RISK TRANSFER SOLUTIONS FOR THE INSURANCE INDUSTRY

ABSTRACT: The paper focuses on the traditional and alternative mechanisms for insurance risk transfer that are available to global as well as to domestic insurance companies. The findings suggest that traditional insurance risk transfer solutions available to insurance industry nowadays will be predominant in the foreseeable future but the increasing role of alternative solutions is to be expected as the complementary rather than supplementary solution to traditional transfer. Additionally, findings suggest that it is reasonable to expect that future development of risk transfer solutions in Serbia will follow the path that has been passed by global insurance industry.

KEY WORDS: insurance, reinsurance, alternative risk transfer, securitisation, Serbian insurance market

JEL CLASSIFICATION: G22, D81, G28, E44
1. INTRODUCTION

Insurance always involves risk transfer, which according to Rejda (2005: 21-22) means that a pure risk is transferred from the insured to the insurer, who typically is in a stronger financial position to pay the loss than the insured. Thus, insurers can better manage pure risks than individual insureds due to the application of central limit theorem and the law of large numbers. However, in reality the possibility that real losses will deviate from expected is very probable, especially if there are positive correlations among risks in insurer’s portfolio, as it is in the case with catastrophic events (OECD, 2005). In order to protect themselves from these deviations insurance companies, in addition to the reserve formation, can raise additional equity or debt capital and/or apply mechanisms of transferring risks to other carriers. Thus, in insurance risk management the main dilemmas, related to the aim of achieving optimal level of risk management, are to determine the level of risk that will be retained and the level of risk that will be transferred and which risk transfer solutions will be applied. As is shown in Figure 1, with regard to the first dilemma, the optimal level is achieved when retentions are established at a given total reinsurance price (price of risk transfer) so that the remaining variance cannot be further reduced by transferring more risk (Schmitter, 2003: 13).

**Figure 1**: Insurance risk management costs optimisation

After having made decision on optimal risk retention and transfer level, insurance companies need to decide which risk transfer method or combination of them will be used in order to further contribute to the optimisation of the total costs of insurance risk management. In this regard we should know that the risk transfer mechanism utilised by insurance companies for centuries has been reinsurance.
However, due to many factors, among which the most important has been the capacity shortage of the global insurance and reinsurance industry\(^1\), the search for alternatives of transferring the unbearable excess of insurance risks has begun. The logical approach in obtaining additional risk transfer capacity was to search for the possibilities of utilisation of large volumes of capital that are available at capital markets.\(^2\) As a result of the innovations in insurance risk transfer, insurance companies can now diversify their exposure, reduce the cost of capital and expand the availability of insurance by transferring insurance risks not only to reinsurers but also to capital markets investors. Numerous studies (see for example, McGhee, C. et al., 2008, Global risks (2008), Klein and Mooney (2008) and Cummins (2008)) indicate that although still modest in relation to traditional reinsurance, the use of insurance-linked securities is broadening and now can be considered as mainstream rather than alternative risk transfer solutions.

Despite the fact that nowadays global insurance companies have the ability to use traditional and/or alternative risk transfer solutions, in order to optimise their risk transfer programs, the insurance companies in Serbia have only traditional solutions at their disposal. However, it is reasonable to expect that capital market solutions will be also developed and applied by Serbian insurance companies in the future. In order to facilitate this development and to improve the effectiveness of traditional solutions, it is important to understand the mechanisms of currently available risk transfer solutions globally and their potential benefits and drawbacks. That is the rationale behind the fact why during the conceptualisation we decided to firstly explore risk transfer solutions that are available to global insurance companies and to determine if these solutions are mutually exclusive or complementary to each other and then to briefly describe the current practices of domestic insurance companies, in regard to application of risk transfer solutions, and to explain our opinion of their desirable future development in Serbia.

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1. The capacity shortage has been provoked by increased frequency and severity of catastrophic events. The first event that marked the beginning of the new era in insurance risk transfer was Hurricane Andrew that caused $23.654 million of insured losses indexed to 2007 (Enz, R., et. al. (2008), 'Natural catastrophes and man-made disasters in 2007: high losses in Europe', Sigma No. 1, Swiss Re, Zurich, p. 40)
2. Capital markets are far more liquid and much more capital is available than on insurance and reinsurance market. For example, according to BIS (2008) the notional amount of derivatives outstanding at the end of 2007 was around $677 trillion, much more than the reinsurance industry’s total capital of around $238 billion, measured as the sum of aggregate shareholders’ funds of the 30 leading reinsurance groups and subordinated debt (Benfield Group (2008), Global Reinsurance Market Review: Changing the Game, London).
In order to hedge portfolios of insurance risks that exceed their retention levels insurance companies traditionally use reinsurance. Essentially, reinsurance is insurance protection purchased by insurance companies. Although some forms of reinsurance existed before\(^3\), the modern reinsurance started to develop from 1846, when Cologne Re was established as the first professional reinsurance company. Since then, reinsurance has the role of insurance risk reduction for insurance companies, especially for the catastrophic risks. Although through reinsurance insurance companies transfer insurance risks, which they initially assumed from their insureds, there is no contractual relationship between insureds and reinsurers. The need for reinsurance grew out from catastrophic events, as was Hamburg fire of 1842, but due to the increased frequency and severity of loss events\(^4\) it was found that even the capacity of reinsurance market is not enough. The reinsurers found solution in additional risk spreading through the retrocession market. The mechanism of risk transfer through insurance, reinsurance and retrocession is shown by Figure 2.

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\(^3\) The oldest known trace of reinsurance existence is found in marine policy issued in Genoa in 1370. That policy covered the shipment of goods from Genoa to Sluys and the most dangerous portion of the shipment trip, from Cadiz to Sluys, was reinsured (Herrmannsdorfer, F. (1926), *Bedeutung und Technik der Rückversicherung*, Verlag von Piloty & Loehle, München, p. 332).

\(^4\) The increased frequency and severity of loss events are especially emphasised in the last several decades due to the factors such as global warming, globalisation and accelerated rate of economic development. For example, the number of human-made catastrophes worldwide has risen from around 60 in 1970 to nearly 250 in 2005, while the number of natural catastrophes over the same period has risen from around 30 to nearly 150. (Zanetti, A. and S. Schwarz (2006), ‘Natural catastrophes and man-made disasters 2005: high earthquake casualties, new dimension in windstorm losses’, *Sigma* No 2, Swiss Re, Zurich). Another researches suggest the increased severity of catastrophes as possibility that future Hurricanes impacting the Northeast USA and Florida could create losses of $20b and $75b, respectively, a California earthquake or continental European windstorm could lead to losses of $50b to $100b, an 8.5 magnitude earthquake in the New Madrid Seismic Zone of the central USA could create $100b of losses, and a repeat of the devastating 1923 Tokyo Earthquake in today’s market could lead to losses of $500b to $1t. (Banks, 2005: 10).
Figure 2: The mechanism of risk transfer through insurance, reinsurance and retrocession

As is shown in Figure 2, the risk transfer can be accomplished through direct or indirect relationships between contracting parties. Its path starts with the insureds that transfer life or non-life insurance risks and accompanying premiums through insurance market to insurers. If insurance company does not have enough capacity to retain the total risk it transfers the total risk exposure or the certain percentage of it, and accompanying premium, to one or several reinsurers in the process called cession. For some exceptionally large risks, such as risks in marine or aviation insurance, reinsurers transfer risks to other reinsurers\(^5\) in the process called retrocession. If the loss event occurs, from own financial resources insurer will compensate insured for the financial losses, but if that loss event or its share was reinsured and later retroceded, retrocessionaire will compensate reinsurer who will then compensate insurer in the same proportion as was the proportion of initially transferred risk and premium.

The explained risk transfer mechanism is universal but many different types of reinsurance coverage exist. The two basic types of reinsurance contracts are facultative agreements, which are intended to cover individual risks\(^6\), and

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\(^5\) Although in the Figure 3 the term retrocessionaire is used, there are no companies that specialise in retrocession business alone. This term is used to describe the function of the reinsurer who assumes the risk and receives the accompanying premium while reinsurer who transfers risk and premium is called retrocedant.

\(^6\) They are basically separate reinsurance agreements negotiated for each insurance policy that insurance company wishes to reinsure.
treaty agreements, which are intended to cover portfolios of risks. Both types of reinsurance agreements can be in proportional, which means that reinsurer takes a determined share of risk for the same share of premium and when a loss occurs it is indemnified in that same proportion, or non-proportional form of reinsurance cover, which means that the reinsurer indemnifies the ceding insurer only for losses that are in excess of cedant’s retention, subject to the reinsurance upper limit.⁷

Although there are numerous types of reinsurance cover, all of them have the same major aim of reducing risk in insurer’s portfolio, or in other words, the purchase of reinsurance can substitute for capital and allow an insurer to hold less capital without increasing its insolvency probability (Harrington and Niehaus, 2004: 89). In the same way as insurance reduce the standard deviation of real claims from expected, reinsurance by pooling of risks of different insurers reduce the standard deviations of claims costs for each of them. If we assume that expected claims costs for insurer are equal to μ and his assets are equal to μ+x and hence the capital is equal to x, then the reinsurance will lower the probability of insolvency from the area under the “without reinsurance” curve in Figure 3 to the area under the “with reinsurance” curve.

**Figure 3**: Probability distribution of claims costs with and without reinsurance

![Figure 3: Probability distribution of claims costs with and without reinsurance](image)

*Source: Modified according to Harrington and Niehaus (2004: 90)*

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⁷ Insurers can use different types of reinsurance or their combinations, but usually non-life insurers require more reinsurance than life insurers. According to IAIS (2007: 16) the share of life insurance risks in 2006 was 24% while non-life insurance risks made the remaining share in total reinsurance premiums. Also, proportional reinsurance contracts are used more than non-proportional (International Association of Insurance Supervisors (2007), ‘Global Reinsurance Market Report 2007’, Basel, Switzerland).
Figure 3 clearly shows that if there is reinsurance the variation of real from expected losses will be lower and thus the need for capital for coverage of the deviations would be lower. In addition to this basic function of reinsurance, it has many other benefits to insurance companies and other stakeholders, such as financial stability and solvency protection, reduction in volatility of earnings or sudden fluctuations in the premium rate, reduction of loss of equity capital, reduction of the possibility of loss of job or regular tax payments, facilitates better compliance with regulatory constraints, enhance insurability, insurance products become less expensive, increase competitiveness and international spreading of risks, reduce capital costs and increase profitability and by lowering the necessary capital it facilitates opportunities for development of new markets and products. However, reinsurance has some drawbacks such as the need to renew cover as it is provided usually on an annual basis; the capacity is limited and volatile as are reinsurance premiums and having reinsurance cover means being exposed to the credit risk.

The transfer of insurance risk from insurers to reinsurers is done through the global reinsurance market. The global nature of reinsurance market is one of its key specific characteristics. Reinsurance market is de facto secondary market for insurance risks and it may be seen, according to Rotar (2007: 565), as a market where commodities to be exchanged are risks. This market is highly concentrated and for decades it was considered as adequately capitalised to offer additional protection for the insurance risks coverage, especially for the catastrophic ones. However, due to increased frequency and severity of loss events in the last several years, and especially after Hurricane seasons of 2004 and 2005, which

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8 The volatility of reinsurance premiums is often characterised by cyclical nature of reinsurance, that is to say, reinsurance market continuously passes through phases of “soft” and “hard” market (Njegomir, 2006a). “Soft” market is the phase in reinsurance cycle when capacity is freely available, pricing is cheap and terms, conditions and exclusions are not rigidly enforced (Paine, 2004: 21).

9 Credit risk in reinsurance business is the risk of reinsurer default, or in other words, it is the risk that reinsurer will fail to pay the claims under a reinsurance contract.

10 At the beginning of the new millennium the group of 10 leading reinsurance companies accounted 60% of worldwide reinsurance premium, compared to 40% a decade earlier (Group of Thirty, 2006: 12), while in 2006 in property and casualty reinsurance market, 10 leading reinsurance companies had the market share of 54% (Benfield (2007), ‘Global Reinsurance Market Review: Pick ‘n’ Mix’, Benfield Group, London, p. 23).

11 According to IAIS (International Association of Insurance Supervisors (2007), p. 20) natural catastrophes are the most notable threat to the stability of the reinsurance industry as was illustrated by hurricane season of 2004 and 2005, which cost insurance industry $30 billion and $83 billion respectively.
demonstrated how catastrophe events can endanger even the upper layers of reinsurance coverage, reinsurance and especially the retrocessional capacity became limited due to the fact that large share of losses from these events have been cover by reinsurers (see Figure 4).

Figure 4: Share of insured losses from the chosen catastrophic events paid by reinsurers

![Bar chart showing percentage of insured losses from different catastrophic events paid by reinsurers.]


Although these losses had the great impact on the availability of reinsurance and retrocessional coverage, the most important consequence of the recent catastrophic events has been the perception change in relation to potential size of losses as well as the lowered risk appetite towards large risks (Njegomir, 2006b: 69). As a result of combined effect of high reinsurance prices and limited availability of coverage and subsequent increased scrutiny in solvency regulation by supervisors and rating agencies, insurance and reinsurance companies rapidly started to search for alternative risk transfer solutions. However, it must be noted that some forms of alternative life and non-life insurance risk transfer solutions existed even before the new millennium, but the stated combined effect gave the impetus for exponential growth of new risk transfer solutions in the last few years.

3. ALTERNATIVE INSURANCE RISK TRANSFER SOLUTIONS

The development of alternative risk transfer solutions is part of a bigger trend of convergence of insurance and capital markets. The word converge means “to come from different directions and meet at the same point to become one thing” (Longman, 2003: 343). That is exactly what is happening with insurance and capital markets. In addition to insurance risk transfer to capital markets, this trend encompass developments such as issuance of insurance contracts for
risks that has previously been managed by capital market instruments or selling of insurance contracts by banks, the process called bancassurance. In regard to alternative risk transfer solutions and gradual disappearance of demarcation lines between insurance and capital markets, the convergence is visible as it is no longer important, from a purely economic view, whether a certain product is formally insurance or reinsurance, or whether insurance solutions are combined with banking approaches to create a mixed product (Bock and Seitz, 2002: 4).

The most comprehensive definition of alternative risk transfer found states that “alternative risk transfer products are contracts, structures, or solutions provided by insurance and/or reinsurance companies that enable firms either to finance or to transfer some of the risks to which they are exposed in a nontraditional way, thereby functioning as synthetic debt or equity in a customer's capital structure” (Culp, 2002: 352). Hence, alternative risk transfer (ART) is not a single product and can be described as a way of doing business (Hartwig and Wilkinson, 2007: 925). The reason we use the term solutions rather than products or instruments is because ART includes alternative carriers (such as captives, risk-retention groups and pools) and alternative products (such as finite risk reinsurance, run-off solutions, committed or contingent capital, multi-line, multi-year products, multi-trigger programs, structured finance and new asset solutions, and capital market solutions) which are available to corporations and insurance and reinsurance companies. However, our discussion on the role of alternative risk transfer solutions will be limited to the nontraditional solutions in insurance risk management utilised by insurance and reinsurance companies.

Although the history of application of alternative risk transfer solutions can be traced back to 1970’s, the most important stimulus for their development, in relation to risk transfer to capital markets, was the capacity shortage of the global reinsurance and retrocession market during 1990’s and especially after Hurricane seasons of 2004 and 2005. In the last two decades these solutions pass through the transformational change from “the exciting idea” (Hengesbaugh, 1998: 119) through “the brave new world” (Laster and Raturi, 2001) to “mainstream” solution (McGhee et. al., 2008).

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12 These solutions are nontraditional in the sense that insurance risks are transferred, or in other words repacked and sold to capital market investors, in particular to institutional investors, instead to be transferred to traditional reinsurance or retrocession market.

13 The first ART forms were alternative carriers like captives and captive-like structures that were developed during 1970’s while the first form of alternative products, utilised by insurance companies, were life insurance securitisation developed during late 1980’s.
As previously mentioned, the capital markets have come to be seen as an alternative source of capacity for catastrophe protection, especially in the area of natural catastrophes. Securitisations, in particular, have been used by insurance and reinsurance companies in the circumstances of scarce capacity and high prices at reinsurance and retrocession markets. However, other factors such as the need for economic value maximisation, taxes, regulatory constraints and deregulation of financial services industry contributed to the development of ART solutions. All mentioned factors contributed to the attractiveness of these new solutions to insurance and reinsurance companies, but the growth of ART solutions would not be of such pace if there was no interest from the investors, who saw the attractiveness in this instruments because insurance risk is uncorrelated with other risks in investors portfolio, thus provide the diversification benefit for investors and offers relatively high returns. Also, these solutions enable investors to invest in insurance risk and profit from it without the need to tie up their capital for a longer period, as it would be in the case of investment in insurance and reinsurance companies’ equities. Hence, investors participate only in sharing of insurance risks and not in sharing of all risks that insurance or reinsurance company is exposed to. These reasons, accompanied with advances in technology, attracted more diverse investor base and were

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14 After Hurricane Katrina of 2005 majority share of new capital in 2005 and 2006 in insurance and reinsurance industry has been raised by recapitalisation and by the foundation of new companies despite the fact of the increasing role of ART solutions and especially cat bonds, which issuance doubled in 2006 in relation to 2005, while the majority share of new capital raised in 2007 was through utilisation of sidecars and cat bonds, which new issuance exceeded $7 billion and doubled in relation to 2006. Thus, even after Hurricane season of 2005, when they have marked the highest development, alternative risk transfer solutions have been used by insurers and reinsurers only as a supplement to traditional capacity.

15 For example, the return on catastrophe bonds, measured as a spread over some reference rate such as LIBOR, has been reduced in 2007 (Benfield (2008), ‘Global Reinsurance Market Review: Changing the Game’, Benfield Group, London). However, in the period from June 2007 to June 2008 Swiss Re’s BB-rated Cat Bond Total Return Index showed better performance than Lehman’s BB High Yield Corporate, which means that cat bonds offered investors better returns than corporate bonds in the period (GR, 2008: 68). This is particularly important as this period is characterised by the existence of financial crisis.

16 On the basis of new technologies such as catastrophe models, mapping software, dynamic financial analysis, scenario testing and dynamic portfolio optimization investors that are not familiar with insurance risks as insurance and reinsurance companies are can easily get information on various types of natural disasters at a relatively low cost.

17 The leading investors in these solutions at their inception were insurance and reinsurance companies but in such circumstances it could not be said that ART market actually attracted very much new capital into the financing of catastrophic risk (Cummins, 2008). However, hedge funds, pension funds, money market funds, investment banks and dedicated catastrophe funds recently started investing in the market.
behind the increased interest of investors in ART solutions during the financial crisis of 2007 and 2008. Finally, it must be noted that the development of ART market was facilitated by the interest of intermediaries such as stock exchanges, investment banks and insurance and reinsurance brokers who found possibilities of new business opportunities.

The basic issue for insurance companies regarding utilisation of ART solutions is to compare them to traditional reinsurance and on the basis of cost/benefit analysis choose the right solution or combination of solutions that would best suit their needs. Both, reinsurance and ART solutions have certain advantages and disadvantages that need to be factored in when making such decisions (see Appendix 1).

ART solutions have been primarily used for accounting and capital relief purposes by life insurance companies, thus they have been focused more on risk finance than risk transfer. In the field of non-life insurance ART solutions have been primarily used for financing peak catastrophe risks in conditions of scarce and expensive capacity. However, these solutions can offer insurance companies other benefits in addition to supplementary capital. Actually, their primary objective has been to increase insurability of risks. The main advantage of ART solutions in comparison to traditional reinsurance is the possibility of moral hazard and credit risk elimination, because by addressing these issues and offering coverage where traditional capacity is not available or is limited, they can increase limits of insurability. Moral hazard is present in insurance and reinsurance as they are indemnity based, which means that the indemnification is directly linked to actual losses what creates possibility, because of the information asymmetry between buyers and sellers of coverage, for behavior change of insureds or insurers in sense that they can directly influence the underlying risks. By applying triggers that are not indemnity based, such as indexed or parametric, the moral hazard problem can be reduced or eliminated. Credit risk, that is inherent to traditional reinsurance, as explained above, can be avoided by collateralisation, which means that funds invested in risk-linked security are kept in collateral trust that serves as a guarantor for future contingent payments. Additionally, ART solutions can lower insurers’ and reinsurers’ costs by using indexes which facilitates avoidance of administrative costs related to loss handling, as there would only be need for index to reach certain attachment point (trigger) and thus there would not be need for the provement of losses, and by sharing acquisition costs with institutional investors, especially in life insurance. Also, they usually offer multi-year coverage thus helping reduction in volatility of coverage prices and avoidance of reinsurance market cycles.
However, the ART solutions have certain disadvantages as they are usually complex to structure, time-consuming and expensive.\textsuperscript{18} The main issue, which concerns insurance and reinsurance companies when they consider ART solutions, is the presence of basis risk, the risk that coverage and losses will be mismatched, if trigger other than indemnity-based is used.\textsuperscript{19} Also, ART solutions are still not recognised by regulators and supervisors in relation to capital relief on the same footing as is reinsurance. However, the recent developments in regulation such as Solvency II project, which is designed to reward insurance companies, in the form of capital relief in the context of solvency regulation, for every kind of risk transfer as long as they can demonstrate that they understand the nature and limitations of the techniques used and that the real transfer exists and Reinsurance Directive, which gave the legitimacy to Special Purpose Vehicles that are necessary in structuring of risk securitisation transactions, will solve the problem and potentially will give additional impetus for the development of ART solutions.

Finally, when choosing adequate risk transfer solution(s) insurance companies need to consider the market conditions. Although it is reasonable to expect that insurance and reinsurance companies will use ART solutions only when reinsurance and retrocession capacity is limited and expensive, it is not really true, as the empirical evidence from 2007 and 2008 showed. Despite the soft reinsurance market insurance-linked securities maintained the interest of investors but also insurance and reinsurance companies. Actually, insurers and reinsurers have followed the logic that even if one source of credit is slightly more expensive than another, a company might still access both just to be prepared for changing market conditions (Laster and Raturi, 2001: 15). In other words, insurers and reinsurers showed interest in maintaining relationships with capital market investors in order to be able, if market conditions harden, to transfer risks to them.

### 3.1 Securitisation – catastrophe bonds

Securitisation firstly appeared in the US during 1970’s in the form of monetisation of mortgages while in Europe it firstly appeared during 1980’s. Since then, until the credit crisis of 2007 that became financial crisis in 2008, there has been continuous

\textsuperscript{18} For example, securitisations of insurance risks through bonds are still very expensive and they require about $100 million as a minimum volume to make them economically viable (Zeller, 2008).

\textsuperscript{19} For example, a Hurricane or other catastrophic event may not trigger the insurance-linked security although it can create substantial damages for insurer.
growth of these transactions in the US while growth in Europe continued even in 2007 despite the crisis (ESF, 2008). There are many different definitions of securitisation which are essentially similar as the fundamental purpose of the securitisation is transformation or monetisation of illiquid financial assets, such as credit, leasing and other receivables, into tradable securities. However, it is worth mentioning definition given by Schwarcz (1994) who links securitisation with an alchemy, technique used by medieval chemists to turn base metals into gold, and explains that this alchemy really works as it enables companies to partly “deconstructs” themselves by separating certain types of highly liquid assets from the risks generally associated with the functioning of the company, and then using these assets to raise funds in the capital markets at a lower cost than would be the cost of raising funds by issuing more debt or equity. Securities that are “born” as a product of securitisation transaction are fully collateralised by assets, thus economic interest as well as associated risks in these assets are transferred to investors.

In insurance business securitisations were firstly utilised by life insurance companies during late 1980’s. These securitisations were not specific to insurance business except they referred to monetisation of receivables from insurance contracts. Essentially, there are three types of life insurance securitisations: securitisation of embedded value, reserve funding securitisation and insurance risk securitisation. The reasons for the development of securitisation in life insurance were more result of regulatory pressures and financial needs than problems with capacity shortages of reinsurance and retrocession market, although they allow insurance companies to hedge risks in addition to capital raising. Additionally, securitisation has the potential to improve market efficiency and capital utilisation thus enabling insurers to better compete with other financial institutions, increase return on equity and improve their operating performance (Cummins, 2004). As their mechanism is similar to mechanism used in catastrophe bond transactions they will not be discussed further.

Catastrophe bonds utilise securitisation in order to obtain additional capacity for insurance risk transfer in the circumstances of capacity shortage of the global reinsurance and retrocession market. Although the methods of securitisation of receivables are implemented, catastrophe bonds actually represent risk securitisation transactions that are intended to finance the risk transfer from the originator, typically insurance and reinsurance companies, and securities issuer, who is usually called Special Purpose Reinsurance Vehicle (SPRV). The goal of these transactions is not raising funds, as it is with other securitisations,
but management of the insurable risk. Typical catastrophe bond transaction is shown in Figure 5.

**Figure 5:** Mechanism of a typical catastrophe bond transaction

In a typical transaction of insurance risk transfer to the capital markets investors, insurance company as a transaction sponsor transfers assumed insurance risks from insureds to reinsurance company or directly to the SPRV, which has the role of retrocessionaire in the first case or reinsurer in the second. The coverage provided by bankruptcy remote SPRV is similar to quota-share, excess-of-loss reinsurance. The SPRV issues bonds that refers insurance risks and sell them to investors, thus it repackages untradeable insurance risks to tradable securities. The principal received and premiums are invested through the collateral trust, thus the coverage for insurance or reinsurance company is fully collateralised and thus credit risk is minimised. If needed the collateral trust can swap interest from investment acquired for an interest rate based on LIBOR increased for a spread. Insurance company acts as a servicer to investors as its obligation is to collect premiums from insureds and transfer them to the SPRV. Sometimes investors

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20 SPRV must be bankruptcy remote and not associated with the sponsoring insurance or reinsurance company. This means that the obligations of insurance companies other than those that originate from transferred insurance risks are not of investors’ interest. If insurer or reinsurer goes bankrupt the obligations of SPRV to investors will not be affected.
can seek credit enhancement, for example in the form of credit guarantees. If during the period of coverage the triggering event do not happen, investors will receive the principal invested increased with interest based on LIBOR plus spread. However, if triggering event does occur, the investors might lose the interest but sometimes the principal as well.

The basic difference between catastrophe bonds, as securities linked to insurance risks, and other securities that are based on the financial assets are triggers that are used. Catastrophe bonds use four types of triggers: indemnity-based, modelled loss, industry loss indexes and parametric triggers. Indemnity-based triggers are based on actual insured losses experienced by the sponsoring insurance or reinsurance company. These triggers tend to be most favored by sponsors as the cover is most closely aligned to the actual catastrophic loss and hence the basis risk is minimal. Other three types of triggers have been more appealing to investors. These triggers include trigger that is based on modelled company losses, trigger that is based on industry loss indexes such as the Property Claim Services index, an indicator of catastrophe-related property losses products by Insurance Services Office, a New Jersey-based insurance data specialist, and parametric triggers where the payout from a bond to sponsors is based on a certain independent parameters, such as wind speed or the Richter scale for earthquakes.

Although first catastrophe bonds appeared after Hurricane Andrew of 1992 and Northridge Earthquake of 1994, the wider acceptance these alternative risk transfer solutions gained after hurricane seasons of 2004 and 2005. They offer insurance and reinsurance companies complementary capacity to traditional reinsurance and retrocession, especially for peak catastrophe risks. They also eliminate counterparty credit risk as they are fully collateralised, offer multi-annual coverage that helps eliminates the unpredictability in available capacity and pricing that are inherent to each traditional reinsurance renewal season and has not only the potential for improvement of the overall balance sheet position,

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21 Their growth in the period from 2000 to 2007 was above 200% but the volume of transactions of larger value, those exceeding $200 million, significantly increased during 2006 and 2007 (Klein, and Mooney, 2008)

22 Catastrophe bonds are used for earthquake risk (for California, US Midwest, Japan, France and Monaco), hurricane risk (for US Northeast/Atlantic, US Golf coast, Puerto Rico, Hawaii and Japan) and for European windstorm and hailstorm risk (Banks, 2004: 124). Additionally, Australian wind/earthquake and Mexican earthquake were perils for which catastrophe bonds were first issued in 2006 (Klein, and Mooney, 2008). During 2007 catastrophe bond coverage expanded to include multiple perils as well as new risks such as European earthquake risk (Benfield (2008), ‘Global Reinsurance Market Review: Changing the Game’, Benfield Group, London).
but also helps in stabilisation of earnings and therefore in raising shareholder value. As is the case with other alternative risk transfer solutions, catastrophe bonds offer investors ability to invest in insurance risks that are uncorrelated with other risks in their portfolios and to gain additional, relatively high income. The main drawbacks of catastrophe bonds is the presence of basis risk in addition to illiquidity, high expenses, the need for a lot of analytical work and modelling which leads to relatively long periods of time for their establishment and in Europe in particular, their development was hindered by lack of appropriate indexes, such as Property Claims Services index in the US.

3.2 Contingent capital

Contingent capital is a pre-loss alternative risk transfer product that enables insurance or reinsurance company with the possibility to issue securities such as equities and bonds and structured securities such as catastrophe bonds. The word “contingent” is used to differentiate these structures from the paid-in capital, which understands classical meaning of capital that is available to insurance and reinsurance companies upon issuance of equities or bonds. Contingent capital is low-cost off-balance sheet alternative (Culp, 2002a) that provides conditional coverage upon the occurrence of some triggering insurable event. Figure 6 is included in order to provide better understanding of the difference between paid-in and contingent capital by presenting their most simplified structures.

**Figure 6:** The difference between paid-in and contingent capital on the example of put option on stocks

![Figure 6](image_url)

*Source: Modified according to Munich Re (2001).*
Paid-in capital structures have been common for many years and they are usually utilised in order to raise capital by issuing securities for which insurance, reinsurance and other companies receive cash payments immediately after the completion of the transaction. Contingent capital structures, however, provide insurers and reinsurers with the right, but not the obligation, to issue specified security in the future at specified terms regarding price, triggering event and the time frame. For example, if the catastrophe happens during the period of option validity the insurer or reinsurer will have the right to sell securities to investors (option writers) at prices that are agreed in advance. The predetermined price is very important for insurance companies as after the occurrence of catastrophic event it is usually very hard to obtain financial resources at prices that were prevailing before the occurrence of the triggering event and in addition, reinsurance and retrocession markets capacity becomes scarce and expensive. The costs of structuring contingent capital deals are much lower than are for catastrophe bonds as these deals are made through private placements (Culp, 2006) and usually the main cost is option fee paid to option writer at agreed intervals. Additional benefits of contingent capital include balance sheet protection when it is most needed and access to financing with neither a corresponding increase in leverage nor a dilution of shareholders’ equity (Benfield, 2008). However, due to the fact that they are usually structured as private placements, by utilising contingent capital structures insurers and reinsurers are exposed to the increased credit risk of the option writer.

The most widespread type of contingent capital structures utilised by insurance and reinsurance companies are catastrophe equity puts (Cat-E-Puts). The structure first developed by insurance and reinsurance broker Aon in the wake of Hurricane Andrew and the Northridge Earthquake is the most popular transaction format used mainly by reinsurers (Ehrhart, 2002). This puts enable insurers and reinsurers to raise capital by issuing equities at a pre-agreed price after the occurrence of the catastrophic event. However, due to the exposure to credit risk they haven’t attracted as much interest as catastrophe bonds.23

### 3.3 Insurance Derivatives

Insurance derivatives are financial derivatives that are used for insurance risk hedging. In order to understand the mechanism of insurance derivatives it is important to briefly explain financial derivatives. The broadest accepted

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23 For example, while cat bond issuance in 2007 reached $7 billion the total size of contingent capital deals reached $1.2 billion (ibid.).
definition of financial derivatives is given by the Group of Thirty (1993) according to which a derivatives transaction is a contract whose value depends on (or “derives” from) the value of an underlying asset, reference rate, or index. Financial derivatives firstly appeared during 1970’s and their origin was influenced by inflation pressures, high oil prices and breakdown of the Breton Woods system of monetary management that resulted in increased volatility of interest and exchange rates. Financial derivatives are essentially contracts that are traded at financial markets either through organised exchanges (futures and options) or at over the counter markets (forwards, options and swops).\footnote{24} As financial derivatives provided a good mechanism for interest and exchange rate risk hedging, during 1990’s the similar mechanism is implemented for insurance risks. The basic difference of insurance derivatives is that they are derived from insurance risks rather than from typical financial market risks. Insurance derivatives enable insurance and reinsurance companies to transfer insurance risks to capital market investors and serve as a complement to traditional reinsurance and retrocession while investors are offered additional opportunity to diversify risks in their portfolios. Additionally, investors can achieve supplementary returns by speculating on natural catastrophes (Doherty, 2000). Insurance derivatives include futures, options, catastrophe swaps and industry loss warranties. First insurance derivatives introduced by Chicago Board of Trade (CBOT) in 1992 were catastrophe insurance futures contracts. The values of these contracts were derived from the value of the index which was based on a loss ratio for the pool of 100 insurance companies in Insurance Services Office index (Lane, 2006). In 1993 this exchange introduced options on these futures but because of insufficient interest both instruments were replaced with options based on Property Casualty Services index, which measures loss instead of loss ratio. However, these new instruments experienced the same fate as derivatives from 1992 and 1993 and were delisted in 2000. Until 2007 there was no trading of

\footnote{24 Futures and forwards are contracts that obligate buyers and sellers to exchange specified assets at specified price at specified future date. The only difference is that futures are standardised while forwards are not. Swaps are most widespread financial derivatives and while also refer to future they enable contracting parties to exchange cash flows from specified assets instead of exchanging assets for specified price (Bank for International Settlements, (2008), \textit{BIS Quarterly Reviews}, Basel, Switzerland, http://www.bis.org/publ/quarterly.htm, accessed 10 November 2008). Options are not standardised financial derivatives that provide option buyer with the right but not with the obligation to sell, in the case of put option, or to buy, in the case of call option, certain assets at specified price during specified time period.}
insurance risks at exchanges. However, in 2007 the New York Mercantile Exchange (NYMEX), Chicago Mercantile Exchange (CME) and Chicago Climate Futures Exchange (CCFE) started trading with futures and options that refer catastrophe insurance risks (Benfield, 2008). Trading of futures and options on NYMEX is based on the same index that was used by CBOT in 1992 although now exist three separate indexes (National, Florida and Texas-Maine) that are calculated by dividing insured losses by $10 million. CME uses CME-Carvill hurricane index derived from hurricane risk in the US while CCFE uses index developed by Insurance Futures Exchange Services. The advantages of exchange traded options and futures are transparency, standardisation, relatively low credit risk and the fact that the standard margin requirements are defined by exchange. However, due to the fact that these instruments are based on excessive modelling or historical loss records they are not best correlated with industry losses thus the basis risk is present. However, unlike to first attempts from 1990’s the insurance and reinsurance industry as well as investors expressed more interest in these instruments. Although the trading volume is still low it could be reasonable expected that in future these derivative instruments will have important role as a supplement to traditional reinsurance programmes.

Catastrophe swaps are insurance derivatives instruments that enable insurance and reinsurance companies to exchange two or more catastrophic risks. The risks

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Options are actually exchanged in the over-the-counter market but the clearing is done on NYMEX.

CME-Carvill hurricane index is actually a suite of products that covers five zones: eastern US coastline, Gulf coast, Florida, southern Atlantic (from Georgia to North Carolina) and northern Atlantic (from Virginia to Maine). The indexes are calculated by using publicly available information on maximum wind velocity and size of each storm provided by National Hurricane Center of the National Weather Service (Smith, S. (2008), An index to measure the destructive potential of hurricanes, Chicago Mercantile Exchange, http://www.cmegroup.com/trading/weather/files/WEA_chl_whitepaper.pdf, accessed 05 November 2008).

This index is used for trading of event linked futures that are modelled on Industry Loss Warranty reinsurance policies, but are contracts for difference, rather than reinsurance policies. Initially only ‘First Event’ contracts were listed and Second Event contracts were introduced on May 2 2008. On July 11 2008 IFEX (Insurance Futures Exchange Services website, http://www.theifex.com, accessed 05 November 2008) listed First and Second Event Tropical Wind event linked futures contracts for Florida and for the US Gulf Coast (the states of Alabama, Mississippi, Louisiana and Texas).

While the total number of contracts that were traded at CBOT was below 20000, during the first seven months of 2008 there was 30000 contracts traded at CME (Risk and Insurance (2008), ‘Gustav’s ‘Live CAT’ Capacity’, Risk and Insurance magazine, LRP Publications, Horsham, PA http://www.riskandinsurance.com/story.jsp?storyId=124326385, accessed 20 September 2008).
can be exchanged as a floating-for-floating swap contract, in which one reinsurer makes cash payments to another reinsurer following a triggering event in exchange for receiving LIBOR plus a spread, or they can be exchanged with one another (Lane, 2006). Figure 7 presents the example of catastrophe swap transaction when different catastrophe risks are exchanged between two companies.

**Figure 7**: Example of catastrophe swap transaction between Japanese insurance company Mitsui Sumitomo Insurance and Switzerland-based reinsurer Swiss Re

![Diagram of a catastrophe swap transaction](source: MSI (2003))

In the shown transaction Mitsui Sumitomo Insurance company exchanged $50 million of Japanese typhoon risk for $50 million North Atlantic hurricane risk and $50 million of Japanese typhoon risk for $50 million European windstorm risk. This transaction is done on parity basis which means that there was no exchange of money, although such swap transactions are also possible. Swap transactions helped these companies to reduce their peak exposures to certain risks and to diversify existing risks in their portfolios, thus freeing capital for new business acquisition or for regulatory purposes. In addition, because a risk swap transaction does not harm any existing profits of the swap counterparties, capital efficiency of both should improve (Takeda, 2002). Swap transactions are privately placed transactions what makes them less expensive than other alternatives but also exposes counterparties to the credit risk of the other counterparty. Additionally, as they are based on excessive modelling basis risk is present more than in some competitive solutions. However, the main problem for swap transactions is finding the right counterparty. With the aim to solve this problem the Catastrophe Risk Exchange was formed in 1994 in Princeton, New Jersey. It is actually a company with the main objective to facilitate parties in buying and selling reinsurance coverage and to transact reciprocal reinsurance swaps.

Another important development in the field of insurance derivatives was industry loss warranties. Industry loss warranties, originated in London in the late 1980's, are actually reinsurance contracts that have two triggers. The first is

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Each party respectively ceded and assumed specific catastrophe reinsurance contract(s) to/from the other party.
indemnity trigger that is based on the losses that buying insurance or reinsurance company experience and the second is warranty trigger that is based on losses experienced by the whole insurance industry. All triggers must be hit in order for industry loss warranty to pay off its buyers for specified catastrophe event in specific geographic region. Because of the retention of the first trigger industry loss warranties have regulatory treatment as reinsurance contracts, what makes them appealing for insurance and reinsurance industry participants. Although industry loss warranties are exercised as private transactions (Benfield, 2008) and thus the limitation of reliable data on utilisation of these instruments exists, there are estimates that in 2007 the total market value of these instruments exceeds $4 billion (Pennay, 2007:3) and even $7 billion (Wheeler and Janeke, 2008: 4). Despite the fact that the basis risk is present, which is certainly one of the main concerns for insurers and reinsurers, the main obstacle to their development in Europe has been the lack of reliable and independent industry loss index. Although Swiss Re and Munich Re had developed two loss indexes they are not widely accepted because insurance industry participants associate them with exposure to basis risk and found them biased and of limited geographic spread (Benfield, 2008). In order to solve this problem, Swiss Re, Munich Re, AXA, Zurich Financial Services and Allianz started initiative for the development of independent body that will create reliable European loss index such as that of Insurance Services Office in the US.

3.4 Reinsurance sidecars

Sidecars\(^{30}\) are alternative risk transfer solutions which have similarities to cat bonds and traditional reinsurance and can be used as a supplement to both. Although the similar structures existed for several years before,\(^{31}\) the true enthusiasm for them was expressed after hurricane season of 2005. During 2006 $3.6 billion of equity and loan capital was raised through sidecars to support mainly North American catastrophe risk (Benfield, 2007), while in 2007 only around $1.15 billion of new capital has been raised through sidecars (Benfield, 2008). Although they also marked significant presence in 2008 (Klein and Mooney, 2008) it is estimated that the interest for them is decreasing because of the currently present “soft” reinsurance market. However, because of their

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\(^{30}\) Sidecars are small vehicles attached to the side of a motorcycle, in which a passenger can ride (Longman, 2003: 1532). In the sense of their application in insurance and reinsurance the term “sidecars” is used to describe that these vehicles are used as off-balance sheet solution.

\(^{31}\) The existence of sidecars can be traced back to 1999 when State Farm and Renaissance Re formed joint venture which lead to the formation of Top Layer in order to provide high layer, catastrophic property coverage for RenRe’s portfolio of property programs.
advantages in providing additional capacity, they would probably be a viable alternative when the reinsurance market hardens again.

A.M. Best (2006) defines them as limited-life special purpose entities that generally provide property catastrophe quota-share reinsurance exclusively to its sponsor. This definition suggests that they have limited lifetimes in the sense that they serve to fulfill the specific reinsurance needs to the sponsor. They are usually used with the aim to provide additional retrocession capacity on a short-term basis for property or marine risks, although some sidecars have been used for the life/health risks. Usually the structure of sidecars is based on a quota-share reinsurance. The simplified sidecar structure is shown by Figure 8.

Figure 8: Simplified sidecar structure

Source: A.M. Best (2006)

Figure 8 shows that sidecar is actually a holding company, usually found at Bermuda, which issues debt and equities to investors and collateralises full amount of the ceded limit with the trust account. Sidecars provide reinsurers with the possibility to underwrite more risks than their balance sheet capital would allow but without the treat that their credit rating will be endangered, as some of peak risks are transferred off-balance sheet. In addition to fully collateralised coverage

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32 Because of their limited lifetimes they are also called “disposable reinsurers”.
33 However, there are concerns of rating agencies that when they are written on an ultimate net loss basis, some of the risks for which it was supposed that are transferred to the sidecar can actually be borne by the sponsoring reinsurer (Benfield Group (2007), Global Reinsurance Market Review: Pick ‘n’ Mix, London).
that minimises credit risk to the sponsoring reinsurance company, sidecars are attractive to reinsurers as there is no need to disclose information (Klein and Mooney, 2008) such is needed in a typical retrocession transaction. Because of the simplicity of their structure (see Figure 8 and Figure 5) in comparison to catastrophe bonds they are less time-consuming and the costs are lower than the costs of traditional reinsurance, debt or equity financing or establishment of new reinsurance companies.

Sidecars as other alternative risk transfer solutions could not be developed if there was no interest from investors such as hedge funds and private equity investors. The main attraction of sidecars to investors is that they allow investments in insurance-linked risks without the need to take on long-term investment risk, the problem associated with the establishment of a reinsurance company. Also, in comparison to traditional investment in establishment of a new reinsurance companies sidecars provide the advantage of easy entrance and exit. In other words, sidecars provide easy entrance to the market during the “hard” and the easy exit during the “soft” phase of reinsurance market cycle. Additionally, they enable investors to diversify their portfolios with insurance risks, as they can with catastrophe bonds, but unlike catastrophe bonds sidecars are simpler to understand as they are, from investors’ point of view, very similar to traditional investments in equity and debt securities.

4. CURRENT STATE OF RISK TRANSFER SOLUTIONS IN THE SERBIAN INSURANCE MARKET

Although some embryonic forms of risk sharing existed before34, the development of insurance business in Serbia started in 1868 with the establishment of first insurance companies Gresom and Anker, which were in foreign ownership. First insurance companies established with majority share of domestic capital were Beogradska zadruža and Srbija (Marović, 2001: 7) After the Second World War insurance industry passed through the all development phases of economic and social system of former socialist Yugoslavia. The worst period in domestic insurance history has been the period of hyperinflation that destroyed insurance companies’ funds that combined with irregularities in the functioning of insurance companies resulted in a loss of confidence in insurance. The consequence of such

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34 The traces of primitive forms of insurance in Serbia can be found in Dusan’s Code of 1349.
developments was currently undeveloped insurance market. Only after the introduction of the new insurance law in 2004 insurance and partially restored confidence in the insurance industry, market started to develop. However, despite the increased development in recent years, the market is still undeveloped because of slow overall economic development.

While the first idea for the establishment of state-dominated reinsurance company was born in 1940 (Kočović and Šulejić, 2002: 15), until 1977 there was no any professional reinsurer, although coinsurance as a way of spreading the same risks between insurance companies existed. In 1977 the first professional reinsurance company Dunav Re was established and this marked the beginning of reinsurance operations in Serbia. Nowadays reinsurance market in Serbia is represented by three reinsurance companies, Novi Sad Re, established in 1980, and Delta Re in addition to Dunav Re. The market is highly concentrated as the leading reinsurer Dunav Re has a market share of over 70%. Although there are no reliable data on the functioning of reinsurance companies, from the data found at insurance companies' balance sheets it can be assumed that approximately 10% of direct insurers' premium is transferred to reinsurers while a great part of the accepted premiums in reinsurance is transferred to global reinsurance market. In this way, national reinsurers actually collect small risks from local insurance companies and then repackage them into an offer with premium volumes that are attractive to global reinsurers. The reason of such protected position of reinsurance companies is the insurance law (Insurance Law, 2004, Article 15) which made it obligatory to insurance companies to reinsure with domestic reinsurance companies. However, International Monetary Fund had recommended to National Bank of Serbia to phase out restrictive trade practices regarding mandatory reinsurance cessions.

35 The share of total premium in GDP in 2007 was just 2.04%, much lower than the EU average of 9% while the total insurance premium per capita was about $103, which is fairly enough when we know that the average salary was approximately $400, but is too low in comparison to regional average of between $300 and $1000 of premium per capita. Additionally, measured by the total premium volume of $766 million in 2007, Serbian insurance market’s share in total world premium was 0.02% , despite the achieved real growth of 8.2% (Staib, D. and L. Bevere (2008), ‘World insurance in 2007: emerging markets leading the way’, Sigma No 3, Swiss Re, Zurich).

36 For example, the Yugoslav oil pipeline in Rijeka was coinsured from fire and associated perils by three insurance companies: Croatia, Sarajevo and Vojvodina with 50%, 32% and 18% of share in risk coverage respectively (Marović, 2001: 291).

and long-term property insurance contracts (IMF, 2006: 43). Additionally, when Serbia becomes member of the World Trade Organisation (WTO)\textsuperscript{38}, the solid position of domestic reinsurance companies will be lost, as the experience of other Eastern European companies has shown. It is expected that with opening of the domestic reinsurance market the only competitive advantage for domestic over foreign reinsurers will be their experience in the local insurance business and their ability to reduce their administrative expenses.

From the brief description of the reinsurance market it is clear that reinsurance is the only\textsuperscript{39} and by Insurance law obligatory risk transfer solution for domestic insurance companies. Currently, Serbian insurance industry lacks of even legal basis for the development of capital market solutions for insurance risk transfer. But besides the current insurance law incomprehensiveness in regard to range of legally accepted insurance risk transfer solutions and undeveloped insurance market\textsuperscript{40}, the underdevelopment of capital market and the absence of catastrophic events are additional factors that hindered the development of capital market solutions.

Currently, Serbian capital market is represented by the trades that take place at the Belgrade Stock Exchange as over-the-counter market does not exist. Although the stock exchange has been established before the Second World War, in the period after the war it was closed until 1989, but the trading actually started after 2000 when privatisation process began and when restricted foreign currency public saving bonds were issued by the Serbian government. Although recently there has been an increase in the number and value of transactions\textsuperscript{41}, the

\textsuperscript{38} Serbia is in negotiation for WTO membership from 2005.

\textsuperscript{39} Although the Insurance Law (2004) provide legislative basis for the existence of risk sharing through coinsurance in addition to reinsurance, the only risk transfer mechanism exercised in practice by domestic insurers is reinsurance.

\textsuperscript{40} The opinion of the authors is that undeveloped insurance market has led Serbian insurance companies to form opinion that they cannot do anything in order to hedge against the reinsurance market cycles. The rational behind such development has been the low share of Serbian insurance market in the world’s total premium, which limited domestic reinsurers’ contractual position in relation to the possibility of changing conditions that are determined in advance.

\textsuperscript{41} In the period from 2004 to 2007 the total number of transactions rose by 113% and the total volume of transactions rose by 307% (Belgrade Stock Exchange, 2008).
market currently lacks of wider investor base\textsuperscript{42} and wider diversity of investment instruments available.\textsuperscript{43}

Finally, we have seen that the most important stimulus for the development of alternative risk transfer solutions were catastrophic events. The absence of catastrophic events in Serbia in recent years, although generally positive trend, had negative impact on the need of insurance companies to search for alternative sources of capacity. Additionally, because of low insurance penetration, large catastrophic events, even when they did occur\textsuperscript{44}, were not born by insurance companies but were compensated from public funds formed on the basis of social solidarity principles.

5. EXPECTED FUTURE DEVELOPMENT OF RISK TRANSFER SOLUTIONS IN SERBIA

Currently, insurance companies in Serbia lack of the opportunities of transferring insurance risk to capital markets as the only relationship between insurance and capital markets have been through investment operations of insurance companies and direct investments of capital markets investors in shares of insurance companies. However, in order to improve efficiency of risk and capital management and to make use of other advantages, which are confirmed in developed insurance markets, it would be desirable for domestic insurance companies to develop solutions that would enable transfer of insurance risks to capital markets in addition to traditional transfer to reinsurance market.

The general fact is that economic progress has direct impact on the rise of capital stocks and property values in economy and the level of people’s consciousness about the importance of insurance protection. Additionally, the experience of developed economies and economies that have passed through the changes from administrative to market economy clearly shows that with increased economic development the frequency and especially severity of loss events becomes

\textsuperscript{42} Although new laws on investment and pension funds provide the legal basis and had led to the establishment of these institutions, even under these new legislations the establishment of hedge funds, so important to the development of capital market solutions for insurance risk transfer, is not anticipated.

\textsuperscript{43} Although in 2004 several transactions with corporate bonds and commercial papers were recorded, only available instruments in 2005, 2006 and 2007 were shares and restricted foreign currency public saving bonds (Belgrade Stock Exchange, 2008).

\textsuperscript{44} For example, Montenegrin earthquake of 1979 or Serbian floods of 2006.
greater as well as the volume of available income that can be used for insurance protection. Thus, the economic development leads to increased demand for insurance, but as the experience of developed market shows, usually the pace of this increase is faster than that of the capacity of insurance and reinsurance industry. Thus, it is obvious that the level of economic development, that could be expected to significantly increase in Serbia in the long-run, will lead to increased need for additional sources of capacity. On the other hand, the development of insurance market leads to increased competition, as it has been seen recently in Serbia\textsuperscript{45}, which further leads to increased pressures on capital of insurance companies, as more money needs to be invested in the market development and acquiring new customers. Combined with the increased insurance penetration that leads to greater loss exposures of insurance companies, this would lead to increased pressures on insurance companies’ solvency margins and thus the need for alternative risk transfer solutions from insurance companies in Serbia can be expected. Finally, the development of ART solutions is inconceivable without the developed capital market. If Serbian capital market continue to develop at the pace that was noted in the last four years, it is reasonable to expect that it would become one of the major impetuses for the development of ART solutions.

However, we argue that alternative risk transfer solutions, which provide transfer of insurance risks to capital market investors, have two-way relationships with the level of development of insurance and capital markets as well as with the level of overall economic development (see Figure 9). By providing the additional capacity and more efficient capital utilisation they would enable insurance companies to offer better coverage conditions and price stability which would directly lead to increased development of insurance operations in Serbia. Additionally, the development of ART solutions in Serbia would facilitate the development of domestic capital market, as the subsequently greater variety of available financial instruments would improve risk diversification possibilities, which would consequently provide basis for the increased attractiveness of greater number of investors from the country and abroad. The positive effects on the development of insurance and capital market would facilitate the overall economic growth, which would in turn facilitate further development of insurance and capital markets and ART solutions.

\textsuperscript{45} From November of 2007 when DDOR Novi Sad, the second largest insurance company in Serbia, was privatised, Serbian insurance industry is in majority ownership of foreign capital (National Bank of Serbia (2008), Insurance Companies Operations, Belgrade, \url{http://www.nbs.rs/export/internet/cirilica/60/60_2/index.html}, accessed 12 November 2008).
However, in order to facilitate the development of ART solutions it will be needed, in addition to changes in economic factors, to provide the legal basis for their development. One of the positive signs in this regard has been the development of the draft of the Law on Securitisation that will provide, if adopted, the legal basis for the securitization of receivables. When this happens, as the experience of developed economies shows, the basis for the development of risk securitisations will be provided. However, the most important change would be the change in the way how insurance and reinsurance companies’ solvency is regulated, which means that the modified insurance law would have to provide the capital relief for ART solutions on the same footing as for coinsurance and reinsurance. Although we expect that reinsurance will retain the leading role as a risk transfer solution in the future of Serbian insurance market, the mentioned changes will certainly be made within the total efforts of making Serbia closer to the EU membership.

6. CONCLUSION

Risk transfer solutions that are available to contemporary global insurance companies encompass traditional reinsurance and alternative risk transfer solutions, which are one of the results of the long-term trend of convergence of insurance and capital markets. It could be expected, by extrapolating the past developments, that in the future the role of alternative risk transfer solutions will be increased because of the increased interest of insurers and reinsurers, as
there is continuous discrepancy between the demand and supply of insurance and reinsurance cover caused by slower growth of capacity in relation to growth of risk exposures, and capital market investors, who can achieve relatively high returns combined with proved diversification effect. Additionally, it is reasonable to expect that alternative risk transfer solutions will be utilised not only for catastrophe risks but also for non-catastrophe risks, such as further development of already implemented solutions for the motor and liability insurance risks. In support to the conclusion of growing importance of alternative risk transfer solutions is the fact that in 2007 and 2008, despite the financial crisis and “soft” reinsurance market, there was continued growth of interest from investors, although there was slight decrease of interest from insurers and reinsurers. However, in order to compete effectively with reinsurance, especially in the “soft” phase of reinsurance cycle, some fundamental issues, such as still relatively high transaction costs in comparison to reinsurance, the need to obtain capital relief on an equal footing as for reinsurance from regulators and rating agencies, lack of liquidity, transparency, standardisation, reliable industry loss data and indexes in Europe, expertise and insurance risk diversity, still need to be fully addressed.

On the basis of the mechanisms that underlie the functioning of reinsurance and alternative risk transfer solutions, explained in the paper, we can draw the conclusion that these solutions are complementary, although the term “alternative” is used for the risk transfer solutions other than traditional reinsurance. The fact that alternative risk transfer solutions have been used mainly in the field of catastrophic risks in the conditions of limited reinsurance and retrocession capacity and high premiums as a supplementary method to this capacity goes in support for this conclusion. Additional fact that support this conclusion is that insurers and reinsurers make their decisions in relation to the choice of traditional and/or alternative risk transfer solutions in the same way as they made them in relation to the choice of risk retention and/or transfer, that is to say, they made these decisions on the basis of the analysis of costs and benefits of different available alternatives in addition to having factored in objectives that they aim to achieve, their size, risk tolerance and other specific characteristics. For example, if the relatively small insurer has the aim to achieve wider annual cover with the possibility of coverage renewal and relatively lower costs in “soft” reinsurance and retrocession market, with accepting credit risk but without accepting basis risk, the priority would certainly be given to reinsurance. Different preferences would

46 One of the effects of the financial crisis was the collapse of investment bank Lehman Brothers that was guarantor in several catastrophe bond transactions, which consequently marked decrease in credit rating.
be that of a larger insurer or reinsurer with greater financial strength, different objectives and with different conditions in relation to reinsurance market cycle.

By detailed examination of domestic literature in the field of insurance and reinsurance as well as the risk transfer practices of domestic insurance companies, it is evident that the only and even by the law obligatory risk transfer solution available and utilised is traditional reinsurance. The most important reasons behind such underdevelopment have been undeveloped and relatively small domestic insurance market, undeveloped capital market that would enable transferring of insurance risks to investors, the lack of or imperfection of current laws that would provide regulatory framework for insurance risk transfer to capital market investors and the absence of catastrophic events that created the lethargy of insurance and reinsurance market participants in relation to the need to search for alternative solutions.

However, on the basis of the experience gained in developed and countries that have passed through the transformation of their socio-economic systems we argue that the application of capital markets solutions, as complementary risk transfer mechanism to traditional reinsurance, has the potential to play an important role in the future of Serbian insurance industry. The most important drivers of their development that we expect to be are development of capital and insurance markets and overall economic progress. Although the need for alternative risk transfer solutions will certainly be created by economic and the development of insurance market, the stated problems that hindered their development in the past will need to be fully addressed in order to achieve proven benefits of utilisation of complementary traditional and alternative insurance risk transfers, such as guaranteed continuity of protection, greater capacity, price stability and certainty of terms in Serbian insurance market.

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## Appendix 1

### Table A1: Comparison of capital market instruments with reinsurance

<table>
<thead>
<tr>
<th></th>
<th>Cat bonds/ swaps</th>
<th>Exchange traded options</th>
<th>Contingent capital</th>
<th>Property catastrophe reinsurance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compensation/ financing</td>
<td>Compensates buyer against losses, subject to basis risk</td>
<td>Compensates buyer against losses, subject to basis risk</td>
<td>Provides financing on pre-agreed terms in case of loss event. No indemnification</td>
<td>Compensates reinsured against losses</td>
</tr>
<tr>
<td>Basis risk</td>
<td>Present in deals with trigger based on index</td>
<td>Significant</td>
<td>Depends on the index/trigger used</td>
<td>Minimal</td>
</tr>
<tr>
<td>Credit risk</td>
<td>Minimal. Capital is invested in safe securities held by trustee</td>
<td>Minimal. Obligations guaranteed by the exchange</td>
<td>Minimal. Capital is invested in safe securities held by trustee</td>
<td>Depends on solvency of the reinsurer</td>
</tr>
<tr>
<td>Liquidity for risk taker</td>
<td>Currently low. Expected to improve as market develops.</td>
<td>Currently low. Expected to improve as market develops</td>
<td>Low</td>
<td>Limited to retrocession market</td>
</tr>
<tr>
<td>Well-established underwriting accounting rules?</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Well-established accounting rules for investors?</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Standardisation</td>
<td>Customised</td>
<td>Standardised</td>
<td>Customised</td>
<td>Customised</td>
</tr>
<tr>
<td>Multiyear pricing</td>
<td>Available</td>
<td>No</td>
<td>Available</td>
<td>Availability depends on market conditions</td>
</tr>
<tr>
<td>Transaction costs relative to reinsurance</td>
<td>High, expected to decrease as firms gain experience</td>
<td>Low</td>
<td>High, expected to decrease as firms gain experience</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*Source: Laster and Raturi (2001)*