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SECURITIZATION AS AN ALTERNATIVE WAY OF MANAGING THE RISK OF CATASTROPHIC EVENTS

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Abstract: *Catastrophic events caused by natural disasters and human activities pose a unique challenge for insurers, because they make it difficult to estimate expected claims and can cause disruption to the insurance market and impose significant costs on government, businesses and individuals. The lack of available coverage of these risks in the market, due to the insolvency or unwillingness of insurers to ensure catastrophic events, can significantly impede the economic recovery and development of the country. For this reason insurers have sought alternative ways of covering these extreme losses, and one of them, a transfer of the risk of insurance to the capital markets represents the main subject of this research. The aim of this maneuver is to present the advantages and disadvantages of the instruments through which the transfer of insurance risk to financial markets is carried out, as well as to indicate the legal and other assumptions necessary for the functioning and development of this market.*

Keywords: *catastrophic events, securitization, regulatory framework*

1. INTRODUCTION

Recovering damages caused by the occurrence of catastrophic events, the insurance market enables faster economic recovery of the population and economy and plays a key role in managing these risks. Increasing the frequency and severity of catastrophic losses has led insurers and reinsurers to seek alternative ways of covering these extreme losses. The subject of this paper is the characteristics of transfer of insurance risk to the capital market based on creating and issuing securities. The focus is on the basic characteristics of three groups of instruments traded on the financial market: securities related to insurance, conditional capital and insurance derivatives.

Bearing in mind that the risks of natural disasters pose an increasing threat to the developing countries which are lacking financial resources to mitigate the consequences of those disasters, the aim of the paper is to demonstrate the advantages and disadvantages of the instruments through which the transfer of insurance risk to financial markets is carried out, as well as to point out the legal and other assumptions that are necessary for the functioning and development of this market on the basis of experiences in the United States and the European Union.

2. Development of financial instruments in the capital market

The incentive for insurers to develop a new type of financial instruments that transfer the risk of insurance to the capital market represented a disruption in the reinsurance market associated with Hurricane *Andrew*, who hit southern Florida in 1992 and caused losses that exceeded $ 19.6 billion. It was anticipated that insurance charges would amount to over $ 50 billion if the storm had come through Miami, located just a few miles from the affected area. At that time, a loss of $ 50 billion would constitute 25 percent of the capital base of US property insurers (Laurenzano, 1998, pp. 179-185) and it was estimated that it could cause insolvency of 36% of US non-life insurers. In 1994, the Northridge earthquake that struck the Los Angeles area resulted in losses of $ 13.5 billion, while typhoon *Mireille* in 1991 caused

losses of $ 6.5 billion. These events have affected the doubling of the reinsurance premium rate and the reduction of the coverage of catastrophic risks by the insurer. The total economic losses caused by natural disasters during the 1990s amounted to slightly over $ 430 billion, which is nine times higher than the experience from the 1960s (Carayannopoulos, 2003).

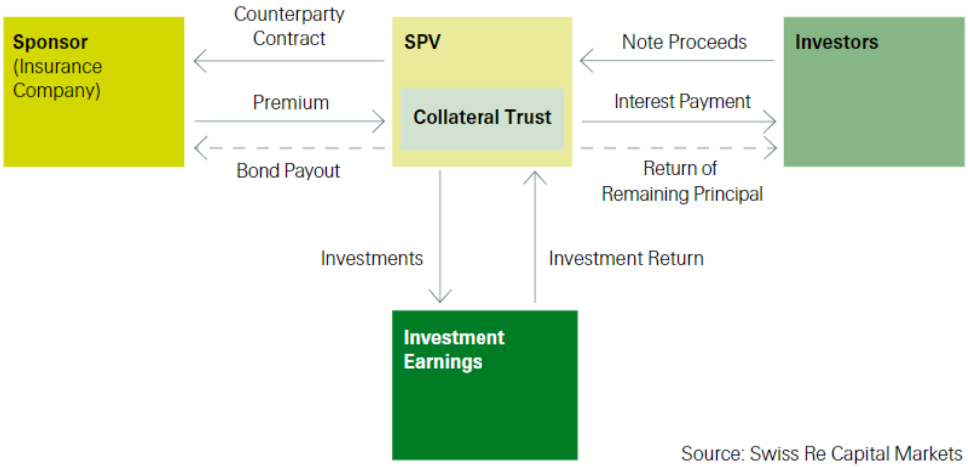
Although the reinsurance capacity in 1999 was estimated at around $ 300 billion, insured values also rose due to an increase in the population density and increased concentration of assets in vulnerable areas. There were fears that catastrophic claims of a similar proportions like Hurricane *Andrew* could cause much greater damage and that the insurance market would not have enough resources to offset the losses of such a catastrophic event (IAIS, 2003). For this reason, insurers and reinsurers sought alternative ways of covering these extreme losses, and one of them is the transfer of part of the risk to financial markets (Briys and Varenne, 2001, pp. 31-39). The transfer of the risk of insurance to the capital market on the basis of creating and issuing securities related to insurance is called securitization of the insurance risk.

Although there are different ways of defining and categorizing capital market instruments, they can be divided into three basic groups: 1) insurance-linked securities, 2) contingent capital, and 3) insurance derivatives (Banks, 2004). The next section will show the basic characteristics of these instruments.

3. Insurance-linked securities

Insurance-linked securities- ILS emerged in the 1990s with the first catastrophic bonds that transfer the risks of natural disasters to the capital market (Mitrašević, 2010, pp. 175-180). Their primary purpose is to manage insurance risk using alternative sources of funding. The following figure shows the scheme for covering natural disaster losses through catastrophe-bonding, as one of the forms of security-related securities (Figure 1). The illustrated transaction includes three participants: company cedent or sponsor, SPV-specific purpose vehicle or issuer, and investors (large institutional buyers).

Figure 1. Coverage of natural disaster losses through catastrophic bonds



Source: *Swiss Re, The fundamentals of insurance-linked securities, www.swissre.com (4.4.2018.)*

According to the scheme of loss coverage, it is assumed that the insurance company covers catastrophic risks to a certain retention, and for the amount through the retention to a certain limit of coverage, the contract is entered directly with a special purpose entity (SPV). SPV issues emissions of catastrophic bonds whose value corresponds to defined coverage limits. It is customary for the insurer to initially enter into a contract with a reinsurance company representing an intermediary between the cedent company and the SPV. In the case of the realization of the insured case, the reinsurance fee would correspond to the part of the insured losses transferred to the rescue, while the payment by the SPV would depend on the type of activator. With this, the reinsurer would absorb the base risk arising from the non-compliance of the amount of actual loss and payment on the basis of the bond.

Revenues earned through the issuance of catastrophic bonds are invested in high quality securities or held on a collateral trust account and serve as a means of securing issued bonds. The

returns on investments in these securities and premiums paid by the ceding company are used to pay off coupons based on catastrophic bonds.

Each security-related security has a certain trigger that determines the conditions under which investors can suspend the payment of interest and / or principal (temporarily or permanently). If an event that represents an activator did not happen, the issuer makes the principal payment to investors together with the last coupon. The award to the investor to take over catastrophic risk is a relatively high interest rate on bonds.

The activator can take three different forms: a compensation-based activator, index activators and a parametric activator (American Risk and Insurance Association, 2007, p. 10).

Compensation-based activators are based on real loss exposure when implementing a predefined event. Similar to traditional reinsurance in this type of security, a careful analysis of the insurer's books of accounts and risk control methods is required. A rating agency has a key role in the objective risk assessment of securities. They examine the validity of the used risk assessment model and the assumptions used. Since the capital market lacks the knowledge and experience of the insurance market held by a reinsurer, measures to reduce moral hazard can cause high transaction costs that can make these contracts extremely expensive (McGhee and Faust, et al., 2005, page 6).

For parametric activators, the compensation in advance depends on the physical attributes of events such as the size, strength and epicenter of the earthquake or the speed and location of the hurricane. In the case of this type of activator, the possibility that the nominal value of the bond will differ from actual losses is increased. Index-based activators are based on an index of market damage, such as PERILS (https://www.perils.org/products/industry-loss-index-service) and PCS Catastrophe Loss Index (https://www.verisk.com / insurance / products / property-claim-services / pcs-catastrophe-loss-index /). In this case, the insurer must carefully structure the contract with the appropriate selection of the aggregate index of damage. In the case of index activators, the company cedent reimburses the percentage of total losses on the market above a predetermined amount, to the available limit (ie the remainder of the principal) (Swiss Re, 2011).

Given that the previous two types of activators do not require a full assessment of the underlying risk portfolio of the cedant, they are favorable by many investors. Since the compensation is not in the function of the actual loss of the insurer, such a contract eliminates the problem of moral hazard. The investor no longer needs to examine the risk exposure of the insurer and the method of damage control, the transaction costs can be significantly reduced. However, an insurer may be exposed to a significant base risk, i.e. the risk of a possible deviation of the actual loss of the insurer from the amount of compensation received on the basis of the contract on transfer of risk.

According to Swiss Re, the total ILS emissions in 2017 exceeded $ 10 billion, a significant increase compared to the $ 5.9 billion in 2016. The data published in Swiss Re Capital Markets show that the ILS market in 2017 proved to be extremely resistant and that regardless of the volume of losses recorded in 2017, there was no significant withdrawal of investors from this market. According to Willis Towers Watson Securities, the year 2018 should be another year in which ILS emission increases, because the market is recovering from recent natural disasters, and investors are showing an increasing interest in ILS products (NAIC, 2018).

Securities linked to insurance may be of paramount importance to insurers in the period of a hard-market reinsurance where reinsurers are not willing to cover certain risks or to cover it too costly. Assuming that an event that represents an activator does not happen, investors can generate above-average yields. Brokers can also benefit from and earn profits from participating in the structuring of securities and from commissions generated by the sale of bonds.

However, the benefits of securities related to insurance are accompanied by certain disadvantages related to the relatively high costs associated with the formation of the SPV, preparation of documentation, work on valuation and determining the prices of securities, and so on. Market illiquidity is an additional disadvantage for the development of ILS. Therefore, improved standardization of this type of transactions and liquidity are of key importance for the success of securitization of insurance.

4. Conditional capital

Conditional capital is a relatively new type of product that connects the insurance and capital markets and is based on the contractual obligation to provide a more favorable access to the necessary capital after a certain unwanted event that causes financial problems (Bruggeman, 2001, p. 8).

The insurance market uses the instruments of provisional capital for about two decades, and the most common types of these instruments are *catastrophe equity puts* and *contingent surplus notes* (Shang, 2013).

Catastrophe equity puts are structured in the form of a path option that allows an insurer to sell an investor's share in share capital at pre-agreed prices when catastrophic damage exceeds the level defined by the option. Catastrophe equity puts thus ensure that the insurer has access to additional capital in case of catastrophic losses of a particular situation. The activator can also be based on the price of the company's shares. These instruments are traded on the Chicago Board of Trade (CBOT) and the Bermuda Commodities Exchange.

Contingent surplus note (CSN) entitles the insurer to issue them at a specified period at a pre-determined price in exchange for cash or liquid assets. The right to issue surplus notes may be triggered by certain trigger events or may be unconditional (Martínez and Laye, 2001, pp. 66-67).

Conditional capital instruments began to attract attention and become more popular during the 2008 financial crisis. However, it has been shown that capital increase costs may be unnecessary, as in a period of pronounced systemic risk, a much higher liquidity risk and the risk of another counterparty can significantly affect the company's solvency. Attempts to address these shortcomings focused on activators and the way of absorption of losses. Market indicators, such as the aggregated market loss index or the financial industry loss index, may be more suitable for mitigating systemic risk. However, it is difficult to apply it in an objective way (Shang, 2013, pp. 6-8). Dual Trigger Event (Dual Trigger Event) are also proposed, such as company stock prices and the value of financial institutions index (McDonald, 2011). As far as the way of covering the loss is concerned, there are two approaches. After an event that represents the activator occurs, the conditional capital instruments provide cash or conversion into ordinary shares (Maes and Schoutens, 2012, pp. 59-79).

Conditional capital, and in particular contingent surplus notes, exposes investors to liquidity risk due to a low volume of trading. Investors are also exposed to credit risk because they face possible non-execution of the obligation by the issuer. In addition, investors bear the risk of negative selection, that is, the possibility that only those companies exposed to the higher risk of catastrophic events will issue these securities.

5. Insurance derivatives

The first securities derivatives traded on the stock market are catastrophic futures and insurance options introduced by the Chicago Board of Trade (CBOT) in the period from 1992 to 1993(Cummins and Geman 1995: 46-57). At first, there was no real market interest, and the options were very low in trade. In 1995, CBOT completed trading for all disastrous futures, and the options were restructured so that, since there are no base assets,they are based on non-life insurance indexes covered by Property Claims Services ("PCS"). The PCS options were also slightly traded and CBOT stopped trading in all the PCS options in 2000 (Hammer and Singer, 2001).

To explain the failure of the CBOT contract, various reasons are listed, including significant base risk, lack of expertise in trading options, low liquidity, counterparty credit risk and uncertainty in regulatory accounting treatment (American Academy of Actuaries, 1999). Other efforts to launch catastrophic options, for example, the Bermuda Commodities Exchange, were also unsuccessful.

Given that there was a belief that options provide a more effective mechanism to protect the risk of catastrophic events than it was possible through bonds for catastrophic damage, regardless of past failures, there were some efforts to re-launch this market (Cummins and Weiss, 2009).

In 2007, futures and options contracts were introduced to the New York Mercantile Exchange (NYMEX), the Chicago Mercantile Exchange (CME) and the Insurance Futures Exchange (IFEX), which were traded on the Chicago Climate Exchange (CCX) (Bruggeman, 2007) . At the moment, only Hurricane Futures and Options is traded on the Chicago Mercantile Exchange (CME).

An international experience suggests that a clear and appropriate regulatory framework can encourage the supply of security-related securities and increase the number of investors who are qualified to carry out their assessment (Carayannopoulos and Kovacs, 2003). The existence of appropriate regulations is an important issue for any organization that is considering transferring the risk of catastrophic events to financial markets as a risk management tool. The next part of the paper will show the directions of the regulation of securitization of insurance in the United States and in the territory of the European Union.

6. Regulatory framework

Following the research presented to the *NAIC* working group that suggests that domestic securitization is also beneficial to consumers and the general public in the United States, the development of the regulatory framework governing this area has begun.

In 1999, the *NAIC* adopted the *Protected Cell Company Model Act*. This law was adopted to provide the basis for the creation of protected cells by insurers based in the United States as one of the ways of accessing alternative sources of capital and securing the benefits of securitization of insurance. A protected cell is a specific group of assets and liabilities of a special purpose entity that is separated and isolated by the statute from other assets and liabilities held by a special purpose company. (NAIC, 2002). The adopted model is the basis for the creation of Special Purpose Reinsurance Vehicles ("SPRVs"), aimed at achieving greater efficiency in implementing securitization of insurance, securing diversification and expanding the access of insurers to risk capital sources (NAIC, 2001).

The present legislative framework concerning securitization in the European Union consists of provisions in various areas including: banking; insurance (Directive 2009/138 / EC of the European Parliament and of the Council of November 25, 2009 on the Establishment and Performance of Insurance and Reinsurance Activities "Solvency II" and the delegated regulation of the EU Commission 2015/35 of October 10, 2014), the management of assets , credit rating and prospectuses.

In autumn of 2015, at the initiative of the Capital Markets Union, the European Commission proposed a regulation on securitization. The draft regulation on securitization followed the consultation with stakeholders and took into account initiatives at international (*BCBS-IOSCO*) and European levels (*EBA*). The objective of the proposed regulation is to provide a framework for the identification of simple, transparent and standardized-STS securitization and enable investors to analyze associated risks. In the package with the proposal of the regulation on securitization, a proposal was made to amend the *Regulation on capital requirements* applicable to credit institutions and investment firms in relation to securitization. It is planned that the European Parliament decides on these proposals during the plenary session of October 2,2018 (EPRS, 2018). The proposal contains provisions related to supervision, ie appointment and powers of the competent authorities when the parties involved in the process of securitization apply the EU legislation regulating financial services.

Insurers need to know that the securitization of risk insurance will affect their capital adequacy requirements. A regulatory environment that defines a clear and appropriate tax treatment prescribes the necessary volume of available information for investors to evaluate new, lesser known securities, such as security-related securities and defines capital requirements in relation to these financial instruments, allows a better assessment of risk exposure and an appropriate risk management strategy. A clear regulatory framework contributes to the greater confidence of investors in the securities being issued (Carayannopoulos, 2003). However, it should be kept in mind that excessive regulation could have a negative impact on the development of securitization of insurance as a mechanism for transferring risks and increasing the insurance capacity.

CONCLUSION

The paper shows that as a result of significant losses caused by catastrophic events in the early 1990s, costs in the name of the reinsurance premium increased and some reinsurers stopped providing coverage for these types of risks. This increase in costs and the reduction in supply led the insurers to look for alternative ways of transferring risk. Recognizing the ability of the capital markets to absorb the risk of catastrophic events, a series of products have been developed through which insurance risk transfer is carried out. This paper presents the basic characteristics of three groups of instruments of the capital market: securities related to insurance, conditional capital and financial derivatives. Each instrument has different characteristics and the way in which they are designed determines which type of investment risk will be borne by the participants. The paper emphasized that in addition to the willingness of insurance companies and investors to appear as participants in this market, the key prerequisite for the development of the securities market related to insurance is an adequate regulatory framework.

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SUMMARY

After Hurricane Andrew, who hit south Florida in 1992 and caused losses that at that moment amounted to about 9.8% of the capital base of US property insurers, it became clear that the increased risks of catastrophic event realization bring new challenges in mitigating their consequences and coverage incurred costs. Bearing in mind that the global reinsurance market is relatively small compared to the potential exposure to catastrophic risks in order to provide additional capacity, insurers and reinsurers have begun securitization of portfolios of these risks through: securities related to insurance, conditional capital and financial derivatives. These securities may be extremely important for insurers in the period of a hard-market reinsurance where reinsurers are not willing to cover certain risks or are too expensive to cover. For the successful development of this market, a regulatory environment that defines a clear and appropriate tax treatment is of key importance; activities aimed at reducing transaction costs, improving liquidity and providing the necessary volume of available information, which would allow investors to evaluate this type of financial instruments.

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