Insurance

REINSURANCE OF THE CATASTROPHICAL RISKS

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Abstract

The article discusses particular forms of reinsurance treaties that are used within activities of insurance companies. Each of the treaties in question offers different possibilities of protecting an insurance company's portfolio by providing different ways of the risk transfer. Reinsurance is necessary to perform correct financial economy of an insurance company. Hence, appropriate selection of a scope and methods of reinsurance in the context of insuring risks of catastrophical nature gains in particular importance. Catastrophical risk are more and more frequently observed and they are more and more expensive. The paper suggests application of a decision tree as a tool that supports an optimal selection of the scope of reinsurance for a given structure of the insurance portfolio.

Keywords: *reinsurance; catastrophical risk ; decisions tree*

1. Introduction

Risk is a phenomenon that is directly connected with carrying out any insurance activities. Moreover, risk is an inherent element that accompanies all insurance and reinsurance decisions. The notion of 'risk' is of cardinal importance for both theory and practice of insurance. The latter classifies insurance risks according to sectors and groups, and divides them while determining premium tariffs and selecting forms and scope of reinsurance. Nowadays risk functions as an ambiguous term in insurance. Such multi-aspectual nature of understanding risk – and at the same time searching for different methods of decreasing its effects and related burdens – results in the increased attention paid to an issue of the insurance risk transfer. It particularly concerns reinsurance of catastrophical risk whose effects and consequences are more and more frequently to be faced by insurance companies these days (the World Trade Center attack in September 2001, earthquake and tsunami in the South-East Asia in December 2004, hurricane Katrina in the USA in September 2005, earthquake in Pakistan in October 2005 or a series of aviation crashes in 2005).

Each insurance company is obliged to run sound financial economy that would make it possible to satisfy all claims resulting from already concluded insurance contracts.

Therefore, a problem of making optimal decisions that are related with carrying out activities of a non-life insurance company may be presented in the following way:

- meeting statutory financial requirements that are connected with covering - by own means - a solvency margin, amount of guarantee capital and covering an insurance fund by means of deposits,
- carrying out a deposit policy that complies with statutory constraints,
- creating technical insurance reserves that would be adequate to the size and scope of undertaken insurance activities,
- acquiring right structure of the insurance portfolio,
- reaching a planned level of the loss ratio in the insurance portfolio, and
- carrying out an optimal reinsurance policy.

2. Reinsurance

Reinsurance is a specific form of insurance where an insurer transfers some part of all liabilities that result from already concluded insurance contracts to a reinsurer. Reinsurance companies usually do not cover individual risks. Covers provided are to make sure insurance companies enjoy financial security. Reinsurance is sometimes referred to as insurance of insurance in

order to highlight a fact that reinsurance is supposed to secure or strengthen meeting all insurance companies' liabilities to the benefit of the insured. However, it is necessary to underline the fact that a reinsurer has no obligations or rights that result from insurance contracts that are concluded by an insurance company that is reinsured. Therefore, reinsurance does not affect the insured or insurer directly.

Wishing to demonstrate all formal and legal aspects of reinsurance thoroughly, it is necessary to quote its definition coined by Montalbetti: 'reinsurance is a contract by virtue of which one insurance company that is called a ceding company cedes all or part of the risk insured or a group of risks insured of a particular sort together with an appropriate part of premiums to some other insurance company that is called a reinsurer. The reinsurer then commits itself to pay its ceding company an appropriate part of benefits that are to be paid to the insured".[1]

Reinsurance is a specific extension of insurance. Insurance companies accepting some risk in their portfolios demand some premiums that together with incomes generated while depositing insurance funds should be sufficient to cover compensations and benefits, and other costs born while carrying out insurance activities. The means in question should also allow for generating some profit. However, it sometimes turns out that insurers' incomes obtained are insufficient.

Such a situation may result from:

- fierce competition on the insurance market that makes insurance companies reduce insurance premiums;
- disadvantageous loss distribution that results in some increase in the loss ratio;
- accumulation of great damages or emergence of catastrophe damages;
- decrease of incomes generated by means of insurance deposits; and
- exceeding of planned volume of insurance activity costs.

Reinsurance is one of the means that provides some cover against events that might prove disadvantageous for any insurance company, and it makes up a major factor that supports insurance companies' activities allowing them, inter alia, for:

- risk distribution together with a possibility to apply a principle of mutuality;
- stabilization of the loss ratio level;
- increase in insurance capacity;
- protection of insurance company' balance surplus; and
- additional financial cover against effects of catastrophe damages.

[1] See Montalbetti [1970], PWE Warszawa, p. 13.

Hence, reinsurance fulfils two fundamental functions: a technical function and a financial one.

As quoted from E. Montalbetti: 'a technical function of reinsurance protects insurance companies from excessive increase in the loss ratio in a given period incurred as a result of occasional great damages or unusual accumulation of normal damages in time resulting in significant deviation from the average loss ratio'[2].

On the other hand, a financial function is mainly manifested in accepting a large part of compensations paid to the insured by insurance companies. It allows ceding companies to save some means in form of reserves of premiums and reserves for non paid losses.

Reinsurance may be carried out in different forms. A form of reinsurance should be understood as a way of sharing risk between a ceding company and a reinsurer. Reinsurance contracts are most frequently divided into two basic groups:

- Proportional reinsurance contracts that are to be divided into quota share treaty, surplus treaty and quota and surplus treaty share; and
- Non-proportional reinsurance treaty that include excess of loss treaty (with a further division into reinsurance excess of los treaty for risk and for event) and stop loss ratio (aggregate excess of los ratio treaty)

Proportional reinsurance is characterised by the fact that a reinsurer's share in each market is determined in the agreed relation to a ceding company i.e. the reinsured. The reinsurer takes over a determined part of an insurance premium that is decreased by the reinsurance commission and then participates in covering all damages that are reported in the reinsured portfolio to the same extent. In proportional reinsurance the reinsurer unequivokably shares their lot with the reinsured.[3]

Conversely, unproportional reinsurance is characterised by the fact that while sharing risk between the reinsured and reinsurer there are no pre-arranged proportions.[4] Reinsurer will be obliged to cover damage or equalise value of the loss ratio only in the very case when their pre-set volume is exceeded.

2.1 Quota share reinsurance

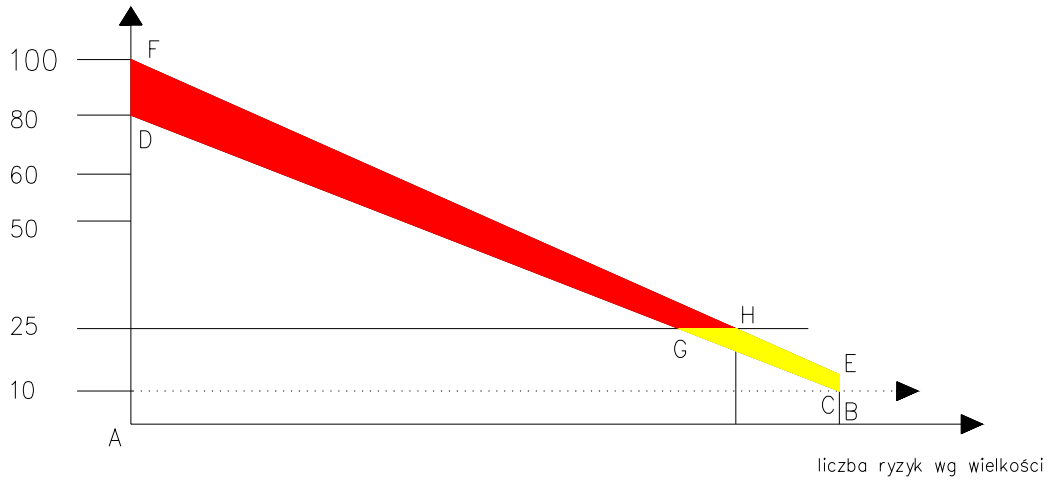
Quota share treaty are the simplest form of reinsurance. They involve providing reinsurers with a given part of the whole risk portfolio included in the contract. The major advantage of the quota share treaty is to be found in its simplicity. In order to administer such a contract neither particular

[2] See Montalbetti [1970], PWE Warszawa, pp. 28-29.
[3] Banasiński: [1993], pp. 68-169.
[4] Montalbetti: [1970], p. 89.

qualifications of the insurer's personnel nor specialist information technology assistance are required because – as a general rule – risks subject to contracts are automatically subject to reinsurance in their determined part.

In the quota share treaty cession refers to a specific amount or share in each ceded risk. The same proportion will be applied with reference to the sum of insurance, premium and possible damage. The Figure 1 presents a mechanism of quota share reinsurance.

Figure 1 Quota share reinsurance



Where: liczba ryzyk wg wielkości – a number of risks according to their size
Source: Monkiewicz. [2000], p. 142.

In the Figure 1 a vertical axis shows volume of risks measured by sums of insurance. Horisontal axis illustrates a number of risks. Total volume of risks subject to insurance protection is manifested by the ABEF quadrangle field. Applying 20% of quota share reinsurance a ceding company's participation in risks will be decreased, and manifested by the ABCD quadrangle field. Field of a CEFD figure, on the other hand, manifests reinsurer's 20% share in risks.

Quota share reinsurance disadvantage is observed when an insurance company changes its decisions. For instance, the insurer may conclude that they accept higher deductible (PLN 25 million) CEHG field is unnesessarily reinsured. Quota share reinsurance is always on the same level and it covers small and great risks and good and bad risks

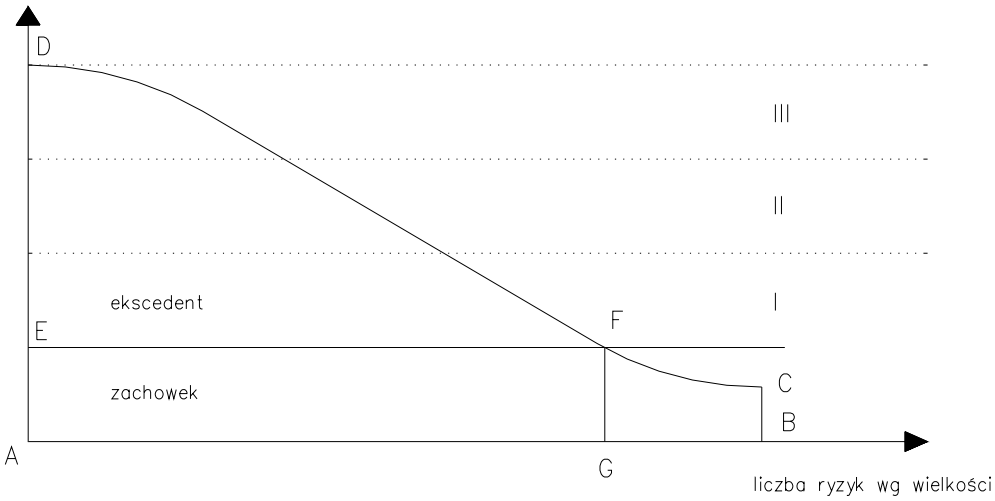
2.2 Surplus treaty reinsurance

Quota share treaty disasdvantage may be – to some extent – eliminated by surplus treaty reinsurance that allows for complete equalisation of volumes of risks that are observed in the insurance portfolio. In surplus treaty insurers – utilising statistical information and actuarial tools – firstly determine volume of maximal deductibles in particular risk sectors. Such shares are called , line or maximum. Other than these shares of some part of risk (excedents) ar ceded to reisurer by the insurance company.[5]

Mechanism of surplus reinsurance treaty is presented in Figure 2. Risk field is shown by the field of ABCD. Field of risks that are not subject to reinsurance is a field of GFBC. The other part of the ABCD figure i.e. AGFD is a field of risks that are subject to reinsurance. EFD represents an excedent and AEFG shows insuring company's.

In practice excedent is determined to the value of line. In case of greater risks a few excedents may be set. The Figure 2 presents the situation when three excedents are observed.

Figure 2 Surplus treaty reinsurance



Where: zachowek – maximum, ekscedent- line
liczba ryzyk wg wielkości – a number of risks according to their size

Source: Monkiewicz , [2000], p. 142.

[5] Ciuman: [1996], p. 27.

In business practice there are also quota share and surplus treaties.

2.3 Excess of loss treaty

As a result of such reinsurance contracts the whole portfolio of particular insurance is reinsured quotatively, and selected determined risks that are higher than the insurer's accepted level are reinsured by means of excess of loss treaty insurance.

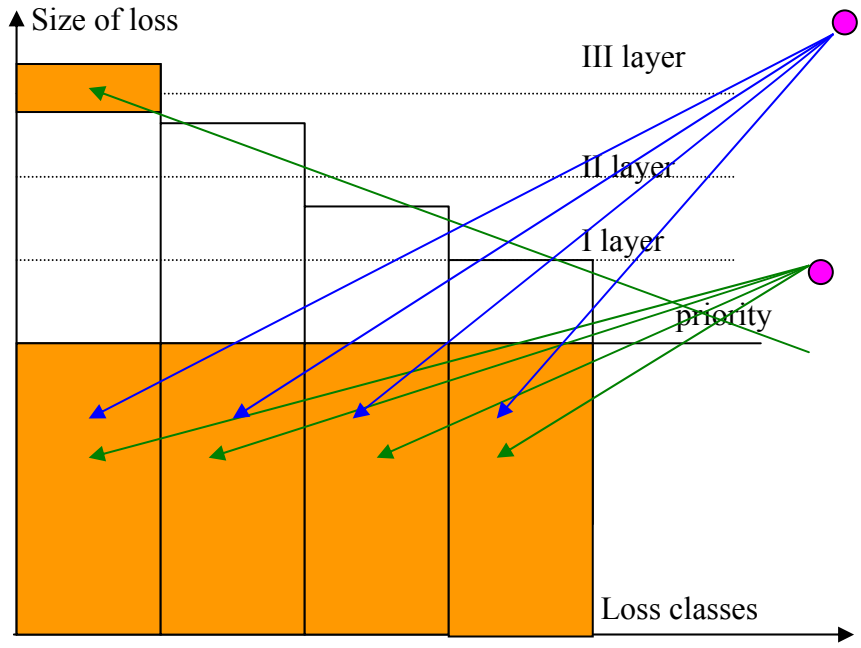
Essence of the excess of loss treaty lies in reinsurer's commitment to cover this part of a loss that is higher than a ceding company's share in the loss, and lower than the sum that is a limit of reinsurer's liability. The amount of loss that makes a reinsurer take over ceding company's liability is called a priority or excess point.

A limit of reinsurer's liability taken as a result of one fortuitous event is called loss ratio working layer.

Excess of loss treaty is applied in order to secure financial equilibrium of insurance transactions that might be disturbed by emergence of particularly high losses in the portfolio. Excess of loss may take two forms:
- a surplus that is calculated in the relation with risk; and
- a surplus that is calculated in the relation with an event.

In case of a surplus that is calculated in the relation with risk, a loss that concerns the whole single risk is involved. In case of a surplus that is calculated in the relation with an event, a sum of losses that result from a single event is involved. Excess of loss treaty is shown by the Figure 3.

Figure 3 Excess of loss treaty



Source: Monkiewicz , [2000], p. 145.

In the Figure 3 particular losses were placed on the horizontal axis. The vertical axis illustrates the amount of losses in question. A ceding company's liability concerns losses up to priority (deductible) and losses that exceed the last loss ratio working layer. Losses below priority and above loss ratio working layer are covered by the reinsurer. Loss layer field is usually divided into some number of limits reinsured by different re-insurers (the Figure 3 presents three of them). Such diversification of liabilities among different reinsurers is particularly important in the situation of a complex cover whose priority is set on a very low level.

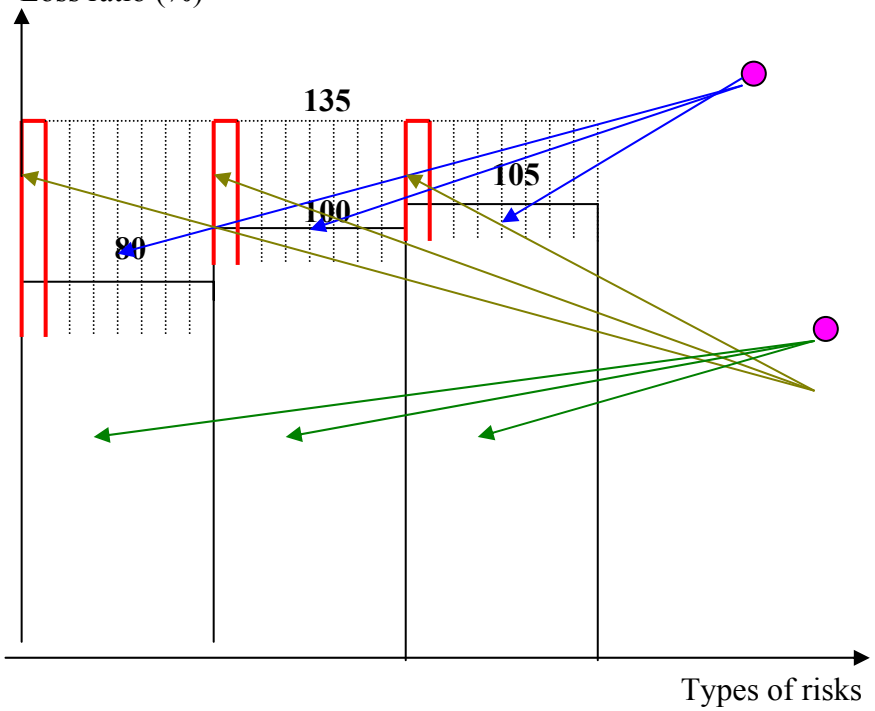
Aggregate excess of loss treaty (stop loss) is another form of non-proportional reinsurance. In this type of reinsurance reinsurer's liability concerns a situation when value of reported losses in a given year results in either exceeding of a determined loss ratio or a determined quota level. This type of a reinsurance contract concerns the whole insurance portfolio of a given kind or even the whole portfolio of insurance of an insurance company. In aggregate loss treaties three basic principles are followed:

- generally, reinsurer's liability commences only when an insurer enters the zone of a technical loss or exceeds a calculation level of rates;
- a ceding company participates in re-insurer's losses i.e. reinsurance cannot cover the whole excess of loss; and

- reinsurance cover has upper limits exceeding of which results in the complete liability of the ceding company[6].

Aggregate excess of loss is shown by the Figure 4.

Figure 4 Stop loss treaty



Source: Monkiewicz , [2000], p. 147.

Assuming that a concluded contract stipulates a reinsurance cover of excess of loss in the situation when loss ratio exceeds 80%, 105% and 110% depending on the kind of risk Simultaneously assuming the cover in question finishes at the moment when the loss ratio exceeds a level of 135%.) In the 80%-135% loss ratio range depending on the kind of risk a determined re-insurer's liability amounts to 80%. In case of a ceding company it is 20%.

To conclude, it is necessary to state clearly that insurance activities are always accompanied by the reinsurance ones. The only thing that changes is the form and scope of reinsurance since technological development results in emergence of new risks and in the increase of those already existing.

[6] Compare Monkiewicz, [2000], pp. 143- 148.

Reinsurance market development is a natural consequence of the increase observed on the market of insurance services. The problem to be solved by insurers is to select the most beneficial combination of reinsurance forms. In principle, all presented above forms of reinsurance may be applied by insurers to different extent and in various combinations. Each of the variants to be applied will differently influence the kind and amount of loss recovered by insurers. Quote share treaties and surplus treaties together with excess of loss treaty based on single risks will decrease a size of losses incurred as a result of single events. On the other hand, excess of loss treaty as a result of a single event will decrease insurance company's exposure to catastrophe events or accumulation of events in a given year. In contrast, aggregate loss treaty is the most suitable to avoid adverse effects of mass events that are observed in a given year.

Forms and methods of reinsurance that is applied by reinsurers will depend on numerous factors including:
- a level of reinsurance market development;
- a form of risks to be reinsured;
- a size of insurance company's portfolio;
- current insurance company's financial standing;
- their experience in reinsuring insurance; and
- skills of managerial staff[7] and threats posed by catastrophe risks.

An insurance company should carry out an optimal reinsurance policy. In order to do this and to foresee changes in its environment effectively, such a company does need to know the market well and it has to be flexible.

In their portfolios, reinsurers do not always retain all risk ceded by insurance companies. They may carry out secondary distribution of already underwritten risks by means of further reinsurance, i.e. retrocession. A necessity for retrocession arises when reinsurers have already underwritten in their portfolios risks that are excessively high and potential coverage of such risks exceeds reinsurers' financial capacities.

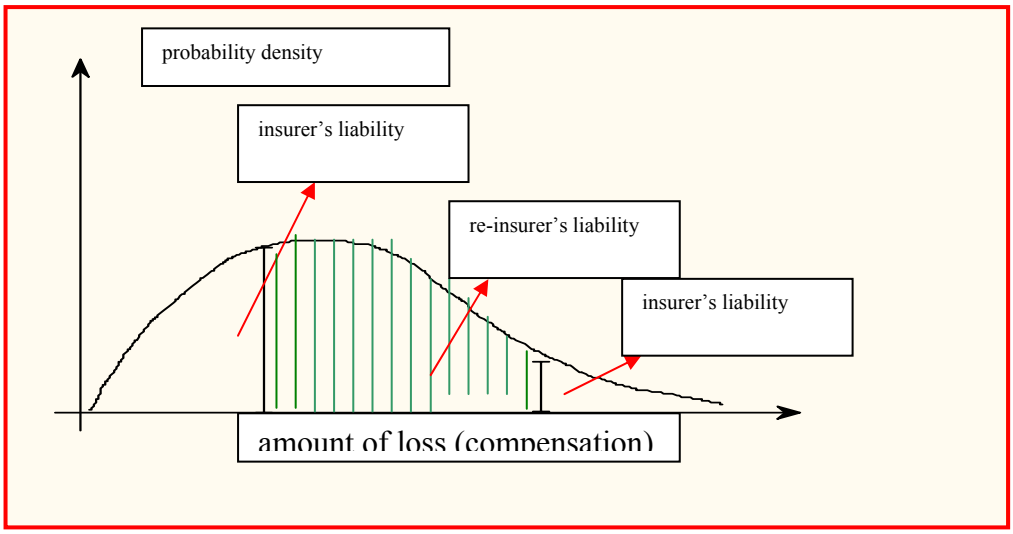
3. Optimal reinsurance

A reinsurance contract is concluded between an insurance company and a reinsurer who makes a charge in form of a part of premiums collected by an insurance company in return for appropriate protection of a part of insurance company's portfolio. However, it is not the last stage of risk distribution. A reinsurer may also transfer some part of its portfolio to a

[7] Ciuman: [1996], pp. 35-36.

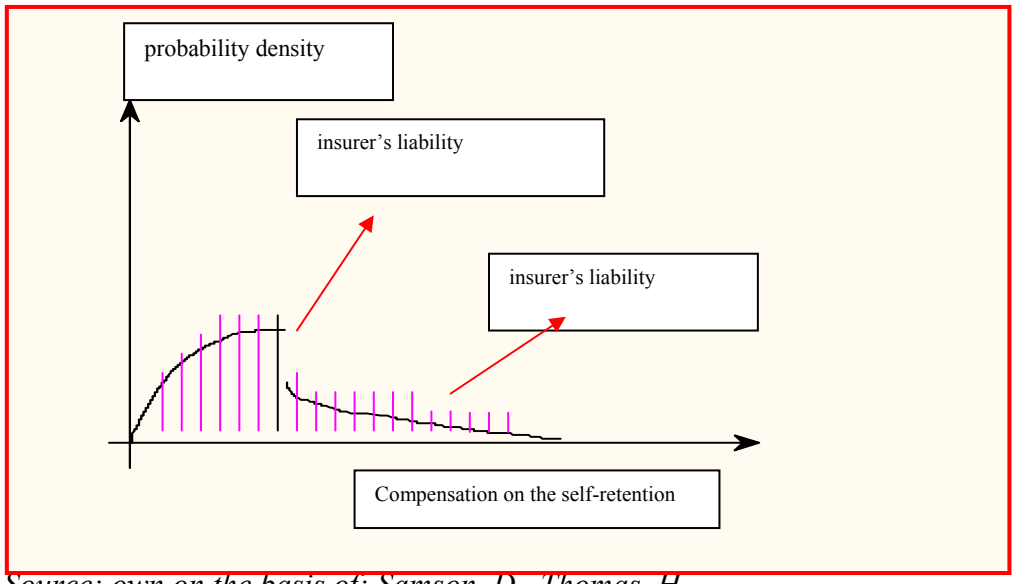
retrocesionaire who will then reinsure it. Such a process may consists of many stages and, as a result, some part of insurance company's own risks together with parts of other insurance companies' portfolios may return to the portfolio of the insurance company in question. Risk sharing by means of self retention, different forms of reinsurance contracts or setting limits of reinsurer's liability leads to some change in the shape of the very distribution. This way two distributions are obtained: a retained part of risk and a transferred part of risk (meant for reinsurance). Figures 5, 6 and 7 present these distributions graphically.

Figure 6 Distribution of loss probability



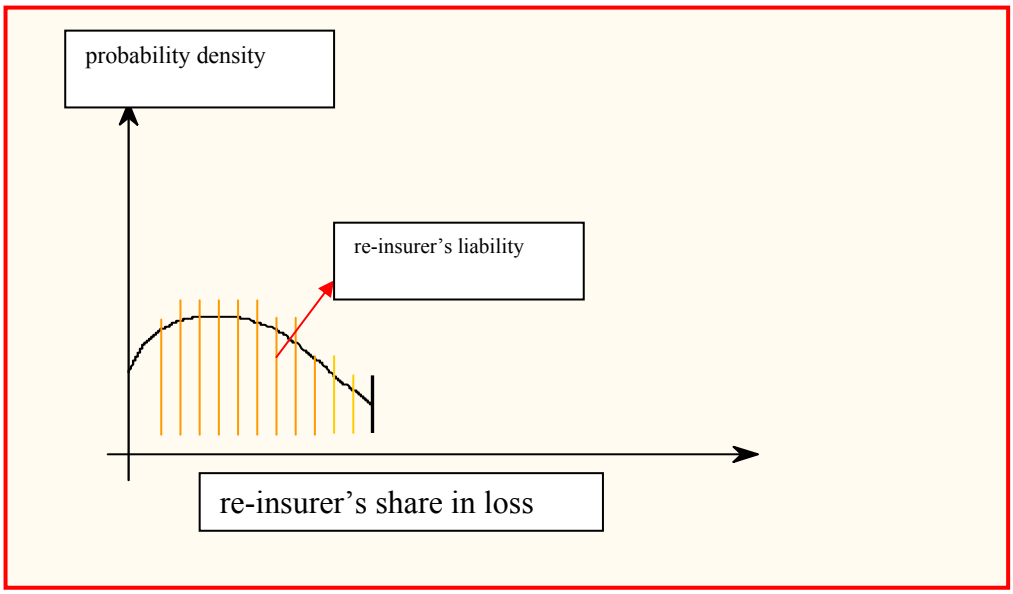
Source: own on the basis of: Samson, D., Thomas, H.,

Figure 6 Scope of insurance company's liability in the distribution of loss



Source: own on the basis of: Samson, D., Thomas, H.,

Figure 7 Scope of insurance company' liability in the distribution of loss



Source: own on the basis of: Samson, D., Thomas, H.,

From the perspective of an insurance company, it is important to find optimal proportions of the very distribution taking insurance company's

portfolio structure into consideration, i.e. to choose a scope and forms of reinsurance that would bring the insurance company in question the highest possible financial benefits. A very good and effective tool that might help while solving this type of problems may be provided by decision trees.

As it has already been mentioned, a method of equality of collected premiums and expected amount of paid compensations is a basic method that is used in insurance to calculate premiums. An insurance company has to match a scope and forms of reinsurance with its insurance portfolio size and structure correctly. A problem of insurance risk transfer that is a prerequisite for a reinsurance contract arises here. Because of their construction, proportional reinsurance contracts naturally ensure risk transfer. There is only one exception when a re-insurer determines an upper limit of its liability. A similar situation takes place in case of a disproportional reinsurance contract of an excess of loss type.

There is a different situation in case of reinsurance of aggregate excess of loss. For this type of reinsurance, it is not possible to point out elements of risk transfer evidently. Since risk transfer is one of the elements of the reinsurance contract, there is a clear necessity to determine constraints that will facilitate transferring some part of ceding company's liabilities adequate to the costs borne to a re-insurer in order to comply with reinsurance contract provisions. The fact that both in Poland and in the world such constraints have not been determined yet is a major problem that generates additional risk for activities of insurance companies.

As Seweryn[8] writes, a standard number 113 ('Accounting and Reporting for Reinsurance of Short – Duration and Long Duration Contracts') was published in 1992. This document determines the following conditions for reinsurance contracts:

- reinsurer underwrites a large part of insurance risk; and
- there is a real probability that a reinsurer will incur major financial loss as a result of a transaction made.

To meet all conditions stipulated in the re-insurance contract it is necessary to meet the above conditions simultaneously. Hence, with reference to the above statements, a contract between a reinsurer and an insurance company may be deemed a reinsurance contract only in the situation when there is a real probability that a reinsurer will incur major financial losses. However, there are some problems to be discussed here:

- firstly, how to understand a notion of 'a major financial loss'?;
- secondly, how to assess a level of such probability?; and

[8] Compare: Seweryn [2002], pp.3-6.

- thirdly; are there sufficiently exact and historically complete statistical data that will allow for estimation that would be precise enough?

As far as the major loss is concerned, such loss is thought to be incurred when there is at least 10 per cent loss in relation to the price of reinsurance. However, this statement is not explicit. After a one year period such understanding is clear for an insurance company. Before a reinsurance contract is concluded – it is not. Theoretically, a good measure of a loss incurred by a reinsurer may be provided by a traditional loss ratio of a premium written to a contract. Such ratio is defined in the following way:

$$LR = \frac{\textbf{total amount of compensation paid}}{\textbf{premium earned}} \qquad (1)$$

However, this ratio does not include costs of loss liquidation borne by insurance companies[9]. As a result, an important question if a value of a loss ratio that will allow for assessing effectiveness of a concluded reinsurance contract is known emerges. To follow FASB 113 standard properly, it is necessary to know exact probability distribution of a loss ratio on the basis of historical data. Nevertheless, even the most accurate statistical data do not guarantee that a forecast to be obtained will come true. Therefore, a decision tree is a tool that may effectively support decision made by an insurance company in the discussed area. A decision tree enables to analyse consequences of all decisions that are made in the conditions of uncertainty and risk. Such a situation is to be dealt with by an insurance company while it decides about a form and scope of reinsurance.

4. Decision tree

An insurance company in its activities aims at reaching certain objectives of a pre-determined hierarchy. The hierarchy in question determines preferences and selection criteria of decisional variants. Decisional variants determine possible actions that meet pre-set constraints and are to help the insurance company in question realise its objectives. Such a mechanism leads to a necessity for making decision in conditions of uncertainty and risk. In conditions of uncertainty and risk typical elements that compose a decisional situation include:

[9] See: Seweryn [2002] pp. 3-6.

- a decision maker (an insurance company);
- a set of acceptable decisions (variants of forms and scope of reinsurance);
- a set of the external world states (a set of possible realisations of value of a random variable);
- a utility function that presents profits or losses that result from making certain decision; and
- a level of uncertainty about realisation of states of the external world[10].

State of the external world – sometimes referred to as the states of Nature – directly influence effectiveness of realisation of objectives set. They are of random nature and are characterised by a possibility to realise only one state in the analysed period. They result from the effect of external factors that are out of a decision maker's (an insurance company's) control.

Making decisions in conditions of risk and uncertainty is always accompanied by the selection of the utility function form. This function determines utility (amount of payment) that accompanies each decision made (each selected strategy) for each of the states of nature.

Realisation of the specific state of nature is characterised by uncertainty that is expressed by the probability that some particular event will take place. If the probability is known, decisions are made in the conditions of risk. However, if it is unknown - decisions are made in the conditions of uncertainty.

While determining a specific set of states of Nature the following conditions have to be met:

- states of nature must be events that are mutually exclusive;
- probabilities of realisation of all states must sum to 1;
- it is necessary to include all possible states of nature;
- probability of realisation of each state must be within an interval (0;1);
- probability of a sum of two states is equal to the sum of probabilities of emergence of each of those states.

A decision tree is a graphic method to present and solve a specific decision problem. Such a tree consists of decision and chance nodes. A decision node signifies an event that is related with a selection of one decisional variant. A chance node means a random event that involves realisation of one of possible states of nature. Arrows that come out of decision nodes indicate possible decisional variants. Arrows that come out of chance node show possible states of nature. Above a chance node an expected amount of payment is given.

[10] Compare Nowak [1999] p.10

In order to construct a decision tree for any problem, it is necessary to form a matrix that presents utility of particular decisions for a decision maker. Insurance company's decisions that concern an optimal selection of a sort of methods and scope of reinsurance may be very well modelled by means of a decision tree, as it is illustrated by the following example. To solve a problem of an optimal selection of reinsurance by means of a decision tree an insurance company must have two pieces of information:

- probability of realisation of a particular state; and
- expected utility or benefit that results from realisation of a specific state.

Let us consider the following decisional problem of an insurance company. An insurance company has its insurance portfolio that does not require reinsurance or may be reinsured by a surplus reinsurance treaty with one or two surpluses. Cost of purchase of the first surplus for the loss 25-50 million PLN amounts to 20 million PLN. Cost of purchase of the second surplus for the loss 50-75 million PLN amounts to 15 million PLN.

With the above assumptions, the following matrix of payments for the problem in question is obtained:

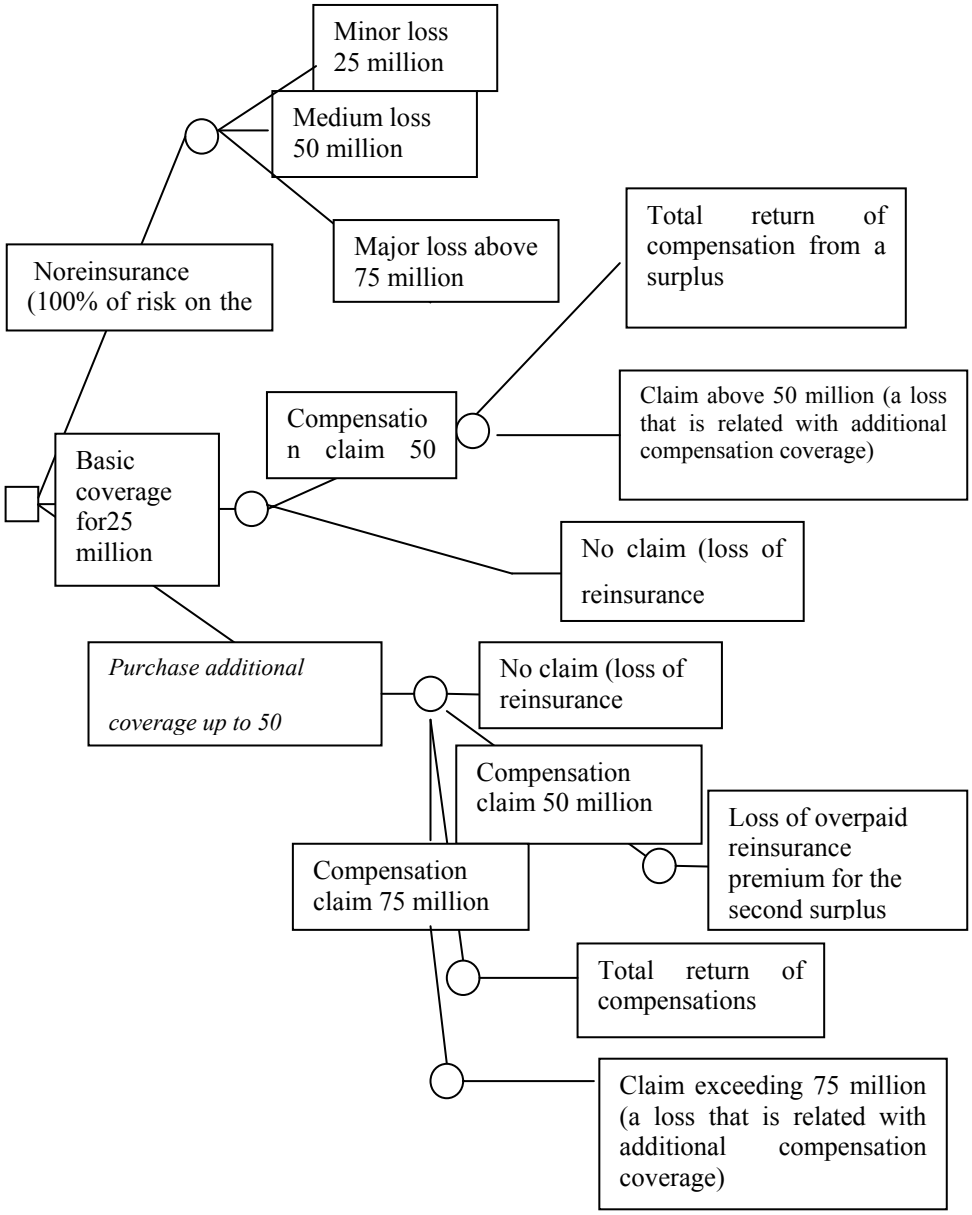
Table 1 . Matrix of payments for reinsurance decisions

Decision of an insurance company	**Cost of compensation**		
	loss of 25 million	**loss of 50 million**	**loss of 75 million**
No reinsurance	**25**	**50**	**75**
Reinsurance with one surplus	**45**	**20**	**70**
Reinsurance with two surpluses	**60**	**50**	**60**

Source: own based on pre-arranged data

On the basis of this information it is possible to construct a decision tree that allows for making the most beneficial reinsurance decision for an insurance company.
Below, The Figure 1 presents a decision tree for the quote reinsurance treaty in a non-life insurance company.

Figure 1 Decision tree for the optimal selection of the quote reinsurance



Source: Author's calculation on the basis: Samson, D., Thomas, H.,

5. Conclusion

While selecting a decision it is possible to use a principle of benefit maximisation. This principle may be characterised in the following way:

Using a probability distribution of emergence of subsequent states of nature, expected benefits for particular decisions are calculated. A recommended decision is a decision for which an expected benefit is maximal. In case of ambiguity, all decisions for which the above condition is met are recommended.

The approach suggested above allows an insurance company to analyse all decisional situations exactly and select a scope and forms of reinsurance in the optimal way.

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THE NEW APPROACH OF THE BEST SOLVABILITY SYSTEMS FOR INSURANCE COMPANIES' SURVEILLANCE

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Abstract

The last years events on the international insurance market point out that, the financial market volatility and the dynamics (more and more emphasized) of the business environment influenced in a high measure the financial security of the insurance companies. In this way, International Association of Insurance Supervisors – IAIS – has elaborated some principles, which have to represent the base for the solvability regime. The systems utilized by the surveillance institutions to evaluate the solvability insurance companies differ from one country to another. Regarding the IAIS opinion, the objective of surveillance institution is to maintain an efficient, fair, sure and stabile insurance market in order to protect the interest of the insured persons. As well, the solvability and the adequated capital regime represent one of the most important elements for the surveillance activity of the insurance companies. The solvency causes discussions permanently and, as a recent proof, in the European Union, it has been started the so-called Solvency II project which will run on a few years period and it will have as purpose to determine whether fundamental changes of the solvency system and a risk orientated approach are necessary.

Keywords: *insurance activity, risks, solvency system, surveillance institution, models of solvency*

1. The importance of the solvency in the insurance activity

The solvency reflects the capacity of a insurance company to achieve all obligations resulting from the contracts in any moment, even some obligations related to the current activity will be closed after few years.

The international law in the insurance field forecast the existence and the maintenance of a minimum amount of the net asset of a company, that is a solvency margin.

The International Association of the Insurance Surveillance Institutions – IAIS – defines the **solvency margin** as been represented by the positive difference between the assets and liabilities of the insurer, in the conditions which are determined in accordance with some standards that refers to their evaluation process. This difference should be higher that the value established by the standards regarding the minimum limit of the solvency margin of the insurers.

The settle up of the solvability supposes ***the knowing of the risks*** the insurer is confronted with and the ***necessity of capital in order to face these risks***. The future activities of the insurer are uncertain, and the role of the solvability margin is ***to guarantee the fact that insurer has sufficient assets in order to pay the future damages***, with the purpose of insured person's protection.

In the directives of the European Union is underlined the necessity to settle up a solvency margin which should take into consideration the whole activity of the insurers and which is represented by " the free obligation assets".

In the condition of the free circulation of the services, ***the protection of the insured person interests supplied by the insurers should be the same,*** which means that the solvency requests – as main protection instrument – should be the same for all insurance companies from the European Union.

2. Solvency Margin Types

There are several notions regarding the solvency margins, as following:

1. The commercial solvency margin reflects the net asset of an organization and is determined on the base of the current reports established by the normative. The drawback consist on the fact that in the determination of the commercial solvency margin are taken in the consideration the assets from the balance sheet, even some of these should not be included because

prudential considerations, as well, all obligations, with no adjustment in function of their underevaluation risk.

2. The statutory solvency margin represents the surplus of the assets over the liabilities, both being evaluated on the base of strict reglementation. These reglementation regards the accounting statements, imposing special prudential principles and rules, as well, the limits of the margin necessary in a context. In the category of the assets which were not taken into account are included the assets with a high risk, eventually the tax exemption offered as a result of a accumulated losses and some investment of the company in the affiliated societies. The level of the statutory solvency margin will be always less than the commercial solvency. The difference between these will be as higher as is the weight of the excluded assets in the total assets.

For the difference between the assets and the liabilities of the insurer determined and evaluated in conformity with the law it is used the name of ***disposable solvency margin.***

3. The minimum required solvency margin represent the minimum level of the statutory solvency margin, calculated in conformity with a methodology established by law or methodological standards. The surplus over the compulsory minimum solvency margin is named ***the surplus of the minimum margin***.

Considering the minimum solvency margin as an expression of the insurer's capacity to accomplish all his liabilities against the insured persons in an extreme situation, it should not be understood that an insurer does not have the paying ability if the margin is under a admitted minimum level.

The role of the minimum solvency margin is to take over the effects of the unquantifiable risks, as well, the impact of underestimation the quantifiable assumed risks or the risk of unusual variation of those, in order to offer to the insurer and to the surveillance authorities enough time to correct the situation generated by the materialization of the respective risks.

3. Regulation systems of the solvency used on the international level

The modalities used by the surveillance institutions for controlling the financial security of the insurance companies are different from a country to another. In many countries, for the insurers are imposed minim values for the solvency margin and in some of them are imposed the constituting of deposits as a form of protection for the insured person interests. We can mention the main regulation system for the solvency used on the international level, as they are defined in note sent to the Subcommittee for Solvency of

the Insurance Commission from the European Commission, document issued in March 2001 and in the OECD Report regarding the supervision of the solvency in the member countries (Insurance Solvency Supervision, OECD Country Profiles, 2002):

1. Solvency systems which are based on the models adapted to the specific of each company (ruin models, resilience tests).

This approach comes from The United States and is less familiar to the European supervision institutions, being used just in Canada, Australia and some of the North American states. In conformity with these methods, the insurance companies should pass a test which simulate the possible financial consequences, starting from the hypothesis of some negative changes of the assets or liabilities' values. The difficulty, and in the same time, the major deficiency of this model consist, in principal, on the selection of the test scenario: the risk factors taken into consideration should be chosen and dimensioned with a lot of attention in order to get a correct image on the solvency of the tested company. The subjective nature of these working hypothesis selection, as well the choose of the type of test used determine this model to be less popular.

2. RBC Systems (Risk - Based Capital)

The RBC system, used on large scale in US was adopted by NAIC (National Association of Insurance Commissioners), for the life and health insurance industry, with the purpose to answer to the necessity of a standard regarding the capital adjustment which should take into consideration all risks which each insurer is confronted with: technical, investment, commercial, management and so on. The weight amount of the adequate values for each risk represents the minimum capital requested to that insurer. New versions of this model are used in Canada and Japan.

The most objections raised by this model are related to the difficulty and accuracy of the calculation, as well to the lack of transparency for the public.

3. The three pillars system (solo solvency), used mostly exclusively in the European countries, this system is based on three requests imposed to the insurers: adequate reserves, assets and the minimum solvency margin imposed, calculated with the method of fixed ratio. The limits of this approach have the origin in its own quality, simplicity. The most objections mentioned in the specialty literature refers to the narrow profile taken into consideration and to the incapacity of the capital requests formulated in order to reflect the risks specific to every company, as well to the capital or the reserves report to the gross or net premium, gross or net reinsurance, which

do not take into consideration the variation of the premium, which, in the case of a soft market, have no advantages for the insured persons, the level of the guaranteed protection being reduced.

The system has not being contested by the European supervision authorities so far, and need some improvements in the scope of harmonize and reciprocal validation of the supervision activity in the European Union countries.

4. The standardize of the solvency requests for the insurance companies from European Union

When talking about the free movement of services, the protection by the insurers of the interests of those insured must be the same, this meaning that the solvency requirements – as a major protection instrument – must be the same for all the insurance companies in the European Union.

The establishing of the solvency means to know the risks to which an insurer is exposed and a necessary capital to overcome those risks. The insurer's future activities are uncertain, and the part of the minimum m.s. is to guarantee that the insurer has sufficient assets to pay the future damages, with the purpose of protecting the insured.

The present system of solvency was created in the '70s, being actualized relatively recently throughout two Directives issued in 2002, as part of the ***Solvency I project***. The solvency permanently causes discussions and, as a recent proof in the European Union, it has been started the so called ***Solvency II project*** which will run on a few years period and will have as a purpose to determine whether fundamental changes of the solvency system are necessary, a risk orientated approach.

In the two directives, the following **concepts** are used:

- ***compulsory solvency margin***, representing the amount by which the assets value overcome the bonds' value, imposed to an insurance company which is going to practice the authorized activity;

- ***the solvency margin available***, representing elements by the nature of capital, which can be taken into account for the estimation of the compulsory solvency margin;

- ***the guarantee or safety fund***, representing 1/3 of the compulsory solvency margin, which can't be lower than a minimum level.

One of the **new elements** introduced by the 2 directives from 2002 refer to the existence of the safety fund, its volume being different for the two

types of insurance, respectively: 2 million EUR for non-life insurance and 3 million EUR for life-insurance.

The two directives through which the solvency margin are actualized ensure minimum conditions for the harmonization of the legislation of the member states, and, in turn, the states can impose even more restrictive conditions through their national legislation, thus maintaining their freedom of adapting the compulsory solvency margin to the specific conditions of their markets.

5. The solvency regime for the Romanian insurance companies

5.1 Results obtained on the Romanian insurance market compared to the European Union States

The international insurance market has shown fluctuating evolutions from one period to another. Thus, at the end of 2003, some economically developed countries dominated the insurance market, like USA with a market share of 36% of the world market total, Japan with 16% and Great Britain with around 9%, together having 61% of the total gross premiums received on the whole insurance activity. Referring to the structure of the insurance, in the life insurance domain, on the first three ranks worldwide there are the same countries with a market share of 29%, 22% and 10%, but in the non-life insurance domain, the rank of Great Britain is undertaken by Germany, closely followed by the latter. So, the weight of the gross premium in the non-life insurance domain by the first three countries is of 60.51% as it is shown in Table 1.

These countries together with France, Italy and Canada, meaning the great seven industrialized powers of the world, known as the G7, obtained around 78% of the amount of insurance premiums from total market, life insurance and non-life insurance.

Table 1 Worldwide market share regarding gross premium level on total insurance activity and on structure in 2003

Country	*% Total insurance*	*% Life insurance*	*% Non-life insurance*
United States of America	**35.90**	**28.79**	**45.23**
Japan	**16.04**	**22.23**	**7.92**
Great Britain	**8.63**	**9.64**	**7.31**
Germany	**5.77**	**4.56**	7.36
France	5.48	6.22	4.51
Italy	3.75	4.29	3.05
Canada	2.03	1.43	2.81
G7	**77.60**	**77.16**	**78.19**
EU 15	**31.71**	**32.70**	**30.41**
EU 25	32.27	33.06	31.23
Total worldwide	100	100	100

Source: Swiss Re, Sigma, No 3 (2004), update February 2005, processing page 3-9

The European insurance market registers quick and consolidating changes, mainly due to the plans and strategies made by the European Union, which refer to the extending of the insurance transactions. However, the differences between the organizational and the national cultures have hindered the creation of the required financial mechanisms. The best results have been obtained on the life insurance market, which have promoted the efficiency of the activity by cost reduction.

The evolution of the main indicators registered on the **Romanian market compared to the results of the European countries** and to the worldwide results, in 2003, shown in Table 2, emphasizes the development of the insurance activity in these countries and the capacity of absorption of the insurance market.

Despite the fact that the effective gross premium volume is higher in some states than in others, **the indicators of the insurance market**, meaning the insurance density and insurance penetration, do not show the same situation. So, as it concerns the gross premium, on the first three ranks there are situated Great Britain, Germany and France, while from the insurance penetration in GDP, on the first three ranks there are situated Great Britain with 13.37%, Switzerland with 12.74% and both Holland and Belgium with 9.77%. If we consider the insurance density, in the hierarchy are placed

Switzerland, Ireland and Great Britain with 5 010 EUR/capita, 3 932 EUR/capita and 3 689 EUR/capita.

Table 2 Romanian insurance market compared to the results registered in the European countries in 2003

Country	***GP* (mill EUR)***		***Insurance density** (EUR/capita)***		***Insurance penetration******	
	Total insurance	***Life insurance***	***Total insurance***	***Life insurance***	***Total insurance***	***Life insurance***
Great Britain	**218 359**	**137 035**	**3 689**	**2 315**	**13.37**	**8.62**
Germany	**151 168**	**67 913**	**1 837**	**825**	**7**	**3.17**
France	**144 857**	**93 311**	**2 430**	**1 566**	**9.15**	6
Italy	98 908	63 449	1 720	1 104	7.45	4.86
Holland	44 485	22 453	2 746	1 386	9.77	4.93
Spain	41 607	17 737	1 015	433	5.58	2.38
Switzerland	36 073	21 871	5 010	3 038	12.74	7.72
Belgium	29 925	18 589	2 905	1 805	9.77	6.91
Sweden	18 620	12 653	2 092	1 422	6.97	4.73
Ireland	15 335	7 998	3 932	2 050	9.59	6.02
Romania	**704**	**165**	**31.7**	**7.5**	**1.45**	**0.34**
EU 15	**808 016**	**479 612**	**2 111**	**1 248**	**8.58**	**5.09**
EU25	838 545	484 976	1 797	1 055	8.35	4.83
Worldwide level	2 602 493	1 480 175	416	236	8.06	4.58

Source: Swiss Re, Sigma No 3/2004, processing page 9-12
**Gross premium*
***Insurance density shows the level of gross premiums per inhabitant*
****Insurance penetration shows the weight of gross premiums in GDP*

In Europe, **Romania** ranks as the 26th regarding the amount of the gross premium, among the 34 countries, as the 33rd regarding the insurance

density and the insurance penetration – Ukraine, respective Turkey, being on the last places.

Concerning the **structure of insurance**, the highest premiums volume per capita is bigger for life insurance than for non-life insurance, respective of 60% in the countries of Europe - 15, and of 57% worldwide. In Romania, the structure of life insurance is in favor of general insurance, respective of 76.5%.

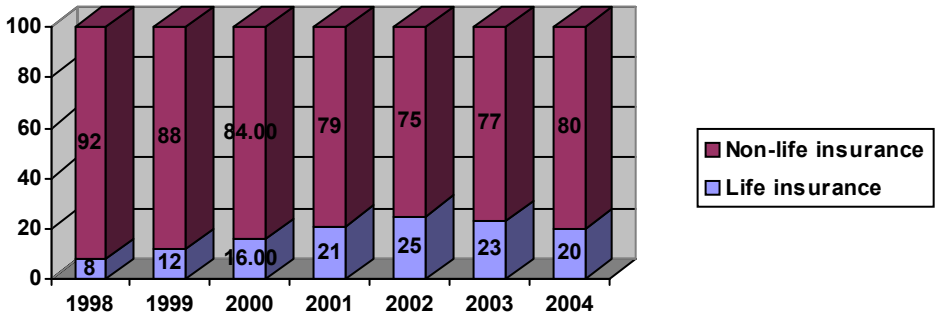
Table 3 The evolution of gross premium on total insurance activity and on structure, in Romania, in the period 1998-2004

Year	*Life insurance gross premium (%)*	*Non-life insurance gross premium (%)*
1998	8	92
1999	12	88
2000	16	84
2001	21	79
2002	25	75
2003	23	77
2004	**20**	**80**

Source: processing from the ISC Annual Report for 2001, 2002, 2003, adding data from a specialized magazine "PROFIL Insurance", March the 30th, 2005.

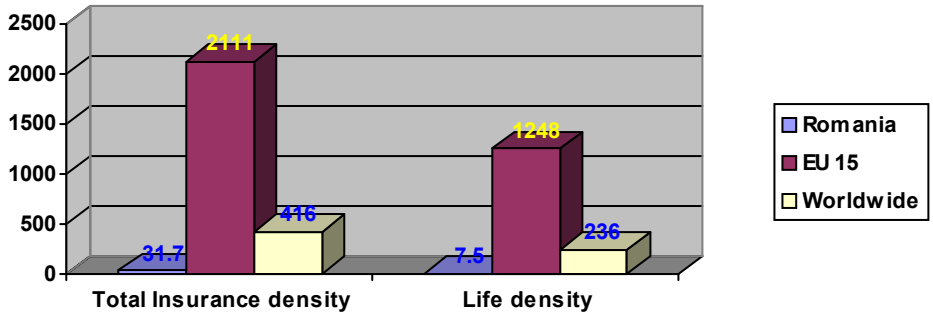
From Table 3 and Figure 1, it can be seen that the highest percentage on total insurance market in Romania, of 80%, still belongs to non-life insurance, increasing from 2003 and with fluctuating evolutions in the analyzed period.

Figure 1 Structure of gross premium on life insurance and non-life insurance, in Romania, in the period 1998-2004



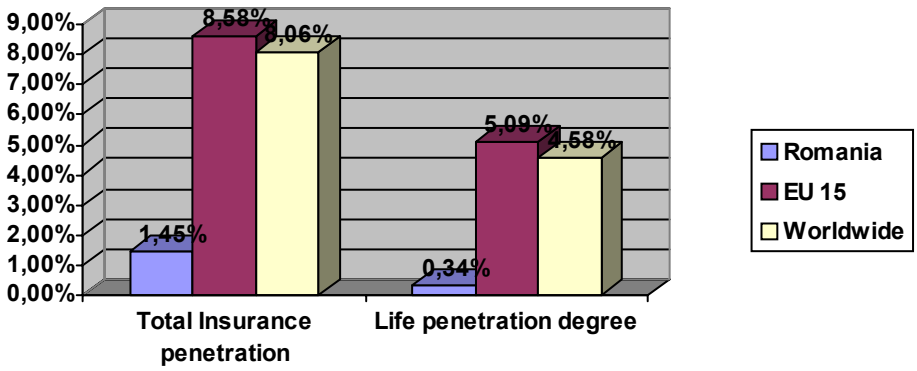
The insurance density in Romania has achieved a level of 31.7 EUR/capita, of which gross premium from life insurance – 7.5 EUR/capita, and from non-life insurance – 24.2 EUR/capita, while in the European Union states, the insurance density represents 2 111 EUR/capita, and on worldwide a level 416 EUR/capita, shown in Figure 2.

Figure 2 Insurance density on the whole insurance market and the life insurance, in Romania, EU 15 and Worldwide in 2003



For a level of the GDP per capita of 2 193 EUR[1], in Romania, ***the penetration degree*** registers a level of 1.45%, shown in Figure 3. Even though increasing from previous years, the insurance penetration in Romania remains low compared with the ones registered in Central and Eastern European countries – which are between 3% and 5%, with the European Union average of 8.6% or with the worldwide average of 8.06%.

Figure 3 Insurance penetration on the whole insurance market and the life insurance, in Romania, EU 15 and Worldwide in 2003



[1] Xprimm Magazine, Insurance Profile, year II, no. 4 (2004), page 3: http://www.1asig.ro

The insurance gross premium by the first ten insurance companies from Romania[2], at the end of 2004, represent ***83%*** of gross premiums received on the whole market, situation that reveals the insurance market's level of concentration. On the first three ranks are situated the following insurance companies: Allianz-Tiriac, Asirom and Omniasig, with a total market share of 46%.

The gross premium by the first ten insurance companies providing life insurance in the same period (from the 23 insurance companies that had activity in life insurance domain) represent ***93%*** of the total insurance gross premium received on this insurance industry. ING Life Insurance remains the leader of life insurance, with a market share of 40,5%. The first three insurance companies (ING Life Insurance, Asirom, AIG Life) hold together a share of 64% of life insurance market.

The number of societies that provided ***non-life insurance***[3] has been of 34, and the percentage of gross premium for the first 10 insurance companies has represented ***86%*** of the total gross premium in the non-life insurance domain. Also, more than half (53%) of the gross premium was made by the first three insurance companies, and those are: Allianz-Tiriac, Asirom and Omniasig.

Regarding ***the preferences of individuals for financial investments***, in ***the European Union***, insurance rank on the 2-nd place, with a percentage of 24.5% in the investment portfolio structure, followed by pension funds with 13% and mutual funds, with 10.6%. ***In Romania***, the investment portfolio structure of individuals, according with a study made by an Italian group UniCredit at 22.10.2004, was: banking deposits, 63.3%; cash, 14.9%; listed stocks, 9.6%; other commercial papers, 8.3%; savings insurance, 3.8%; mutual funds, 0.2%.

The explanation given to this evolution is based on the connection between the modest performances registered on a global level by the insurance market and the unfavorable economic conditions, a high inflation rate, the depreciation of the local currency, the excessive taxation and the reduction of purchasing power of population. Along with these general inconveniences, there can be added the specific ones of the insurance domain, like the legislation

[2] Insurance market in 2004 – Top 10, 31.03.2005: http://www.1asig.ro
[3] Top 10 – non-life insurance, 30.03.2005: http://www.1asig.ro

5.2. The calculation methodology for the solvency margin in Romania

Romania has adopted the European Union Directives by submitting the insurance companies to estimate ***solvability margin*** at the end of every year and to transmitting the report application about the solvency margin to the insurance supervision commission. Solvency margin represents the value by which the assets of an insurer are higher than the value of his bonds and which has to be higher than the value established throughout regulations related to the minimum limit of the solvency margin of the insurers.

The solvency margin settle up by the insurer will be compared with the minimum solvency margin, recommended by the standards issued by the Insurance Supervisory Commission[4].

For each insurance category, non-life and life insurance, there are established particular methods of calculation the solvency margin, the criteria regarding the assets and liabilities evaluation and the category of the assets and liabilities which can not be taken into consideration for the calculation of the solvency margin for the insurer or which will be taken into consideration just in a certain proportion.

The evaluation of the insurers' assets and liabilities for determining the solvency margin is based on their values and they are underlined in the balance sheet.

The authorized insurers to practice **non-life insurance** has the obligation to have permanently a **available solvency margin,** in concordance with their activity, at least equal with the minimum solvency margin calculated in conformity with the present standards.

To the available solvency margin corresponds the total of ***the free obligation assets,*** excepting the immaterial assets.

For determination of the available solvency margin, the following elements are taken into consideration:

a) the share capital subscribed and paid or, in some cases, if it is about mutual societies, the free reserve fund at which will be added all members' accounts;

b) all reserves, others than the technical reserves, as followings: the reserves of capital premium, the reevaluation reserves, legal, statutory, conversion or other reserves;

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[4] The standards from 12. 27 . 2001 regarding the minimum limit of the solvency margin of the insurers which practice non-life insurance and the its calculation methodology, MO no 43 from 01. 22 . 2002

c) the net profit resulted from the deduction of the dividends which should be paid or, in some cases, the loss registered by the insurer.

The available solvency margin is diminished with the value of the shares owned by the insurer.

Besides these, in the calculation of the available solvency margin ***can be included*** the following components:

a) the cumulative preferential shares and the liabilities subordinated till 50% from the least value resulted from the comparison between the available solvency margin and the minimum solvency margin. From these maximum 25% should be constituted from the debts subordinated with fixed deadline and/or cumulative preferential shares with a determined term of payment.

b) the securities with undetermined term and other securities, including the cumulative preferential shares, till a level which can not overtake 50% from the least value resulted from the comparison between the available solvency margin and the minimum solvency margin.

The determination of the minimum solvency margin is different for the general insurance and for the life insurance, following a calculation algorithm presented in the Insurance Supervisory Commission standards in that sense.

The minimum solvency margin for the general insurance can be determined by two methods:

a) the report to the yearly premium or the contributions;

b) the report to the average gross damages paid in the last fiscal years.

If an insurance company take in the insurance one or more risks: the credit risks, the storms, the freeze, the reference period for the calculation of the average gross losses paid will correspond to the last 7 fiscal years.

The minimum solvency margin is equal with the highest value between the two results got through the application of the methods presented above.

A third from the minimum solvency margin of the insurer **form the security fund.** The minimum value of the security fund for the general insurance is the lei equivalent for 2 million Euros at the report date, as results from the table 4.

The Euro value of the security fund will be revised yearly in function of the changes of the European consumer price index, published by Eurostat.

The determination of the minimum solvency margin for the life insurance will be achieved taking into consideration the specific of the life insurance' products, respectively insurance classes which cover the survival risk, the demise risk, accident risk, which represents an investment component.

The insurer is forced to determine permanently the available solvency margin, the minimum solvency margin, as well, the security fund based on the financial statements and to transmit to the Insurance Supervisory Commission, a report at the end of every fiscal year.

The introduction of the safety fund in the calculation of the solvency margin, at this moment, would have a negative impact for almost 60% of the insurance companies. New regulations regarding the method of establishing the solvency margin for the insurance companies in Romania will be introduced, considering the fact that for 2005 the level of minimum capital will be taken into consideration, this being replaced in 2006 by the safety fund. Under these circumstances, there have been issued regulations regarding the gradual annual increase of the minimum capital of the insurance companies, up to the levels required by the EU, the last increase ending at 30 of June 2006. A process in two steps regarding the establishment of the solvency margin according to the EU regulations offers the time needed by the companies with a lower level of capital in order to act for adapting to these new requirements.

Table 4 The actualization of the owners equity by the insurance companies in Romania, according to the EU regulations – mill. EUR

	Until June 30th, 2005	*Until Dec 31st, 2005*	*Until June 30th, 2006*
a) Non-life insurance, except for compulsory insurance	0.8	1.3	2
b) Non-life insurance	1.3	2	3
c) Life- insurance	1.2	2	3

Source: Press release regarding the actualization of the minimum levels of owners equity for the insurer, 24.03.2005, www.csa-isc.ro.

The models used for establishing the credit worthiness status are those existing in the present directives. There are some options that say that the model of National Bank of Romania should be used, but insurance companies have not yet fulfilled the process of aligning the capital of credit institutions, because they first have to financially consolidate the insurance capital, i.e.

capital increase, and after this step Solvency II model can be successfully applied.

An extremely interesting source is the Basel Accord on regulations of capital alignment in the banking field. Based on the conclusions of the study, elaborated in May 2002, on European Commission request, a model of credit worthiness surveillance for insurance companies, inspired by the solutions adopted through the Basel Accord, should comprise of the following 3 pillars:

1. Financial resources – minimum requests on capital, elaborated based on a risk profile estimated in direct connection to the subscription data, assets and liabilities gathered in financial reports; companies can be the beneficiaries of elaborating their own model of risk profile;

2. Surveillance – the evaluation of the risk management system through checking on exposures, risk profiles elaborated on internal level, stress tests on technical reserves and assets, managerial performances;

3. Market discipline – the compulsory communication of information, fully transparent, which allows for the other operators to evaluate the financial stability of the company.

In conclusion, the solvency margin represents the amount with which the assets value overtake the liabilities value, which should be higher than the value settled by the standards regarding the minimum limit for the solvency margin of the insurers. .

For the insurance companies is compulsory to determine the solvency margin at the end of every year and to transmit to the Insurance Supervisory Commission, together with the balance sheet, a report regarding the solvency margin. The first report regarding the solvency margin will be transmitted to the Insurance Supervisory Commission together with the yearly reports for 2002, and in 2003, Insurance Supervisory Commission will analyze its values and will take the necessary measures in order to prevent the insurers' insolvency.

The solvency ratio for the insurance companies (S), can be determined by the report between the solvency margin of the insurers and the minimum solvency margin, as follows:

$$S = \frac{M_S}{Ms_{\min}}.$$

In order to prevent the insolvency for the insurer, as well for its recover, the Insurance Supervisory Commission will do, at least once a year, a control regarding the financial situation of the insured persons, in order to

check the observance of the legal rules regarding the solvency margin and the maintenance of the share capital.

In function of the ***result got from the determination of the solvency margin of the insurer,*** the insurers are appreciated as following[5]:

a) ***the insolvency*** insurers, in the case the report's result is less than 1;

b) the insurers being at the ***insolvency limit***, in the case the report's result is equal with 1;

c) the insurers for which exist a ***high insolvency risk*** , in the case the report result is between 1 and 5;

d) the insurers for which exist a ***low insolvency risk*** , in the case the report result is between 1.5 and 2;

e) the insurers for which do not exist a ***insolvency risk*** , in the case the report result is higher than 2.

These evaluations are synthesized in the table 5.

Table 5 The evaluation of the insurers in function of the results of the insolvency level

	Results regarding the solvency level				
	<1	***=1***	***1-1.5***	***1.5-2***	***>2***
The evaluation of the insurers	insolvency	at the insolvency limit	high insolvency risk	low insolvency risk	no insolvency risk

If as a result of the financial report and the controls, the Insurance Supervisory Commission find out that the insurers is ate the *limit of the insolvency or has a high insolvency level*, which threaten the payment of the assumed obligations to the insured persons, this will request the elaboration and application of a **financial recovering plan**, which should forecast the following aspects:

a) the limitation of the gross or net premiums subscribed for a period, thus these should not overtake certain values;

[5] The standards from 12. 27. 2001 regarding the insolvency of the insurer and the special administrator, MO no. 43 from 22 Januaruy 2002

b) the interdiction of the selling and renewing the insurance contracts of a certain type;

c) the interdiction of some investments;

d) the increasing of the paid share capital or of the paid reserve fund;

e) any measures which are considered necessary for the recovering.

If the insurer, as a result of the determination of the solvency level, realize that is at the insolvency level or has a high insolvency level has to fill and send to the Insurance Surveillance Commission the financial recovering plan, which being approved by the Insurance Supervisory Commission, will include the deadlines for achieving the objectives.

Till the complete recovering of the insurer, as well in the case in which the Insurance Supervisory Commission consider that the financial situation of the insurer will get worse, this can narrow or forbidden the insurer to use a part or all assets and can take any other measures in order to protect the insured persons.

The Insurance Supervisory Commission can withdraw the authorization for the a part or all insurance classes used by an insurer, if this can not recover till the settled deadline.

In the case that *measures of financial recovering did not get the expected results,* the Insurance Supervisory Commission can ask the Low Court from Bucharest for an appointment of a **special administrator** for that insurer.

The special administrator will administrate the insurer's activity, setting up the optimum conditions for assets' conservation and for the debt payment in the interest of the insured persons and other creditors. He will present monthly or any time it is solicited to the Insurance Supervisory Commission an evaluation of the financial situation of the insurer.

If, based on the received reports, Insurance Supervisory Commission will consider that the insurer is recovered financially and correspond to the prudential parameters, this will ask to The Low Court the revocation of the disposal concerning the financial recovering plan.

The Insurance Supervisory Commission takes into consideration the possibility to simplify the solvency classification, which divide the insurance companies in insolvency ones, low solvency level ones, high solvency level ones and no insolvency risk ones. As well, the Insurance Supervisory Commission intends to not make public the solvency level of each company, just the solvency category: solvency company (with a solvency level higher than 1) and insolvency company (with a solvency level less than 1).

The liquidity ratio represents the report between the liquid assets and the certain liabilities on short term of the insurer against the insured persons.

In the category of the ***liquid assets*** are included : the state certificates; the bank deposits of which placement do not overtake 50% at a bank, but not more than 20% in a bank from the same financial group or which is main shareholder at the insurer ; the cash and current accounts.

In the category of the ***certain liabilities on short term*** of the insurer against the insured persons are included the damage reserve and the unexpected damage reserve.

The minimum request regarding the liquidity ratio is fulfilled if the liquid assets of the insurer will represent at least 50% from the certain liabilities on short term.

6. Conclusion

For the elaboration of a new solvency system, the first step was represented by the definition of the requests which this should get answers, as followings:

- to protect the beneficiaries, insuring for the supervision institutions a period of time necessary to identify and recover the negative phenomenon registered in a company;

- to offer comparability, transparency and continuity, thus creating an uniform action environment;

- to establish a set of requests regarding the solvency margin in conformity with the real risks. The methodology of calculation of the minimum solvency margin should permit the transmission of a correct signal toward the management, without encouraging the imprudent behavior;

- to avoid the useless complications – a simple system, easy to understand and to be applied, which should not generate supplementary costs. The purpose of monitoriziong the solvency is that to notice from the beginning the negative trends, not to supply a guarantee against the bankruptcy;

- to reflect properly the market evolutions;

- to avoid, as it is possible, to generate supplementary financial reports, valorizing thus the information from the financial statements;

- to avoid the excessive capital requests which could lead to the decrease of the competitiveness of the European insurance market.

In general, the using of a sophisticated solvency system on a such wide and diversified industry as the insurance one is suppose to surpass some substantial practical problems, especially because these are going to be taken at the international level.

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ON USING ECONOMETRICS IN PRICING AUTOMOBILE INSURANCE

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Abstract

In this paper we add some remarks on using econometrics theory in ratemaking the automobile insurance. The tariff system studied in the paper has the objective to incorporate a priori and a posteriori information in the premium, mainly according to the bonus-malus system proposed by Dionne & Vanasse (1989). For an important car insurance portfolio, within an empirical study, the explanatory variables related to the number of accidents, respectively the claim size are selected. The econometric count model for the number of accidents, respectively the log-linear econometric model for claim size are estimated. We also point out the necessity of including in the premium the explanatory variables of the claim size and a bonus-malus system that incorporates the individual past experience of claim size.

Keywords: *ratemaking, a priori classification, count models, loss distributions, bonus-malus system.*

1. Introduction

Automobile insurance portfolios are heterogeneous because there are a series of characteristics that influence the damage frequency, respectively the severity. The insurers usually combine a priori and a posteriori tarification systems (Lemaire, 1985). The equity of insurance pricing means that the policyholders pay rates according to their level of risk. In a priori rating, it is used a series of characteristics referring to policyholders, vehicles and territory to estimate a policyholder's risk. Some of the commonly characteristics used by the policyholders are: driving record, territory, vehicle use, the country where the vehicle was made in, the model of vehicle, gender, age and marital status of policyholders, type of coverage etc. Risk classes might prove heterogeneous even after an a priori rating, as there are a series of directly unobservable variables (prudence, personality, the driver's health etc). An a posteriori bonus-malus system is used to revise the a priori rating; the individual premiums are adjusted according to accident record of the policyholder. Generally, the a posteriori rating system suits the non-homogeneous portfolios where the individual characteristics are difficult to be measured a priori.

The objective of this study is to use multivariate regression models in selecting the main explanatory variables for the number of claims respectively the claim size dependent variables. The results are used for a priori rating, but a bonus-malus system is also retained in order to improve the insurance rating.

The univariate Poisson model is a plausible model for the distribution of the number of claims inside a homogeneous portfolio. The negative binomial distribution is more adequate for the distribution of the number of claims in heterogeneous portfolios. When the parameter λ, that represents the mean and the variance of the Poisson variable, varies across the portfolio being a random variable that follows the gamma distribution, the number of claims follows a negative binomial distribution (Petauton, 2000).

The most common distributions used in the study of claim size, called the loss distributions, suit the lognormal distribution, the Pareto distribution, Weibull distribution or a mixture distribution.

The univariate models for the number of claims are often rejected from empirical studies as a consequence of the heterogeneity of risk. The count models are used here in order to estimate the distribution of the number of claims and to select the significant variables that explain the variance of the number of claims; the linear regression models are not adequate for discrete variables (Greene, 1997). The Poisson respectively the negative

binomial models with a regression component are used in rating automobile insurance and a bonus-malus system is proposed in order to integrate a priori and a posteriori information in the tariff by Dionne and Vanasse (1989). Premium tables are obtained for liability automobile insurance.

The linear regression model is proposed to be used for the logarithm of claim size in order to select the significant explanatory variables for claim size.

A private insurance company provided the database for which we intend to analyse the distribution of the number of claims and respectively of the claim size; this insurer holds a significant part of the market. We use a sample of 38770 policies. The policies cover damages of the private automobile, caused by accidents produced by the policyholder. Therefore, the automobile insurance taken in view in this empirical study covers only the costs in case of physical damage to own car caused by accidents.

2. Probability distributions and econometric models

The simplest model for the number of claims y_i made by the policyholder i during a given period of time (one year) is the univariate Poisson distribution:

$$P(y_i = k) = e^{-\lambda} \frac{\lambda^k}{k!}, \qquad \text{k=0, 1, 2, ...} \tag{1}$$

where λ is the Poisson parameter, which equals the mean and the variance of the variable. We assume here that the Poisson parameter is constant across the portfolio. Consequently, this model is suited only for a homogenous portfolio.

If the number of claim y_i follows a Poisson distribution and the mean λ_i follows a gamma distribution, with parameters α and β, then the marginal distribution of the number of claims is negative binomial:

$$P(y_i = k) = \frac{\Gamma(\alpha + k)}{\Gamma(\alpha) k!} p^{\alpha} q^k, \qquad \text{k=0, 1, 2, ...} \tag{2}$$

where $p = \frac{\beta}{\beta + 1}$ and $q = 1 - p$. The mean and variance of negative binomial distribution are:

$$E(y_i) = \frac{\alpha q}{p} = \bar{\lambda} \tag{3}$$

$$Var(y_i) = \frac{\alpha q}{p^2} = \overline{\lambda}\left[1 + \frac{\overline{\lambda}}{\alpha}\right] \quad (4)$$

The parameters of these two distributions can be estimated by the maximum likelihood method or the method of moments.

Let us begin with the count model for the dependent variable the number of claims y_i. The explanatory variables $x_1, x_2, \ldots, x_k$ represent a priori classification variables, which explain the variance of the number of claims. The vector of explanatory variables specifies a model for the conditional mean of the dependent variable:

$$E(y_i / x_i) = \exp(x_i \beta) \quad (5)$$

where β is a vector of parameters *(kx1)* and $x_i=(x_1, x_2, \ldots, x_k)$ the vector of explanatory variables. For the Poisson model, the conditional density of y_i given x_i is

$$f(y_i / x_i) = \frac{e^{-\exp(x_i\beta)}\left[\exp(x_i\beta)\right]^{y_i}}{y_i!} \quad (6)$$

and

$$E(y_i / x_i) = \lambda_i = \exp(x_i\beta) \quad (7)$$

The probability that the policyholder to be involved in k accidents is:

$$P(y_i = k / x_i) = \frac{e^{-\exp(x_i\beta)}\left[\exp(x_i\beta)\right]^{k}}{k!} \quad (8)$$

By maximizing the log likelihood function

$$l(\beta) = \sum_{i=1}^{n}\left[k(x_i\beta) - \exp(x_i\beta) - \ln(k!)\right] \quad (9)$$

the maximum likelihood estimator of the parameter β is obtained (Greene, 1997). It has been supposed that the variables y_i are independent.

An alternative to the Poisson regression model is to estimate the parameters of the negative binomial specification. The negative binomial distribution is more adequate when the variance in the data is bigger than the mean and arises from a natural formulation of cross-section heterogeneity (Greene, 1997).

The lognormal distribution is often used as a model for the claim size distribution. A random variable Y has a lognormal distribution with parameters μ and σ if the variable $ln\ Y$ has a normal distribution with mean μ and standard deviation σ. The probability density function is:

$$f(x) = \frac{1}{\sigma x\sqrt{2\pi}} \exp\left[-\frac{1}{2}\left(\frac{\ln x - \mu}{\sigma} \right)^2 \right], \quad x > 0 \tag{10}$$

This is positively skewed; there are a lot of small claims.

The linear regression models are based on normal distribution. Therefore, for the dependent variable m_i, the claim size, we propose a log-linear multivariate regression model

$$\ln m_i = b_1 z_{i1} + b_2 z_{i2} + ... + b_r z_{ir} + \varepsilon_i \ , \qquad i = 1, 2, ..., n \tag{11}$$

The β parameters are estimated by ordinary least squares. This model is used to select the significant explanatory variables for the claim size.

Dionne and Vanasse (1989) proposed a bonus-malus system which integrates a priori and a posteriori information. The premium tables take account of time, accidents record and the individual characteristics. The expected number of accidents is estimated from a Poisson and negative binomial model with a regression component. Let us take y_i^j the number of accidents for the policyholder *i* during the period *j* and $x_i^j = \left(x_{i1}^j, ..., x_{ik}^j\right)$ the vector of explanatory variable observed at period *j*. The expected number of accidents of policyholder *i* during the period j is a function $\lambda_i^j\left(x_i^j, \varepsilon_i\right)$, where ε_i is a random variable. The best estimator of the expected number of accidents for the next period, $\hat{\lambda}_i^{t+1}\left(y_i^1, ..., y_i^t; x_i^1, ..., x_i^{t+1}\right)$, depending on the past experience and on the *k* characteristics known a priori should be determined. Applying the negative binomial distribution to the model, Bayes's optimal estimator of the expected number of accidents for policyholder *i* is (Dionne and Vanasse, 1989):

$$\hat{\lambda}_i^{t+1}\left(y_i^1, ..., y_i^t; x_i^1, ..., x_i^{t+1}\right) = \dot{\lambda}_i^{t+1}\left[\frac{\alpha + \overline{Y_i}}{\alpha + \overline{\lambda}_i} \right] \tag{12}$$

where $\lambda_i^j = \exp\left(x_i^j \beta\right)\varepsilon_i = \left(\dot{\lambda}_i^j\right)\varepsilon_i$, $\overline{\lambda_i} = \sum_{j=1}^{t} \dot{\lambda}_i^j$ and $\overline{y}_i = \sum_{i=1}^{t} y_i^j$ the total number of accidents over t periods for the policyholder *i*.

For a new policyholder when t=0, $\hat{\lambda}_i^1 = \dot{\lambda}_i^1 \equiv \exp\left(x_i^1 \beta\right)$ the only a priori rating is used. When the regression is reduced to a constant, one obtains:

$$\hat{\lambda}_i^{t+1}\left(y_i^1, ..., y_i^t\right) = \overline{\lambda}\left[\frac{\alpha + \overline{y}_i}{\alpha + t\overline{\lambda}} \right] \tag{13}$$

which is the Bayes's estimator of an individual's expected number of accident based only on past accidents $\overline{y}_i = \sum_{i=1}^{t} y_i^j$.

In order to calculate the premium for the policyholder *i* we propose to take account of the significant characteristics for the number of claims and for the claim size respectively of the accidents record

$$\hat{m}_i^{t+1} \cdot \hat{\hat{\lambda}}_i^{t+1} \cdot \left[\frac{\hat{\alpha} + \overline{Y_i}}{\hat{\alpha} + \overline{\lambda}_i} \right] \tag{14}$$

where

$$\hat{\hat{\lambda}}_i^{t+1} = \exp\left(x_i^{t+1} \hat{\beta}\right) \tag{15}$$

$$\hat{m}_i^{t+1} = \exp\left(z_i^{t+1} \hat{b}\right) \tag{16}$$

3. An empirical study

An important Romanian insurance company provided the database used in this empirical study and it includes a considerable number of policies (38770 policies). The policies cover damages of the policyholder's car, caused by accidents produced by the policyholder. For each policyholder, we observe the following variables:

- the dependent variable: the number of accidents produced over a period of time of one year and the individual claim size.

- the explanatory variables: the cylindrical capacity of the engine, the age of the car, a variable explaining the country where the car was manufactured, the legal status of the policyholder, the number of seats in the automobile, the gender of the policyholder.

First, we are looking for a probability distribution that describes adequately the number of accidents that actually occurred. Observed and fitted numbers of accidents for the Poisson distribution are presented in table 1 from appendix. The Kolmogorov-Smirnov test enables us to reject the Poisson distribution hypothesis, as the statistics *Z= 12,9* is significantly different from zero for a significance level of $\alpha = 1\%$. We observe a poor fit of the univariate Poisson model for the distribution of number of accidents. Also in table 2 from appendix we present the observed distributions for claim size.

For the explanatory variables we have introduced indicative variables:

- the age of the car (A)

$A_1 = 1$, if $A \leq 1$ (reference class), otherwise it is 0

$A_i = 1$, if $A = i$, otherwise it is 0, for $i = 2, 3, \ldots, 10$

$A_{11} = 1$, if $A \geq 11$, otherwise it is 0;

- the cylindrical capacity of the engine (C)

$C_1 = 1$, if $C \leq 1200$ cm^3 (reference class), otherwise it is 0

$C_2 = 1$, if C is between 1201-1400 cm^3, otherwise it is 0

$C_3 = 1$, if C is between 1401-1600 cm^3, otherwise it is 0

$C_4 = 1$, if C is between 1601-1800 cm^3, otherwise it is 0

$C_5 = 1$, if C is between 1801-2000 cm^3, otherwise it is 0

$C_6 = 1$, if C is ≥ 2000 cm^3, otherwise it is 0;

- made in :

ROM = 1, if the automobile is manufactured in Romania, otherwise it is 0

STR = 1, if the automobile is manufactured abroad, otherwise it is 0

DW = 1, if the trade mark of the automobile is Daewoo (reference class), otherwise it is 0;

- the gender of the policyholder

M = 1, for the male group (reference class), otherwise it is 0

F = 1, for the female group, otherwise it is 0;

- the use of the car

P = 1, if the car is for private use, otherwise it is 0

B = 1, if the car is used for business, otherwise it is 0.

The classes for the explanatory variables have been constructed by taking into consideration the tariff classes used by most of the insurance companies from our country.

The dependent variables are the following:

NRC – the number of accidents per year

LNC – the logarithm of the claim size

In order to estimate the econometric models, we used the statistics packages EViews 4.1.

3.1 The econometric model for the number of accidents

We estimate the parameters of the Poisson count model and of the negative binomial model. Many variables were found significant. Table 3 from appendix includes the results obtained after the estimation of the Poisson count model (the conclusions regarding the significant variables are identical to those resulting from the negative binomial count model).

The coefficients of the indicative variables P, respectively of A_2, A_3, A_4 were found insignificant in both methods of estimation. The variable use of the car does not exert a significant influence on the number of accidents; the number of accidents is similar in the case of private cars as well as in the case of those used for business. In addition, the count model does not show any justification of distinct tariff classes when the age of the automobile is of 0, 1, 2, 3 or 4 years. In the new model for the dependent variable the number of accidents which includes only the significant explanatory variables, presented in table 4 from appendix, the reference class for the age of the car is defined as A = 1, if the age of the car is of 0, 1, 2, 3 or 4 years, otherwise it is 0. The number of accidents is significantly lower for older cars than for the relatively new ones (less than 5 years of age).

The dummy variable related to the cylindrical capacity of the engine illustrates positive significant coefficients: the bigger the cylindrical capacity of the car, the higher the number of accidents.

For the gender variable, we observe, as expected, that women are involved in a considerably lower number of accidents as compared to men. The empirical result that has been obtained is similar to that contained in other studies (Dionne & Vanasse, 1989; Dionne & Ghali, 2003).

As for the "made in" variable, the cars made in Romania are involved in a considerably lower number of accidents than those manufactured by Daewoo. However, the study does not show any justification for the existence of a distinct class for automobiles manufactured abroad.

3.2 The econometric model for the claim size

For the dependent variable the claim size we used a log-linear regression model. In a first step we considered all the explanatory variables described above. The sample comprises 7247 individual claims. The model, estimated by techniques specific to linear econometric models, is presented in table 5 from appendix.

The variable related to the use of the car proves to be significant. The claim size is considerably higher if the automobile is used for business purposes. The claim size is also considerably higher for the automobiles that

have a bigger cylindrical capacity of the engine. As for the age of the car, we notice that the claim size does not vary in a significant manner comparing with the reference class. Therefore, the study does not show any justification for differentiating the insurance premium for each of these tariff classes. The cars made in Romania register a significantly lower claim size while those manufactured abroad have a higher one as compared to the reference class. The new model, after the exclusion of the variables of age and gender, is presented in table 5 from appendix.

As for the validity of the model:

- the residuals are not correlated according to the Breusch-Godfrey serial correlation LM test, as the LM statistics equals 0,75. The same result is given by the Durbin-Watson test, as well as by the Ljung-Box one;
- the residuals are not heteroscedastic, according to Lagrange's multipliers test for ARCH heteroscedastity; the LM statistics is LM = 1,466.

The level of significance, which has been considered here, is of 5%.

4. Conclusions

The tariff system studied here has the objective to incorporate a priori and a posteriori information in the premium, mainly according to the bonus-malus system proposed by Dionne & Vanasse (1989). For an important car insurance portfolio, the empirical study presented here selects the explanatory variables related to the number of accidents, respectively to the claim size. The econometric count model for the number of accidents, respectively the log-linear econometric model for claim size are estimated. We also point out the necessity of including in the premium the explanatory variables of the claim size.

Appendix

Table 1. Observed and fitted number of accidents for the Poisson distribution

Number of accidents	*Observed number of policies*	*Expected number of policies* $\chi = 0.291155$
0	31518	287978.28
1	4627	8435.57
2	1640	1227.79
3	590	119.14
4	234	29.78
5	79	0.51
6	27	0.03
7	8	0.00
≥ 8	2	0.00
Total	38770	38770
Descriptive statistics	mean = 0.291155 std. dev. = 0.7269	

Table 2. The claim size distribution

Claim size (euro)	*Observed number of policies*
≤ 4000	7057
(4000 – 8000]	100
(8000 – 12000]	45
(12000 – 16000]	27
≥ 16000	23
Total	7242
Descriptive statistics	mean = 677.22 std. dev. = 2226.87

Table 3. Poisson regression model for dependent variable number of accidents

Dependent Variable: NRC				
Method: ML/QML - Poisson Count				
Included observations: 38770				
Variable	*Coefficient*	*Std. Error*	*z-Statistic*	*Prob.*
C	-0.579617	0.063725	-9.095537	0.0000
P	0.024097	0.021816	1.104576	0.2693
C2	0.274010	0.046125	5.940663	0.0000
C3	0.191648	0.043301	4.425936	0.0000
C4	0.471912	0.054814	8.609381	0.0000
C5	0.486557	0.048477	10.03692	0.0000
C6	0.454671	0.046915	9.691398	0.0000
A2	0.089354	0.060495	1.477049	0.1397
A3	0.065275	0.058719	1.111648	0.2663
A4	-0.074764	0.058464	-1.278794	0.2010
A5	-0.130825	0.059945	-2.182400	0.0291
A6	-0.569014	0.058928	-9.656089	0.0000
A7	-0.344630	0.062493	-5.514703	0.0000
A8	-0.310797	0.062242	-4.993337	0.0000
A9	-0.408368	0.065389	-6.245198	0.0000
A10	-0.485030	0.072302	-6.708410	0.0000
A11	-0.718367	0.062606	-11.47446	0.0000
ROM	-0.907730	0.037481	-24.21838	0.0000
STR	-0.050792	0.035822	-1.417891	0.1562
F	-1.105815	0.024301	-45.50443	0.0000
Log likelihood	-26178.24	LR statistic (19 df)		5246.247
Restr. log likelihood	-28801.36	Probability(LR stat)		0.000000

Table 4. The reestimated Poisson regression model for dependent variable number of accidents

Method: ML/QML - Poisson Count				
Included observations: 38770				
Variable	***Coefficient***	***Std. Error***	***z-Statistic***	***Prob.***
C	-0.579283	0.038637	-14.99291	0.0000
C2	0.262715	0.042736	6.147337	0.0000
C3	0.184235	0.042805	4.304091	0.0000
C4	0.449357	0.051909	8.656575	0.0000
C5	0.458987	0.043887	10.45844	0.0000
C6	0.421161	0.041255	10.20871	0.0000
A5	-0.139754	0.032419	-4.310919	0.0000
A6	-0.594870	0.030406	-19.56396	0.0000
A7	-0.353066	0.036709	-9.617939	0.0000
A8	-0.314362	0.035918	-8.752238	0.0000
A9	-0.414529	0.041227	-10.05485	0.0000
A10	-0.500027	0.051804	-9.652222	0.0000
A11	-0.731610	0.036657	-19.95851	0.0000
ROM	-0.872379	0.024723	-35.28625	0.0000
F	-1.105080	0.024128	-45.80059	0.0000

Table 5. Log-linear regression model for dependent variable the claim size

Dependent Variable: LNC				
Method: Least Squares				
Included observations: 7242				
Variable	***Coefficient***	***Std. Error***	***t-Statistic***	***Prob.***
C	5.223869	0.082592	63.24874	0.0000
P	-0.094860	0.029984	-3.163723	0.0016
C2	0.123056	0.066608	1.847461	0.0647
C3	0.248453	0.060138	4.131387	0.0000
C4	0.373584	0.077616	4.813239	0.0000
C5	0.436205	0.069267	6.297422	0.0000
C6	0.695436	0.067412	10.31618	0.0000
A2	0.111969	0.082112	1.363620	0.1727
A3	0.152156	0.078728	1.932677	0.0533
A4	0.119713	0.078451	1.525944	0.1271
A5	0.047591	0.080397	0.591947	0.5539
A6	-0.001086	0.078050	-0.013914	0.9889
A7	0.058933	0.083621	0.704765	0.4810
A8	0.075754	0.084050	0.901292	0.3675
A9	-0.075485	0.087511	-0.862578	0.3884
A10	0.071664	0.097275	0.736716	0.4613
A11	-0.138070	0.083394	-1.655626	0.0978
ROM	-0.524454	0.053307	-9.838301	0.0000
STR	0.193728	0.050504	3.835856	0.0001
F	0.055488	0.028864	1.922378	0.0546
Log likelihood	-11007.78	F-statistic		74.66047
Durbin-Watson stat	1.979408	Prob(F-statistic)		0.000000

Table 6. The reestimated log-linear regression model for dependent variable the claim size

Dependent Variable: LNC				
Included observations: 7247				
Variable	***Coefficient***	***Std. Error***	***t-Statistic***	***Prob.***
C	5.297142	0.051784	102.2937	0.0000
P	-0.124958	0.029375	-4.253886	0.0000
C2	0.135729	0.065821	2.062095	0.0392
C3	0.257040	0.058966	4.359139	0.0000
C4	0.365099	0.076419	4.777588	0.0000
C5	0.470459	0.068224	6.895753	0.0000
C6	0.683841	0.065662	10.41454	0.0000
ROM	-0.523077	0.052207	-10.01931	0.0000
STR	0.178272	0.049093	3.631344	0.0003
Log likelihood	-11034.82	F-statistic		171.5200
Durbin-Watson stat	1.979600	Prob(F-statistic)		0.000000

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CHANGES IN LEGISLATURE SINCE 2000 AND THEIR IMPACT ON TECHNICAL RESERVES OF INSURANCE COMPANIES IN THE CZECH REPUBLIC[1]

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Abstract

The paper is fission into 4 parts. In the first part are introduced changes, which with teak system of insurance into year 2000. Here go above all about nullification monopoly some insurance company and conformity market environment. Second part a short characterizes the changes from year 2000. News was drawn law about system of insurance conformable with European rightly the lawful insurance of responsibility from operation motor vehicle was abolished. A tax deduction was accepted insurable on life insurance. Third part describe responsible position changes from year 2004, it means after entrance Czech republic into European union and at once A and B validity biennial important law - law about premium agreements and law about insurable mediator. Fourth part collation responsible position indices insurable market from year 1991 till this time. They are target premium and the expenses on the indemnifications. In conclusion is then mentioned growth specified insurable near industrial insurance in proportion to inanimate and general vegetative trend specified insurable compared to fall load on the indemnifications, which is denote as a prosperous development insurable market in Czech republic.

Keywords: *Class of insurance, life assurance, non-life insurance, technical reserves, insurance technical rate of interest*

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1. Introduction

On the break of the 80s and 90s significant political-economic changes occurred in the Middle and East Europe. At that time one of the main objectives of then Czechoslovakia was to re-build insurance environment, which will function on the base of the market –economic principle. Consistent with this clear requirement on April 26, 1991 the Law on Insurance Industry which corresponded to that by its character and content and published in the Collection of Laws under no. 185/1991 was accepted by the Czech National Council.

The Law adjusted specific conditions of entrepreneurship in the insurance industry, was valid for the territory of the Czech Republic and established above it the government control the execution of which was entrusted to the Ministry of Finance of the Czech Republic. The executor regulation of the Ministry of Finance no. 259/1991 Col., which was issued to the Law, set the way of creating and using special-purpose insurance funds.

The Law no. 185/1991 Col. corresponds in its principle to the transient time and therefore it was based on the rules of the material supervision. The licence system activity was concentrated on setting permitted legal forms of domestic insurance companies and reinsurance companies and on the performance of the government control when approving general policy conditions. That was at the same time in agreement with a very short adjustment of the insurance policy, which is incorporated into the still valid Civil Code. Financial supervision then according to the legal adjustment restricted on the obligatory bailment in the amount of CZK10 million for the benefit of the Ministry of Finance of the Czech Republic on submitting of three-years commercial and provisory plans and on the setting of special-purpose insurance funds.

The licence system and control activity of the state supervision in the spheres associated with entrepreneurship in the insurance industry as e.g. an intermediary activity in the insurance industry had only a common character. According to some provisions it was obvious that that activity constructed the inequality of entrepreneurship conditions among domestic and foreign companies.

2. Insurance Industry in the CR in the Year 2000

Already in the first half of the 90s it was obvious that the legal adjustment would require fundamental changes mainly in the bigger security

of a consumer. It meant readjustment to the law of the European Economic Community both in the financial control of entrepreneurship and in the national legislature in the sphere of private contractual insurance. In its concrete form it meant mainly legalization of the duty for all insurance companies and reinsurance companies registered to transact business in the CR to create to its liabilities which result from contracted policies technical reserves in concurrence with a new account classification of insurance companies, at the same time to cover these reserves by corresponding assets and to show fixed rate of solvency.

This significant change was defined in the amendment of the Law on insurance industry, that is the Law no. 320/1993 Sb. (Coll.) and by the regulation no. 52/1994 Sb. of the Ministry of Finance. By this regulation at the same time the prior regulation no. 259/1991 Sb. was revoked. However, after implementation of stated changes the legal adjustment remained tributary to the time of its origin and it required fundamental revision. The amendment of the Law, which was done by the Law no. 60/1995 Sb., contained in addition a problematic regulation, which make possible for health insurance companies to carry business in private insurance industry.

Despite those mistakes occurring in the Law and its amendment it is necessary to say that the Law no. 185/1991 Sb. fulfilled its role by enabling the origin of insurance industry in the Czech Republic.ext of the chapter using “Paragraph” style. Use this style for all plain text through the entire paper.

3. Insurance Industry in the CR after the Year 2000

Only by the end of the 90s it was managed to enforce the fundamental legislature change, which meant de-monopolization of motor vehicle driving liability that is by accepting the Law no. 168/1999 Sb. Since the beginning of the year 2000 about 12 insurance companies which fulfilled strict conditions for granting authorization to operate this insurance could offer to roughly five million of car vehicle owners a quite new product, that is contractual liability insurance for the damage caused by driving a vehicle. Despite certain restrictions in the creation of insurance rates which were valid till the end of the year 2002 and which incorporated into the law this insurance fulfils all parameters valid no the EU and a consumer has thus the possibility of the choice of the insurance company and the product as well with preserving high security and certainty of the damaged with the compensation of the damage which he was caused by another vehicle.

Adoption of the Law no. 363/1999 Sb. was another significant step and consequently then the executor regulation no. 75/2000 Sb. Both of these

legal norms inured the virtue on April 1, 2000. In a significant way they changed conditions of carrying out insurance and reinsurance activities, mediator activities in the insurance industry and in the way and extent of performance of the government control in the insurance industry. The licence system activity set other conditions of capital facilities of claimers related to performed nurturance industry. From this date life and general insurance and reinsurance were divided. Another significant step was to adopt the law no. 363/1999 Sb. and consequently then the executor regulation no. 75/2000 Sb.

The significant change concerns further the business plan, which is based on the actuarial base with the emphasis on the permanent ability of the society to fulfil its engagements. Simultaneously the control of the criminal-law accountability of the owners of companies and persons with the decisive participation on their management was introduced.

By the example of developed countries the institution of a responsible actuary was introduced, and that is not only in the sphere of life insurance, but also in the general insurance and reinsurance.

Conditions on operating mediator activities in insurance industry were adjusted with distinguishing insurers and reinsuring brokers including the definition of their basic features.

Important changes also concerned the government control in the insurance industry, and that is in the direction of strengthening the financial control emphasizing the protection of a consumer. Thus there were made extensions and specifications of measures, which the Ministry of Finance is not only entitled but as well obligatory to admit provided it finds out deficiencies in the activity of supervised subjects.

The Law further brought changes mainly in creating technical reserves, in the composition of financial setting and solvency of insurance companies and reinsurance companies.

Insurance companies, which operated on the insurance market till the new law on the insurance industry came into force, were obliged to keep a two-years period for adapting their activities to new conditions and a ten-years period for dividing universal insurance companies into insurance companies specialized on insurance activities as for insurance spheres of life insurance or as for insurance spheres of general insurance.

All these changes were set from the reason of even more complete protection of a consumer

Another very significant change for consumers of the offer in the matter of insurance products mainly in the sphere of life insurances is the change of the Law on income taxes no. 586/1992 Sb. as amended, according

to which the amount of CZK12.000 is the deductible for the tax calculation of the income tax which is the sum of the paid insurance on life insurance in case it is this type of insurance:

- An insurance on life,
- With the insurance period for minimal 5 years,
- With the end of insurance at least in sixty years of age,
- When a policy holder and a policy client are identical persons, which means that the insured amount must not be bonded to the credit of another person that the insured

4. Insurance Industry in the CR after Entry the European Union

The year 2004, which became significant mainly by admitting the Czech Republic as a regular member into the European Union, meant also in the sphere of insurance legislature the release compared to the previous period when it was necessary to coordinate the legislature of the Czech Republic in the sphere of insurance industry with the legislature of the European Community.

The process of common convergence of legal regulations of the CR, repeatedly the CSFR, with the rules of the European Community already began by accepting the CR government degree no. 533/1991 on securing compatibility of the Czechoslovak system of law with the law of the European Community. In the sphere of insurance industry that process was initiated by the CR government decree no. 704/1997 by which the base for the preparation of new legislature was set.

Till the entry of the Czech Republic in the in the sphere of the private insurance it was necessary to prepare many legislature changes directly related to that act. It was mainly introducing the principle of a unified licence, execution of the control over the groups of insurance companies and financial conglomerates with the participation of insurance companies and reinsurance companies, releasing investment possibilities of insurance companies and reinsurance companies, within a free movement of the capital etc.

These changes are the content of the amendment of the Law on insurance industry no. 39/2004 and consequently then the executive regulation no. 303/2004 Sb. Consistent with the law of the European Community this law and the regulation modify conditions of carrying out insurance and covering activities after the entry of the Czech Republic to the

European Union. The above mentioned law came into force on May 1, 2004, that is on the day of the entry of the CR into the EU, the regulation then by the day of its decree, that is on 14.5.2004 and at the same time by this date it annulled the force of the regulation 75/1999.

This was achieved by adopting not only the amendment of the Law on insurance industry, but also the amendment of the law on operating motor vehicle liability insurance and tow completely new laws:

- An amendment of the Law no. 363/1999 Sb. on insurance industry, that is Law 39/2004 Sb.,
- An amendment of the Law no. 168/1999 Sb., on operating motor vehicle liability insurance, that is the Law 47/2004,
- Law no. 37/2004 Sb., on insurance policy,
- Law no. 38/2004 Sb., on insurance mediators and independent loss adjusters of insured accident

In the year 2000 the legislature activity of the Institution was concentrated mainly on completing executive regulations:

- to the Law on insurance industry the regulation of Ministry of Finance no. 303/2004 Sb.,
- to the Law on operating motor vehicle liability insurance the regulation of the Ministry of Finance no. 309/2004 Sb.,
- to the Law on insurance mediators and independent loss adjusters of insured accident the regulation of the Ministry of Finance no. 582/2004 Sb.

Now it is necessary to mention a significant change in the regulation 303/2004 Sb., according to which from the date of coming into force insurance companies have the duty and the accountable actuary confirms correctness of rate and reserves calculation for life insurance using at maximum 2,4 % of actuarial rate of interest instead of original 4%. Basically that could mean the rise in price of the insurance; however, fro the time being it is not possible to trace whether and how the change has influenced the insurance market of life insurance.

By these laws implemented all valid regulations for the sphere of insurance industry, a full harmonization of legislature of the Czech Republic with the current legislature of the European Community has been reached. The Czech Republic was one of the first countries, which implemented into the national legislature one of the important directive of the European

Community- Directive 2002/92/ES concerning mediator activities in the v insurance industry.

By the end of January 2005 the mentioned directive was implemented only in 13 countries of the European Community, which does not represent even the half.

5. Comparing Indexes and their Development from the Year 1991 So Far

The development of the insurance industry in the Czech Republic had a positive influence on most of the indexes which were from the year 1993 regularly monitored at first by the ministry of Finance of the Czech Republic, then from the year 2000 by the Office of Government Control in the insurance industry and pension scheme supplementary insurance and at the same time from the year 1995 by the Czech Association of Insurance Companies which is a special interest association of commercial insurance companies and from 42 subjects which are licensed for entrepreneurship in the insurance industry on the territory of the Czech Republic, 28 insurance companies are its members.

Technical reserves, which are exactly defined by the Law on insurance industry, are one of the most important indexes of activities of insurance companies. However, in the course of the last 14 years, that means since de monopolization of the insurance industry in the Czech Republic in the year 1991 setting their amount has been subjected to many changes. Simultaneously with the development of the insurance industry in the CR values of these parameters have been changing gradually.

In the tables which are the enclosure of this article there are given mainly the values important for the insurance company functioning, which are fixed capital, specified insurance, indemnification expenses consistent with the development of insurance on the market in the CR in single years gradually from 1991 to 2004. Tables are in two variations, that is to the year 2000 and from the year 2001 as only since the year 2001 mainly the reserves on indemnification, the number of settled and unsettled insurance events were monitored.

Tables are the resource of the Ministry of Finance of the CR, and so they show he development of the insurance market on the base of all insurers operating on the Czech insurance market.

Insurance industry – development of some monitored indexes 2001 – 2004 (Up-dating 27.10.2005)

	04/03	04/01	04/95
Market of life insurance – specified gross insurance (thousand - CZK)	107,47%	156,29%	473,16%
Number of concluded insurance policies of life insurance	100,07%	105,12%	127,24%
Indemnification expenses from life insurance (thousand - CZK)	152,75%	187,05%	364,74%
Market of general insurance - specified gross insurance (thousand - CZK)	105,49%	130,34%	279,62%
Number of concluded insurance policies of general insurance	100,30%	79,37%	202,87%
Indemnification expenses from general insurance (thousand - CZK)	79,05%	132,39%	287,39%

	04	01	95
Ratio of specified gross insurance of life insurance on specified gross insurance of general insurance	39,26%	35,03%	27,64%

	04/95
Surge of specified gross insurance total	3,33

6. Conclusion

From the results of the Czech Association of Insurance Companies (ČAP) for the year 2004 it concludes that the insurance market has a constantly growing tendency. Total specified insurance of the ČAP members has increased since the year 2003 by 6,6% and has reached the level CZK111,5 mld.

Even from now on it can be observed the growing trend of the life insurance at which the specified insurance has increased by 7,5 % on CZK44,2 mld. Its ration on the total specified insurance has grown and amounted to 39,6 %.

In the same period general insurance has increased exactly by 6 % and amounted thus CZK67,3 mld.

Growth of specified insurance in total in the year 2004 is again higher than the rate of inflation 2,8 %. Compared to previous years, however, the growth rate slightly slowed down.

Definitely as for the positive phenomenon it can be considered the decrease of total indemnification expenses, that is by 2,5 %.

According to preliminary results of the ČAP, which it received from its members for the period 1-9/2005, it concludes that the insurance market in this period will increase. Total specified insurance of the ČAP members has increased compared to the same period of the year 2004 by3,4 % and has reached the amount of CZK87,3 mld.

In the life insurance specified insurance has increased for the period 1-9/2005 by 1,1 % to CZK32,7 mld. It is important that currently paid insurance has increased by 9,9 %. Single-payment insurance, which is calculated into specified insurance immediately for the whole period of the validity of the insurance policy, however decreased by 16,4 %.

In the general insurance for the period 1-9/2005 the inter year growth 4,9 %, that is on CZK54,6 mld., has been recorded.

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PERSPECTIVES OF BANCASSURANCE DEVELOPMENT IN POLAND

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Abstract

The beginnings of co-operation between banks and insurance companies reach the 70-ties. Along with changes on the world's financial market a new formula of providing financial services was formed – it was given the name "bancassurance". In its broadest meaning the bancassurance service covers products and activities related to those services that are needed by an individual or institutional customer in order to create, manage and secure one's property.

Key words: *bancassurance services, development, legal rules, economic factors*

1. Introduction

To explain the term of bancassurance in a wider sense we can point out to three basic organisational and functional forms in which banks get involved to sell insurance products:

insurance companies owned by banks; in this case the bank has the majority share in the company settled by the bank, or a company it took over, or merged with;

bank - insurance captive: products of such company owned by the bank and offered mainly at bank establishments,

banks acting as insurance agents: the bank enters into distribution alliances with insurance companies at a low capital involvement and operates as an insurance agent selling products of one or more companies1.

All of these forms of co-operation between banks and insurance companies warrant a comprehensive financial service desired by customers. This complexity is advantageous for clients and justifies the existence of bancassurance services. Customers of modern financial institutions search for products that would entirely satisfy their financial needs in the quickest and most comfortable way. Thus, merging banking facilities with insurance seems obvious and while offered to a customer along with active finance consulting makes a full financial service.

2. Legal frames of bancassurance in Poland.

The basic factor conditioning bancassurance development is the adjustment level of legal regulations referring to distributing insurances through banks. One model of co-operation between a bank and an insurance company assumes informing the bank's customer about an opportunity to enter into an insurance agreement with a specific insurer. In this model a chosen insurance company is advertised on the bank's premises by displaying the company's informational brochures. Bank's activities of this kind can base on a promoting agreement concerning selling insurance policies by the bank. However, this procedure raises some reservations, particularly in reference to the act from the 22 of May 20032 concerning insurance intermediation, according to which agency activities include activities

[1] M. Śliperski, *Bancassurance w Unii Europejskiej i w Polsce*, Biblioteka Menedżera i Bankowca Warszawa 2001r, s.8.
[2] *Ustawa z dnia 22 maja 2003 r o pośrednictwie ubezpieczeniowym , Dz. U. Nr 124 poz. 1151*

consisting in winning over customers and executing actions preparing to enter into an insurance contract. Thus, in order not to fall within the scope of this broad concept of insurance intermediation the bank has to adopt a policy consisting in simple promotional actions devoid of elements providing information about insurance conditions and not allowing getting the bank's client in touch with a particular insurance company agent. It appears that the concept of insurance intermediation is defined more accurately in the European Parliament's and Commission's directive3. As insurance mediation does not mean an activity consisting in casual information supply performed in frames of other basic activities, if the purpose of these activities is not aimed at helping the customer in concluding or executing the insurance contract, professional damage managing of the insurance office or valuation and liquidation of damages.

However, experiences of banks on the Polish financial market show that these casual relations between banks and insurance companies are short-termed and as a result lead to development of more durable relations between both institutions. Under the Polish banking law4, banks can perform as an insurance agent by providing consulting services in money matters and other financial issues. So the bank acts here as an agent -entrepreneur. Basic legal aspects of this form of co-operation are regulated by both the Act of Insurance Intermediation5 and the Civil Code6. Agency activities include thus activities consisting in winning over customers and executing actions preparing to conclude an insurance contract. New regulations stemming from the Civil Code protect interests of insurance agents in a clear way. Thus it is highly beneficial to put the bank in the position of an insurance agent; in this was the bank gets a significant advantage over the insurance company and a privileged position in relation to its equivalent so far partner – the insurance company. According to novelized regulations of the Civil Code, not only consumers but also banks are subject to protection concerning relations with the insurance office, under unilateral standards of strictly binding force. As an example an agent has a right to compensatory benefit if within the contractual period of the agency agreement he/she won over new clients, or led to a significant increase in turnover with the present customers, and the person who gave the order still derives considerable benefits from agreements with these customers. The agent-entrepreneur - the bank, has the right to obtain a commission on an agreement signed after the termination of

[3] *Dyrektywa Parlamentu Europejskiego i Rady 2002/92/WE z 09.12.2002r o pośrednictwie ubezpieczeniowym*
[4] *Ustawa prawo bankowe z dnia 29.08.1997 r. Dz. U. 2002r,Nr 72,poz.665,art.6*

[6] *Ustawa kodeks cywilny z dnia 26.07.2000r, Dz. U. Nr 74 poz.857*

the agency agreement if except for fulfilling other conditions to get the commission the agent obtained the proposition to conclude the agreement resulting in the order before the end of the contractual period.

Moreover, the agent can demand the commission on an insurance agreement concluded after the termination of the agency agreement in case when this insurance contract was concluded mainly due to the bank's activity within the contractual period or within a reasonable time after it's termination. By analysing the above-mentioned examples it seems obvious that a bank acting as an insurance agent in this type of relations between banks and insurance companies is put in a very advantageous position which is secured by law regulations binding in Poland in this field of activity.

The situation is different when the bank concludes an insurance policy with the insurer on behalf of a third party - that is a bank's customer. Then the bank as the insurer is obliged to pay the premium. However, this premium is paid from the bank's client's money accumulated on his account. This scheme often refers to payments due for securing transactions made by the bank's customer with a credit card. This situation conforms to the art. 808 § 1 of Civil Code and the Act on Insurance Activity that assume an opportunity to conclude an insurance contract on behalf of a third party.

Development of bancassurance in Poland is possible also due to favourable legal regulations included into widely understood consumer's rights. It is assumed that in case of a bank credit insurance, withdrawal from the credit contract evokes the same consequences to the insurance of the contract7.

Bank agreements granting credits, the repayment of which is secured by the creditor's life insurance agreement concluded for the period equal to the crediting period, should thus contain a provision making possible termination of the insurance contract in the situation when the credit agreement is resolved, for example in case of an earlier credit repayment.

Bancassurance is also legally acceptable according to regulations of the Act on Fighting Against Dishonest Competition and the Act on Protection of Competitors and Consumers8. In accordance to the first one activities consisting in hindering access to the market to other firms are prohibited. Very often banks condition the decision about concluding a crediting contract

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[7] *Ustawa z dnia 20.07.2001r o kredycie konsumenckim , Dz. U. Nr 100 poz. 1081, art. 11.*

[8] *Ustawa z dnia 15.12.2000r o ochronie konkurencji i konsumentów, Dz. U. Nr 122 poz. 1319, art.5 pkt.6.*

E. Nowińska ,M.Du Vall: „Komentarz do ustawy o zwalczaniu nieuczciwej konkurencji", Warszawa 2001r,s.131.

on buying the life insurance for crediting purposes in a selected insurance company. However, banks argue that in this case they do not infringe regulations of the above mentioned act as they appoint a company of a good financial position, so that the policy should primarily guarantee an effective security for the interests of the bank. This action also conforms to the Act on Protection of Competitors and Customers which bans agreements that aim at or result in elimination, limitation or infringement of fair competition on the proper market, consisting in particular in restricting the access to the market for other companies not covered by agreements. However, this ban doesn't refer to companies that operate on various levels of circulation and their total share in the market in the calendar year preceding the conclusion of a contract does not exceed 10%. Summing up, one of the main premises of bancassurance development in Poland is the state of various regulations that in this field are convenient for banks. There are no regulations referring directly to the institution of bancassurance and the indicated various forms of co-operation between banks and insurers are acceptable.

3. Economics factors

The other group of factors that influence the development of bancassuracne in Poland are market and economic factors such as:

possibility to increase profits of the banks and insurance companies through offering a complex financial service to the banks' clients, and lowering of the joint operational costs without using other financial agents,

possibility to lower the price of banking services and so to better compete in the financial market,

lowering of operational risk of the bank through its partial transfer onto an insurance company,

diversification of sources of the bank earnings allowing greater freedom in deposit policy handling of the bank and ensuring greater financial safety,

winning over a larger group of clients through the effective application of loyalty in relation to clients by, e.g. offering them complex financing services.

The first of the above-mentioned factors confirms the tendency across the globe to offer complex services by the banks, comprising financial advice services, typical bank products, bank innovations and insurance products9.

[9] „European bancasurance market to 2002" Datamonitor research and analysis 2003,s.43.

Offering of the above-mentioned services "under one ceiling" (meaning under the same roof) guarantees the associations of banks and insurance an increase of their profits. For example, in France, considered to be the leader of the bancassurance market in EU10, insurance is also sold with the use of networks of cash dispensers. In 2000 within bancassurance, 35% of life insurance policies, 60% of deposit type insurance policies and 7% of real estate insurance policies11 were sold. The gross premium income of the five biggest banks amounted to 27600 million USD12. Additionally, the fact of lowering of the operational costs determines attractiveness of the connections between the banks and insurance companies. The market research shows that a cost of distribution of insurance policies in the bank amounts to 8% of a collected premium, which constitutes an amount three times lower compared to an amount of costs designated for remuneration of insurance agents13. As much as 80% of the main European banks which started to deal with the sales of insurance services show their operational costs at a lower level than traditional insurers14.

The risk transfer constitutes another important factor for the banks to establish the formal links with insurance companies. Thanks to this co-operation, the banks gain access to an enormous amount of capital for many years. Additionally, as a rule they try to transfer the weight of risk onto other entities. The insurance companies, however, deal with 'taking' of this risk, therefore the bank becomes for them a perfect partner. The insurers learn the principles and objectives of the investment policy of the bank. They use access to the network of bank branches, their website , and, first of all, to their wide client database. It can also be noted that, in the Polish market, the clients have much greater confidence in the banks than in the insurance companies. Therefore, an insurance company that has started a regular co-operation with the bank counts on loyalty of its clients, their trust and their attachment to ordering management of their finance with bank advisors.

The diversification of services is another equally obvious factor of success. On the current financial market, the trend to complete the traditional bank offer with other products may be observed, mainly advisory services, and insurance products. The modern financial institutions offer their clients a

[10] www.actuaries.org dated02.04.2004r, „Analysis and prospects of the French bancassurance market".
[11] www.scor.com dated18.03.2004., „ Bancassurance across the globe".
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[14] R.N.Hanisz „Strategia polskich banków wobec wyzwań rozwojowych",Katowice 2002r, s.110

package offer which is well adjusted to the needs of individual clients, enterprises or local government units as these clients expect, first of all, to be offered a complex service that saves their time and money.

There are also some barriers that may limit the bancassurance development in Poland in a considerable way. Decrease of the pace of economic growth may result in lower demand for financial products among people. Moreover, the issue of the bank and insurance relations is relatively little known to financiers. The missing experience within that scope and ignorance of the issue may effectively limit development of these services. According to Datamonitor, a research and analysis agency, a negative attitude of the banks may prove to be the next barrier for bancassurance development. It turns out that most of the banks show their "superiority" over the insurance companies and they reluctantly decide to take up new enterprises for fear of typical bank offer sales drop and of putting their make and reputation to the test.

Summing up, it can be stated that creation of the connections between the banks and insurance companies results from the globalization and liberalization of the financial market across the world. This transformation is accompanied by aspiration of the banks to continuously modernize, to search for new income sources and to diversify risks of their operations. If the indicated success factors are met and certain barriers overcome, it will be possible to speak about development and success of the bancassurance market in Poland.

4. The idea of bancassurance service

There are two more factors also supporting attractiveness of the bancassurance service: it's simplicity and low price - as an English statement puts it: keep it simple keep it cheap. The proposition of linking banking facilities with insurance products completing them brings benefits to both the bank and its customer. The customer saves time on searching and purchasing an insurance product from an external insurance firm. Thus the customer is encouraged by an opportunity to fulfill all his financial needs "under one ceiling".

The insurance product proposed at the bank establishments can also turn out to be cheaper for the customer than a matching product offered to him by other financial insurances agents that usually take higher commissions for their services. The customer's trust is an extremely important factor to the bank. Apparently, banks enjoy much higher trust than insurance companies, agents or insurance brokers. Yet, so far bank customers

usually lose their chance to choose an insurance offer from the whole palette of all insurance products from financial market oferrors. Banks propose their own specific offer or a specific insurer. Obviously, the customer is free to choose: either use the bancasurance offer or to search on his own one and negotiate insurance conditions with an external insurance firm. Yet, there is some risk that the bank will reject an insurance policy other than their own that would contain conditions insufficiently protecting the interests of the bank in securing the credit repayments. For the customer that situation would mean that he would have to accept worse credit conditions or that he would be refused a credit from the bank. Another issue is an option to make an easy resignation from the insurance product offered him along with the bank product as the so called financial services package. It could turn out that an earlier resignation from the insurance bought out in the bank is impossible, ineffective and very costly. On the other hand using by the customer external insurance products that would make an integral part of banking services involves the need to update these agreements and submit them to be accepted by bank. Advantages and inconveniences of using the bancasurance services presented here are similar for the customer in our country and abroad. However, differences may concern the scope, the method and the quality of these services. In Poland this area of banking business is still relatively poorly managed.

It is also necessary to point out to factors influencing the bank's decision to start selling insurances at its enterprises. In conditions of constant changes on the financial market that manifest in a constant drop in the interest profit margin and income of the bank, to be able to ensure a competitive position the bank is obliged to take up actions in the field of expenses control, diversification of revenue sources, implementing modern risk management tools. Bancassurance is a perfect tool to diversify revenue sources and a modern tool which transfers the risk to the insurer. Following the globalisation of financial markets the banks' position dominating in respect to other financial institutions has been reduced. In the face of the strong competition between banks and non-bank institutions operating in the banking sector, consolidation of banks and insurance companies guarantees a definite competitive advantage and it changes the present image. A bank co-operating with an insurance company in one of the mentioned forms:

- increases his capital potential,
- implements modern technologies,
- increases its personnel's qualifications,
- introduces innovative bancassurance services

- obtains additional sources of income,

what proves its high ability to compete on the market. Moreover, an optimal risk level is ensured thanks to the possibility to transfer a part of this risk to the insurer, or due to accepting the same range of risk but by a stronger capital of a bancassurance group. Bancassurance institution is a banking and insurance group created for the purposes of offering comprehensive financial services, called bancassurance services, including fragmentary services typical for a bank, of insurance and consulting character performing as the product's amalgam15.

The risk incurred by bank does not increase proportionally to its size and annual turnover obtained by it. A large bancassurance institution characterizes with a lower risk of bankruptcy, and possesses increased bargaining power on the financial market. This enables reducing expenses related to capital acquisition by giving it a form of a credit and loans interest rate in case of individual customers or deposits for banks. A large financial institution, possessing a bigger credit wallet, spreads losses to a significantly higher number of transactions and moreover is capable of limiting them by applying insurance products or covering them with profits from an extra insurance activity. Co-operation between banks and insurance companies makes society perceive banks as developing financial institutions aimed at comprehensive customer service. Complex financial services comprising finance consulting and modern bancassurance products, has significant importance not only from the customers' points of view, but also for strengthening their loyalty to the very institution.

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THE DEMAND FOR DIFFERENT LIFE INSURANCE PRODUCTS IN ROMANIA: A DISCRETE CHOICE MODEL APPROACH

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Abstract

The Romanian life insurance market is in full expansion. There exists competition between insurance companies as well as between different products of the same company. In this article we describe a study using data that we collected from clients of a Romanian insurance company. We have observed two types of variables: characteristics of insurance products (e.g. profitability, risk), as well as characteristics of individuals (e.g. sex, age, income). We use a Discrete Choice Model – The Multinomial Logit Model. We estimate the variations in the market shares of life insurance products using marginal effects. The variations are due to possible changes in the values of some characteristics such as age or income.

Keywords: *life insurance; demand; multinomial logit; market shares.*

1. Introduction

In the past years, Romanian insurance industry has gradually emerged to become an important part of the financial services sector. While in the Western Europe countries the life insurance sector dropped with more than 3% in 2003, the average of the Central and Eastern Europe (CEE) growth rate in this field was of 15,22%, exceeding the last ten years average growth rate with almost 80%.[1] It is expected that, while the welfare of the CEE inhabitants will grow, the density and the penetration degree will show a sustained evolution. According to the results provided by the insurance companies for the year 2004, there is a certain fact: the Romanian Insurance Market is rising and the life insurance sector has increased of about 10% from 2003. The life insurance line of business remains polarized, the market share held by the top ten companies ranked by gross written premiums is of 92% and the market share of the leader company exceeds 40%.

The study of life insurance demand has attracted the interest of a number of researchers in the past. Theoretical models on life insurance demand have been developed and empirical studies also have been conducted extensively to examine the influence of specific factors on the demand for life insurance.

This paper proceeds to review the literature related to life insurance demand, to present the Romanian life insurance market, to describe the data and estimation model, to present and discuss the empirical results, and to conclude with the findings of this study.

2. Literature Review

Economic theory predicts that households will save and insure in order to enjoy the same living standard over time and in the event of the death of a household head or spouse. Economic theory in this case accords with common sense and every day observation. “We save to be able to maintain our life styles in retirement. And we buy life insurance to make sure our survivors can continue to live at the same standard to which they have become accustomed” -Kotlikoff, Gokhale (2002).

There is no unique theory for life insurance demand. Yaari (1965) was the first to develop a theoretical framework to study the uncertainty of lifetime and the demand for life insurance. He predicted that investors make asset allocations decisions and life insurance purchase to maximize their

[1] “*Insurance Profile – Romanian Insurance Market”* - Quarterly Insurance Review, issue 4, 2004.

lifetime utilities of wealth and consumption. Almost all of the theoretical works which study the impact of wealth and bequest motives on life insurance demand developed later have expanded their models based on the study of Yaari (1965).

There are a number of empirical studies of life insurance demand that have been developed in the past. Bernheim (1991) uses estimates of the demand for life insurance to assess the strength of bequest motives. He finds that a significant fraction of total saving is motivated by the desire to leave bequests. Browne and Kim (1993) present evidence on life insurance demand across 45 countries. They find that the main determinants of country variations in the demand for life insurance are the dependency ratio (the number of dependents per potential life insurance consumer), income, inflation and price of insurance.

The findings of Browne and Kim (1993) and Outreville (1996) confirm that the income level affects significantly the life insurance demand. Life insurance becomes more affordable when income increases.

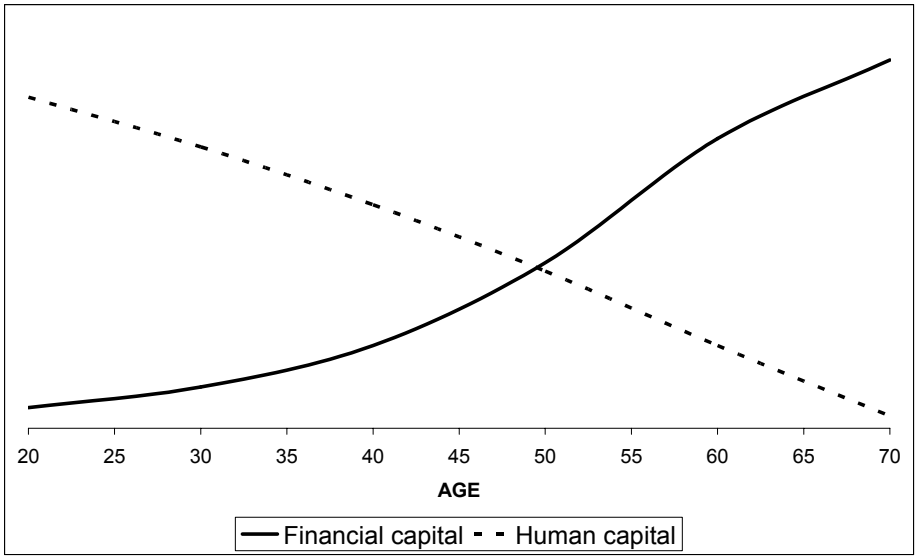
Over time, the life insurance decisions and the asset allocation have been analyzed separately, both in theory and practice. The human capital is the factor that makes the linking between these two, because it affects both the optimal asset allocation and the demand for life insurance – Chen, Ibbotson, Milevsky, Zhu (2005). They defined the human capital as the present value of an investor's future labor income.

An investor's human capital contains a unique mortality risk, which is the loss of all future income and wages in the unfortunate event of premature death. Life insurance has been used for long time to hedge against mortality risk. The greater the value of human capital is, the more life insurance the family demands.

Younger investors have far more human capital than financial capital. This is because younger investors have more years to work and they have had few years to save and accumulate financial wealth. On the other hand, young investors tend to have more financial capital than human capital, since they have fewer years ahead to work but have accumulated financial capital over a long career.

Figure 1 illustrates the amounts of financial capital and human capital over an investor's working years from age 20 to age 60. When the investor is young, his human capital far outweighs his financial capital. As the investor gets older, he will continue to make savings and with the return from the existing financial portfolio, the amount of financial capital will increase.

Figure 1. Financial Capital and Human Capital over the Life Cycle



Source: Chen, Ibbotson, Milevsky, Zhu (2005) - "Human Capital, Asset Allocation and Life Insurance", Working Paper

The human capital gradually decreases as the investor gets older and the remaining number of working years gets smaller. The amount of financial capital increases as the investor ages. This is the result of the growth of the existing financial wealth and additional savings that the investor makes each year.

The allocation of capital in risky asset decreases as the investor ages. This result is due to the dynamic between human capital and financial wealth over time. When an investor is young, the investor's total wealth is dominated by the human capital. Since human capital in this case is less risky than the financial risky asset, young investors will invest more financial wealth into risky assets to offset the impact of human capital on the overall asset allocation. As the investor gets older, the allocation to risky assets is reduced, as human capital gets smaller.

3. Data Issues About Life Insurance

There are two issues about life insurance that we have to emphasize: first we provide descriptive statistics on the structure of life insurance policies in Romania and secondly, we briefly present the types of life insurance products that we are referring to.

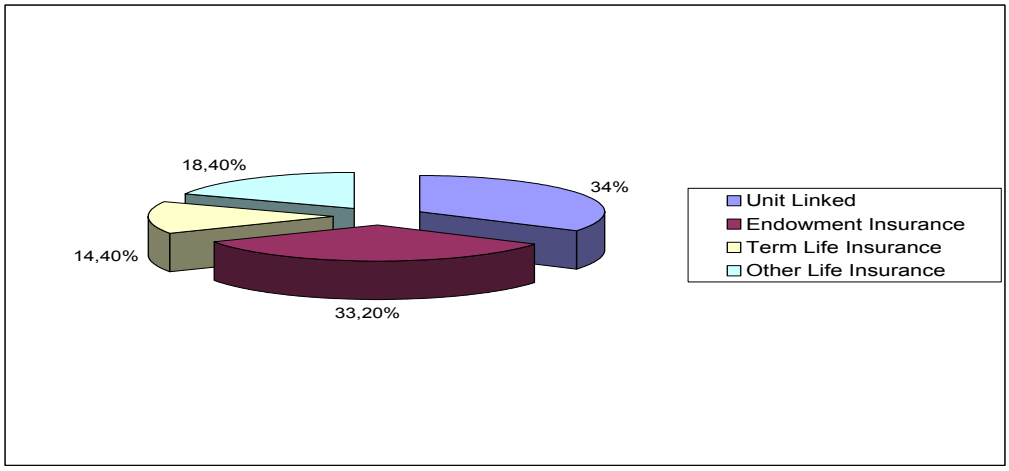
3.1 The Classification of the Life Insurance Products in Romania

The main types of life insurance products offered by the insurance companies in Romania are the *Term Life Insurance,* the Whole *Life Insurance,* the *Endowment Insurance,* the *Life Insurance Annuities* and the *Unit Linked Life Insurance.*

In the year 2004, three types of life insurance products held 81, 6% from the total of gross written premiums, as follows[2]:

- *Unit Linked Life Insurance* with a market share of 34% from the total of gross written premiums;
- *Endowment Insurance* with a market share of 33,2% from the total of gross written premiums;
- *Term Life Insurance* with a market share of 14, 44% from the total of gross written premiums.

Figure 2. The Market Share of the Main Types of Life Insurance Products considering the Volume of the Gross Written Premiums, in 2004



Source: The Insurance Supervision Commission, Annual Report for the Romanian Insurance Market, 2004.

Taking into consideration this ranking of the insurance products, we have analyzed for a certain insurance company the factors that influence an individual to choose one these three top products. From here on, we will briefly present the three types of life insurance products mentioned previously.

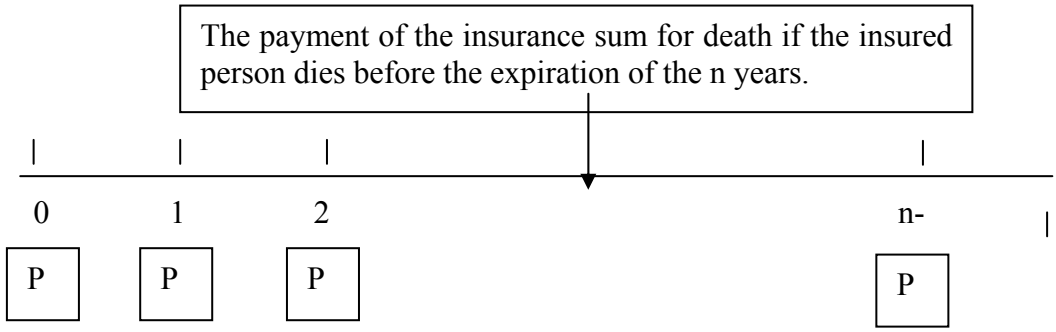
[2] The Insurance Supervision Commission, Annual Report for the Romanian Insurance Market, 2004.

3.2 A Brief Presentation of the Analyzed Insurance Products

3.2.1 The Term Life Insurance

This insurance provides protection for the risk of death only, it doesn't imply saving or capitalization. The insured person pays periodically the prime, for which a third person – the beneficiary - will collect the insured sum at his death. If when the term is reached the insured person is alive, he or the beneficiary doesn't receive anything. This is the reason for the prime to be quite small in relation with other types of insurance.

Figure 3. The scheme of the Term Life Insurance

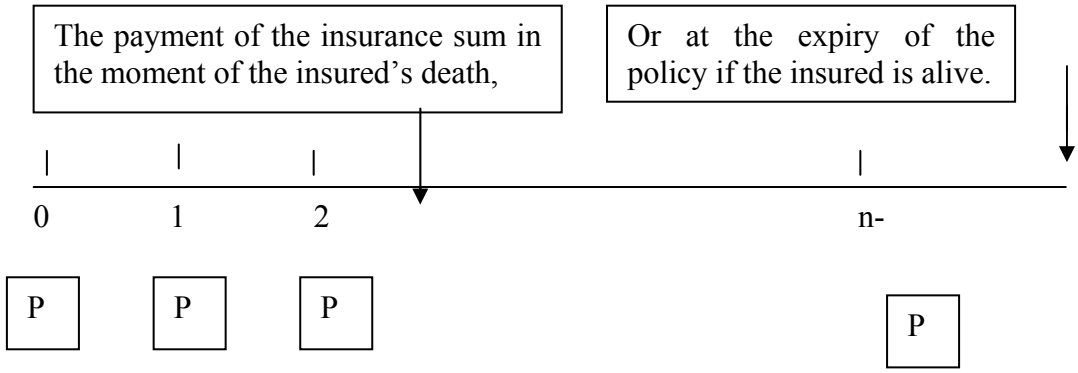


Source: Corfias, Th, (2003), Assurance-vie: techniques et produits, L'Argus de L'assurance, Paris.

3.2.2 Endowment Life Insurance

The Endowment Life Insurance is a capitalization insurance, which covers both the risk of death and the risk of "surviving". If the insured person is alive at the end of the contract he personally gets the insured sum, and if he dies before the end of the contract the insured sum would be collected by the beneficiary. The advantage of this insurance type is the fact that the sums paid as insurance premiums are capitalized and can be used when the policy expires. Obviously, the insurance premium in this case is greater than in the case of the term life insurance.

Figure 4. The scheme of the Endowment Life Insurance



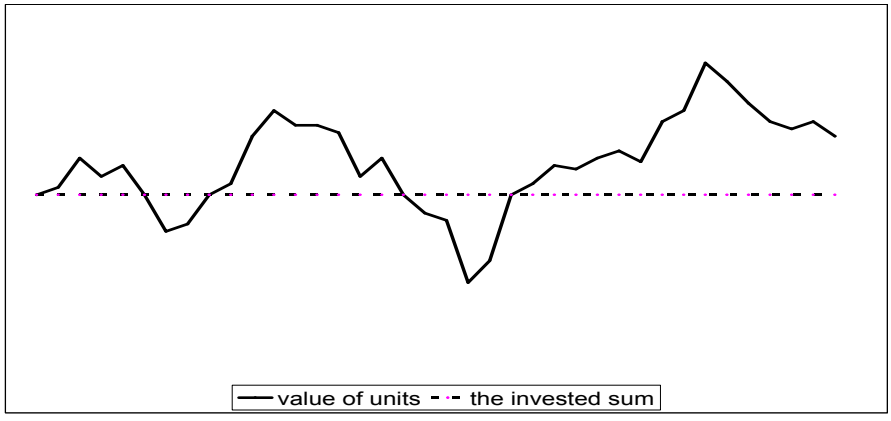
Source: Corfias, Th, (2003), Assurance-vie: techniques et produits, L'Argus de L'assurance, Paris.

3.2.3 Unit Linked Life Insurance

The Unit Linked Life Insurance has an investment component and a protection component. The *protection component* is represented by a whole life insurance. In case of death, the beneficiary will get the maximum between the invested sum and the value of the count. The value of the count represents the value of the units held in the funds of the insurer.

The *investment component* consists of buying units in the financial funds constituted for this type of insurance. The value of the count is obtained by multiplying the number of units with the value of the unit fund for that day. The profits obtained by investment are connected to the performance of the funds, which may imply a lower or a higher risk.

Figure 5. The scheme of the Unit Linked Life Insurance



Source: Corfias, Th, (2003), Assurance-vie: techniques et produits, L'Argus de L'assurance, Paris.

For the traditional insurance products, the insured person has considerable guarantees which consist of a fixed insured sum at death or when the policy expires.

The risk of the investment belongs to the insurance company:

- The company must adopt a prudential attitude towards the future profits obtained from investments;
- The company has to invest their clients' money in safe financial instruments like governmental bonds, treasury bonds or bank deposits at safe banks.

In the case of Unit Linked Life Insurances, when it comes to investing his savings, the insured person is given the possibility to choose between different funds (having different composition in bonds and shares). The policy profitability depends on the risk exposure of the chosen funds and on the proportion invested in them. The risk of the investment belongs to the insured. If the insured is willing to take greater risks he will select the funds with a greater proportion of shares, which offer the opportunity of a higher profitability.

We will estimate the variations of the market shares of these three life insurance products using marginal effects, in the case when the values of the two variables, age and income, are modified.

4. Data and Estimation Model

Our application involves clients of a Romanian insurance company, whose name will remain unrevealed, out of competition reasons. In July, we have made a poll consisting of 78 subjects who possess insurance polices at that company. Three insurance products have been taken into consideration: term life insurance, endowment life insurance and unit linked insurance, which altogether represent 80% of the turnover of the company.

4.1 The Sample

The individuals from the sample have been questioned about two kinds of variables: variables that characterise the insurance products and variables that characterise the insured person.

1. Defining the profitability of an insurance as being the income produced for a given value of the insurance premium, mark on a scale from 1 (lowest profitability) to 10 (highest profitability) the following products:

   a) term life insurance : .....

   b) endowment life insurance : .....

   c) unit linked insurance : .....

2. Defining the risk as being the certainty of achieving the estimated income, mark on a scale from 1 (lowest risk) to 10 (highest risk) the following products:

   a) term life insurance : .....

   b) endowment life insurance : .....

   c) unit linked insurance : .....

3. You have a:

   a) term life insurance : .....

   b) endowment life insurance : .....

   c) unit linked insurance : .....

4. You are: ..... years old.

5. You are a:

   a) Male

   b) Female

6. Your monthly income is: ..... RON/month .

4.2 The Model

Supposing that each one of the individuals of the sample chooses only one type of life insurance, the decision of choosing the product is discreet. Consequently, the model chosen for explaining the choice of an insurance product is a discreet one, so the estimation will be made using the econometrics of qualitative variables. The model will be a multinomial one because the qualitative dependent variable y has more than two states, $y_i = j$, $j = 0,1,...,m$, respectively. In our application, the states of y are the insurance products.

The Multinomial Logit Model. The multinomial Logit is actually an extension of the binary Logit model, having more modalities of choice. Let $(p_0, p_1, ..., p_m)$ be the probabilities of $m+1$ modalities of choice. The probability of an individual i to choose the modality j is given by:

$$p_{ji} = P(y_i = j) = \frac{\exp(x_i b_j)}{1 + \sum_{j=1}^{m} \exp(x_i b_j)} \qquad j = 1,2,...,m \tag{1}$$

where x_i is the vector of the explicative variables associated to the individual i, and b_j is the vector of parameters associated to the modality j.

The Conditional Multinomial Logit Model. The generalization of the Logit model for the multinomial case is made taking different parameters b_j depending on the variants of choice (products), such that the explicative variables x_i remain constants depending on the products. Still, there is another possibility: the McFadden conditional Logit model which considers a constant vector of parameters b and allows the explicative variables x_{ij} to depend on the variants (McFadden 1973, 1980). The probability of an individual i to choose the modality j is given by:

$$p_{ji} = P(y_i = j) = \frac{\exp(x_{ij} b)}{\sum_{k=1}^{m} \exp(x_{ik} b)} = \frac{\exp(x_{ij}^* b)}{1 + \sum_{k=1}^{m} \exp(x_{ik}^* b)} \qquad j = 1,2,...,m \tag{2}$$

where $x_{ij}^* = x_{ij} - x_{i0}$, and the proportion of the probabilities is:

$$\frac{P(y_i = j)}{P(y_i = l)} = \frac{\exp(x_{ij}^* b)}{\exp(x_{il}^* b)} = \frac{\exp(x_{ij} b)}{\exp(x_{il} b)} = \exp[(x_{ij} - x_{il}) b] \qquad \forall j, l = 1,2,...,m \tag{3}$$

which, as in the case of the multinomial Logit is independent of the other variants of choice.

When computing the marginal effects, we are interested in the estimated variation of the probability of an individual *i* to choose modality *j*, when the explicative variable *k* associated to a product varies. We have:

$$p_{ij} = \frac{\exp\left(\sum_{k=1}^{K} x_{ijk} b_k \right)}{1 + \sum_{h=1}^{m} \exp\left(\sum_{k=1}^{K} x_{ihk} b_k \right)} \tag{4}$$

the marginal effect $\frac{\partial p_{ij}}{\partial x_{ilk}}$ being:

$$\begin{cases} b_k p_{ij}(1-p_{ij}) & \text{daca} \quad j=l \\ -b_k p_{ij}(1-p_{il}) & \text{daca} \quad j \neq l \end{cases} \tag{5}$$

The General Multinomial Logit Model. Due to the fact that our application involves both explicative variables that characterise the products and variables characterising the individual, a more general model will be used, which contains both the multinomial and the conditional Logit models. The probability of an individual i to choose the modality j is given by:

$$p_{ji} = P(y_i = j) = \frac{\exp(x_{ij}b + x_i b_j)}{\sum_{k=1}^{m} \exp(x_{ik}b + x_i b_k)} \qquad j,k = 1,2,...,m \tag{6}$$

Once the parameters have been estimated, by replacing the values of the explicative variables with the mean values from the sample, we can obtain an estimation of the probability $\widetilde{p}_j$ that a randomly chosen individual (average individual) will choose the product j . By multiplying this number by the total number of consumers N , an estimation of the demand (or of the market share) for the product j will be obtained:

$$\widetilde{D}_j = \widetilde{p}_j \times N \tag{7}$$

We can also obtain simulated market shares for products, computed for other values of the explicative variables, thus facilitating the foundation of some product policies.

The Variables

`Profitability` – values from 1 to 10
`Risk` – values from 1 to 10
`Age` – years
`Sex` – 0 if the individual is a woman, 1 if it is a man
`Income` – RON/month
`Term` – dummy variable. Equal to 1 if the term life insurance product is chosen, 0 otherwise
`Endowment` – dummy variable. Equal to 1 if the endowment insurance product is chosen, 0 otherwise

Unit linked – dummy variable. Equal to 1 if the unit linked insurance product is chosen, 0 otherwise
Age_term = Age × Term
Age_endowment= Age × Endowment
Age_unit linked= Age × Unit linked
Sex_term = Sex × Term
Sex_endowment = Sex × Endowment
Sex_unit linked = Sex × Unit linked
Income_unit linked = Income × Unit linked
Income_endowment = Income × Endowment
Income_unit linked = Income × Unit linked.

5. Results Presentation

Table 1 The average values of variables in the sample

	Variables				
	Profitability	**Risk**	**Age**	**Sex (% of males)**	**Monthly income (RON)**
Term Insurance	4.44	6.05	59.3	33.3	819
Endowment	2.78	2.01	50.4	48.1	928
Unit Linked	8.17	6.90	40.6	66.8	1118

5.1 The Estimation of the Model

For estimating the parameters, the LIMDEP 7.0 program will be used and as an estimation algorithm, the Newton-Raphson method.

Table 2 Parameters estimates – all variables

Discrete choice (multinomial Logit) model
Maximum Likelihood Estimates
Number of observations 78
R-sqrd 0.78815

Variable	***Coefficient***	***Standard Dev.***	**t-statistic**
*Profitability****	2.030	0.6562	*3.094*
*Risk****	-2.695	0.6977	*-3.862*
Age_term	0.000	Fixed parameter	-
*Age_endowment***	-0.159	0.0726	*-2.194*
*Age_unit linked****	-0.268	0.0965	*-2.777*
Sex_term	0.000	Fixed parameter	-
Sex_endowment	0.898	1.430	*0.628*
Sex_unit linked	-1.674	1.733	*-0.966*
Income_term	0.000	Fixed parameter	-
Income_endowment	0.0027	0.0040	*0.664*
*Income_unit linked***	0.0114	0.0052	*2.177*

****p<0.01 **p<0.05 *p<0.10*

We remark that the *sex* variable is insignificant from a statistical point of view, for all possibilities of choice (all types of insurances). We estimate once more the model, after having eliminated this variable.

Table 3 Parameters estimates – all variables except for *sex*

Discrete choice (multinomial logit) model
Maximum Likelihood Estimates
Number of observations 78
R-sqrd .76708

Variable	***Coefficient***	***Standard Dev.***	***t-statistic***
*Profitability****	1.753	0.5415	3.237
*Risk****	-2.182	0.5122	-4.259
Age_term	0.000	Fixed parameter	-
*Age_endowment***	-0.132	0.0583	-2.258
*Age_unit linked****	-0.211	0.0744	-2.844
Income_term	0.000	Fixed parameter	-
Income_endowment	0.0021	0.0034	0.845
*Income_unit linked***	0.0082	0.0041	2.004

****p<0.01 **p<0.05 *p<0.10*

The values of the parameters are according to prediction. The plus for `profitability` shows an increased probability of choosing the product when the value of the variable increases. The minus for `risk` shows a decrease of probability. The minuses for `age_endowment and age_unit`

linked show the fact that when age increases, it decreases the probability of choosing the endowment insurance and unit linked insurance products, with respect to the reference product, the term insurance. The minuses for inc_endowment and inc_unit linked show the fact that when income increases, it increases the probability of choosing the endowment insurance and unit linked insurance products, with respect to the reference product, the term insurance.

For each individual, we can compute according to the formula (6) the probability of choosing each of the three insurance products:

Table 4 Predicted Probabilities (* marks chosen, + marks prediction.)

Indiv.	term insur	endow.insur	unit_linked.insur
1	.7456*+	.2515	.0029
2	.9690*+	.0246	.0064
.	.	.	.
17	.9684*+	.0276	.0039
18	.9987*+	.0007	.0006
19	.6737 +	.2945*	.0318
20	.3366	.6566*+	.0068
.	.	.	.
44	.0036	.7231*+	.2733
45	.0355	.9518*+	.0127
46	.0000	.0001	.9999*+
47	.0021	.0088	.9891*+
.	.	.	.
77	.0001	.0107	.9893*+
78	.0064	.0063	.9873*+

A study of the estimated probabilities show that the model is an evolved one from the point of view of predictions, the percentage of correct prediction being 84.6%.

5.2 The Applicability of the Model

We may consider the case when the values of the explicative variables change. We compute the marginal effects, the percentage variations of the share markets of the products respectively, when the *profitability* and *risk* variables are increased by 1.

Table 5 The marginal effects (%) for the variable *profitability*

		The marginal effect over the product		
		Term insurance	***Endowment***	***Unit Linked***
The product for which "profitability" varies	*Term*	6.45	-4.62	-1.82
	Endowment	-4.62	10.93	-6.31
	Unit Linked	-1,82	-6,31	8,12

Source: Author's calculation

The results obtained are according to prediction: the increase of the profitability of a product determines the increase of its market share and the decrease of the market shares of the other products, but of different values. For instance, the increase of profitability for the term insurances will have a greater impact on the endowment insurances than on the unit linked ones.

Table 6 The marginal effects (%) for the variable *risk*

		The marginal effect over the product		
		Term insurance	***Endowment***	***Unit Linked***
The product for which "risk" varies	*Term*	-8.02	5.76	2.26
	Endowment	5.76	-13.61	7.85
	Unit Linked	2.26	7.85	-10.12

Source: Author's calculation

For the *risk* variable, the results are very similar, but of opposite sign: when the risk of a product increases its market share decreases and the market share for the other products increase.

The model can be also used for founding some product strategies (advertising, promotion). Considering this, we estimate the markets shares of the three insurance products, for different values of the variables *income* and *age*. The variables *profitability* and *risk* keep their medium values from the sample.

Table 7 The market shares for the three insurance products in the group age 30-40 years

	Medium income (RON/month)							
	700	800	900	1000	1100	1200	1300	1400
Term	2.1	1.2	0.7	0.3	0.2	0.1	0.0	0.0
Endowment	56.4	43.9	31.8	21.7	14.0	87.8	5.4	3.2
Unit Linked	41.5	54.9	67.5	78.0	85.8	91.1	94.6	96.8

Source: Author's calculation

Table 8 The market shares for the three insurance products in the group age 40-50 years

	Medium income (RON/month)							
	700	800	900	1000	1100	1200	1300	1400
Term	9.3	6.2	3.8	2.1	1.1	0.6	0.3	0.1
Endowment	68.2	60.1	49.2	37.4	26.4	17.5	11.2	6.9
Unit Linked	22.5	33.7	47.0	60.5	72.5	81.9	88.5	93.0

Source: Author's calculation

Table 9 The market shares for the three insurance products in the group age 50-60 years

	Medium income (RON/month)							
	700	800	900	1000	1100	1200	1300	1400
Term	30.7	23.3	16.7	11.0	6.7	3.8	1.9	1.0
Endowment	60.3	61.2	58.3	51.5	41.7	31.0	21.5	14.0
Unit Linked	9.0	15.5	25.0	37.5	51.6	65.2	76.6	85.0

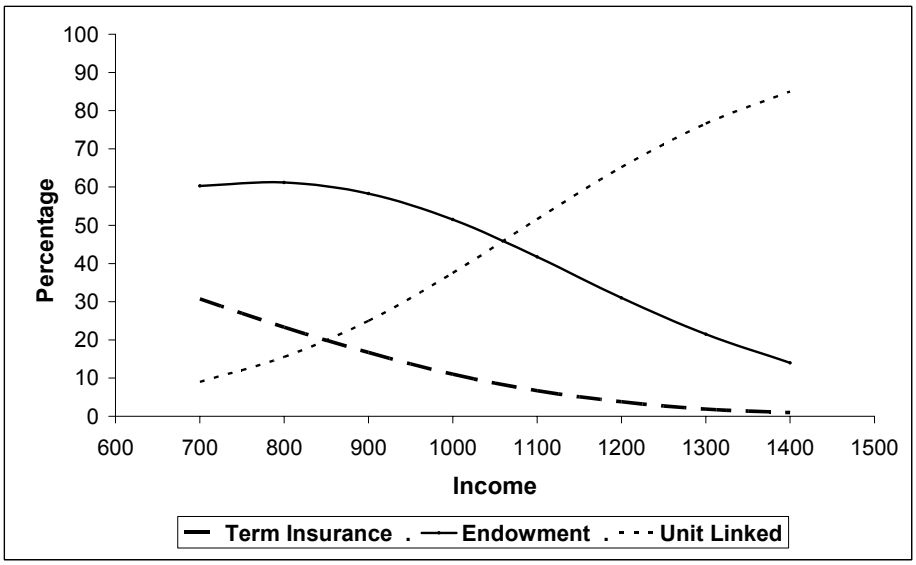
Source: Author's calculation

Table 10 The market shares for the three insurance products in the group age 60-70 years

	Medium income (RON/month)							
	700	800	900	1000	1100	1200	1300	1400
Term	64.0	56.1	47.2	37.6	27.9	18.8	11.5	6.4
Endowment	33.7	39.4	44.2	47.0	46.3	41.7	34.0	25.1
Unit Linked	2.3	4.5	8.6	15.4	25.8	39.5	54.5	68.5

Source: Author's calculation

Figure 6 The evolution of the percentage of the three insurance products with respect to the income, for a 55 years old person



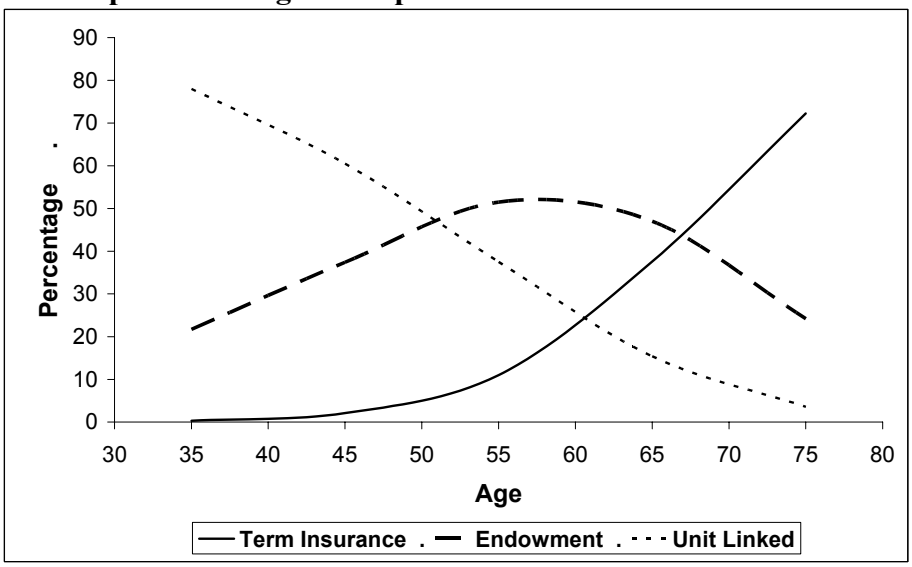
Source: Author's calculation

Table 11 The market shares for the insurance products for an income of 1.000 RON/month

	Age								
	35	40	45	50	55	60	65	70	75
Term	0.3	0.9	2.1	5.1	11.0	21.8	37.6	55.9	72.2
Endowment	21.7	29.0	37.4	45.5	51.5	52.5	47.0	36.1	24.2
Unit Linked	78.0	70.1	60.5	49.4	37.5	25.7	15.4	8.0	3.6

Source: Author's calculation

Figure 7 The evolution of the percentage of the three insurance products with respect to the age. for a person with an income of 1000 RON/month



Source: Author's calculation

6. Conclusion

All in all, we have succeeded to explain through The Multinomial Logit Model different aspects of the demand for life insurance products in a company from the Romanian insurance market. The results obtained in the application match perfectly to the theory presented previously. The demand for products with lower risk level increases, as a person is getting older, to the detriment of the products of higher risk level. Moreover, the income is a major factor that influences the choice of a specific insurance product: as income increases, there exists an increased affordability for the higher risk products.

The demand for each product is well forecasted. as well as the attributes of the products (and individuals) that determine the choice. The model can be used for modifying the characteristics of the life insurance products, in order to obtain among these a relation that would maximize the profit of the company. One insurance product may be more profitable than another, while the achievement of a demand structure, as profitable as possible for the company, can be determined based on the estimations of the marginal effects of the risk and on the profitability of insurance products.

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THE COMPULSORY BUILDINGS' INSURANCE IN ROMANIA – A POSSIBLE SOLUTION FOR CAT-EVENTS' CONSEQUENCES?

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Abstract

Recently, Romania has been confronted with severe floods. Thousands of people found themselves homeless in couple of hours. Lifes were lost and people injured. And it seems that the vagaries of weather and its risks will not stop here. On the same token, given its geomorphological and geographical location Romania is permanently exposed to the imminence of a severe earthquake. This paper intends to examine the problems with the introduction of compulsory buildings' insurance in Romania as a solution for managing the consequences of natural catastrophes. Three important viewpoints will be considered: 4the insured, the insurance companies and the recommendations of the World Bank.

Keywords: *compulsory insurance, natural catastrophes, consequences, solutions, World Bank's recommendations.*

1. Introduction

According to a recent study conducted by the World Bank in april 2002, Romania is strongly exposed to natural catastrophes risks, especially earthquakes, floods and landslides which could severely lead to a loss of human lifes and important damages. Bucharest, is the European capital most exposed to earthquakes, and one of the first 10 capitals in the world that could face such a risk[1].

Regarding properties, the above mentioned study estimates that annual damages following possible earthquakes and floods would reach 400 millions USD.

Since 1908, in Romania there have been recorded :

a) 14 strong earthquakes out of which 3 with a magnitude above 7 degrees on a Richter scale (in 1940,1977,1986) that have affected 60% of Romania's territory.

b) 8 major floods that affected more than 2 million people and caused important economic damages.

Moreover, 20% of Romania's territory may be exposed to landslides.

Tabel 1. Top Natural Catastrophes in Romania

Earthquakes	***Floods***
1977; 7,2 degrees Richter scale, 2 bilion USD damages; 1.641 deaths.	**1991**; 500 million USD damages, 15.000 people distressed; **1997**; 310 million USD damages, 222.320 people distressed;
2005, 7 earthquakes, above 4 degrees Richter are being produced each 15 through 45 days; specialists estimate a major earthquake (2006).	**2005;** the damages following the April, July, August and September floods reached 1,4 billion EUROS, approximately 2% of the 2005 estimated GDP; 31 deaths.

Source: Author's compilation

[1] Munich RE's specialists have characterized Bucharest as a *" a large city with a Mexico City effect". There are only 6 location in the world with such a possible effect, out of which 2 are in Europe: Bucharest and Lisbon.*

How will this damages be covered (2005)? How will the reconstruction houses works, socio-cultural objectives' works, the reconstruction of the infrastructure such as piers, bridges be financed?

2. Overview of the Romanian insurance market.

2.1. Comparisons with the insurance markets in Central and East European countries, European Union 15, European Union 27 and with the global markets.

We will consider useful this comparison, given certain macroeconomic ratios and indicators such as *density of insurance and the degree of insurance penetration.* Below, we will provide a table with data supporting our comparison:

Table 2 Major macroeconomic indicators concerning the comparison between Romania's insurance market and the insurance market in CEE, EU 15, EU 27 and the global markets.

Country	***Insurance premiums 2004***		Population	GDP	GDP/ inhabitant	***Density of insurance***		***Insurance penetration***	
	total	non-life				total	non-life	total	non-life
	Mil. euro	Mil. euro	Mil. inhabitants	Mild. euro	euro/ person	euro/ person	euro/ pers	%	%
Poland	5,538	3,492	38.6	183.2	4,746.0	**143.5**	90.5	**3.02**	1.91
Czech R.	3,287	2,027	10.2	73.2	7,201.5	**322.2**	198.7	**4.47**	2.76
Hungary	2,172	1,304	9.9	72.6	7,330.3	**219.4**	131.7	**2.99**	1.80
Slovakia	1,009	598	5.4	30.1	5,572.2	**186.8**	110.8	**3.35**	1.99
Romania	876,52	687,19	22,2	48,7	2,192.6	**40.4**	30.85	**1.46**	1.01
Bulgaria	342	304	7.9	17.7	2,240.5	**43.4**	38.4	**1.94**	1.72
Russia	12,468	8,160	143.5	383.2	2,670.4	**86.9**	56.9	**3.25**	2.13
Ukraine	1,515	1,504	48.4	42.5	877.7	**31.3**	31	**3.57**	3.54
Croatia	801	623	4.4	24.8	5,631.8	**182.0**	141.6	**3.23**	2.51

Serbia-Monte negro	386	372	10.7	16.8	1,571.5	**36.1**	34.7	**2.29**	2.21
EU 15	808,016	344,33	382,8	9,417.4	24,601.	**2,110.8**	862.7	**8.58**	3.66
EU 27	838,545	353,57	466,8	10,043	21,516	**1,796.6**	741.5	**8.35**	3.52
Global	2,602,49	1,122,3	6,262.1	32,289.	5,156.3	**415.6**	179.2	**8.06**	3.48

Source: Piata Financiara – Supliment Asigurari, february 2005; CSA, Report CSA 2004

Considering the 2004 financial year, Romania has a low density of insurance[2], compared with the Czech Republic. Romanians are almost 8 times more "uninsured" and 8 times more exposed to natural catastrophes risks than the Czechs. If we are to compare Romanian indicators with the global and European ones, we are 10 times more "uninsured" than the global inhabitant and 44 times more insurance deficient than EU 27.

Moreover, Romania has the lowest insurance penetration ratio [3].

How can this be explained?

2.2. The Romanian insurance demand.

At the initiative of the Romanian publication "Piata Financiara" and under the auspices of the Media Controller Research Company, a program is being run named TEBA – "Trends in Economics, Banking and Insurance". The program aims at periodically evaluating couple of indicators pertaining to the attitudes of the Romanian population towards the financial institutions active on the Romanian market and the financial institutions' offers[4].

Three polls have been conducted in Bucharest in September 2001, February 2002 and November 2002.

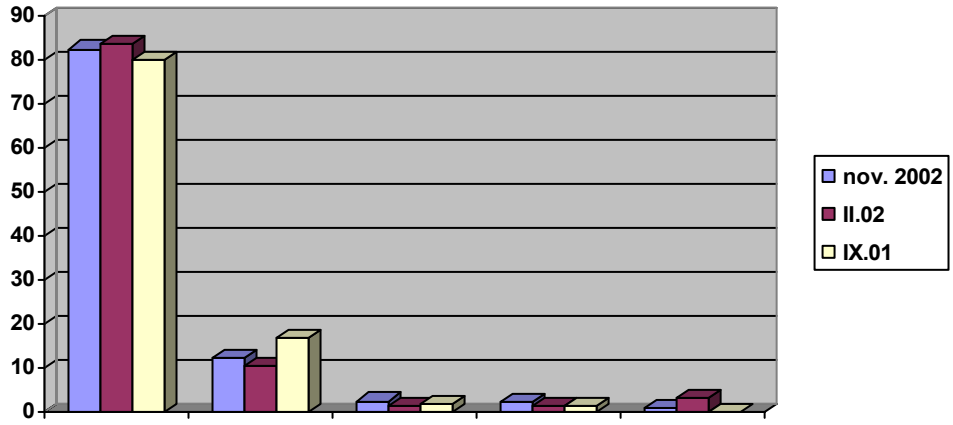
The results led us to couple of conclusions presented below:

[2] The insurance density is computed as a ratio between gross insurance premiums and the volume of the population.
[3] The degreee of insurance penetration is computed as a ratio between gross insurance premiums and the gross domestic product (GDP)
[4] Piata Financiara, *Asigurari,* february 2003, pag. 23 – 24.

Table 3. Do you have an insurance contract (other than RCA – mandatory car insurance)?

	NO *%*	*Yes, I have a single insurance contract with a single insurance company.* *%*	*Yes, I have multiple insurance contracts with a single insurance company.* *%*	*Yes, I have multiple insurance contracts with multiple insurance companies.* *%*	*NS/NR* *%*
nov. 2002	82,5	12,1	2,5	2,2	0,7
feb. 2002	83,7	10,4	1,5	1,3	3,1
sep. 2001	79,9	16,9	1,7	1,4	0,1

Figure 1. Do you have an insurance contract (other than RCA – mandatory car insurance)



Source: Piata Financiara, Supliment - Asigurari, February 2003, page. 24;

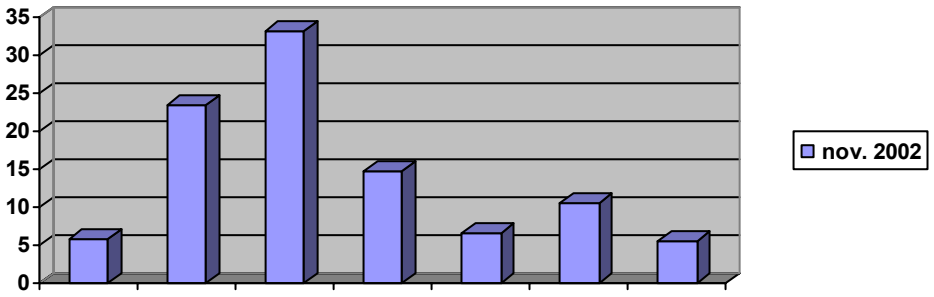
NS/NR: don't know / no answer.

(1) In November 2002, out of the 1330 subjects questioned, only 17% had optional insurance contracts (i.e. less than 1/5)

Table 4. How much trust do you have in the insurance companies?

	Very much %	*Much %*	*Not much, not less %*	*A little %*	*Very little %*	*None %*	*NS/NR %*
nov. 2002	5,9	23,5	33	14,7	6,7	10,5	5,7

Figure 2. How much trust do you have in the insurance companies?



Source: Piata Financiara, Supliment - Asigurari, February 2003, page 23; NS/NR: don't know / no answer.

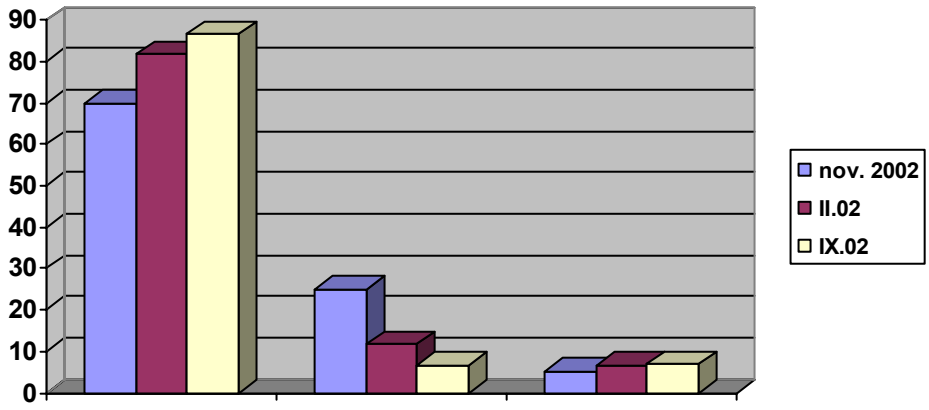
(2)30% of the people subject to the poll trust the local insurance companies, 1/3 are skeptical when it comes to the seriousness of the insurance firms and 33% are indifferent. The answers' structure is in equilibrium, indicating that "the trust" is not the critical problem blocking the insurance market development in Romania.

Table 5. Do you intend to buy an insurance contract in the next 6 months?

	No	*Yes*	*NS/NR*
nov. 2002	69,9 %	24,9 %	5,2 %
feb.2002	81,7 %	11,7 %	6,6 %
sep.2002	86,5 %	6,7 %	6,9 %

Source: Piata Financiara, Supliment - Asigurari, February 2003, page 24; NS/NR: don't know / no answer.

Figure 3. Do you intend to buy an insurance contract in the next 6 months?

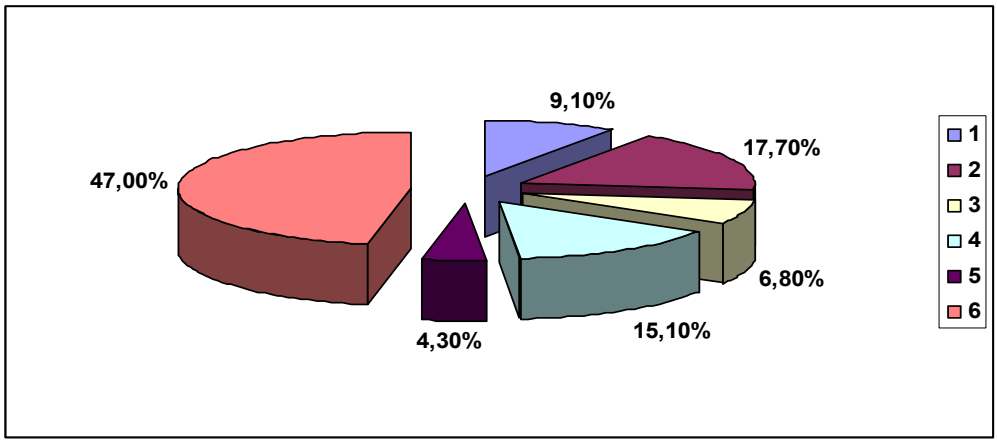


Source: Piata Financiara, Supliment - Asigurari, February 2003, page 24; NS/NR: don't know / no answer

(3) In November 2002, the polls indicated that a 25% increase in demand was possible. This percent is higher that 9 months or 13 months ago.

What is the reason behind this low interest of the Romanians in buying an insurance contract?

Figure 4. The reasons why they are not interested in buying an insurance contract.



Source: Piata Financiara – Supliment Asigurari, march 2002, page 24.

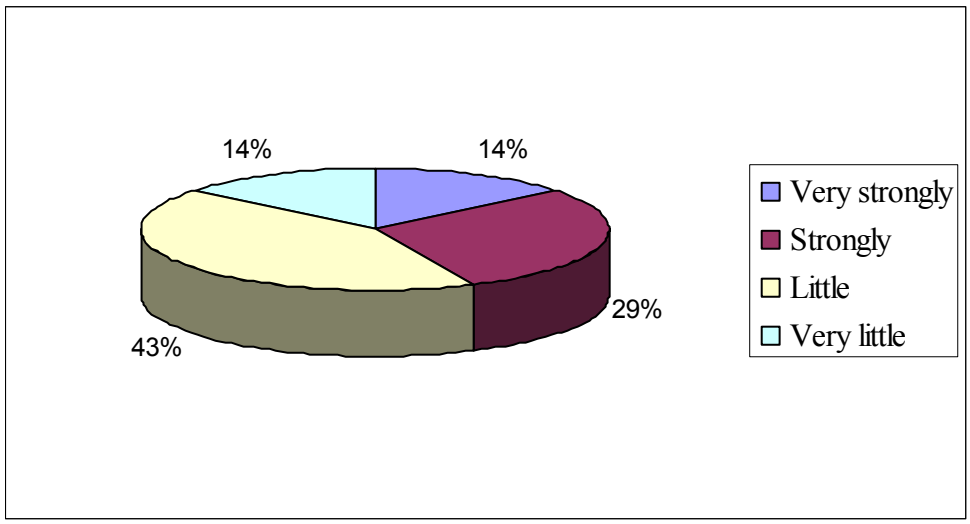
1. 9,1% (935 persons) do not trust the insurance market and system;
2. 17,70% don't think they need one;
3. 6,80% have no information regarding the advantages of buying an insurance coverage;
4. 15,10% are indifferent regarding the subject;
5. 4,30% other reasons, and
6. 47% can't afford one.

Note: The subjects of the poll were inhabitants of Bucharest ; the degree of insurance penetration in Bucharest is higher than in the rest of the country.

How are the perspectives after the major 2005 floods?

The results of a poll conducted on the portal 1asig.ro regarding "the measure in which this year floods will influence the population's proneness towards buying an insurance contract" reflected the following characteristics:

Figure 5. The population's proneness towards buying an insurance contract after the 2005 floods:



Source: 1asig.ro / Archives.

According to the above figure, 57% of the people participating in the poll believe that the 2005 floods have influence in the population's proneness towards buying an insurance coverage.

The motives often invoked are:

- lack of population's education regarding insurance coverages;
- the cost of such insurance coverages.

The lack of population's education regarding insurance coverages, is a characteristic of the population living in the rural areas. The rural population is old and has a low purchasing power of insurance coverages. Moreover, as the data presented in Table 4, Figure 2 suggests, the Romanian population does not have sufficient trust in the Romanian insurance system, although the insurance companies have consistently strived through advertising and promotions to overcome this obstacle. The governmental policies regarding the matter are not helping the insurance companies' cause, especially if we think at the fiscal policies enacted.

Often, remarks like « people living in the rural area don't have money ; they live from the crops they harvest in the fields, they don't have cash, they prefere the barter when they need something. This is the reason why they can not insure their house» are made.

There are 2 opinions related to the above mentioned statement: on one hand there are those who represent the insurance companies and who consider that the lack of cash is a false problem as the annual premiums for 10.000 EURO are between 1,5 – 3,5 EURO and that from the increase in the insured properties the state, the insurance comany and the insured win ; on the other hand, the insurance premiums used in the Western Europe can not be afforded by a middle romanian employee and the cheap premiums are not worth their money.

What is the genuine view of the romanian insurance market reflected in numbers ?

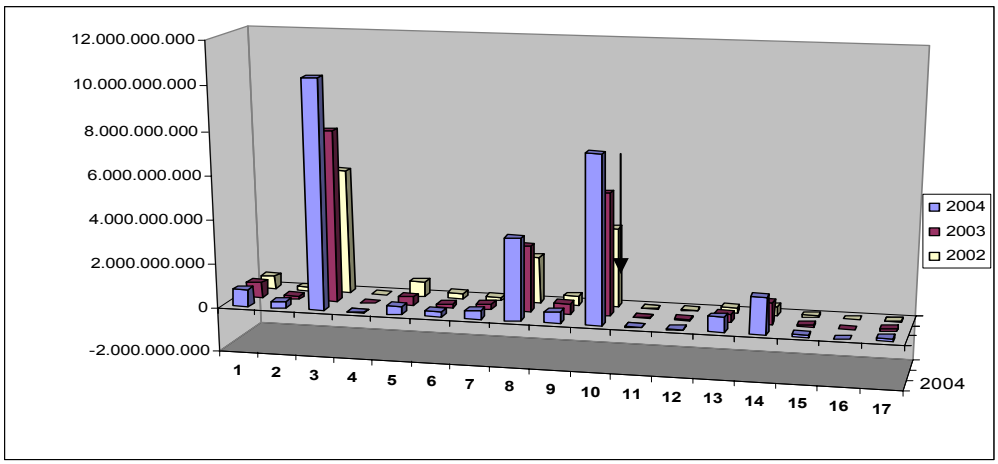
2.3. The insurance offer in Romania

We would like to assert that our perspective, presented below, is sinthetic. We will tackle the issue of general insurance coverages and out of those 17 legal insurance categories we will develop the eight one : « The insurance against fire and the insurance against natural catastrophes ». The period considered is that between 2001-2004, according with the official data published by the Insurance Supervisory Commission in their annual reports.

Why 2001 ? Because according with CSA's norm no. 3/2001 regarding the insurance coverages categories that can be used by the insurance companies[5], for the harmonization of the romanian legislation with the comunitarian one, the legal tipology of the insurance coverages has been modified.

[5] Published in Monitorul Oficial al Romaniei, Partea I, nr. 501 in 24 august 2001.

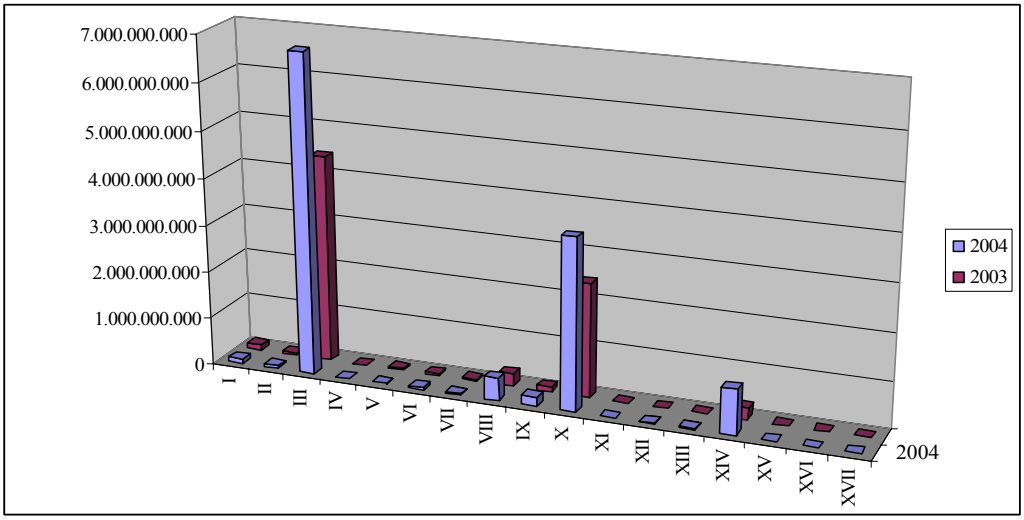
Figure 6. The insurance against fire and the insurance against natural catastrophes' position in the general insurance coverages – the evolution between 2002-2004 – taking into consideration the volume of subscibed insurance premiums (thousands ROL)



Source: CSA, Reports 2002, 2003, 2004, www.csa-isc.ro/Rapoarte .

As the above figure suggests, the insurance against fire and the insurance against natural catastrophes was ranked third during 2002, 2003, 2004, after the insurance against car damages (IIIrd category) and the mandataory auto insurance (malpractice) (Xth category).

Figure 7. The insurance against fire and the insurance against natural catastrophes' position in the general insurance coverages – the evolution between 2003-2004 – taking into consideration the volume of the indemnity (compensation) paid by insurance companies (thousands ROL)



Source: CSA, Reports 2003, 2004, www.csa-isc.ro/Rapoarte.

Data for 2002 was not available.

During 2004, the insurance against fire and the insurance against natural catastrophes was ranked 4th after the insurance for credit and warranties.

Table 6. The dynamic of the insurance against fire and the insurance against natural catastrophes market during 2001-2004

Year	***Gross premiums subscribed*** *Thousands ROL*	***Nominal annual increase*** *%*	***Inflation rate*** *%*	***Real annual increase*** *%*
2001	1.106.517.000	-	-	-
2002	2.112.478.710	90,91	17,8	62,06
2003	3.011.215.343	42,54	14,1	24,93
2004	3.716.950.266	23,44	9,3	12,94

Source: 1. CSA, Reports 2001, 2002, 2003, 2004, www.csa-isc.ro / Rapoarte; 2. Author's compilation.

Table 7. The insurance against fire and the insurance against natural catastrophes – macroeconomic indicators

YEAR	***Percent in the total volume of the subscribed premiums – general insurance coverages*** *%*	***Percent in the total volume of the paid compensation – general insurance*** *%*	***The rate of indemnity*** *%*
2001	14,01	4,45	14,01
2002	14,56	ND	ND
2003	14,89	3,49	8,98
2004	13,78	3,90	12,92

Source: 1. CSA, Reports 2001, 2002, 2003, 2004, www.csa-isc.ro / Rapoarte; 2.Author's compilation. ND: not available

Conclusions:

1. The percent in the total volume of the subscribed premiums of the general insurance coverages during 2001-2004 was approximately 14%, less than 1/5.
2. The positive aspects are:

a) the real annual increase for this insurance type is above the annual real increase for general insurance coverages.

b) the 4% of the compensations paid for this type of insurance in the total volume of compensation paid.

3. The increase in the trend of the indemnity rate, rate that is expected to grow further given the natural catastrophes that are expected in the years to come.

Given this background and adding the issues of the damages produced by the 2005 floods evaluated at 1,4 billion Euros, the indemnities paid by the insurance companies which amounted to 5,5 million Euros, the insurance rate of 0,4% or 4‰ raised the issue of mandatory house insurance.

What are the opinions of the insured, the insurance companies and the representatives of the supervisory commission? What are the recommendations of the World Bank?

3. The issue of reinstating compulsory insurance on population's houses and apartments.

3.1 An Analysis of the main elements and topics involved in compulsory building insurance.

We consider it is much more compelling to present in a tabelar illustration the comparison between the characteristics of the insurance form mentioned in the title of this study and of this chapter for the period 1971 – 1995 (with some necessary observations for 1990 -1995) and the project introduced for debate in 2001, forgotten for a while and then recently awakened– October 2005.

Table 8 Comparative study regarding the insurance's product characteristics

Elements	*During 1971[6] - 1995[7]*	*Project 2002*
Insured (Policyholders)	- individuals; - agricultural cooperatives[8]; - intercooperative economical associations[9]; - firms.	- individuals

[6] Type of mandatory insurance through the state regllementations (decret) no. 471/197

[7] The insurance was not considered mandatory as enacted in the Law no. 136/1995, the Law regarding insurance and reinsurance in Romania, published in « Monitorul Oficial al Romaniei « , Part I, no. 303 from 30 december 1995.

[8] Discontinue after 1990;

Insurer	ADAS (State Insurance Administration (in Romanian: Administratia Asigurarilor de Stat) – state monopoly until 1990.	*Type 1*)Specialized insurer [10] whose sole shareholder is the state;
		Type 2) Private insurance companies.
Insured risks	1) fire, lightning, explosion, even if the lightning or explosion were not followed by fire, torrential rain and the indirect effects it has ; flooding, storm, hurricane, earthquaqe minimim 6 on Richter scale, land fall or land slide, snow or ice weight, snow avalanches, fall on buildings or other annexes; 2) distruction or damage provoked by the salvage measures taken during the insured event ; 3) demolishing, dismounting or moving expenses.	*Type 1)* Earthquake plus fire or explosion produced by the earthquake.
		Type 2) 1) storm; 2) earthquake; 3) floods; 4) land fall and land slides.
		Exemptions : Financial loss following the insured risk appearance (loss of income from rent, costs associated with finding an alternative accomodation)
Insured object	1. Buildings and other constructions ; 2. Including: a) engines, machines, installations, means of transport and tools owned by the firm; b) raw materials, fuel, semifinished and finished products; c) animal products, agricultural	The insurance is only for *individuals' buildings* (private) and will provide cover only for buildings not for the objects inside them.

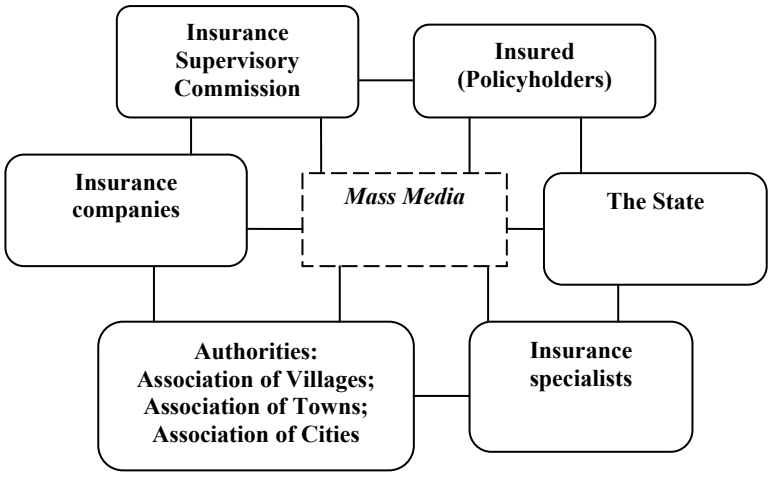
[9] Idem.
[10] Whose sole purpose would be mandatory building insurance.

	products, fodders and the deposited crop of orchards.	**Exemptions** : -buildings constructed after 1989 without proper authorizations or that do not fulfil the resistance standards; -buildings deemed as major risk for earthquakes (larget than 7 degrees on the Richter scale)
Insured Amount (Sa)	*a) individuals:* Sa = Sc · Na/m²; unde: Sc –built surface; Na/m² - insurance norm / square meter built, differentiated between urban and or rural whereabouts and type of building.	Maximum amount insured = 15.000 euro; "extra value" of buildings can be insured (optional).
	b)firms: value of the buildings as stated in the balance sheet (accounting value).	
Insurance Premium (Pa)	Pa = ct · Sa Tarrifs quota (ct): -urban: 0,3%; - rural: 0,4%.	Pa = ct · Sa Tarrifs quota (ct): - urban: 0,2%; - rural: 0,3%.
Insurers responsibility begins	Automatically: a) immediately after contract is signed; b) if the object is under construction, from the moment the building has walls and roof ; c) when construction begins for buildings belonging to agricultural cooperatives.	24 hours after the day when the contract is signed ends.
Insurers responsibility ends	When the building no longer belongs to the insured ot can no longer be used for living or for any economical destination due to degradation or ruin.	At midnight of the last day of validity of the contract,.

Source: Author's compilation.

3.2 Opinions regarding the reintroduction of compulsory insurance of buildings

The dialogue partners will be schematically drawn below:



The State is present at discussions through the voice of governmental representatives : R. M. Popescu – state secretary for local communities at the Interior Ministry – coordonating ministry of the relaunched project of 2005; L. Borbely – Ministry of Public Works and Territory Fitting. Both support the idea of reintroducing compulsory insurance of individuals' houses starting January 1, 2006*:*

a) against floods, earthquakes, landslides and storms;

b) insured value: maximum 15.000 euro;

c) insurance premiums differntiated by area (rural/urban), not more than 30 euros anually.

Reprezentatives of Association of Villages, Association of Towns, Association of Cities have announced their support in promoting the project, their role being thet of intermediaries in the process of singning the contracts..

The Insurance Supervision Agency through its president, Mr. N. Crisan supports the idea of coercitive measures such as : those individuals that have not signed insurance contracts will not be able to sell their houses or fill inheritance papers.

The representatives of the insurance companies and insurance intermediaries don not disapprove the introduction of compulsory building insurance, but they make couple of remarks related to the subject:

a) in order for the population not to think of this compulsory insurance as a sort of fiscal burden, a financial and fiscal motivation must be found, such as: the deduction of the insurance premium from the annual building tax paid by the owners.

b) the insurance companies can not take the state's place and they can not solve the social problems in Romania – such as those concerning the capability of the population to pay the premiums.

The policyholders (insured) are very reluctant to the subject. They believe that this sort of mandatory insurance coverages are a sort of "forced consumer protection". Their opinions regarding the subject are summarized below:

a) the insurance coverage must be the individual's own option given that the premium is "cheap" and that the compensation is high.

b) those affected by natural catastrophes must receive aid from the government and not compensations from the insurance companies.

c) for the insurance companies this mandatory insurance system is their "cup of tea"; besides the insurance companies obvious advantages, the local authorities will certainly act as intermediaries, bringing more clients for the insurance companies.

d) the biggest complaint is that the authorities and the politicians do not debate or make public the causes that led to such high damages from this year' floods: possible undone protection works of the piers and the bridges, improper construction works etc.

The insurance specialists, mainly Prof univ. Gh Badea, PhD, the president of the Insurance Institute thinks that such a mandatory introduction of insurance coverage is wrong on one hand because the state should not intervene in such a problem as the state has proven to be a poor manager when it comes to money management and on the other hand because obliging the population to such a thing would impair the right to property. He sustains the introduction of prevention programs and plans to reduce such damages

and an educational plan that would help people comprehend the risks involved. We totally agree with this opinion.

3.3 The World's Bank Recomendations

The World's Bank specialists think that an insurance pool is needed because:

1. a dispersion of the risks from natural catastrophes is made at the national level; different regions in the country have different exposure to natural catastrophes so the concept of national solidarity would be brought forward.
2. the "pool" would be an important partner in the dialogues with the government, the capital markets, the reinsurance companies, the hedge funds and the investment bankers.
3. through this pool, optimal levels for insurance retaining would be chosen and there would be an obvious advantage in the international negotiations in the insurance companies.
4. managing the consequences of the natural catastrophes through a pool by exporting an optimal level of risk would reduce the country's risk on the global market with net benefits for public policy and capital markets.

Al the above mentioned advantages would not reduce the difficulties with implementing such a system, difficulties generated mainly due to the low level of insurance penetration (below 1% in GDP – Table 2), low level of optional building insurance coverage and the low level of insurance companies capitalization:

1) strict and transparent pool's organization's structure and coordination; transparent management of the compensations procedures and schemes; transparent investment methodologies and techniques.
2) types of buildings and houses subject to such an insurance pool: private buildings, companies buildings', public buildings.
3) the methods and techniques involved in the monitorization and the supervision of the compulsory insurance coverage must be made public.

4. Conclusions

The Government's representative, R. Popescu -state secretary in the Internal Affairs Minister – said on 11.10.2005 that although the government is tempted to adopt the World's bank recommendations regarding an insurance pool according with Turkey's model, the fact that in Turkey only 16% of the population subscribed to such a pool would make the Romanian government willing to adopt another solution or mode**l.**

Eugen Gurenko, the World's Bank insurance specialist estimated that there are 3 kinds of dilemmas regarding the management of CAT events.

I. Government's Dilemmas.

a. A national program for managing the consequences of natural catastrophes, program that includes mandatory insurance coverages, should surpass the political alternance. On the other hand, the lack of natural catastrophes would make this national program unpopular.

b. Financing these techniques towards managing CAT events would reduce the financing capabilities for other investment projects.

c. International aid is diminished whether such an insurance system is used.

II. Insurance market's dilemmas concern the low level of insurance premiums used by local insurance companies which provide fronting operations for the international insurance firms. Acting as intermediaries, the local insurance companies receive huge reinsurance fees whish are disproportionate with the size of the potential damages from cat events.

III. The policyholder's dilemma. The potential policyholder's balance between two way of reasoning: on one hand they believe that nothing bad would happen to them and on the other hand they regard the issue of buying an insurance coverage as futile as long as the government should intervene and help them out. By subscribing to an insurance coverage they will diminish any chance they would have to receive governmental aid. Looking from another perspective, they are at the state's mercy, which can decide to help them or not.

Our own opinions regarding the matter are as follows:

The policyholders: As the analysis provided in subchapter 2.2 shows, 44.2% of the Romanians tend to underestimate the importance of buying an insurance coverage; to this 44,2% we should add the other 49% that can not

afford to buy an insurance coverage due to financial restraints. This proves the low level of insurance penetration (5%) and the indemnity rate of only 0.4% for the year 2005.

Romanians above the age of 60 strongly believe in "charity hazard" which means that they do not consider approaching other means of insurance as they believe they will receive help from the government through some governmental emergency programs. They must learn how to be responsible and how to act proactively when it comes to possible risks and dangers. For this to happen they must be educated.

Our opinion is that they must learn how to be responsible and imposing a compulsory insurance coverage system through the legal governmental constraints will not do them much good; besides, this system greatly impairs the right to property. More "actors" involved there are, more difficult it is to control and manage the whole system.

The state must help educating the population and the potential policyholders and it has certain tools that can help him in fulfilling this goal:

a. the deductability of insurance premiums in the context of the tax on global income;
b. offering reductions for the tax on buildings paid for those who have subscribed to an insurance coverage;
c. different quotas for the insurance companies that provide insurance products against the risks from natural catastrophes.

The public intervention and opinion moulding is being made through the activity of the Supervisory Insurance Commission through:

- access on the insurance market;
- close and permanent supervision of the insurance market operators and "actors";
- enacting reglementations regarding the insurance conditions.

The insurance companies that offer insurance products that cover CAT risks must have the authorization of the Supervisory Insurance Commission, must make available the data and calculus regarding the maxim level of exposure on each insurance type, the method for estimating the maxim damage possible, must provide the Supervisory Insurance Commission with the reinsurance program for this kind of risks, with copies of the reinsurance contracts, broker's contracts or the list with the reinsurers mentioning the participation quota.

The insurance companies' services must be organized on modules with coverage types for the risks insured, offering the option for the potential policyholder to choose the level of the amount insured and the availability to index the amount to the inflation rate or to the indices regarding currency devaluation. The insurance companies will decide the tariffs systems, tariffs criteria, but these tariffs should not be below a certain threshold. The Supervisory Insurance Commission may intervene for imposing minimal tariffs. They may fix mandatory insurance tariffs criteria for differentiating the insurance types such as: the type of the building, type of the region where the building is, the age of the building etc.

The category of the compensation, favorable to the insured is that of "the first risk", but the policyholder should have the option of buying an insurance contract with franchise.

But before everything else, the insured must have the option of choosing the insurer.

Certain problems still remain:

a. The age of many buildings, buildings that do not have a construction authorization and which structure do not follow all the technical procedures imposed in the construction business; these kind of buildings can not be insured.

b. The impossibility of many people living in the rural area to pay the insurance premiums, not even if the premiums are amounting to 30 euros.

On 11.10.2005, Mr. L. Borbely, the minister of the Public Works and Territory Fitting Ministry said that all the expenses related to the rehabilitation of the buildings exposed to an earthquake would be supported from the state budget and that in 2006 the budget will be supplemented with 67 billion lei. These are signs that those in power acknowledge the risks population is confronted with, but we believe that the government major goal shoul be not the introduction of mandatory building insurance, but the standard of living of the Romanians.

The insurance industry in Romania, as the analysis provided in subchapter 2.3. (table 6 and 7) suggests, there are positive an encouraging signs that things are evolving in the right direction. Those with the power of decision should keep their promises so that Romania becomes an European country for the insurance industry as well.

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