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# **Quantitative Methods** in Accounting and Finance



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Wrocław University of Economics

## BUSINESS INSURANCE COSTING FOR THE PURPOSE OF DECISION-MAKING CALCULI

**Summary:** The range of insurance products is extremely extensive, including insurance directed at both natural persons and business entities. Insurance addressed to entrepreneurs is an extremely individual product normally prepared based on the individual needs and considerations of a given business entity. Despite the fact that in the context of using insurance as a risk management method its cost is only one of the features which determine the structure of an insurance portfolio, in practice it is frequently the most significant factor contributing to a decision on purchasing insurance.

**Key words:** business insurance, premium calculation, cost of insurance.

#### 1. Business insurance

The range of insurance products is extremely extensive, including insurance directed at both natural persons and business entities. Although a separate group of insurance addressed to entrepreneurs is not distinguished in the basic and statutory classification of insurance, such insurance may be identified due to the nature of these products and expectations of this group of clients. Since there is no formal name for this type of products, they usually function, particularly in practice, as a part of the offer of insurance companies under the name "business insurance".

These products are intended for business entities as a possibility to secure them against the impairment of assets or the incurrence of high and unexpected costs resulting from various types of loss. The decision on purchasing insurance by a business entity is conditioned by multiple factors, among which the cost of such insurance is the crucial element. Therefore, the aim of the present paper is to present the costing related to taking out insurance in the context of making a decision on its purchase.

Insurance addressed to entrepreneurs is an extremely individual product normally prepared based on the individual needs and considerations of a given business entity. Figure 1 presents the basic classification of business insurance. It is divided into two groups: asset insurance and liability insurance. Asset insurance may be further classified as tangible asset insurance, financial result insurance and intangible asset insurance.

Asset insurance is a group of products characterized by the fact that the sum insured is determined based on the accounting data of a business entity, where the valuation of assets is an extremely significant and, at the same time, a relatively unambiguous element. Typical insurance from this group includes: insurance of equipment, panes, machinery, crops, property in transit, casco, as well as insurance guarantees, credit insurance, receivable insurance or loss of profit insurance.

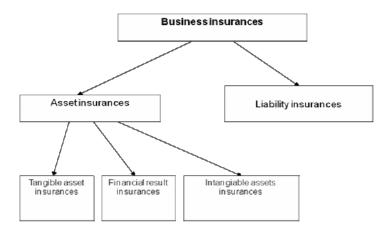


Figure 1. Classification of business insurance

Source: author's own work based on Kwiecień [2009, pp. 118–127].

Liability insurance is more ambiguous when it comes to determining the sum insured since its essence is compensation for damage to property, health or life of a third party arising from improper performance of the actions within the scope of the liability of a given person. This insurance group includes civil liability insurance, related to performing particular professions, such as communication, farmers, carriers, mass event organizers or health care institutions. A product which is fairly interesting from the viewpoint of its structure, that is, product civil liability insurance, also belongs to this group. It is intended primarily for the entities involved in manufacturing activity.

The insurance companies operating on the Polish market do not provide a particularly extensive business insurance offer. This market, despite having always been present, has developed relatively recently, and thus the offer of this type of insurance has still been extremely limited. It needs to be also remembered

that such insurance is very individual in nature and requires among others the highest quality of insurance intermediation, that is, the service of the insurance broker, who not only sells insurance but also helps to choose an insurer, sign an agreement, prepare accounting documents, and also often performs the function of an attorney-in-fact in disputable situations, where a disagreement concerning a payment or amount of damages occurs between the insuring entity and the insurance company.

#### 2. Cost of insurance

Despite the fact that in the context of using insurance as a risk management method its cost is only one of the features which determine the structure of an insurance portfolio, in practice it is frequently the most significant factor contributing to the decision on purchasing insurance. The cost of insurance includes several components, the most important of which, although not the only one, is the amount of an insurance premium. The remaining components of the cost are as follows [Kwiecień 2009, p. 88]:

- costs of preventive actions,
- costs related to asserting claims,
- costs of retention,
- costs of uncertainty related to the possibility of denying disbursement of damages,
- costs of insurance availability.

The costs of preventive actions include all the conditions required by the insurer which are related to insurance cover. In the case of business insurance, this element is particularly significant because maintaining business activity is exposed to numerous factors influencing risk volume and related above all with considerable volatility of the environment. This cost needs to be accounted for in insurance costing prior to signing an agreement, but it refers to the entire insurance cover period. An illustration of such a cost may be a necessity to prepare monthly reports on transactions with debtors in the case of receivable insurance. If the entity has not done this before, it needs to account for and calculate the cost of preparing such reports over the whole term of an insurance agreement, that is, normally 12 months. Occasionally prevention costs are negligible or are low enough to be considered insignificant, but at times they may even constitute an obstacle in purchasing insurance.

Another component of the cost of insurance, which is also extremely significant in practice, is the cost of asserting claims, in particular through judicial proceedings or the one related to past due disbursement of damages. Two issues influence the amount of this cost. One is excessively long loss adjustment procedures notoriously occurring in practice, which are often an indirect result of

an earlier cost reduction by the insurer. The loss adjustment process is very expensive for the insurance company and therefore some insurers reduce their costs by decreasing the number of loss adjusters or employing loss adjusters with worse qualifications. Due to such actions, they become more attractive to their clients in terms of prices, which is reflected in sales increase but at the expense of poorer quality.

Another factor affecting the amount of this cost is the complex problem of loss appraisal in business entities. This results primarily from the fact that the sum insured is determined at the moment of signing an insurance agreement based on the asset value at that time. When a loss occurs, in turn, this value needs to be updated as disbursement of damages is a compensation for an actual loss and not a specified value under an insurance agreement. Additionally, a loss may be incomplete and therefore the percentage of asset value loss needs to be determined.

What poses a problem for the enterprise here is not the determination of the value of damages, since this is the responsibility of the insurance company, but the uncertainty of the situation, which results in the fact that this needs to be foreseen, while it is very difficult to accurately calculate the costs related thereto. One of the solutions in such a situation may be purchasing additional insurance of legal protection, the essence of which consists in covering the costs of judicial proceedings (among others fees of attorneys-in-fact). Such insurance does not ensure eliminating this cost, but it allows for a more precise calculation.

Yet another position in the cost of insurance is costs of retention, that is, incurring risk with personal contribution. This results from the so-called "deductible", which may assume a form of a percentage or an amount, and which consists in deducting the portion arising from the deductible from the value of a loss when disbursing damages. This cost is significant because it influences the amount of a premium (the higher personal contribution, the lower a premium) on the one hand, but reduces the disbursement of damages to the insuring entity in the situations where there are multiple losses of low values, on the other. The business entity which analyzes potential insurance is supposed to find an optimum product which will be adapted to its individual conditions with the deductible level and the premium amount. In the case where there are numerous minor losses, it is profitable to reduce the deductible level at the expense of a higher premium, and where the losses are rather large, it is pointless to pay a higher premium in exchange for a low level of personal contribution.

The next item in the cost of insurance is the costs of uncertainty related to the possibility of refusing to disburse damages. This cost is closely related to the one discussed above, that is, the one of the judicial proceedings, and results from the occurrence of ambiguities or errors in interpreting the terms and conditions of an insurance agreement. In the case of the insurance addressed to entrepreneurs, this is extremely important since these products are less standardized and insurance agreements, despite being based on general terms and conditions of insurance, are frequently adapted to individual entities. The most effective way of eliminating this

cost is taking advantage of the insurance broker, who is the best qualified intermediary, which should ensure, or at least largely reduce, the risk of the occurrence of such a cost.

The last of the listed items of the cost of insurance is costs of insurance availability. This is a value involving certain substantive, time and financial outlays for seeking and optimizing insurance cover. Business entities' needs for insurance are often so individual, and even unusual, that they require spending time and funds for finding an appropriate product or modifying the standard one. In the case of this cost position, the use of the services provided by the insurance broker, who takes on this portion of responsibilities, and whose brokerage is paid by the insurance company, may also prove a solution to this problem.

## 3. Decision-making calculi

The awareness of the costs related to purchasing insurance by the business entity and the ability to calculate them allows for a reliable evaluation of insurance products in the context of their application as a risk management method. All the actions related thereto form a certain type of decision-making calculi consisting of:

- costing related to purchasing compulsory insurance;
- comparing the situation without voluntary insurance being purchased with the situation where insurance is purchased by calculating probable financial results (losses, loss of profit, necessary disbursement of damages, additional insurance-related costs if any);
- calculi related to various options with respect to selecting insurance products –
  determining the scope of the insured risk, comparison of the offers of various
  insurance companies, adapting insurance to the specificity of an activity;
- preparing a schedule of insurance-related payments for estimating the value of cash flows:
- recognizing insurance and financial results related thereto in the entity's budgeting and controlling.

These actions constitute a certain whole which creates a process of selecting business insurance. It may be illustrated in the form of stages, as in Figure 2.

The first of the listed stages is actions related to accounting for the purchase of compulsory insurance. This mainly refers to two basic insurance groups. One is motor liability insurance, which concerns virtually every business entity and is particularly significant in the case of entities for which the value and the number of the purchased means of transport are high. Insurance costing will come down here to the mere amount of a premium since the remaining items of the costs of insurance are irrelevant costs because their amount does not influence decisions on purchasing insurance. A significant issue to which attention should be drawn is accounting for the costs of insurance in decision-making calculi not upon purchasing a

means of transport but prior to taking this decision. This is frequently forgotten in practice despite the fact that these costs influence the results and expenses.

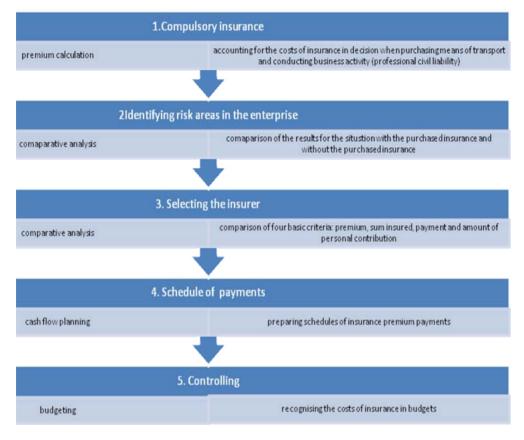


Figure 2. The process of selecting insurance based on decision-making calculi

Source: author's own work.

The other group of compulsory insurance which is significant for conducting business activity is professional civil liability. It is related to performing specific professions. Here, the situation is even simpler since it is usually a portion of membership contributions in various professional chambers and associations, and hence a decision on purchasing it and the amount of contribution is not made by the insured.

The second stage in the above presented process is identifying risk areas in an enterprise and adapting particular insurance cover thereto. At this stage, decision-making calculi are most extensively used since a decision on whether to purchase insurance or not depends on insurance costing with the inclusion of all its components described in the previous section. It needs to be remembered that the situation of each entity depends on individual factors, which requires calculations

for given insurance each time. The most important components of such a calculus include estimating:

- the amount of a premium,
- necessary costs related to the terms and conditions of insurance cover,
- the amount of damages if any,
- the costs of covering parts of a loss arising from personal contribution.

An example of such a calculus may be estimating a situation for a manufacturing enterprise which is considering the purchase of product civil liability insurance. It needs to be calculated whether it is more profitable for it to purchase such insurance taking into account all the costs related thereto and compensation in the form of damages, or not to use such insurance and incur the costs of manufacturing defective products or their repair on its own.

The third stage in the process of selecting insurance is choosing the insurer, which occurs upon taking a decision on purchasing insurance but prior to taking a decision on where to purchase it. Leaving aside the aspect of legal regulations related to the scope of general terms and conditions of insurance, this stage is supposed to focus particularly on comparing several basic criteria of assessing the insurer, the most important of which is estimating the relation of the amount of a premium to the amount of personal contribution. The greater the exclusion of insurer's liability is, the lower a premium. The amount of a personal contribution needs to be compared to the amount of potential losses. If a large number of minor losses are expected, it is better to pay a higher premium but with a lower personal contribution, and reversely.

The two last stages comprise recognizing the effects of purchasing insurance in schedules of payment as components of cash flow plans and in the budgets prepared normally by controlling departments.

#### 4. Business insurance on the Polish market

Business insurances are not popular on the Polish market as presented in Table 1. Typical insurance classes which are offered for entities include the ones from the 4th to the 7th group and those from the 11th to the 16th group. In Table 1 they are marked in bold.

Tables 2 and 3 present basic financial ratios for a few typical business insurance products.

Table 3 shows a continuation of this data for the next three classes.

Looking at Tables 2 and 3, one could draw a conclusion that the ratios are very unstable and there are many variances in financial situations for business insurance. This information is additional and completed earlier chapters.

Table 1. Non-life insurance companies according to insurance business

	Insurance classes																		
Insurance companies	1	2	3	4	5	6	7			10			13	14	15	16	17	18	Number of insurance classes
ALLIANZ POLSKA S.A.	х	х	х			x	X	х	х	х	x	X	x	x	x	x	х	х	16
AVIVA TU OGÓLNYCH S.A.	х	х	x	x		X	X	х	x	Х		X	x		x	x	X	X	15
AXA TUiR S.A.	х	х	х	x			X	х	х	Х			x	X	x	x		X	13
BENEFIA TU S.A. Vienna Insurance Group	X	х	х				x	х	х	Х			x			x	X	Х	11
BRE UBEZPIECZENIA TUIR S.A.	х	х	х					х	х	Х			x	X	x	x	х	Х	12
BZ WBK- AVIVA TU OGÓLNYCH S.A.	х	х						х	х				x			x		Х	7
COMPENSA TU S.A. Vienna Insurance Group	х	х	х			X	X	х	х	Х	X	X	x	X	x	x	Х	х	16
CONCORDIA POLSKA TUW	х	х	х				X	х	х	Х			x	X	x	x	х	х	13
CUPRUM	х	х					X	х	х				x						6
D.A.S. TU OCHRONY PRAWNEJ S.A.																	х		1
ERGO HESTIA S.A.	х	х	х	x	x	x	x	х	х	Х	x	x	x	x	x	x	Х	Х	18
EULER HERMES S.A.									х				x	X	x	x			5
EUROPA SA	х	х	х				x	х	х	Х			x	X	x	x	Х	Х	13
GENERALI T.U. S.A.	х	х	х	x	x		x	х	х	х	x	x	x	x	x	x	х	х	17
HDI ASEKURACJA TU S.A	х	х	х	x		x	x	х	х	Х		X	X	X	x	x	Х	Х	16
INTER POLSKA S.A.	х	х	х				x	х	х	х			x		x	x	х	х	12
INTERRISK TU S.A. Vienna Insurance Group	х	х	х	x		x	x	х	х	Х		x	x	x	x	x	Х	Х	16
KUKE S.A.														x	x				2
LINK4 TU S.A.	х	х	х					х	х	Х			x				Х	Х	9
MEDICA POLSKA UBEZPIECZENIA ZDROWOTNE TU S.A.		x																	1
MTU Moje Towarzystwo Ubezpieczeń S.A	х		х					х	х	Х			x			x		Х	8
PARTNER S.A.	х		х					х	х	Х			x		x				7
POCZTOWE	х	х	х				x	х	х	Х			x		x			Х	10
PTR S.A.																			
PTU S.A.	х	х	х			x	x	х	х	Х		X	x	X	x	x	х	Х	15
PZM TU S.A. Vienna Insurance Group	х	х	х				x	х	х	Х			x			x	х	Х	11
PZU SA	х	х	х	x	x	x	X	х	х	Х	X	X	x	X	x	x	х	Х	18
SIGNAL IDUNA POLSKA TU S.A.	х	х					X	х	х	Х			x		x	x		Х	10
SKOK	х	х						х	x				x	x		x			7
ТUW	х	х	х				x	х	х	х			x			x	х	х	11
ΤUZ	х	х	х				x	х	х	х			x	x	x	x		х	12
UNIQA TU S.A.	х	х	х		x	x	x	х	х	х	x	x	x	x	x	x	х	х	17
WARTA S.A.	х	х	х	x	x	x	x	х	х	х	X	X	x	X	x	x	Х	х	18

Source: www.knf.gov.pl.

Table 2. Selected technical efficiency ratios by non-life insurance classes – direct business

Ratio	Cla	ss 4	Cla	ss 5	Class 6			
Ratio	31.12.2010 31.12.2011		31.12.2010	31.12.2011	31.12.2010	31.12.2011		
	Ratios based on technical accounts (%)							
Dynamics of gross written premiums	96.64	26.19	157.81	94.89	83.33	18.05		
Dynamics of gross claims paid	61.00	314.03	172.36	122.74	81.55	99.82		
Premiums retention ratio	84.32	75.42	58.25	39.40	86.20	88.60		
Claims retention ratio	98.41	55.04	63.04	20.71	88.86	69.16		
Gross claims ratio	143.53	44.45	93.73	251.05	122.81	83.96		
Claims ratio								
- net of reinsurance	72.82	26.67	126.82	17.15	17.17	76.65		
Acquisition costs ratio	22.02	15.77	13.17	12.56	18.79	13.87		
Administrative expenses ratio	10.50	66.62	11.22	33.83	11.44	66.82		
Gross operating expenses ratio	32.53	22.39	24.39	16.39	30.23	20.70		
Ratio of technical charges - net of								
reinsurance	35.42	34.21	57.88	26.29	35.73	28.35		
Profitability ratio of gross technical								
activity	-8.70	25.05	-35.42	28.25	-37.83	-3.44		
Profitability ratio of technical activity								
- net of reinsurance	-9.84	41.88	-83.35	58.10	-40.38	-4.23		

Source: www.knf.gov.pl.

Table 3. Selected technical efficiency ratios by non-life insurance classes – direct business

Ratio	Clas	s 11	Clas	ss 12	Class 16			
Ratio	31.12.2010	31.12.2011	31.12.2010	31.12.2011	31.12.2010	31.12.2011		
	Ratios ba	sed on technica	al accounts (%)					
Dynamics of gross written premiums	101.24	108.04	74.05	102.21	90.89	97.87		
Dynamics of gross claims paid	616.06	57.88	103.73	156.09	150.29	171.04		
Premiums retention ratio	36.47	27.08	54.43	65.55	87.08	84.05		
Claims retention ratio	-16.46	63.85	68.16	62.29	58.93	68.02		
Gross claims ratio	16.34	23.98	-29.11	77.81	38.81	12.89		
Claims ratio – net of reinsurance	-3.83	74.99	-12.04	69.43	19.96	12.75		
Acquisition costs ratio	9.54	12.06	13.93	9.89	56.22	55.39		
Administrative expenses ratio	6.42	7.33	10.07	11.41	8.38	7.46		
Gross operating expenses ratio	15.96	19.39	24.00	21.30	64.60	62.85		
Ratio of technical charges - net of								
reinsurance	38.28	66.06	46.64	40.36	88.69	79.31		
Profitability ratio of gross technical								
activity	54.32	-8.60	38.84	-0.58	-6.25	5.54		
Profitability ratio of technical activity								
- net of reinsurance	137.31	-29.90	66.26	-0.97	-8.76	7.10		

Source: www.knf.gov.pl.

#### 5. Conclusion

The risk management process has become an obligatory element of enterprise activity in the contemporary world. The information on risk areas and insurance which is to serve risk reduction is desirable by various groups of recipients, such as investors, contracting parties or financial institutions. Therefore, comprehensive insurance costing is an extremely significant activity in the decision-making calculi when creating an insurance portfolio.

In conclusion, the actions related to selecting insurance for a business entity include the following:

- insurance purchase costing,
- analyzing offers of various insurance companies,
- cooperation with the insurance broker,
- planning expenses and insurance costs,
- determining the areas of activities where insurance could apply,
- designing an insurance portfolio adapted to individual needs of an entity.

Business insurance is a product whose market has been developing rapidly for a few years in Poland, which is certainly an effect of the increasingly greater awareness of entrepreneurs, greater financial stability and acquiring patterns from other countries, which are more developed in terms of insurance tradition.

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#### Website

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### KALKULACJA KOSZTÓW UBEZPIECZEŃ DLA PRZEDSIĘBIORSTW NA POTRZEBY RACHUNKÓW DECYZYJNYCH

**Streszczenie:** Ubezpieczenia dla przedsiębiorstw są odrębną grupą produktów oferowaną przez zakłady ubezpieczeń. Wykorzystywane są one w zarządzaniu ryzykiem przedsiębiorstw i wymagają indywidualnego podejścia przy ich doborze. Jednym z kluczowych kryteriów tworzenia portfela ubezpieczeń jest umiejętność kalkulacji kosztów z nimi związanych.

Słowa kluczowe: ubezpieczenia dla przedsiębiorstw, kalkulacja składki, koszt ubezpieczenia.