

From the Research on Risk Management in Polish Construction Enterprises

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Abstract. A variety of insurance options are used when managing risk in the construction industry. Numerous insurers operating on the Polish market provide suitable types of insurance, thus allowing participants of a construction process to obtain a comprehensive cover against almost all potential risks. Therefore, ‘all-risks’ types of insurance is of particular importance in case of construction and assembly activities. In addition to this instrument, the paper also deals with other forms of insurance used in the construction sector in Poland, which apply to various aspects of activities conducted by actors involved a construction project. This is the main topic of the paper, which also outlines the theory on the subject as well as providing the results of empirical research carried out in this area and emphasizing the practical applicability of the discussions. Consequently, the key aim of the paper is to present the issues related to insurance in the construction industry as a method of financing risk in operations of construction companies. The paper adopts a synthetic approach to these issues. The paper also reviews the related scholarly literature.

1 Introduction

Almost any type of industry has its specific risks which need to be coped with in order to continue in business [1]. This is also true about the construction industry, where risk is particularly relevant and appears to be ubiquitous. It virtually affects all entities involved in a construction process and may be looked upon from objective and subjective perspectives. In Poland contractors are a group which is particularly exposed to many risks, and they also frequently need to arrange insurance for their construction projects on an obligatory basis when participating in tenders [2]. This is particularly important in the public sector. Since the construction market in Poland is currently the investor’s market, contractors who want to win a tender are often forced to quote such a contractual price which will make them competitive on the market. This problem concerns not only the public sector of the construction business but also the private sector in all its forms and formulas. Risk management theory draws special attention to the concept of risk distribution [2], which in practical terms refers mostly to undertakings conducted under public private partnerships (PPP) [2, 3]. No matter, however, what types of risks need to be addressed by any participant of an investment and construction process, it has to be insured in order to mitigate its negative consequences, including the ultimate one of bankruptcy and insolvency. Therefore, insurance is an effective way of managing risk in the construction industry. In principle, almost any type of risk in the construction

industry may now be insured against. Insurers worldwide offer a wide portfolio of insurance products designed for the construction business. These issues are addressed in the paper, which supplements the theoretical deliberations with the results of the empirical research conducted in this field, highlighting – at the same time – the practical applicability of the presented knowledge. Hence, the underlying aim of the paper is to outline the issues related to the types of insurance used in the Polish construction sector, with the focus on ‘all-risks’ insurance, such as CAR (Constructors All Risks) and EAR (Erection All Risks). The publication also reviews other forms of insurance which are used in the construction industry in Poland, including third party insurance (OC), property insurance or, for example, Advanced Loss of Profit (ALOP) and Machinery Loss of Profit (MOLP) [4]. The discussions refer to business activities carried out by construction companies. Consequently, the key aim of the paper is to present the issues related to insurance in the construction industry as a method of financing risk in operations of construction companies (a perspective of construction company). The research covered 31 randomly selected contractors operating mainly in the Silesian and the Małopolskie voivodships in Poland, and the basic research tool was a questionnaire. The survey was completed by face-to-face interviews, and the research sample comprised extramural students of Construction and Environmental Engineering at the University of Bielsko-Biala (Akademia Techniczno-Humanistyczna w Bielsku-Białej), i.e. people who combine studying and working

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for the entities covered by the research conducted in 2016. During the research 31 respondents filled in their questionnaires in a detailed way. The research covered small, medium-sized and big construction enterprises, which were categorized according to their employment figures; mainly small and medium-sized entities. The participation in the research was voluntary and anonymous. In order to show a broad picture of the analysed problem the paper also outlines the findings of the similar empirical studies conducted in 2012 among 34 from the top 100 construction and assembly companies operating on the Polish market, including some contractors listed on the Warsaw Stock Exchange and included in the WIG-Construction index [2]. The criterion for the selection was the value of sales of construction and assembly production for the previous financial year [2]. In addition, the paper also quotes the results of a similar study conducted in 2015 among 29 small, medium-sized and big contractors operating in the selected poviats (i.e. administrative districts) belonging to the Silesian voivodship (Bielsko-Biała, Tychy, Żywiec, Jastrzębie Zdrój, Wodzisław Śląski, Rybnik and Czechowice-Dziedzice) in Poland [5]. The paper derives information from literature sources in order to verify the theoretical concepts against the empirical background. Besides, the authors draw on their own knowledge and experience gained from many-years' research into risk faced in the construction industry as well as by enterprises operating in other sectors of the economy and by public entities. The risk management theory is universal knowledge, which is clearly emphasized in the scholarly literature [6, 7]. The paper adopts a synthetic approach to the problem. It is limited to selected issues only. In addition, the methods of deduction and induction are used in the publication.

2 Risk and insurance in Polish construction industry – a synthetic approach

The scholarly literature presents the issues of risk management in the construction industry in a comprehensive manner [8-34]. This also applies to types of insurance protection used in the construction sector worldwide [35-40]. In theory and in practice risk is generally understood as: a possibility (a chance) of a loss occurrence or a condition in which there is a likelihood of a loss, a divergence between actual results and expected ones, a probability of an outcome which differs from the expectation, uncertainty, a peril or the object of insurance [41]. In the construction industry risk is defined differently depending on which participant of an investment and construction process it refers to [2]. A contractor (subcontractor) will understand it differently from an investor, a designer or any other actor involved in the construction project, including a bank which finances the execution of the construction etc. [40] In this context, an insurer who calculates the size of an insurance premium and estimates the risk to be incurred during the operations of a construction enterprise plays a

particularly significant role. The extent of risk caused by a specific project, which results from the estimation, determines the cost of an insurance policy which has to be paid by the insured party. The factors which are taken into consideration in this process include the industry risk profile, and the construction industry tends to be regarded all over the world as a risky sector of any economy [2]. The reason for this may be e.g. a high accident rate, including lethal cases, in the construction business, or so-called Force Majeure. In addition, the industry-specific risks stem from construction disasters or potential breakdowns on construction sites. Unlike in other sectors of the economy, the multitude of risky situations which may be encountered in the construction and assembly business makes risk a cross-functional category from the scientific point of view [32]. Therefore risk in the construction industry is not a purely technical concern but it is also an economic or a legal issue [2]. No matter, however, how the construction risk is defined or understood the scholarly literature emphasises four key categories which make up its industry-specific profile. The first one is the time risk [20, 28, 42], which is connected with a failure to perform a construction project within a planned schedule and by a defined deadline. The second consideration is the price (cost) risk [42, 28] which, in turn, concerns the price established in a construction agreement (contract) [11, 28], although it should be borne in mind that the concepts of cost and price are not identical in meaning [11, 28]. The third one is the quality risk, which applies to a failure to perform a construction project in line with quality requirements established by an investor (a customer) [2, 11, 28, 42]. The fourth one is the safety risk [11], which is caused by a lack of safety experienced by employees who are directly involved in a construction process including, in particular, construction workers [2, 32]. These four categories, when combined, provide an overview of what the construction risk is about [32], although it should be remembered that there are a lot more types of risks due to the specific character of construction or assembly works which are performed. The scholarly literature adopts a broad approach to this issue [11, 28, 38, 39]. A particular importance here is attached to the specific nature of a given construction project. For instance, tunnel construction will involve different types of risk when compared to hydro-technical construction or road building projects, etc. A key issue is the right understanding of a risk mechanism in the construction business. Every risk has its sources and leads to specific consequences [11]. Irrespective of the type of risk a given construction undertaking is exposed to every specific risk may be mitigated and its negative impact on the construction enterprise may be limited. This can be done by arranging an insurance cover which enables the contractor to protect themselves against the effects of risk occurrences which, at the end of the day, are invariably translated into financial losses [18]. Risk is costly and the contractor needs to find sufficient financial resources to pay for an appropriate insurance policy. They may choose from a variety of insurance offers available on the Polish market but they may also take advantage of products rendered by international

providers. When managing a construction company, 'all-risks' types of insurance, which can be divided into CAR insurance and EAR insurance, are particularly relevant as they offer such benefits as covering all the stages of an investment and construction process [40]. In Poland they are commonly labelled as the Munich option and may be arranged by any party to a contract. Everything depends on negotiations conducted before concluding the contract with an investor and on the specific character of an assignment [40]. Such insurance provides compensation for almost any sudden and unexpected loss – caused by people, but also random events – which has occurred in a specific stage of the construction process, during the period of time covered by the insurance, and which is not excluded from the scope of the insurance cover [16]. The major difference between CAR insurance and EAR insurance lies in the object of insurance [4]. In particular, the scope of the insurance protection under CAR formula comprises: „(...) firstly, contractual works to be construed as any works carried out by contractors and sub-contractors, including any preparatory works, such as the area levelling, ground drainage, fencing a construction site, etc.; secondly, construction equipment and accessories, particularly temporary barracks, scaffolding, installations supplying media to the construction site, etc.; thirdly, construction machines essential in the processes of erecting buildings, i.e. in particular is the heavy machines for earth works that may be subject to protection, such as bulldozers, rolls, tractors, cranes, excavators, etc., i.e. the insurance covers exclusively those machines that are do not have a licence for being used in the road traffic (are not liable for being registered); fourthly, costs of removing the remains after the damage that are e.g. rubble clearance, mud removal, remains disposal; fifthly, civil liability of the insurance company for the damages caused to third parties (property and personal damage)” [35]. „(...) The protection under EAR insurance, in turn, covers in particular: firstly, assembly works, including preparatory works, such as e.g. making or modernisation of foundations for a specific machine or device, secondly, machines and devices for assembly forms, such as arm cranes, cranes, masts, etc., thirdly, post-damage remains removal costs, fourthly, property surrounding the venue of the assembly executed being the property of the project investor, fifthly, civil liability for the damages caused to third parties (property and personal damages)” [35]. Another advantage offered by such insurance is also the fact that it covers the back-up of a construction project, property located around a construction site and the costs of removing the remains after a loss [35]. Under CAR and EAR contracts, part of such events are excluded and the insurer bears no liability in case these occur [35]. Such insurance in the United States excludes, for example, an earthquake, an airplane disaster, a theft, a tsunami etc. [40]. In particular, „(...) the insurer bears no liability for any losses indirectly or directly incurred due to: firstly, a war, a state of emergency, a strike, a riot, a rebellion, a revolution, an uprising, social and military unrests, a civil war, a sabotage, an act of terror, which should be understood as the use of violence for political purposes, directed against a society and aimed

at intimidate its members; secondly, an intentional act or a gross negligence on the part of an insurance holder or people authorised by them or acting on their behalf; thirdly, a nuclear reaction, radioactive pollution, contamination or pollution with industrial waste; fourthly, partial or complete discontinuation of construction and assembly works due to any reasons except for a situation when this is caused by any loss covered by insurance under the general terms and conditions of an insurance agreement“ [4]. „(...) In addition, in construction and assembly insurance the insurer is not liable for: firstly, with reference to construction facilities: costs of repair, replacement of faulty material, or incorrect workmanship; secondly, with reference to assembly facilities: damage due to material faults or casting faults except for assembly faults for which the insurer is liable; thirdly, damage due to design faults; fourthly, damage to property seized by authorities; fifthly, consequential damage and, in particular, liquidated damages, interest and losses due to delayed or improper performance of construction and assembly works; sixthly, normal tear and wear, rusting, oxidation, sediment formation (deterioration due to non-use, continuous effect of normal weather conditions); seventhly, losses due to property theft, except for burglary and house-breaking, for which the insurer is liable; eighthly, damage to equipment, fittings and construction/assembly machines due to electrical or mechanical breakdowns, bursting, spoilage, freezing of coolants (but in case when – due to such a breakdown – other insured property is damaged or destroyed, then such losses will be covered by insurance); ninthly, damage to vehicles subject to mandatory registration, which has occurred outside the place of insurance; tenthly, damage to vessels or aircraft; eleventhly, damage of the size which does not exceed the deductible; for the eleventh, damage caused by any person hired by an insurance holder who performs construction and assembly work, if he/she does not possess appropriate licences to practice his/her job, as required by applicable regulations, if he/she is banned from practicing his/her profession or suspended” [4]. In addition to the 'Munich option' insurers operating on the Polish construction market also offer the types of insurance which are commonly referred to as 'PZU standard', i.e. insurance against named perils, where specific types of risks specifically listed in an insurance contract are covered. The common name for such insurance originates from the fact that PZU, the corporate group of Powszechny Zakład Ubezpieczeń S.A., is a traditional and, at the same time, the oldest and the biggest Polish insurer. Contrary to this name (i.e. the domestic standard – PZU standard) PZU S.A. also offers CAR and EAR types of insurance for the construction sector. On the Polish market, as mentioned in the introduction, apart from CAR and EAR, which are examples of voluntary insurance, there are also third party liability insurance (OC), property insurance, Advanced Loss of Profit (ALOP) insurance or Machinery Loss of Profit (MOLP) insurance [4]. From the theoretical perspective, however, the most relevant division is the one into so-called Munich option

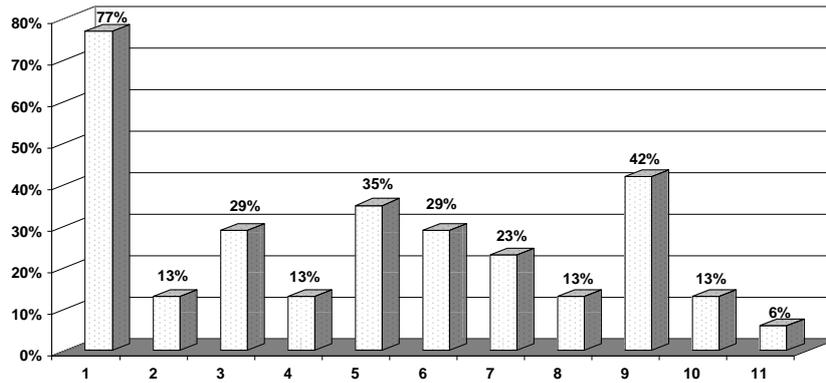
insurance and so-called domestic standard insurance [2]. In case of third party liability (OC) the insurance covers „(...) damage incurred by a third party (which/who are not involved in the contract, are not parties to the contract or are not employed with any company which performs the contract) as a direct result of contracted works” [4]. In particular, a third party liability policy should be concluded by an investor and it should comprise activities carried out by all participants of the construction project, i.e. a designer, a contract engineer, a sub-contractor etc. [40]. It should also be added that in Poland only designers and site engineers are obliged by law to take out third party insurance [4]. ALOP and MOLP insurance, however, allows the insured party to receive compensation for any potential losses or increased costs incurred by an investor due to a delay in delivery of a project for use [4]. The investor may arrange ALOP insurance to cover their fixed costs, ensure funds for payment of their liabilities and generate the planned level of profits [4]. One should also note that by payment of an additional premium the party concerned may also extend the scope of insurance to cover some extra losses [40], which is a common practice in Poland.

3 Construction Risk Management: The use of insurance among Polish contractors in the light of the empirical research

The empirical research conducted in this area shows that in Poland a wide range of insurance products are readily available and contractors usually arrange the Munich option insurance to protect their activities only when they are forced to do so, that is when it is formally required by investors, while 32.4% of top construction and assembly enterprises in Poland opt for insurance offered by PZU S.A. [2]. The largest players on the Polish market tend to choose named perils insurance, when it comes to construction and assembly business (35% of the respondents) [2]. The detailed findings of the studies conducted in 2016 show that 45% of contractors take out insurance for every single construction and assembly project they undertake. The main reasons for a failure to arrange on-going insurance for construction and assembly production, as given in the research, include: a high cost of insurance, unprofitability of insurance, the fact that low value investment projects do not require insurance, a low risk or probability of a loss, a lack of awareness when it comes to possible consequences of any problems resulting from risks, the fact that bigger investment undertakings conducted for regular customers do not require insurance, time pressure when formulating a contract, a low bidding price (55% of the respondents), as insurance adds to a selling price. At the same time, the studies demonstrate that for as many as 68% of the

respondents contractors are the party to an investment and construction process which arranges insurance. Also, the research confirms the conclusions which may be drawn from a review of the scholarly literature, i.e. that insurance in business practice is the best way of protecting oneself against negative consequences of risks [2], although a mere 13% of the ones surveyed do not agree with this statement. When it comes to CAR and EAR insurance policies, however, only 32% of contractors are interested. This figure largely overlaps with the result obtained from the research among the biggest construction companies [2]. As many as 55% of the respondents use ‘PZU standard’ insurance and 58% of contractors buy their insurance from PZU S.A., which seems to confirm the conclusion that this traditional domestic insurer enjoys a high level of trust. This conclusion may also be drawn when reviewing the literature on the subject [2]. The remaining respondents state that they use insurance offered by other insurers operating on the Polish market, including TUiR Warta S.A., which is another domestic insurer on the construction and assembly market. The foreign insurers which are present on the Polish market and which are indicated by the respondents include, first of all, ALLIANZ Polska S.A., TU ERGO Hestia, InterRisk S.A., as well as other insurance companies (29% of the respondents). The major reasons, as indicated in the empirical research, why companies choose a particular insurer include: terms and conditions of insurance, its scope, an insurance company’s reputation, an insurer’s well-established position on the market, the way an insurer behaves towards a contractor, satisfactory customer service, discounts for the amount of construction machinery, discounts for policy renewal, meeting expectations in terms of specific risks, and payment of compensation by an insurer, although as many as 70% of the respondents stress the importance of policy costs as the key criterion, which is also confirmed by the literature on the subject [2]. Therefore, in the Polish construction sector the price of insurance appears to be the dominant criterion when selecting an insurer. Another issue is the choice of PZU S.A. and TUiR Warta S.A. due to the fact that these companies are associated with the Polish capital, though not rightly so since the structures of capital shareholding have changed for these insurers. It may be seen that contractors show less trust towards foreign insurers which operate on the Polish market. Both domestic and foreign insurers, however, are not reluctant to offer insurance for construction and assembly projects and only one contractor surveyed states that an insurer has refused to offer insurance for their construction work due to its specific character, i.e. renovation of a historical facility. Let’s then have a look at the types of insurance products used by construction and assembly enterprises in their business activities. The related research findings are shown in Fig. 1.

Fig. 1. Types of insurance used by construction companies.

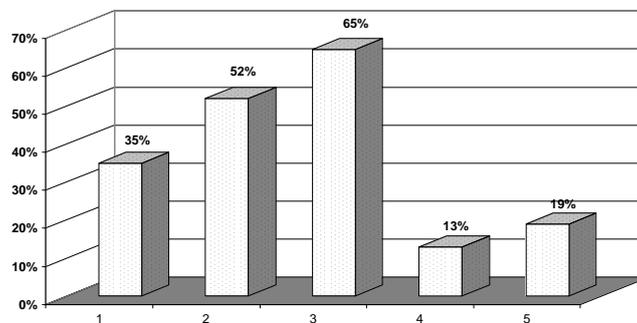


- 1 – insurance for construction machines and equipment
- 2 – insurance for machines against breakdown
- 3 – insurance for electronic equipment
- 4 – machine loss of profit insurance
- 5 – loss of profit insurance for an investor for losses covered by construction insurance
- 6 – loss of profit insurance for an investor for losses covered by assembly insurance
- 7 – insurance for construction facilities handed over for use
- 8 – insurance for boilers and pressure vessels
- 9 – insurance for leased machines and equipment
- 10 – insurance against risks located in the natural environment e.g. sea etc.
- 11 – other insurance

The results of the survey illustrated in Fig. 1 show that contractors most often arrange insurance for construction machines and equipment (77% of the respondents). The second most common type of insurance is insurance for electronic equipment and leased machines and equipment (42% of the respondents). These results almost overlap with the outcome of the studies conducted among the largest contractors operating on the Polish market [2]. In addition, contractors have also indicated other types of insurance used to safeguard themselves against risks, such as ten-year insurance under the French law or employer’s insurance under the

British law (which concern investment projects conducted outside the Polish borders) or i.e. insurance against flood [2]. Similarly to the largest contractors, also the sample surveyed may be seen to generally indicate that a variety of construction and assembly insurance types are used in the Polish construction sector and they are mostly determined by the character of construction or assembly work being performed at the given time. Such a general conclusion may also be drawn from the review of the literature on the subject [2], which overlaps with the results of the research presented in Fig. 2.

Fig. 2. Insurance for machines, devices, fittings and other construction equipment in operations of construction enterprises.



- 1 – insurance against fire and other random events
- 2 – insurance against burglary and house-breaking
- 3 – AC (comprehensive cover) and OC (legal liability) insurance
- 4 – insurance in transport
- 5 – insurance for machines against breakdown

As can be seen in Fig. 2, the results of the research concern insurance for machines, devices, fittings and other construction equipment used by contractors directly on their construction sites [2]. The analysis of Fig. 2 shows that 65% of the contractors use OC and AC

insurance, 52% of the entities buy insurance against burglary and house-breaking and only 35% of the respondents say that they use insurance against fire and other random events. For the sake of comparison, also the largest contractors in Poland mostly use OC and AC

insurance against risks they are exposed to (27% of the respondents) [2]. In this case as well a general conclusion may be derived that the types of insurance listed in Fig. 2 concern the construction risk, which is typical for construction and assembly activities due to the nature of deliverables and the locations where construction and assembly work is performed (construction sites), where equipment and building materials, often of a significant value, are collected and where theft cases are nothing extraordinary [2]. Similarly, the types of building materials used make the construction sector face a high risk of damage which may occur on construction sites or in transit [2]. That is one of the reasons why 13% of the respondents use transport insurance.

4 Conclusion

All these deliberations may lead to one basic conclusion i.e. that one of the key methods used to manage risk in the Polish construction sector is insurance. The conducted research shows that in the surveyed sample, as well as among the largest construction and assembly enterprises operating on the Polish market, all entities, without any exceptions, arrange insurance against risks although they use insurance in different ways, depending on a given company's profile. From among surveyed entities 26% use this instrument to manage risk on an ongoing basis, which means that they select CAR and EAR insurance for their companies' activities. When it comes to the largest construction companies in Poland, however, as many as 69% of them use such insurance [2]. These differences seem to result from different structures of entities covered by the research. Nevertheless, the general conclusions remain the same. At the same time, many years of observations in this area prove that numerous contractors operating in Poland see CAR and EAR insurance more as an unnecessary expense than an instrument which may help them protect themselves against potential risks [2], which is generally not a desirable outcome. Big companies have a wider range of options here when it comes to the purchase of 'all-risks' policies. In practical terms it is not always needed to obtain such insurance for every single construction project on hand. This is more, as emphasized before, about a formal requirement in the construction business in the public sector, such as in undertakings conducted within the framework of public private partnerships (PPP) [3]. In practice, this is also an integral element of FIDIC (Federation Internationale des Ingenieurs-Conseils) contracts that are concluded, in particular, in case of larger construction projects, where risk is allocated in different ways, depending on the type of agreement signed between an ordering party and a contractor. In general, the contractor's risk increases and the ordering party's risk decreases as we move from a contract for construction, through a contract for equipment, construction and design to an EPC/turn-key contract [44]. In the commercial sector, in turn, particularly in the property development business, the 'PZU standard' seems to prevail. When looking at the

biggest developers present on the Polish market, including the ones from the stock exchange index of WIG-Developers, as many as 67% of them transfer risks to insurers by taking out insurance in the 'PZU standard', while 37% of the developers opt for CAR and EAR insurance [43]. Consequently, another conclusion may be drawn here, i.e. in the Polish construction sector an important factor when deciding about an insurance policy is its price (insurance price) – which should clearly be emphasised – as insurance in the Polish conditions is generally perceived as expensive. Therefore, a vast majority of contractors consider other solutions when trying to find appropriate risk responses. Risk transfer to insurers is one of many possible risk responses available in the construction business, which is also stressed in the literature on the subject [37]. The risk management theory often makes the point that risk diversification [45] should be seen as an important element of corporate management [46]. As a result, contractors should try to undertake and perform a portfolio of assignments, in order to diversify risks. A loss generated on one project will be compensated with a profit made on another one. In theory it is also recommended that the biggest part of risk should be transferred to another participant of a construction process [40]. In this area, the following findings were obtained from surveyed entities: 22% of the respondents state that risk is shared evenly by contractual parties, i.e. between an investor and a contractor; similarly, 22% of the ones surveyed say that risk is divided between a contractor and subcontractors hired by the contractor; only in 9% of cases an investor bears the bulk of risk. No contractor in the research indicates that risk is transferred completely to subcontractors. In a large number of cases, however, total risk is borne by a construction enterprise (38% of the respondents). The general conclusion is the same as mentioned in the introductory part of the paper, i.e. in the construction sector in Poland contractors, including general contractors, tend to be responsible for risks. Insurance, however, is seen as highly important but also as a specific method used by construction companies to respond to risks. The scholarly literature emphasizes the benefits and the drawbacks of this method, drawing attention to its high effectiveness [13]. Also construction engineers perceive the method as highly reliable. In the empirical research, when responding to the following question: Would you agree with the statement that the most effective way of counteracting risk in business practice is the transfer of risk, by means of specific clauses contained in construction contracts, to other participants of a project (e.g. subcontractors) and to an insurer?, as many as 69% of the respondents replied positively. Similar responses in the empirical research were given by the largest contractors operating in Poland [2], including the contractors-developers [43]. Summing up it may be concluded that irrespective of a risk management method used in the construction industry, insurance should invariably be used as a complement to other methods, which are potentially available in this respect. Only such an approach adopted in practical management of construction companies may contribute, in a meaningful

way, to mitigating the adverse impact of risk on operations of contractors as well as other participants of a construction process. In Poland, however, responses to construction risks are usually spontaneous and do not result from well-informed and controlled decisions. This is mostly due to the fact that Polish construction companies seem to lack people who are directly responsible for risk management – construction risk managers. The research conducted in this area in 2015 shows that 51% of the respondents do not have any employees who would be directly responsible for risk management [5]. This also applies to the largest contractors operating on the Polish market.

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