ORIGINAL ARTICLE Received 20 February. 2020 Accepted 18 April. 2020

Vol. 9, Issue 2, 76-86, 2020

Academic Journal of Accounting and Economic Researches

ISSN: 2333-0783 (Online)
ISSN: 2375-7493 (Print)
ajaer.worldofresearches.com

Study Of Coverage, Challenges, and Assessment of Contractors All Risk Insurance from the View of Experts, Iran

Abolfazl Khosravi*, Shahram Mozaffari Anari
1. Faculty Member University of Tehran, Iran.
2. M. A. Student in Business Management, Insurance Orientation, Farabi Pardis, University of Tehran, Iran.

A B S T R A C T
One of coping solutions with effects of natural and unnatural damages is insurance. Insurance industry as a service sector has a compensator and supportive role in economy of each country. Success of this industry is an incentive and stimulus for other industries leading to increase in efficiency of companies. In fact, it can be claimed that presence of supportive and efficient industries in economy scene because of considerable changes and competitions in this scope is one of the most important competitive advantage of countries. The purpose of this research is to study coverage, challenges and assessment of contractors all risk insurance (a sub-branch of engineering insurance) from the view of experts in Iran. This study is an applied and qualitative research in terms of objective through Delphi method conducting through library and field method in terms of data collection method. Statistical population of study included university professors, experts and managers of insurance scope. Statistical sample were equal to 15 members chosen through non-random and purposeful sampling method. The results of studies indicated some challenges and problems in field of market identification and product design coordinated with customer need and these problems are rooted in 1. Lack of required information in field of marketing and sale, 2. Lack of a competitive market in field insurance, and 3. Lack of expert force for risk assessment.

Keywords: Insurance, Engineering Insurance, Contractors All Risk Insurance, Delphi Method.

INTRODUCTION

Economic, social, and cultural activities of societies and daily life of people is full of various threats and dangers. Compensation cost of these dangers is not that much high in comparison with financial capabilities of persons and institutions so that they can afford such compensation at the time of incident occurrence, but a considerable part of these events are such harming that disturb the ordinary trend of economic and social activities. If there is no solution to cope with this incident, not only the natural life of families and employees of active institutions in producing and service scope is disturbed but also it can seriously harm economic and social growth and development at micro and macro levels. Insurance industry prepares a proper mechanism to eradicate these instabilities and disorders in people life as well as

*Corresponding Author: Khosravi_a@ut.ac.ir

To cite this article: Khosravi, A., Mozaffari Anari, Sh. (2020). Study Of Coverage, Challenges, and Assessment of Contractors All Risk Insurance from the View of Experts, Iran. *Academic Journal of Accounting and Economic Researches*, 9 (2), 76-86.

economic and social activities; meanwhile, it plays a key role to equip investment sources for economy of country.

Therefore, insurance has an undeniable and important effect on economic growth and development of societies through creating calmness, assurance, life expectancy, and low-risk activity for economic citizens and actors on the one hand and equipping investment on the other hand(Dadashi, Ashegh Mehravani Hosseini, & Darchini, 2013).

Insurance is the combination of possible losses through transferring some risks to insurers that accept to compensate some damages or pay other cash advantages for occurred incident and or provide some services related to risk(Rejda, 2011).

According to the presented definitions, an insurance plan or formation includes following features:

Combination of losses: in fact, combination or share of losses is the base of insurance. Share means distributing imposed losses to several people among all members of group so that loss average is replaced with real loss within this process. Moreover, combination is collection of groups with numerous insured acting through large numbers law to prepare an accurate prediction of future losses.

Pay for accidental loss: accidental loss is not predetermined or predicted and occurs by chance.

Risk transfer: it means that a pure risk is shifted from insured person to insurer that is financially stronger than insured to pay for loss.

Compensation: it means that insured is returned to the previous financial position before incident(Rejda, 2011).

Insurance is divided to two categories of social insurances and commercial insurances in a general classification. Social insurances are mainly mandatory insurances caused by law and with this characteristic that another person (such as employer) involves to pay a considerable part of premium. Premium is determined as a percent of wage in social insurances while it is determined in accordance with risk in commercial insurances (optional insurance) (Caporale, Cerrato, & Zhang, 2017). Social Security Organization is the most important social insurances' reference in Iran. There are different classifications of commercial insurances. Some of classification methods for types of insurance are as follows(Pukala, Sira, & Vavrek, 2018):

- Marine insurances against non-marine insurances
- Property insurance against personal insurance
- Life insurance against non-life insurance

Regardless of general classification, different majors of insurance are used more and less with similar definitions by insurance companies in different countries(Verrall & Wüthrich, 2016).

Engineering insurance is a branch of property insurances that it includes several types of insurance that the most common types are as follows(Liebenberg & Sommer, 2008):

- Contractors All Risk Insurance
- Erection All Risk Insurance
- Contractor's Plant & Machinery All Risks Insurance
- Machinery Breakdown
- Computer All Risk Insurance
- Completed Engineering Risk Insurance

Contractors All Risk Insurance and Erection All Risk Insurance have been more common compared to engineering insurances among the mentioned insurances in insurance market(Lee, 2017; Roberts, 2005).

BACKGROUND, BASES, AND FEATURES OF CONTRACTORS ALL RISK INSURANCE

Explosion of steam boilers and sever damages and harms to life and property of persons made users of these devices gather together in Manchester City in 1854 establishing an organization for users of steam boilers. This organization regularly monitored steam boilers using specialized experts and gave consultative ideas to users. The members established insurance company for steam boilers in 1858 that was the first insurance company in field of engineering insurances. Engineering insurances started their activities in Iran at early 60s with the help of one of German insurance companies named Insurance company Munich Reand the first engineering insurance policy were issued for Latyan Dam in 1965. Majority of common insurance policies in this field is translations of main insurance policies of mentioned companies.

Engineering insurances are subsets of property insurances that cover constructing projects, operating structures and installations or technical machineries and equipment(Ozyuksel & Bacak, 2020; Porth & Assa, 2015).

According to Contractors All Risk Insurance policy, in addition to construction actions, installation operations of required equipment, materials, electrical devices, setting up of machineries and metal skeleton structures are covered if their value is not more than 20% of total sum insured. Since the insurance's support from main insured and common insured should be enough coherent in construction works and it is not always possible to access to the real reason for damage, insurance policy for construction works are presented as "all risk coverage". These types of insurance policies cover the insured against any type of accidental and unpredictable damage unless the damage is caused by reason that are considered as exceptions by insurer explicitly(Karimi, 2005). Insurer of Contractors All Risk Insurance is liable to compensate for damages and losses imposed by accidental incidents during plan implementation and maintenance time at maximum obligation level (sum insured).

Having insurance of all insurance benefits under the contractors all risk insurance includes this advantage that reparation and reconstruction operations are started without hesitation and lawsuit immediately after approval of insurer so that insurance coverage will be immediate. As it was mentioned, different persons are involved in implementation of a building project so that if the project is damaged due to an unpredictable incident then the damage responsibility will be naturally related to all parties involved in executive actions and responsibility separation will create a complicated and hard situation regardless of the issue that compensation from ordinary resources without presence of insurance will be impossible and difficult due to considerable value of contract of some projects(Malakouti & Bagheri Tajrishi, 2016).

To support employer against possible and unpredictable incidents and to keep them away from long and hard cases, contractors all risk insurance covers all persons who are involved in project implementation as common insured in frame of an insurance policy under the insurance coverage(Beiragh et al., 2020). Contrary to many of common insurances, insurance period is not annual that can be extended or terminated by parties or one of them before expiration time, but when this type of insurance contract is signed then the insurance case is not existed; hence, accurate and technical identification and evaluation of risk is not simple(Goodwin & Mahul, 2004). Insurer in some insurance is forced to analyze and evaluate risk-taking degree of insurance based on project type, technical features of work, plans, professional degree of plan executors, possibility of occurrence of natural incidents such as earthquake, flood, storm, landslide, and all demanded information inserted in inventory of this type of insurances(Hessami, 2018). There are two groups of risks in engineering plans including A)

simple construction risks: residential, administrative, and commercial complexes, industrial plants, warehouse building, hotel building, entertainment cultural, health and educational centers. B) Civil engineering operations risks: building brides, dams, tunnels, ports, subway, and airports(Rejda, 2011).

"All Risk" in this type of insurance means that any risk is not explicitly considered as exception is covered by insurance. The most important cause for compensable damages under the contractors all risk insurance are as follows(Roberts, 2005):

Fire, thunderbolt, explosion, flood, flooding, hurricane, earthquake, theft or break an amulet, the implementation with low quality, lack of skill, negligence and acts caused by bad faith or fault of individuals.

Exceptions: contractors all risk insurance consists of only some explicit exceptions applied by international insurance market. The most important exceptions inserted in text of insurance policy are as follows:

- The harm or damage caused by war or war-like operations, any type of rebelling and actions of strikers because of the factory closure ordered by employer.
- Harm or damage caused by intentional negligence or action of insurer or representatives.
- Harm or damage arises from nuclear radiations or reactions and or radioactive wastes.
- Any type of functional damage such as relevant cases to contractual crimes and harms caused by delay in contract implementation and missing it.
- Harm or damage caused by break down, mechanical or electrical disorder in machineries and construction equipment.
- Damage or harm caused by defected plan implementation or operation stopping.
- Imposed damage to terrestrial motor vehicles, aircraft and floating equipment.

The cost of replacement, repair or eliminate any defects subjected works in contract (for instance, use of poor or inadequate materials) (Ostrager, 2018).

Besides general and special exceptions, there are other exceptions applied within specific projects. Of course, these exceptions are not general because they are used for unique projects and parties can reach an agreement freely. For instance, imposed damages to levees in dam and sealing, deviation from set path for tunnels, or fracture in the experimental setup of petrochemical plants(Ozyuksel & Bacak, 2020).

Features of some contractor and erection all risk insurances are as follows:

- Since the project of insurance case in building actions and erections are not existed at the time of contract signing, insurer should evaluate and analyze the risk based on information of inventories, plans, work features, conditions of the project implementation place, possible vulnerability of plan by natural implications, skill level of main contractor and other contractors, mentioned options in contract, implementation duration, etc. and adjust and determine proper circumstances and his maintenance share(Molaei, Esfahani, & Esfahanipour, 2014).

- All issued contractor and erection all-risk insurances are not considerable compared to other type of insurances such as fire and cargo insurances. Those insurances that cover constructing tunnel, refinery, subway, power plants, dams or airports, would create serious obligations for insurance companies. Hence, the subject of large numbers law, diversities and similarities, which are existed in other insurances to apply the rate, is not simple in these insurances; hence, insurer should accept the risk and simultaneous provision of coverage based on each case in accordance with risk nature, maintenance capacity and market conditions(Ozyuksel & Bacak, 2020).

- Risk taking level of a constructing project is more than complementary projects in some cases. The danger of occurred damage caused by flood or rain in operations of a road building or intubation is respectively more than they are completed.

- Economic recession and price fluctuations affect constructing projects. Work progress will be slow during economic recession and risk of these project will be increased if the implementation time is prolonged (Risk factors and effective factors on sum insured calculation in car insurances, 2015).

- Some new and unknown risks have been created through scientific progress, application of complicated machineries and new techniques as well as change in plans and implementation methods; hence, it is required to use appropriate and effective mechanisms to protect capitals and cope with new risks.

- It is obvious that this matter is more sensible and predictable in engineering insurances more than other fields(Bazyar et al., 2016).

There have not been conducted studies in Iran in field of contractors' insurance in general and contractors all risk insurance specifically.

Odeyinka (2000), expresses in a study in Nigeria that insurance is one of the main risk management methods in construction industry of Nigeria. The most importance in construction industry includes in site security, construction risk, health and welfare requirements and application of all-risk insurance policy is recognized as the most prominent method for risk management. Finally, it was eventuated that there is a relationship between premium and real compensation cost at the time of damages or harms. However, insurance claim for settlement can meet only 61/1% of construction compensation.

El-Adaway and Kandil (2009), came to conclusion in their study that the negative effects of claims and disputes have serious negative impacts on contracting parties, their projects, the construction industry as a whole, and consequently on the nation's economy. This paper explores a method for mitigating the negative effects associated with contractors' claims and disputes using a risk retention approach. This method can help contractors in getting early relief from the financial and economic burdens of construction claims. To meet the goals and objectives of this study, the writers have:

1) investigated the feasibility of pricing insurance premiums using the options pricing theory; 2) Explored the applicability of modeling the options pricing theory using Monte Carlo simulation; 3) Set up the principles required for optimal design of a risk retention group for construction claims; and 4) Tested the possible impact of the newly developed risk retention group using historic data of 10,193 construction projects spanning over 12 different California districts. Pursuant to this study, it was verified that construction claims satisfy the required principles for insurance. Also, based on the used testing framework, the developed risk retention group for construction claims has been proved a success from the insured and insurer sides. It is the writers' hope that this study will lay the basis for a leading risk management technique that could be extended over the nation for the benefit of relieving the negative consequences associated with lengthy claims and disputes resolution in the construction industry. This issue has been also studied in research by Liu, Li, Lin, and Nguyen (2007).

METHODOLOGY

This study is an applied research in terms of objective, a qualitative study through fuzzy Delphi method and survey research in terms of data collection tool through library and field method. Statistical population included experts in field of insurance including university professors, experts and managers in scope of insurance in Tehran City. Data collection tool was researcher-made questionnaire designed in accordance with qualitative method of research to gain ideas of experts through open questions. Statistical sample included 15 members chosen non-random and purposeful sampling method. This sample size is because of the nature of fuzzy

Delphi method in order to make a relative unanimity among experts. Application of this method would lead to valuable results to make decision and reach agreement on issue in which, goals and parameters are not explicitly determined. Important feature of this method is providing a flexible framework that covers many of barriers associated with inaccuracy and inexplicitly. Many of problems in decision-making are related to incomplete and inaccurate information. On the other hand, the made decision by experts are based on their personal competence and are mental. Therefore, it would be better that data are indicated through fuzzy digits instead of definite numbers(Bouzon, Govindan, Rodriguez, & Campos, 2016). Delphi participants are experts or panelists(Powell, 2003). They need four characteristics including knowledge and experience about subject, tendency, enough time for participation and communicational skills(Habibi, Sarafrazi, & Izadyar, 2014), and key parameters of study are panelists' competency, panel size and selection method. There is not any explicit and strong rule about selection and number of experts so their numbers depends on some factors including homogeneity or heterogeneity of sample, Delphi goal or problem extend, decision quality, ability of research team to manage study, internal and external validity, time of data collection, accessible sources, problem range and response acceptance. Number of participants is usually less than 50 members and is mostly between 15-20 members. Although this number has been reported in articles from 10 to more than 2000 members(Powell, 2003), but 10-15 members are enough for homogenous groups. Fuzzy Delphi method has been triangular that the Fuzzy numbers have been reported after de-fuzzification. The de-fuzzified number will be between 0 and 1 and if this number is more than 0.7 indicates an acceptable agreement of experts and fuzzy Delphi method will not be presented in next rounds and only those cases without agreement will be again analyzed based on opinions of experts then the result will be finalized at next round is there is unanimity; otherwise, the statement will be totally removed from questionnaire.

RESULTS

Descriptive results of obtained data indicated that 66% (10 members) of participants were male and 33% (5 members) were female, 80% (12 members) were married and 20% (3 members) were single, all participants were employed, 60% (9 members) were faculty members in universities and 40% (6 members) were managers and experts of insured companies.

The obtained results from first and second rounds of Delphi method that led to a relative unanimity among experts have been presented in tables 1 and 2.

Table 1. Challenges and risk assessment of Contractors All Risk Insurance from the view of Experts (round one)

row	statement	success level through descriptive method			de-fuzzy mean	some opinions of experts
		low	average	high		
1	teaching and advertising industrial risks management in society	1	2	12	0.88*	adding following option: increasing awareness level of factories, machineries, and electronic equipment's owners about advantages of engineering insurances
2	weakness of insurance culture among people, weakness of policy making of insurance companies to introduce insurance to people and society, and existence of habits and specific consideration among society people	0	1	14	0.96*	use of national media and mass communications media

3	elimination of barriers and weaknesses in markets and expansion of sale networks	2	5	8	0.65	real and unreal barriers
4	selection and employment of working people in insurance industry based on their competency	0	1	14	0.96*	Meritocracy has been absent for many years in Recruitment System of Iran
5	presenting new insurance plans in accordance with increasing expansion of technology, increasing life speed in accordance with structure of Iran and society need	0	1	14	0.96*	
6	teaching to employees of insurance industry as professional marketers	1	2	12	0.88*	They should follow win-win game.
7	privatization of insurance institutions with guiding, monitoring and controlling role of government	5	5	5	0.51	guiding role is not required but government should monitor and control
8	promotion of technical ability of risk assessment and use of elite experts	0	1	14	0.96*	this is a crucial option in present conditions
9	preparing tariffs through classical and summarized method so that they have optimal simplicity without need to high scientific and technical expertise	2	2	11	0.79	through modern not classic method
10	damage estimation in insurance industry by neural expert companies officially registered for this purpose	0	0	15	1	the condition is fundamental
11	acceleration in issuing insurance policy	0	1	14	0/.96*	within highly competitive conditions
12	acceleration in damage affairs at the time of incident occurrence and inhibiting from any extra administrative formalities	0	1	14	0.96*	the basic condition for continuous cooperation and mouth advertisements

These statements have obtained de-fuzzy scores above 0.7 and there has been a relative unanimity among experts about it.

Table 2. Challenges and risk assessment of Contractors All Risk Insurance from the view of Experts (round two) after applying experts' opinions

row	statement	success level through descriptive method			de-fuzzy mean
		low	average	high	
1	teaching and advertising industrial risks management in society	0	0	15	1*
2	increasing awareness level of factories, machineries, and electronic equipment's owners about advantages of engineering insurances	0	1	14	0.96*
3	weakness of insurance culture among people, weakness of policy making of insurance companies to introduce insurance to people and society, and existence of habits and specific consideration among society people	0	0	15	1*

4	elimination of barriers and weaknesses in markets and expansion of sale networks	0	1	14	0/96*
5	selection and employment of working people in insurance industry based on their competency	0	0	15	1*
6	presenting new insurance plans in accordance with increasing expansion of technology, increasing life speed in accordance with structure of Iran and society need	0	0	15	1*
7	teaching to employees of insurance industry as professional marketers	0	0	15	1*
8	privatization of insurance institutions with guiding, monitoring and controlling role of government	0	0	15	1*
9	preparing tariffs through classical and summarized method so that they have optimal simplicity without need to high scientific and technical expertise	0	0	15	1*
10	preparing tariffs through classical and summarized method so that they have optimal simplicity without need to high scientific and technical expertise	0	0	15	1*
11	damage estimation in insurance industry by neural expert companies officially registered for this purpose	0	0	15	1*
12	acceleration in issuing insurance policy	0	0	15	1*
13	acceleration in damage affairs at the time of incident occurrence and inhibiting from any extra administrative formalities	0	0	15	1*

These statements have obtained de-fuzzy scores above 0.7 and there has been a relative unanimity among experts about it.

CONCLUSION

This study considered contractors and erection all risk insurances and examined method coverage of inserted items in such insurance policies determining expected risks. In general, examinations indicate that following appropriate proceedings are required in order to access to optimal situation of engineering insurances especially all risk insurances in insurance industry.

- It should be tried to introduce industrial risks management to society and determine the role of risk management in organization through educational and advertising centers. On the other hand, insurance companies, especially central insurance should try to introduce type of engineering insurances to society making people familiar with this type of insurances(Ranjbar et al., 2013).
- Increasing awareness level of people society due to lack of awareness among owners of factories, machineries, and electronic equipment about advantages of engineering insurances; Unfortunately, aggregating factors of this situation include weakness of insurance culture among people, weakness of policy making in insurance companies to introduce insurance to people and society, and existence of especial habits and considerations among society people(Malakouti & Bagheri Tajrishi, 2016).
- Elimination of shortcoming in markets and expansion of sale networks: to present services to insured beside growth and development of insurance, it is required to employ working people

in insurance company based on their competency. It should be tried that being accurate within teaching employers of insurance industry.

- Providing new insurance plans coordinated with increasing expansion of technology, increasing life speed, and current structure of country and society need.
- Reformation of rules and regulations: reforming and removing strict insurance rules to accelerate providing insurance services in insurance companies.
- Privatization of insurance industry and supervision of government instead of sovereignty of government over insurance industry: applying legal supervisions on implementation of Article 21 of contract in which, contractor is liable to cover relevant project with engineering all risk insurances. Privatization of insurance institutions so that government has guiding, monitoring and controlling role; creating healthy, logical, and constructive competition between insurance companies.
- Technical ability of risk assessment and use of elite experts: preparing tariffs through classical and summarized method so that they have optimal simplicity without need to high scientific and technical expertise; damage estimation in insurance industry should be done by neural expert companies officially registered for this purpose.
- Increasing quality of services of insurance companies: accelerating issuance of insurance policy: issuing engineering all risk insurance is done with delay due to formalities and receiving various documents from contractors. Acceleration in damage affairs at the time of incident occurrence and inhibiting from any extra administrative formalities as well as rapid payment for damage is the best advertisement for insurance companies and insurance industry.

Applied Suggestion:

Insurance industry is a collection that is in relation and interaction with non-insurance environment out of insurance industry some of these environments include political, economic, social and cultural environments.

Since insurance prepares the field for more growth and development, it prevents from class gap widening due to its nature and influences so that it mitigates social and political problems. According to the required long time for cultural transformations, it is required to use following strategic methods for culture and insurance developing.

1. Since shortcoming of insurance industry in Iran is related to informing, it is required to expand insurance culture particularly engineering insurances through education and training, holding educational seminaries, mass media, hanging banners, preparing and distributing brochures, and advertising in specialized journals and publications that can be effective steps to introduce engineering insurances.
2. According to positive effect of compensation on insurance demand, insurance companies should try to estimate and pay damages through accurate, rapid and on time method in order to increase customer satisfaction and loyalty level among existed insured and attract new markets.
3. Mitigation of franchise and granting specific facilities to major insured persons with logical and reasonable loss ratio such as sharing insurance premium, pay for sharing of benefits, etc. to increase satisfaction level encouraging customers to increase their insurance coverage.
4. Establishment of center for statistical data process and collection in insurance industry can be effective in progress of this industry especially within engineering insurances.

5. Transparency of liabilities and obligations of contractors and employers toward each other in order to compensate the imposed loss to construction projects making them prepare engineering insurance might lead to expansion of this insurance field.

REFERENCES

Bazyar, Mohammad, Rashidian, Arash, Kane, Sumit, Mahdavi, Mohammad Reza Vaez, Sari, Ali Akbari, & Doshmangir, Leila. (2016). Policy options to reduce fragmentation in the pooling of health insurance funds in Iran. *International journal of health policy and management, 5*(4), 253.

Beiragh, Ramin Gharizadeh, Alizadeh, Reza, Kaleibari, Saeed Shafiei, Cavallaro, Fausto, Zolfani, Sarfaraz Hashemkhani, Bausys, Romualdas, & Mardani, Abbas. (2020). An integrated multi-criteria decision making model for sustainability performance assessment for insurance companies. *Sustainability, 12*(3), 789.

Bouzon, Marina, Govindan, Kannan, Rodriguez, Carlos M Taboada, & Campos, Lucila MS. (2016). Identification and analysis of reverse logistics barriers using fuzzy Delphi method and AHP. *Resources, Conservation and Recycling, 108*, 182-197.

Caporale, Guglielmo Maria, Cerrato, Mario, & Zhang, Xuan. (2017). Analysing the determinants of insolvency risk for general insurance firms in the UK. *Journal of Banking & Finance, 84*, 107-122.

Dadashi, MA., Ashegh Mehravani Hosseini, M., & Darchini, M. (2013). Cultural Development A Prerequisite For The Prosperity Of The Insurance Industry. *Journal of Education Research*(25), 72 [In Prsian].

El-Adaway, Islam H, & Kandil, Amr A. (2009). Contractors' claims insurance: A risk retention approach. *Journal of construction engineering and management, 135*(9), 819-825.

Goodwin, Barry K, & Mahul, Olivier. (2004). *Risk modeling concepts relating to the design and rating of agricultural insurance contracts*: The World Bank.

Habibi, Arash, Sarafrazi, Azam, & Izadyar, Sedigheh. (2014). Delphi technique theoretical framework in qualitative research. *The International Journal of Engineering and Science, 3*(4), 8-13.

Hessami, F. (2018). Business risk evaluation and management of Iranian commercial insurance companies. *Management Science Letters, 8*(2), 91-102.

Karimi, A. (2005). *Insurance comprehensive FAQ*. Tehran, Iran: Insurance Research [In Persian].

Lee, Chen-Ying. (2017). Product diversification, business structure, and firm performance in Taiwanese property and liability insurance sector. *The Journal of Risk Finance*.

Liebenberg, Andre P, & Sommer, David W. (2008). Effects of corporate diversification: Evidence from the property–liability insurance industry. *Journal of Risk and Insurance, 75*(4), 893-919.

Liu, Junying, Li, Bingguang, Lin, Binshan, & Nguyen, Vanthuan. (2007). Key issues and challenges of risk management and insurance in China's construction industry. *Industrial Management & Data Systems, 107*(3), 382-396.

Malakouti, K. , & Bagheri Tajrishi, V. (2016). *Engineering insurance from theory to practice*. Tehran, Iran: Insurance Research Press [In Persian].

Molaei, Somayeh, Esfahani, Mir Mahdi Seyed, & Esfahanipour, Akbar. (2014). Using Genetic Algorithm to Robust Multi Objective Optimization of Maintenance Scheduling Considering Engineering Insurance. *Shiraz Journal of System Management, 2*, 1-19.

Odeyinka, Henry A. (2000). An evaluation of the use of insurance in managing construction risks. *Construction Management and Economics, 18*(5), 519-524.

Ostrager, Newman. (2018). *Handbook on insurance coverage disputes*: Wolters Kluwer Law & Business.

Ozyuksel, Suna, & Bacak, Yavuz. (2020). Impact of Engineering Insurances on the Growth of Turkish Construction Sector. *International Journal of Economics and Finance, 12*(8), 1-28.

Porth, Lysa, & Assa, Hirbod. (2015). A financial engineering approach to pricing agricultural insurances. *Agricultural Finance Review*.

Powell, Catherine. (2003). The Delphi technique: myths and realities. *Journal of advanced nursing, 41*(4), 376-382.

Pukala, Ryszard, Sira, Elena, & Vavrek, Roman. (2018). Risk management and financing among start-ups. *Sumy State University*(3), 153-161.

Ranjbar, Ali Falah, Yousefi, Mehdi, Rahnama, Reyhaneh, Ahmadi, Mona, Ahmadi, Darush, & Abroun, Forough. (2013). Studing Effective Factors in the Development of Engineering Insurance (Case Study: Moallem Insurance Company of Giulan Province). *Arabian Journal of Business and Management Review (Oman Chapter), 2*(6), 207.

Rejda, George E. (2011). *Principles of risk management and insurance*: Pearson Education India.

Roberts, Richard AJ. (2005). *Insurance of crops in developing countries* (Vol. 159): Food & Agriculture Org.

Verrall, Richard J, & Wüthrich, Mario V. (2016). Understanding reporting delay in general insurance. *Risks, 4*(3), 25.