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INNOVATIONS IN NON-LIFE INSURANCE

REVIEW ARTICLE

Abstract

In order to survive and advance in the market, insurance companies must continuously design the offer and introduce new forms of services. When creating new non-life insurance types or subtypes, it is necessary, first of all, to have in mind a completely new form of coverage that was not previously in the market, that is, within the offer of the insurer itself. On the other side, there are numerous gradual innovations that in modern market circumstances imply improvement of existing insurance policies, merger and separation of risk coverage and several forms of parametric insurance. In this paper, special attention was paid also to the drivers of introducing innovations into non-life insurance. The most important of these are the insurance cycle, environmental perils, control environment and the latest technological advancements.

Key words: *innovations in insurance, non-life insurance, types of innovations in insurance, completely new forms of coverage, gradual innovations, innovations' drivers.*

1. Introduction

Occurrences such as increased competition, new perils, variable loyalty and tendency of the insured and constant threatening inflation stimulate the insurance industry to find ways to introduce innovations in order to increase the scope of work,

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that is, insurance premium. Such market changes are continuously occurring and insurers, if they want to survive, should constantly adapt to a changing environment. The advancement of new technologies and the growing awareness of insureds about other protection services are creating an increasing pressure on the introduction of innovations in insurance. This is especially true today, in conditions of the so-called soft market (higher supply than demand) and weak economic growth, which does not provide to insurance companies neither prospects for a fast growth of premium nor the possibility of acquiring significant returns on investment.

We are witnesses that the topic of innovations in insurance in recent years has gained importance in numerous magazines, studies and the internet. Creation and innovations in the insurance industry are now considered necessary and crucial for a long-term success. Some insurance experts even think that this industry has reached a critical point.[3] It is therefore not surprising that the insurance companies give priority to innovations in services.

The general notion of insurance, which is valid within and outside this industry, is that it is not particularly favorable to innovations.[4] Unlike, for example, computer companies, insurance companies often and only to a limited extent invest in research and development in order to create and implement new business ideas. This observation on the insufficiency of investment also applies to related insurance activities. According to a 2010 survey, no insurer was among the top 50 companies in the world according to introduction of innovations, and the best-placed financial company was only in the 39th place. The situation later improved, and in 2015 among the top 50 companies after the introduction of innovations, the insurance company AXA was in the 22nd and Allianz was in the 25th place.[5]

We can point out that, contrary to popular public opinion, non-life insurers nevertheless offer new services to the market in a noticeable extent. Moreover, the findings of certain surveys indicate that the insurance industry in this respect does not lag behind other service industries. However, innovations in insurance occur gradually and in small steps, so they are not overly noticeable.[6]

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[3] Denise Garth, The Insurance Tipping Point: Innovation and Transformation, January 3, 2011, *https://www.perrknight.com/2011/01/03/insurance-tipping-point-innovation-transformation/*, pristupljeno 1. 12. 2017.

[4] Andreas Eckstein, Axel Liebetrau, Anja Funk-Münchmeyer, *Insurance & Innovation 2016*, Karlsruhe, 2016, S. V.

[5] Bruce Einhorn, The 50 Most Innovative Companies, Bloomberg Businessweek, 15 April 2010, *https://www.bloomberg.com/news/articles/2010-04-15/the-50-most-innovative-companies*, pristupljeno 20. 11. 2017, Alan Murray, 50 Most Innovative Companies, Fortune, Dec 02 2015, *http://fortune.com/2015/12/02/50-most-innovative-companies/*, pristupljeno 20. 11. 2017.

[6] Swiss Re, Produktinnovation in der Nichtlebenversicherung: Von kleinen und grossen Innovationen, *Sigma*, 4, 2011, S. 4.

2. Creation of New Insurance Types

2. 1. Innovations in Insurance

Growing awareness of the necessity of insurance protection and growing demands of insureds encourage the insurer to provide as rich and diverse offers as possible, and to continuously provide something new. Innovation, novelty are words widely used, but are often not well interpreted. The term innovation comes from the Latin verb "innovare", which means "renew" or "change". But not every change is sufficient to be considered an innovation. The innovation should introduce something that improves the existing situation, a new action or an idea.

In addition, innovations should also be of benefit to other people. Something new does not necessarily mean to discover something completely new. At the same time, it turns out that not all discoveries in the final outcome are not true innovations. A commercial innovation involves development of ideas into marketable products and services in order to create a new value. The newly created value is expressed by the market success of a new, renewed or altered product or service, which implies growth of sales and profit. More broadly, an innovation includes qualitative improvements in order to meet insurance and other needs of individuals, companies or a society.

Actually, there is no exact form according to which an innovation can be created, nor it is known how it spreads to companies and entire business branches, including insurance. Thus, something can be new for a company that has been used by other companies or other markets for a long time. But over time, successful innovations will, as a rule, be widely accepted throughout the market. On the contrary, innovations with poor demand or no demand at all are slowly disappearing because different solutions have come to the market.

2. 2. Types of Innovations in Insurance

Innovations occur in the following areas:[7]

- a product or a service (introduction of a product or a service that is new or significantly improved in terms of its characteristics or intended use; product adjustment may concern important changes in technical features, parts, material, ease of use, and the like.);
- a process (introduction of a new or significantly altered method of production or delivery; that implies important changes in technology, equipment and computer programmes; innovations can also occur in

[7] OECD, *Oslo Manual: Guidelines for Collecting and Interpreting Data* (3rd Edition), Paris, 2005, p. 29.

order to reduce the number of steps in the existing workflow and the costs of its execution, and therefore costs of the end product or service);
- marketing (implementing significant changes in the appearance of a product or a service, packaging, advertising, pricing or sale) and
- organization (implementation of a new organizational setting related to business practice of a company, work environment or external relations of the company).

When considering the above stated insurance areas, most people associate innovations with services, and probably with a new technology. However, for a mass offer of a new service at a market-acceptable price, additional organizational and marketing innovations are also needed, while services offered by insurance companies are at the same time processes, as they are created and consumed at the same time. Insurers cannot produce and store their services in advance in order to sell it in future.

Innovations are also differentiated to the extent that they change the existing product or service, i.e. the way they are delivered. From this point of view, there are several different innovations. One one hand, there are progressive innovations that include moderate but still important improvements. On the other hand, there are innovations that involve fundamental, radical and complete changes. Between these two extremes there is a whole series of innovations of varying degrees.

According to one similar view, the procedures for shaping insurance services can be divided as follows: development of new services, improvement of existing services and upgrading of services.[8]

Development of new services in the full sense of the word is when completely new insurance services appear on the market. It is much easier to achieve that in developing countries that are taking over already established insurance policies from developed countries, following the development of their insurance business. Such tendency is noticeable in our market in the last fifteen years

A new service may mean creation of a new type or subtype of insurance: sonic boom insurance, insurance of a satellite, insurance against nuclear threats, and so on. Insurance innovations in developed countries often arise as a result of monitoring of achievements in economic areas and their protection requirements.

A service in existing insurance branches that has significant new constituents is deemed new for giving some additional benefit to insured persons - for example, maintenance of a living standard or avoidance of underinsurance as an insufficient protection.

Improvement of existing services means changes that do not affect the core of insurance protection. Previously offered policies are renewed, modernized and adapted. Everything is done to make them more attractive and closer to the

[8] Thomas Köhne, *Versicherungsmarketing*, Karlsruhe, 2016, S. 267–268.

demand. As an example, introduction of supplementary benefits may be stated for the purpose of extending the coverage of basic perils (change of a destroyed lock in theft insurance or cosmetic intervention in accident insurance).

Upgrading of services means their additions, i.e. separation according to different target groups or areas of the country, as well as inclusion of additional services. As an example for the latter, a roadside assistance with casco insurance can be mentioned (vehicle transportation after a traffic accident, repair, obtaining of another means of transport, hotel accommodation).[9]

3. New Services in Non-life Insurance

3.1. Completely New Insurance Coverages

Most innovations are introduced into services in the insurance market gradually, such as expanding of coverage or changes to the existing insurance policies, all based on the long-standing knowledge and upgrades. Radical changes are usually rare.

Of course, there are also insurance companies that are making a lot of efforts to design completely new services. In recent years, the world market has witnessed introduction of completely new coverages or different ways of protection against a variety of perils. Below are examples of new insurance types.[10]

1. Insurance against interruption of supply as protection against interruption or delay of delivery by a supplier, due to which an insured company sustains a financial loss. This type of insurance covers the supplier's risk. In insurance policy it is necessary to state suppliers and types of deliveries. The scope of protection may be restricted to suppliers' faults caused by material damage, such as consequences of a fire or a flood, but may also involve other causes, such as strike, terrorism, computer shutdown.

2. Insurance covering damages from interruption of delivery from renewable energy sources. Numerous insurance companies have introduced insurance that guarantees supply from solar energy devices.

3. Internet liability insurance. Any business user of the internet may face a claim submitted by a third party for infringement of intellectual property rights, property rights, defamation, and the like. A policy with this coverage includes the legal liability and defense-related costs arising from operationsa through a worldwide network. It may include additional provisions that extend the scope of coverage. Internet service

9 „Dunav osiguranje", Pomoć na putu, *http://www.dunav.com/portfolio/osiguranje-pomoc-na-putu/*, pristupljeno 15. 11. 2017.

10 Nebojša Žarković, *Pojmovnik osiguranja*, Novi Sad, 2013, str. 321, 302, 512, Swiss Re, Produktinnovation in der Nichtlebenversicherung: Von kleinen und grossen Innovationen, *Sigma*, 4, 2011, S. 11.

providers with this type of protection are insured against liability toward their users in connection with the acquisition and maintenance of network access.

4. Insurance against loss of reputation presents protection of a company from costs arising from a decline in trust by the environment (mainly parties). Insurance policy compensates for losses of revenue decrease and expenses due to the measures taken for elimination of difficulties in the company that have led to the loss of good reputation. Scope of coverage, manner of evaluation of the lost reputation and the resulting consequences, as well as other details of an insurance contract, vary from insurer to insurer.

5. Environmental impairment liability insurance. Purpose of introducing this environmental impairment liability insurance is the conservation of a variety of flora and fauna and their natural habitats, that is, protected living space in public ownership. It is a liability insurance that encompasses environmental pollution due to the work of insured's business units and facilities, as well as due to performance of certain works and the production or use of certain products. This type of insurance against may also cover damage to the insured's property.

6. Insurance against nanotechnology perils as a science dealing with tiny particles of matter and their compounds. Thus, for example, a type of coverage against liability of companies that implement nanotechnology in their production is launched.

7. Takaful represents the most widespread form of the Islamic insurance. It is based on mutual support, whereby the risks should be shared and not transferred from one party to the other as it is done in a market insurance. Insurers dealing with Takaful insurance respect the Sharia principles that prohibit interest, sale of uncertainty (that is result of the peril), gambling and investments in socially unacceptable activities (such as production of alcoholic beverages, pork products or weapons). Companies carry out all insurance types taking into account the above stated principles. Reciprocity and elimination of uncertainty are reflected in full openness, so the insured person knows exactly which part of the insurance premium is used for insurance benefits, which for settlement of general costs and which make profit. Profit is split either in the form of a premium discount during the renewal of insurance or by returning the premium at the end of the year. Although Takaful has certain similarities with mutual insurance, the vast majority of insurers dealing with it operate as shareholding insurance companies, where the funds of the insureds are separated from the shareholders' funds.

8. Microinsurance involves various insurance services for households and individuals with low income. It is adjusted for small-value assets, and it also provides a compensation in case of an illness, accident or death. Since the level of insurance cover is lower than usual, insured persons are charged a much smaller amounts of insurance premium. It is often offered in developing countries, where the insurance market is underdeveloped or almost nonexistent.

But, as a whole, introduction of new types of coverages is, however, proportionally rare. It is often time-consuming for newly introduced forms of insurance to spread so widely so that all insurers can offer them. And when it happens, usually only a partial coverage is offered in the beginning. For example, the insurance industry currently covers only a limited part of the risk of climate changes.

As a matter of fact, insurance innovations refer mostly to small and gradual adjustments to existing policies, i.e. adapting the existing services to new circumstances in terms of perils. We are citing the findings of a survey according to which, over the last few years, more than half (52%) of announced new insurance services were broadly related to marketing and technical improvements (sale of the existing services to new target groups or significant differentiation of supply from market rivals).

Similarly, insurance companies and other money brokers, compared to companies dealing with other types of services, record a smaller share of services turnover that are completely new to the market in relation to services that are new to the insurer itself. In the stated survey, only one tenth (9%) of the announced new insurance services were completely new.

3.2. Gradual Innovations

The most prominent gradual innovations in non-life insurance include three broad forms: adjustment, i.e. improvement of policies and insurance terms and conditions; merging or separating risk covers; parametric insurance, that is, policies where insurance benefits are not linked to actual damages, but to the event that triggered them. This will be elaborated further in the paper.

3.2.1. Improvement of Policies

In case of changes in insurance services, it is often an extension of the scope of coverage and a change in insurance terms and conditions for appropriate policies. According to the already mentioned study, which included announced new insurance services, almost one quarter (23%) of innovations referred to adjustment of insurance policies in order to improve the scope of protection.

Adjustment of a policy often refers to changes in contractual provisions or scope of coverage, which may have a fundamental impact on the level of protection. By using options such as changing the insurance duration, payment methods, coverage limits and other, insurers may affect the breadth of coverage, more and more including the insured in the core of the business.

Such innovations usually arise on a case-by-case basis, as part of a long-term relationship with a particular insured when the insurer can assess the income from all insurance policies of one party. Disadvantage of this approach is that the service becomes more complex over time, at least in terms of pricing. Therefore, policies need to be adjusted and simplified from time to time.

The most important options for improving the policy in the presented sense are:

1. Coverage Limit - this contractual provision limits the maximum compensation that an insurer can face, converting the risk, whose consequences cannot be reliably and numerically expressed, in the already known maximum exposure of an insurer to losses. An example may be a liability insurance. Also, the coverage limit is common in reinsurance contracts - in excess of loss reinsurance compensation to the reinsured person is settled after the deduction of his part, but only if the damage exceeds the predetermined amount. Then the reinsurer undertakes the liability in whole or in part. Of course, it is understood that when concluding a contract he determines the upper limit of his obligation.

2. Insurance duration-non-life policies regularly cover the insured for one year with annual renewal. But starting from the nature of the risks, some insureds want to contract a coverage under the contracted terms and conditions for several years. Thus, both parties benefit from the advantages resulting from a long-term differentiation regarding risk realisation. In addition, long-term insurance can help reduce the insurer's administrative costs and costs of a search for a new job, while to the owner of the property it brings sustainability and incentive to invest in risk mitigation measures, especially if it has contracted self-retention, that is, share in damages.

3. The scope of coverage - the insurance policy against the said risks covers only damages and losses arising from occurrence of the risks explicitly stated in the insurance terms and conditions. Contrary to that, the insurance policy against all risks covers all risks unless explicitly excluded. Exclusions in insurance against all risks depend on the type of property for which the insurance protection is contracted. As some examples of regular exclusions, we can list damages caused by the following risks: properties of insured items, hidden defects, fatigue, corrosion, rot, evaporation, weight loss, pollution.[11]

4. Flexibility in premium payment - it is especially important in conditions of reduced payment capacity in the economy. The insured will receive protection immediately after signing of the contract, and the premium will be paid later, possibly in several installments. Some insured persons, for example, due to seasonal features of production, do not have continuously the same amount of money on the account throughout the year. Insurer will contract payment with them when they generate income from production - for example, a farmer after harvesting, and the fruit-grower after harvesting the fruit.

5. Multiple triggers - established insurance contracts, as a rule, relate to one or more physical events as insured risks, the realisation of which drives an insurance

[11] Slobodan Jovanović, *Pravo osiguranja*, Novi Sad, 2016, str. 60.

coverage. Contracts with multiple triggers, however, are made so that the insurer's obligation to compensate are driven by more than two different, and not only physical events, which are realized simultaneously. Some of these phenomena are physical, related to the insurance technique (for example, the amount of individual damage should exceed 10 million Euros, while the amount of total damage in the contracted insurance period should exceed 50 million Euros), while others have no connection with the insurance technique, but cause monetary consequences to the insured. These other triggers may be internal (such as a change in the amount of the insured's investment return) or external (for example, changes in the value of the shares of an insured's company, interest rates or raw material prices on the world market). By combining these events in one contract, the likelihood of damage is reduced, which means that the insurance premium is reduced. If there are two such events, they are double triggers. Multiple triggers are also used in reinsurance treaties.[12]

3.2.2. Combining and Separating Insurance Covers

Combining of covers means connecting of various, and sometimes new, risks within a single insurance service. And here, of course, the goal is to offer a comprehensive service to the insured. For example, a policy may include a technical insurance with a liability insurance, or a mortgage insurance with an earthquake insurance. Then, by insuring the loan repayment, the borrower is protected against several different risks - consequences of an accident, illness, unemployment or death.

The attractiveness of combining coverages for insureds can be in a collective self-retention that relates to a set of associated risks, thus obtaining an appropriate insurance coverage at more reasonable costs. Combining of coverages also provides a possibility to reduce the policy limits to a minimum. Generally, this combining of various risks can be attractive to smaller industrial and proprietorship businesses that do not intend to get involved with expert assessments in the area of risk management. Larger companies, again, strive for solutions that are right for them, regarding certain risks, especially because their business often involves dealing with a variety of risks.

An exception to the tendency to negotiate a lower self-retention is the umbrella liability insurance[13], which covers a far higher amount of insurance than the primary insurance, as a rule, with a wider coverage. It is customary to conclude it with a significantly higher insureds' self-retention.

From the insurer's point of view, it is possible that the combination of two independent risks reduces the expected damages. It also provides a way to avoid

[12] Fred Wagner (Hrsg.), *Gabler Versicherungslexikon* (2. Auflage), Wiesbaden, 2017, S. 182, 478.

[13] Excess insurance is a form of protection that comes into force only if the damage exceeds the amount covered by the primary insurance. This additional type of protection is found primarily in liability insurance, but also in the property insurance and health insurance. N. Žarković, p. 431-432.

biased risk, that is, difficulties where presence of insurance increases risky behaviour or leads to excessive claims. In particular, by encouraging insureds to engage in measures to prevent the occurrence of adverse events, the combining of coverages tends to reduce the amount of damage borne by the insurer.[14]

In the same way, the *separation of risk coverages* is a useful way for the insurer to have even better control over the entire exposure, and the insured manages its protection details. As one of illustrative examples of a breakdown, the introduction of the air travel personal accident insurance - *Flightsurance* on the German market in 2010 can be stated.

It's a cheap form of insurance cover with an insured sum of a million Euros, including loss of life and disability. This policy is, first of all, distinguished by simplicity - the only information that the insurer needs are the name of the airline, the destination of the flight and the name of the insured person. From an insurer's point of view, it is important that this service has built-in features that allow greater control over exposure to risks. Contrary to regular travel insurance, an insurance company may limit the accumulation of risks. So, if more than 20 passengers check in for a flight, and all previous ones have bought the policies, their further sale is suspended.

This air travel personal accident insurance has defined provisions on exclusion of a risk, but nevertheless includes the risk of terrorism. The main feature of the *Flightsurance* is the fact that it distinguishes between the established travel insurance with a wide coverage including - fatalities, through loss of luggage, to flight cancellation, and singles out only accidents associated with a specific flight. Personal insureds' data, such as age, are not relevant; decisive information refer to the airline.

An important aspect of this service is linked to the sales pattern. Namely, the goal is to buy the policy at the same time when buying a ticket or just before taking off. This can be done by direct sales channels, although, at least in Germany, tourist companies, as before, remain the main sales channel.

3.2.3. Parametric Insurance

According to a centuries-old, common approach, insurance policies are based on the idea to compensate the sustained damage to the insured. This implies that he has previously insured a certain property, business operations or a company against certain risks such as storm, earthquake, flood, and many others. If the subject matter of the insurance is destroyed or damaged after the occurrence of covered risks, a monetary loss is compensated. This type of protection is still the most important today.

[14] Christian Laux, Multiline Insurance. Bundling Risks to Reduce Moral Hazard, 2004, *http://www.vcharite.univ-mrs.fr/idepcms/confidep/docannexe.php?id=442*, pristupljeno 12. 11. 2017, str. 3.

However, recent market developments have led to a completely different type of insurance against some types of risks within parametric insurance, where the payment depends on a particular parametric trigger, regardless of the actual damage. Such triggers are accurately expressed, physically measurable values related to the risk and damage, such as precipitation, water level, earthquake intensity, air temperature or wind speed, for example, a hurricane. The level of the parametric trigger is monitored and recorded by independent institutions such as hydrometeorological institutes.

Payment of compensation will follow as soon as the agreed amount of the parametric trigger is reached, regardless of the amount of actual damage - for example, if a certain amount of rain per square meter does not fall in some agricultural area during a certain period and drought occurs. However, in accordance with the principle of compensation, an indemnification should be as fair as possible for the parametric insurance. Since the insurer's liability depends on an external criterion, the effect of a biased risk, which would incite the occurrence of an adverse, is excluded. Also, both contracting parties have an equal approach to a selected trigger, which implies the equality of the availability of the noticification. There is no claims administration, which reduces the insurer's costs. The same insurance form exists in reinsurance.

Parametric weather insurance is a type of a parametric insurance limited to the trends of precipitation criteria (drought, flood, snow cover level), i.e. the trends of air temperature (frost, excessive heat). It is intended for insured persons such as farmers, airlines, city heating plants, hydro power plants and tourist companies, whose work depends on weather conditions. It can also be concluded by insured persons indirectly affected by weather, such as financial or government institutions that have granted loans to persons or companies depending on the weather.

3.3. Innovation Drivers in Non-life Insurance

As a rule, innovations in products or services do not occur on their own. Often, external effects on a company or an activity that incite or hinder them are very important. When it comes to innovations in non-life insurance, three factors are especially important – an insurance cycle, an environment from the aspect of a risk and insurance supervision, and technological achievements.

3.3.1. Insurance Cycle

The insurance cycle means volatility of market circumstances that alternate between the hard market and the soft market, and vice versa, reflecting the relationship between supply and demand for non-life insurance. Under conditions of the hard market, insurance premiums are higher, the conditions are less favorable for insureds, so insurers easily gain profits. Contrary to that, the soft market is characterized by the circumstances that are more favourable to insureds. The insurance cycle varies from one insurance type to another and from one to another insurance market.[15]

It is completely understandable that the trend towards the introduction of innovations is affected by the state of an insurance cycle. When there is a hard market, insurers are probably satisfied with focusing on established insurance types. Contrary to that, under soft market conditions, when it is difficult to achieve the increase of premium rates, the emphasis is on attempts to increase the insurance business, among other things, by implementing new solutions or services. However, during a soft market, increased competition can prevent significant innovations. Insureds gain greater bargaining power to contract changes in standard policies, for example with provisions regarding exclusions and coverage limits, so they are more likely to gradually make changes than buy new policies. However, allocation of funds for research and development of new services, especially in times when market conditions are difficult and costs are limited, can help insurers to prepare for innovations even in soft market conditions.

3.3.2. Environmental Risks

Environmental conditions in terms of risks determine the offer of insurance companies. This means that insurers, as a rule, develop new insurance solutions only when the needs of the parties for insurance, i.e. financial restructuring of consequences of the risk. Therefore, insurance innovations tend to follow a particular event or more general changes in environmental risks. Often a major external event, such as an unexpected devastating natural disaster, leads to an examination of the current exposure to risks in companies or individuals. They can then realise that a new need for insurance has arisen. For example, after occurrence of huge clouds of smoke from volcanic ashes in Iceland 2010, airlines had the need to insure themselves against interruption of flights after any future similar events.[16]

Observed as a whole, changes in environmental risks take place slowly, completely new threats are relatively rare, and the existing risks are gradually reduced with changes in the lifestyles of individuals and business practices of companies. It is interesting to stress that innovations in non-life insurance services, which were rooted in the seventeenth or eighteenth century, are still important insurance types today. Fire insurance was introduced in Germany in 1676 and in Great Britain in 1680. Insurance of plant production against hail was created in Germany in 1719,

[15] N. Žarković, p. 140.

[16] Swiss Re, Produktinnovation in der Nichtlebenversicherung: Von kleinen und grossen Innovationen, *Sigma*, 4, 2011, S. 21.

in France 1802, in Great Britain in 1840, while livestock insurance was an innovation in Germany in 1765, in France 1805, and in Great Britain in 1844.[17]

In some insurance types, innovations are introduced more often, in others less often, which is primarily affected by changes from the environment. Thus, in the last years, liability insurance has changed the most. Frequent changes in areas such as legislation and technological advancement, as well as emerging needs, i.e. risks, create the necessity for innovations in these insurance policies. Therefore, the largest number of new types of insurance services has recently been linked to various liability covers.

To a certain extent, a successful launch of novelties into the market can simply depend on the moment. A good example is insurance of solar panels. It is a newer insurance type, introduced into the market at the beginning of the third millennium, at a time of a soft insurance market. It protects the owners of plants that convert solar energy into a different form of energy. The coverage is provided for damages incurred during the construction and subsequent regular operation of these devices. Risks similar to those that are regularly included in fire insurance, builder's risk insurance, theft insurance, loss of revenue insurance, environmental impairment liability insurance, liability insurance and so on are included.

After a certain standstill, the interest in insurance of renewable energy sources has increased, and today, for example, we have a windmill insurance, which is similar to the insurance of solar panels. New forms of protection of renewable energy sources arise as a result of the increased demand, and it is obvious that insurers are becoming more and more comfortable to provide cover for such risks, starting with the increasing stability of energy technology.

From the very beginning, most non-life insurances were focused on providing protection against immediate, physical losses. To a large extent this is true today. Nevertheless, over time, the risks associated with non-material damages, such as business interruption losses, are more and more respected. Advance considerations of risks in insurance industry led to the development of a growing number of services that serve to cover the consequence of non-material risks. Examples include the violation of intellectual property rights, the delay in the operation of computer systems, the termination of the use of a certain item or the violation of the personal data protection law.

3.3.3. Supervision

Similar to various environmental risks, the state supervision can also have an important impact on insurance innovations, either by encouraging new insurance services or by forbiding some. The state supervision refers to the monitoring of the

[17] Swiss Re, *Feuerversicherung*, Zurich, 2009, S. 7, Slobodan Samardžić, *Požarno osiguranje u sistemu neživotnog osiguranja*, Beograd, 2009, str. 26.

work of the insurance companies themselves, but also to the limits regarding business operations of their parties, i.e. the insureds. An example for the latter is narrowing of the possibility to conclude policies with foreign insurers.[18]

The new supervisory and legal rules in financial industry have, for example, already encouraged microinsurance in some developing countries. Furthermore, recently introduced rules of Solvency II in the European Union encourage insurers to review insurance services in order to react better to new requirements for the principal under supervision.

After observed deficiencies that followed the implementation of earlier Solvency 1 regulations, in 2001 the European Union started to develop a wider approach. Solvency 2 implies an assessment of the adequacy of the principal based on the risk available to the insurer. Namely, in cases of insurance companies that have exhausted the payment capacity imposed by the Solvency 1, it turned out that the root of difficulties lies in the poor management of the company - insufficient respect for the profession, excessive acceptance of the risk, inability of a affiliated insurance company to respond to the challenges of the local market due to its poor connection with the parent company abroad.

Solvency 2 is an extremely complex and demanding venture in which actuaries with their knowledge and expertise are necessary. It consists of three pillars. The first pillar concerns the demand of the supervisory authorities for the equity capital and additional capital of the insurer, the second focuses on insurance supervision in order to recognize companies with a higher business risk. The third pillar includes submission of additional data which the supervisory authorities deem necessary. Solvency 2 was introduced in the European Union countries on 1 January 2016.

3.3.4. Technological Advancements

Technology can also play an important role in supporting innovations in the insurance industry. Although most of technological advancements in insurance have so far been associated with innovations in processes or marketing, technological advancements can also affect innovations in insurance services themselves. First of all, technology regularly creates new risks from which companies and individuals seek protection, such as security risks and risks of liability associated with computer systems.

Of course, new technology can also affect the characteristics of existing insurance services. For example, for some non-life insurance types based on the degree of use of insured items, a completely new market has emerged. Such services are, as a rule, directed to the use of so-called telematics. Telematics means

[18] Decision on determination of risks that can be insured, i.e. reinsured with a foreign insurance or a reinsurance company, the *Official Gazzette of the RS*, no. 56/15.

a comprehensive sending, receiving and storing data on the behaviour of the insured through telecommunication devices.

The most common use of telematics is in the motor vehicle insurance, where many insurers in several countries introduced several forms of new policies. By using the principle of determining the premium in casco insurance and MTPL insurance ″pay as you drive″, the insurance premium is adjusted to individual vehicle use and driver behaviour, such as mileage, the type of traffic roads, the area of the country where you are driving, traffic offenses. Primarily drivers who do not drive their motor vehicles much and those who comply with traffic regulations benefit from this kind of offer of insurance companies, due to the lower premium. Opponents of such approach, which was first applied in the Great Britain, state that it interferes with the privacy of the insured. For the protection of motor vehicles on the principle of ″pay as you drive″ driving behaviour notices are usually acquired by the use of satellite tracking technology GPS, which records driving and travel routes, or through devices built into cars that record driving data (acceleration, using of brakes, belts fastening, etc.).

The technology also influenced the shaping of short-term insurance services. For example, in case of already mentioned *Flightsurance*, access to the ticket provision system *Amadeus* is important in order to recognize the extent of exposure to perils on a given flight. In addition, quick access to notification on ticket purchase can help direct marketing, for example, to send a message to the traveler via the mobile phone while he/she is checking in for flight.

In addition, advanced computer capabilities and the development of computing patterns enabled a more thorough risk assessment, such as in insurance against of devastating natural disasters. It is possible to process and examine more and more data that describe the presumed risk factors in order to better estimate the probability of the occurrence of a devastating disaster, whether it was caused by nature or man. This has become an important factor for more reliable pricing of new insurance solutions.

4. Conclusion

It is well known that non-life insurance markets play an important role in transferring risks from those who can sustain unexpected damages to the ones that can best assume them. In its common form, insurance is predominantly based on a pattern of common perils. Many perils are combined within special groups, enabling the insurer to allcoate possible damages. However, in a wider sense, non-life insurance can also be a means of helping to eliminate the consequences of achieving systemic risks that have a general meaning for businesses and the entire industry. Anyhow, the development of new forms of policies greatly contributes to this multi-layered insurance role.

Introduction of innovations in non-life insurance helps us achieve a significantly improved risk sharing, which will contribute to increase the economic performance. However, market imperfection means that there are limits up to which insurers can and should accept certain risks. If we start with the availability of information in the economy, it is obvious that there is a strong concern that an adverse risk selection and subjective perils cause enormous losses to insurers. Insurance companies that assume too high risks can easily exhaust the principal if it turns out that the claims are unusually high. An unexpected drop in assets in the insurance industry could lead to a temporary (or even permanent) lack of insurance capability, which in turn would justify cautious access of the insurer to new insurance covers.

When exploring natural boundaries of a coverage, it is important for insurance companies to balance progressive and complete innovations in their services. This balance is influenced by various factors that can be called the drivers of development and implementation of innovations in the external environment in relation to insurers.

Although some believe that the degree of modernization and development is too slow, innovations in non-life insurance are more prominent than many believe so. Insurers may be criticised that sometimes they try to create innovations themselves, without sufficient consideration of the insured's needs. Nevertheless, in insurance industry there are certain signs of changes. As always, societies will face the challenge to balance self-awareness in design and sale of new insurance services with adaptability to emerging risks.

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