is to paying the amount $(1-d)L$.

To investigate the efficiency of the two mentioned above strategies it is necessary to set financial results of their application in both investigated scenarios of the turn of events.

Table 1. The comparison of the strategy of the credit risk security

Investment value at the zero moment	Value of the credit and the security at the moment 1	
	worse scenario	better scenario
The first strategy • assets stock $\frac{(1-d)L}{r}+L$	$(1-d)L+dL=L$	$(1-d)L+uL$
The second strategy • credit derivatives $K+L$	$(1-d)L+dL=L$	$0+uL$

Source: Jackowicz (2001).

As we can see in Table 1, in case of the worse turn of events both strategies provide for the same final value of investments. In the more favorable version creating of assets stock brings the higher final value because the credit derivative in case of the lack of the credit risk event generates no money flow in exchange for settled commission. When choosing one of the strategies the following factors will be of great importance: the cost of the security by means of the credit derivative K and the difference of the investment value in more favourable scenario is equal to $(1-d)L$.

If the price of the credit derivative K is higher than the amount which is required to buy the securities without the risk, that is $\frac{(1-d)L}{r}$, then the choice is obvious. The strategy connected with the assets stock creation is more efficient. It is because it requires lower initial investments and in better scenario it gives the higher final value with equal final values in the worse scenario. If the instrument's price is lower than the amount spent for the safe securities (and there should be that way in most cases) the situation becomes complicated. The bank gets the possibility of making new investments amounting to: $\frac{(1-d)L}{r} - K$. These investments can for example take the form of the credit stock extending. Then in order to choose the strategy it is necessary to compare final values of the investment making some assumptions about the expected income rate of the additional credit stock, absolute risk of additional credits and their marginal influence on the risk of already existing credit portfolio.

It is also noteworthy to mention the usage of credit derivatives in managing the cost of activity financed by the one who takes the credit risk.

We can often ascribe the main motive of a decision considering taking the risk through the credit derivatives transaction to the craving for making the cost arbitrage of capital gaining. It turns out that thanks to the usage of analyzed instruments class security offerers can get bigger profitability of acting than in case of buying instruments on the cash market. To become convinced about it let us use the second example of the credit with the interest rate $I+1\%$. However, this time let its buyer be the entity with the lower rating and because of it the higher cost of the capital $I+1\%$ gaining than the previously investigated entity. As the instrument characteristics are unchangeable let us assume again that it will be financed with the economic capital in 12%. After the purchase made on the cash market the entity with the lower creditability with $I=10\%$ will gain the following level of the assets profitability and the economic capital profitability:

$$RA = \frac{(I + 1\%) \cdot A(I + 0.7\%) \cdot (1 - 0.12) \cdot A}{A} = 0.12 \cdot I + 0.384\% = 1.584\%,$$

$$RKE = \frac{1.584\%}{0.12} = 13.2\%.$$

Alternatively, this entity can take the credit risk of the analyzed assets component by means of the swap credit contract and gain in exchange for the commission $P = 0.5\%$ of its value. Profitability measures of the economic capital comparable to previously calculated ones for equivalent in relation to the off-balance obligation of the balance transaction RA' and RKE' equal:

$$RA = \frac{P \cdot A + (I + 0.7\%) \cdot 0.12 \cdot A}{A} = 0.5\% + 1.284\% = 1.784\%,$$

$$RKE = \frac{1.784\%}{0.12} = 14.87\%.$$

As we can see, the investigated entity has a higher profitability than in the situation of buying on the cash market with the same scale of the credit risk. However, as regards the definition of the adequate level of the regulative capital two mentioned above versions of receipt gaining do not differ. The risk taking by means of the credit derivatives offers entities with the high cost of the capital gaining the chance of access to high quality assets, that is with the low interest. It even allows to reap profits from assets insurance which offers lower interest than the capital cost of particular entity. Interpreting these results we cannot forget that the above analysis is led in the sense of ex ante, assuming the lack of the credit risk event. After its appearance the investigated entity bears great losses as a result of the swap credit contract issuing as well as the assets component buying.

4. FINAL REMARKS

The swap contracts market is one of the most lively developing segments of the financial market in Poland. First of all, it results from the great variability of these derivatives application and their big flexibility.

However, the swap contracts market is not very flexible in Poland and the secondary market does not practically exist. It means that the transaction sales is not possible.

There is the lack of guidelines defining the rules of swap contracts accounting by companies. There are no regulations concerning:

- swap presentation and the results account of the company in the balance,
- flows imputation to the costs/receipts connected with the transaction influencing the company's taxable base,
- accounting of swaps as securing and speculative transactions,
- joining securing transactions with the amortization of assets financed with the secured credit.

The case of profits of swap contracts interest is not clearly defined. For the sake of that the swap can be the transaction based on various prices, among others, the interest height, goods prices (commodity swaps), indexes values, each contract should be individually analyzed in terms of the tax.

Information-accounting systems of many Polish banks are not adjusted to accounting, monitoring and calculating of derivatives and also the credit ones. Such a situation takes place although a big group of banks made great investments in computer technology for the sake of fear of the year 2000 and consolidative processes.

Among Polish banks the Bank Handlowy SA in Warsaw and the BRE Bank SA lead the way in offering financial derivatives. The Pekao SA and the PKO BP SA are also very active. In the group of foreign banks which have their branches or daughter-companies in Poland the Societe Generale, the ABN Amro Bank SA, the Bank of America Poland SA, the Deutsche Bank Poland SA and the ING Bank Poland SA are very active, too. However, the considerable part of derivative turnover (especially interest swap one) is animated by the foreign banks running their businesses from London. The main participants of this market segment are: J. P. Morgan, Merrill Lynch, the Chase Manhattan and the Credit Suisse First Boston.

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SWAPY KREDYTOWE JAKO INSTRUMENTY ZABEZPIECZAJĄCE PRZED RYZYKIEM

(Streszczenie)

W ostatnich kilkudziesięciu latach znacznie wzrosło zainteresowanie problemem ryzyka kredytowego. Literatura naukowa podaje wiele metod i sposobów ograniczania ryzyka kredytowego. Banki natomiast próbują z różnym skutkiem wprowadzać w życie proponowane metody. Jedną z ważniejszych innowacji w światowym systemie finansowym ostatnich lat są pochodne instrumenty kredytowe. Ich innowacyjność sprawia, że są one przedmiotem zainteresowania zarówno badaczy, jak i podmiotów gospodarczych. W artykule zwrócono uwagę na definicję i rodzaje pochodnych instrumentów kredytowych, a także ich zastosowanie.