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The Parameters for Drafting Insurance and Indemnity Contractual Clauses as the Subset of Risk Allocation Provisions Outlined in the Main Types of Upstream Petroleum Contracts; the case study of IPC

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ABSTRACT

Various hazards exist in the upstream oil and gas industry. Therefore, the contracting parties of any petroleum contract always try to reduce the inevitable economic burdens of occurring adverse events arising out of risks in the course of petroleum operation by applying legal approaches such as contractual risk allocation provisions, which can be realized by drafting efficient insurance and indemnity clauses as the subset of risk allocation provisions. Hence, this study addressed the main research question of "What are the necessary parameters for drafting the insurance and indemnity clauses in the main types of upstream petroleum contracts?" To achieve this end, the mentioned clauses stipulated in the main types of upstream petroleum contracts, have been examined; including concessions, production sharing, and service contracts of 15 different countries around the world besides the comparative analysis with the new model of Iranian Petroleum Contract (IPC). Eventually, the hypothesis of this study stated, "There should be several parameters such as liability towards risks, limitation of liability, exclusions/exemptions, etc. for drafting the insurance and indemnity clauses in these contracts" verified. That is the result and the answer to the research question. Moreover, the comparative analysis of the extracted set of parameters needed to draft these clauses legally, with the related ones in IPC has been done. Therefore, it led to the detection of the existing contractual shortcomings. Thereafter, the necessary suggestions to resolve them are offered, which can enhance the effectiveness of the upstream petroleum contracts and avoids potential litigation in this regard.

1. Introduction

Petroleum, as one of the major natural resources and national wealth, plays a strategic role in each country. It is counted as one of the largest industries and the main source of energy supply in today's world especially in the oil-producing countries such as Iran, which generate a large portion of national income. This vital industry has much more importance in the upstream operation with large scale, capital-intensive and hazardous activities without accomplishing them properly and safely the rest of midstream and downstream operations would not be realized.

The common upstream contracts in the petroleum industry include four main groups of concession systems, production sharing contracts, service contracts, and hybrid ones at different levels, including the main parent, cooperation, financing, and subsidiaries (Shiravi,2018). The wordings of the main parent contract constitute from different sections such as financial regimes, costs and expenditures, work plans and budgets, records, reports and inspection, applicable law, dispute resolution, recruitment and training of personnel, assignment, termination of the contract, and so on. Among them, the risk allocation section is comprised of some provisions which speak about the liabilities and responsibilities for losses and damages in line with determining the best contracting party to bear the risks and the related obligations. This section contains several clauses such as the indemnity clause, insurance clause, exclusions/exemptions, liquidated damages, and limitation of liabilities. These contractual clauses are all considered as the subsets of the contractual risk allocation mechanisms. The primary purpose of any contract is to allocate risks and uncertainties between the parties to the contract (Pipatanapyung, 2004). Thus it should be noted that in the absence of the appropriate contractual clauses regulating the risk allocation provisions especially insurance and indemnity clause which play a major role in this regard, in case of the occurrence of unforeseen and unexpected adverse upstream petroleum events, none of the contracting parties would be willing to undertake the incurred enormous costs, which can lead to serious legal disputes.

Therefore, this paper aims to focus on the insurance and indemnity clauses in the main types of upstream petroleum contracts, whereas the fundamental function of risk allocation is meted by indemnity obligations and is effectuated by the insurance clause, which is discussed subsequently. To achieve this goal, this study addresses the research question of "What are the necessary parameters for drafting the insurance and indemnity clauses contractually in the main types of upstream petroleum contracts?" So that, the hypothesis of this study stating "There should be a set of several parameters such as liability towards risks, determination of liable contracting party for procurement of insurance and indemnification of losses, limitation of liability, exclusions/exemptions, consequential damages, etc. for drafting the insurance and indemnity clauses contractually in the main types of upstream petroleum contracts" is examined. Finally, by applying the obtained set of necessary parameters, the possibility of eliminating the existing weaknesses, clarifying any ambiguities, completing the shortcomings, and finally regulating them more precisely will be achieved that enhance the efficiency and effectiveness of the upstream petroleum contracts in this area.

The theoretical and empirical approach in this study to address the main question is qualitative-descriptive and comparative analysis. The insurance and indemnity contractual clauses as a part of the risk allocation provisions stipulated in the main types of upstream petroleum contracts of 15 different countries around the world have been examined and after extracting the necessary parameters needed to draft them, they have been classified based on their common features, which enables to do a comparative analysis with the related contractual clauses in IPC in the next step. Finally, the probable ambiguities and the existing shortcomings would be found out and the necessary suggestions for overcoming the existing deficiencies and drafting the aforesaid clauses would be presented in a more efficient manner for the upcoming petroleum contracts. Kaarbo and Beasley define comparative analysis as "the systematic comparison of two or more data points ('cases') obtained through use of the case study method". They also confirm that case studies can be both qualitative as well as narrative, and do not necessarily need to rely on multiple sources of evidence to function (Kaarbo & Beasley, 1999, pp369–391). Pickvance, validating the usefulness of comparative analysis as a research method, opines that its purpose is to obtain an informed

understanding of events and their cause. He identifies two conventional types of comparative analysis (the first explains the rationale for similarities and differences between phenomena, and the other emphasizes data collection), and proposes two additional types that reveal a pluralist approach and focus on emergent phenomena in different societies (Pickvance, 2005, pp 2-6). It should be also noted that in this study original versions of upstream petroleum contracts as well as the model contracts- in the cases due to confidentiality and lack of access to the original ones- of 15 countries, have been applied.[1]

Given the structure of this paper, it is divided into five parts. The 1st part sets the stage for the study by defining the theoretical and jurisprudential understanding of "Risk allocation provisions" along with "Insurance and Indemnity contractual clauses" as the central concept. Thereafter, in the 2nd part, the study addresses the question of "How the insurance and indemnity contractual clauses effectuate the risk allocation of upstream petroleum contracts?" by highlighting their roles and contributions. The 3rd part dissects the insurance and indemnity clauses in different upstream petroleum contracts and introduces the set of parameters obtained in an organized table. The 4th part of the study undertakes a comparative analysis and at last, the study is wrapped up by the main conclusions of the study from the foregoing discourses in the 5th part. The limitations of the study and suggestions for future research are also offered in this part.

2.Literature review

According to the investigation of the research background concerning the subject of this study, i.e. the parameters for drafting the insurance and indemnity clauses as the subset of risk allocation provisions, none of the previous studies deal with, which indicates the novelty and significance of this study. However, some domestic and foreign studies are available discussing the risk allocation, insurance, and indemnity in the different petroleum contracts but with different viewpoints. Some of these research papers are presented as an instance in summary, hereunder.

An empirical study on the contractual risk allocation and indemnity and hold harmless clauses in the oilfield service contracts in Malaysia is done by Wan Zulhafiz Wan Zahari, 2015 this empirical study was conducted to investigate the issues and problems concerning risk allocation provisions and indemnity and hold harmless clauses of oilfield service contracts in Malaysia. The main finding of this empirical study indicates that contractors are concerned about the one-way adversarial style of the operator-contractor relationship.

A paper by Henry N. Onukwube, Fidelis O. Achi, with the title of "Risk allocation in oil exploration contracts in Nigeria" examines the risk allocation between parties in oil exploration contracts. A questionnaire survey based on 23 identified risk factors and criteria for the distribution of these identified risks was administered to a population of 60 senior management staff of four multinational oil companies and government-owned oil companies. The results show that some of the leading risk factors and the way of allocation. The study also suggests that similar studies could be conducted in other oil-producing countries since risks vary with culture, social, political, and economic environment.

Another research with the title of "A Comparative Analysis on the Enforceability of Knock-for-Knock Indemnities in Thailand and the United Kingdom", by Wan M. Zulhafiz, 2017, addresses the issue of enforceability of knock-for-knock indemnities pertaining to bodily injury and death in oilfield service contracts in Thailand. It concluded that despite the restriction under the Thai Unfair Contract Terms Act (TUCTA), the knock-for-knock indemnities in standard form oil field service contracts e.g. Leading Oil and Gas Competitiveness (LOGIC) model could still be enforceable in Thailand, subject to certain limitations.

Nasarudin Bin Abdul Rahman, 2020 has researched "Unfair risk allocation in oil and gas upstream service contracts in Malaysia: the necessity for oilfield anti-indemnity act". He argued that a specific legal mechanism should be adopted in Malaysia to protect and limit the liability of the contractors under oil and gas service contracts. It is suggested that the Malaysian Parliament should pass a special law, such as Oilfield Anti-Indemnity Act.

A domestic article of "Analysis of risk allocation of the blowout and kick in offshore drilling contracts

[1] Actual and Model Upstream Petroleum Contracts from 15 different countries including Libya, Russia, Tanzania, India, Georgia, Azerbaijan, Australia, Brazil, Lisbon, Pakistan, Island, Iraq, Angola, Ecuador, Gambia.

and insurance coverage of those risks written by Olomi and Hajmohammad Jafar, 2017. In this article the allocation of risks in Day rate, Turnkey, and Footage Drilling Contracts for "Blow-out" and Kick" risks are examined. According to the Insurability Criteria and Energy Exploration and Development (EED) policy wording, it showed that "Kick" as a drilling risk and a kind of "Blow out"- depending on the situation- is not insurable through the standard available insurance policies in the market.

Sadeghi Shahdani, Askari, et al., in the paper "Juridical Survey of Enforcement of Oil Contractors to Insure Oil and Gas Wells" used analytic descriptive methods and referred to jurisprudence texts and criteria (MASLAHAT & rationality criteria) to prove the hypothesis of enforcement of oil contractors to insure oil and gas wells.

"Designing oil risk securities based on risk transferring insurance-linked securities", 2017, by Seiflou et al. this paper tried to develop a model for issuing oil risk securities based on Simon's theory of bounded rationality (1996). This model is consistent with conditions in the Iranian oil and insurance industries and the Islamic juridical (Shari'ah) considerations for the corresponding investments.

3.Risk allocation provisions

Participation in the upstream oil and gas sector requires significant capital contribution as well as brings with it a high degree of risk to property damage and loss of life.[2] "The oil and gas industry is capital intensive and as such embedded with multifarious risks" (Dike & Chigonu, 2020, p.172). This issue raises more difficulties when facing the multiplicity of parties in an upstream petroleum contract. Also, the nature of risks is different in upstream operation whereas the level of risks in downstream, is not as much as high, according to the main types of activities involving transportation, processing, and storage of oil and gas (Dike & Chigonu, 2020). Contractual risk management is therefore an approach to protecting an organization from losses caused by the potential risks. One of the major elements of contractual risk management as a critical solution is risk allocation. Risk allocation always occurs in any situation where more than one party (owner, contractor, consultant, etc.) is responsible for the execution. Making sure that every risk is recognized and managed is good practice in any business. This activity is an important step in that this allocation can significantly influence the behavior of the business participants and hence impact both project performance and final cost (Zaghlol & Hartman, 2002). Risk allocation in the industry may be achieved by setting out in the contract's clauses which party will be liable for (or exempted from) a given risk and to what extent (Badiru& Osisanya, 2016). To achieve this end, the risk allocation provisions have been always at the heart of negotiation between the contracting parties. In general, most of the provisions of contracts allocate risk. However, certain provisions are designed to do this in a deliberate manner and aim to achieve certain objectives (Coates, 2012). Primarily, these provisions are organized into five broad groups; Indemnities, Insurance, Exclusions/Exemptions, Limitation of Liability, and Liquidated Damages (Gordon, 2011). Among them, this paper intends to deal with the contractual mechanisms of insurance and indemnity clauses which are more fully discussed hereunder.

3.1. The concept of insurance and indemnity contractual clauses

In a legal viewpoint "Clause", is defined literally as "a particular part of a written legal document or agreement, that deals with a particular subject.[3] In addition, "Contractual clause is any provision forming part of a contract, gives rise to a contractual obligation, a breach of which can give rise to litigation"(Martin, 2006). According to the literal meaning of the clause and its implication on a particular subject, one of these particular areas is "insurance and indemnity" which is the subject of this study. In general, the insurance and indemnity contractual clause as the risk allocation mechanism constitutes the risk allocation provisions as its subset. Generally, all policies issued in the energy should include provisions relating to law and jurisdiction. Policies issued by local insurers may require by law that they are subject to the law and practice applying in the country, although they may allow jurisdictions in other countries. There may well be generic insurance laws applying in certain countries,

[2] Caledonia North Sea Ltd v London Bridge Engineering Ltd [2002] UKHL 4; [2002] 1 Lloyd's Rep 553, HL.

[3] Cambridge Dictionary. https://dictionary.cambridge.org/dictionary/english/clause. (Last accessed at: 27.02.2021)

affecting for example the rules relating to disclosure of information or time limits for notification of claims. These issues will then govern the interpretation of the contract despite specific provisions in the policy (such conflicts should ideally be dealt by an overriding clause in the policy), (Sharpe, D., 2009 p35).

3.2. Indemnity contractual clause

The philosophy of the existence of an Indemnity contractual clause lies in the emergence and evolution of risk allocation. One of the fundamental purposes of any contract is to allocate risk and uncertainty between the parties, which is a challenging area especially for operators and contractors of petroleum projects. However, referring to the concept of risk allocation means allocating the risk to one party that can handle the risk more effectively, in the traditional approach, risk allocation clauses are usually drafted in a false-based manner; it means the party in breach is liable, not the party who is best able to handle the risk. So a contractual response to this problem is given by "the Indemnity contractual clause.

In general, the risk allocation process can be accomplished through three approaches comprised of; the efforts and contractual response of contracting parties, judicial process, and legislative intervention or operation of law. The Indemnity contractual clause is under the first approach of the risk allocation process. Under the indemnity clause, the indemnifying party agrees to make a payment to the party having the benefit of the indemnity if the indemnified party suffers loss as a result of the occurrence of a specified event (Gordon, 2011). The indemnity clause has been examined as simple and mutual. According to traditional practice in the oil and gas industry, contractual liability is allocated based on knock-for-knock indemnity. However, after the Macondo incident, it has been argued that the operators tend to shift greater risk to the contractors (Zulhafiz, 2017c). The mutual indemnity clause is named by several terms including “knock-for-knock indemnity”, “Hold Harmless Clause”, “Cross-Indemnity” and “Reciprocal Indemnity”. A simple indemnification clause is where one party (i.e. the operator) undertakes the responsibility to indemnify another party (i.e. the contractor) should a loss be suffered during their contractual relationship. The Operator effectively agrees to absorb the loss (or might choose to insure against it), (Hewitt, 2008, p.177), for breach of contract or care, even if the contractor is at fault (Wang, 2016). Under the mutual hold harmless indemnity regime, each party to the contract (as 'indemnitor') agrees to take responsibility for, and to indemnify the other (as 'indemnitee') against, injury and loss to its own personnel and property and its own 'consequential losses'. Such provisions, setting up the cross-indemnities mechanism, are ordinarily intended to be effective even if the accident and related losses are caused by negligence, breach of statutory duty, or breach of contract of the party protected by the indemnity regime (Hewitt, 2008, p.182). In fact, the clause is designed to avoid the problem of determining the respective liability of parties for a given loss in which the contracting parties will exchange mutual indemnities for any suit or action brought against a counterparty for injuries to or death of both the indemnitor and indemnitee’s employees regardless of fault or negligence (Zulhafiz & Abdul Rahman,2020, p.179). The parties which hold greater bargaining power might not be willing to include such a clause in the contract (Zulhafiz, 2018).

Indemnity clause commonly includes three interrelated requirements; (1) to indemnify that is to compensate a party for its liabilities and losses or settlements of the claims, (2) to hold harmless in which one party will not assert a claim against the other party and (3) to defend that is considered as paying the fees of the attorneys who defend the claims (Peddycord, 2019).

3.3. Insurance contractual clause

Insurance is defined according to Iran's Insurance Act,1316; as “A contract under which one party in consideration of a specific payment (the premium), undertakes to pay a certain amount as the compensation or indemnify the other party in case of occurrence of events that lead to losses or damages.”[4] The insurance clause generally speaks about the responsibility for losses and damages or in other words, the liability of funding the costs of losses and damages, which may arise out of the occurrence of adverse events. The insurance contractual clause requires a party-usually the one to whom risk is allocated- to carry certain types of insurance with specific coverage limits and requirements and to

[4] Insurance Act of Iran, 1316. Article 1.

name the other party as an additional insured (Kagan, 2020)[5]. Insured risks are shifted to a third party that is the insurer. This can be especially helpful if the party required to carry the insurance is not financially strong (Peddycord, 2019). As an instance, *David Sharpe* states in his book, "The *Insurance clause* stipulates that contractor must maintain admitted insurance (i.e. with carries licensed to do business in the applicable state or country), in respect of various liabilities set out in an exhibit attached to the contract. Evidence of such insurance must be furnished by the insurer, in the form of certificates or insurance policies, or by means of certification from a self-insurance fund. The operator is similarly required to maintain certain liability insurances as provided in the contract, with evidence to be furnished to the contractor. Both parties undertake to name the other as additionally insured parties, but only to the extent of the respective indemnification obligations assumed, and this extends to a mutual waiver of subrogation from respective insurers. (Sharpe, D., 2009 p65).

Moreover, some other supplementary clauses as the risk allocation mechanisms have their roles besides the indemnity and insurance clause such as limitation of liabilities, exclusions/ exemption clauses, and liquidated damages.

3.4. Exclusion/exemption clause

Exclusion of liability clause absolves a party or parties to a contract for being liable r responsible for damages, losses, injuries, and other dangers that may arise therefrom (Dike & Chigonu, 2020, p190). Exclusions are usually used in cases of consequential loss, willful misconduct, and gross negligence in upstream petroleum contracts.

3.5. Limitation of liability

Limitation of liability or a 'liability cap' is another contractual mechanism commonly used in the petroleum industry. Unlike indemnities, which look to shift liability, a liability cap looks to the limitation of a party by reference to a total sum of money payable, rather than by reference to a particular species of loss (Moller,2016).

3.6. Liquidated damages

Simply stating, liquidated damages are "amounts fixed, settled and agreed upon in advance to avoid litigation as to damages actually sustained; they may exceed or fall short of the actual damages sustained, but the sum thus fixed and determined (in advance) binds the parties to such agreement".[6]

4.How insurance and indemnity contractual clauses effectuate the risk allocation provisions of upstream petroleum contracts

For clarifying the contribution of the insurance and indemnity contractual clause in the risk allocation process of upstream petroleum contracts, it is necessary to perceive the concept of risk, as the core part of risk allocation and to discover its relationship with insurance and indemnification.

The term "risk" is variously defined as (1) the chance of loss, (2) the possibility of loss, (3) uncertainty, (4) the dispersion of actual from expected results, or (5) the probability of any outcome different from the one expected. Nevertheless, more specifically, "Risk" is defined as a condition in which there is a possibility of an adverse deviation from the desired outcome that is expected or hoped for (Vaughan & Vaughan, 2007, p2). Insurance derives its existence from the nature of risk. Actually, if there is no risk, there will be no need to have insurance. Also "risk management" is a scientific approach to deal with risks by anticipating possible losses, designing, and implementing procedures that minimize the occurrence of the loss or the financial impact of the losses that do occur (Vaughan & Vaughan, 2007, p16). In the terminology of modern risk management, the techniques for dealing with risk are grouped into two broad approaches: risk control and risk financing. The purchase of insurance contracts is, of course, a primary approach to risk transfer. In consideration of a specific payment (the premium) by one party, the second party contracts to indemnify the first party up to a certain limit for the specified loss that may or may not occur (Vaughan & Vaughan, 2007, p19). So

[5] Additional insured is a type of status associated with general liability insurance policies that provides coverage to other individuals or groups that were not initially named in the policy. With an additional insured endorsement, the additional insured will then be protected under the named insurer's policy and can file a claim in the event that they are sued. https://www.investopedia.com/terms/a/additional-insured.asp (last accessed at: 22.03.2021).

[6] Pacific Hardware & Steel Co. v. United states

risk transfer as the core concept of risk allocation is achieved by insurance. Insurance is a complicated and intricate mechanism, However, in its simplest aspect, it has two fundamental characteristics: 1) Transferring or shifting risk from one individual to a group. 2) Sharing losses, on some equitable basis, by all members of the group. Van der Merwe approaches insurance as a contract in which one party (insurer), in return for monies paid, will, upon the occurrence of a specific event, recompense the other party (insured) in a manner that seeks to restore the latter to the status quo ante (Van der Merwe, 1970, p149). It works on the principle of pooling of risks by a collectivity of people who are exposed to the same specific risk, each of whom is willing to make a payment (premium) to avoid bearing the incidence of the economic consequences of an event when it occurs. The insurer arrives at this premium by estimating the frequency of the risk events and applying this outcome to a 'calculus of probabilities (Ewald, 1991), in order to predict the chance of the risk materializing. Therefore, to achieve an effective risk allocation, loss mitigation, and meeting the economic costs of losses as the main function of indemnification, the existence of insurance is essential. Furthermore, we can conclude the close inter-related relationship between insurance, indemnity, and risk, which is quite evident from the definitions provided.

Insurance is one of the most important and widely used risk management techniques that plays an effective role in the risk allocation process. In fact, risk allocation is not about the transfer of 'risk' itself to the best party who is able to manage it, but it is the economic costs and financial burdens that are being allocated. In another word, the economic costs necessary to indemnify losses and damages caused by adverse events due to the risks are going to be allocated. Therefore, insurance plays a complementary role for indemnity obligations in the risk allocation process. Because insurance provides the financial resources needed for indemnifying and so increases the financial solvency of the contracting party to whom risk is allocated and then is in charge of paying the costs of claims. On the other hand, with the aid of insurance, the responsible party will be able to do risk management as well as risk mitigation in a more efficient manner, which both have crucial impacts on risk allocation.

Generally, insurance can be obtained on three main approaches namely (1) on a personal voluntary basis, (2) by contractual obligations, and (3) as the enforcement of laws and regulations. Despite the approach used, the contribution of insurance contractual clauses is pursuant to the risk allocation, leading to the fulfillment and meeting contractual indemnity obligations. The insurance and indemnity contractual clause affects the risk allocation process in different ways. The contracting party to whom the risks have been allocated and have been assigned to bear the economic costs of adverse events is called an indemnitor who is responsible for indemnification following this assignment. Moreover, because of this promise and commitment, there should be sufficient financial capability for fulfilling this obligation, so that if any adverse event occurs that leads to losses, he should be able to pay the costs and compensate the other party who is indemnitee. Therefore, by employing insurance contractual clauses, the contractual requirements to obtain an appropriate insurance plan by the designated party for risk allocation are constituted, to ensure that the obligations setting out in the indemnity clauses against the affected persons would be realized completely. In fact, the insurance company leads to enforcement of the indemnity clause, and the insurance policy here acts as a guarantee of compensation so that the contract's beneficiaries, who are affected by damages, would receive the committed compensation or indemnification services. As it is stated that "Indemnification protections are only 'as good as the indemnitor's balance sheet" (Thornsjo and Hasan, 2007, p.68)v

It is inferred that a linear relationship exists here, in which, risk allocation is at the first stage, then the obligation to indemnify, and eventually the insurance device to fulfill the preceding obligations. In addition, the function of insurance, besides the risk transferring from one individual to a group i.e. insurance company is financing. In another word, the contractual indemnity clause as part of risk allocation provisions should be supported by adequate financial resources, including insurance, self-insurance, and any other appropriate and relevant method. Self-insurance as an alternative to the insurance which is done out of the insurance market can be utilized to effectuate the indemnity obligations, provided that, the indemnitee has agreed and confirmed this method and the indemnitor has proved that there are adequate funds for this goal.

To give efficacy to the insurance requirement arising from the contractual indemnity obligations,

the contract would usually state that the insured is regarded as an 'additional insured', and an endorsement made on the policyholder (indemnitor's) insurance policy in this regard (Anderson, 2008). An additional insured is usually a business partner to a policyholder, and their business relationship makes it sensible to endorse that individual onto the policyholder's insurance policy. Anderson also states that this is usually done to ensure that the indemnity obligation is duly funded, as well as to procure a waiver of the right of subrogation in respect of the policyholder's insurer (Anderson, 2008, p.88).

5. Parameters of insurance and indemnity contractual clauses of upstream petroleum contracts

The key players in the oil and gas industries adopt different contractual risk allocation mechanisms in oilfield service contracts to mitigate their risk exposure in every project (Patson Wilbroad, 2014; Zulhafiz, 2017b). In general, risk allocation provisions are expressed explicitly and implicitly in upstream petroleum contracts. In the implicit cases, it is stated under different contractual clauses, such as those relating to the expenses and financial aspects of the contract, in which the burden of some costs and expenses related to the risks or losses, may be allocated to one of the parties implicitly. Nevertheless, the explicit cases are stated under specific clauses by apparent titles [7], such as "Responsibility for losses and damages" [8] and "Insurance, Liabilities and Indemnities"[9] which is the main subject of this study.

Although the insurance and indemnity contractual clauses comprised only a small portion of the contract wording, the multiplicity of parameters and elements constituting them, indicate the inherent complexity, as well as their key role for dealing with the risks of the petroleum contract, especially in the upstream operation which is large-scale, hazardous and capital intensive, not addressing properly, lead to irreparable consequences. Thus, in this section, the basic and complementary parameters needed for drafting the Insurance and indemnity clauses are being derived, along with the classification based on their common features, which enables us to do a comparative analysis with the related contractual clauses of IPC in the next step. The basic parameters in this study refer to the parameters that are deemed necessary, without them, the contract is incomplete, leading to legal disputes. Moreover, they are the most repeated ones in the reviewed contracts. On the other hand, the complementary or ancillary ones, include those that lack them do not affect the completeness of the contract fundamentally and they are rarely mentioned, but they are recommended for more optimality. In general, the outcome of both basic and complementary extracted parameters in this study, are classified into three main categories of 1) "Liability towards Risks", 2) "Insurance" and 3) "Indemnity" based on their core subject matter. Since the underlying concept of these categories is common in the majority of the contracts and has formed the basis of insurance and indemnity clauses. The first main category includes responsibilities for losses, damages, and risks as well as any matters related to them. Therefore, this group of parameters explicitly address the contractual liabilities of the parties in terms of risks, through the designation of the eligible contracts' parties and stakeholders – including contractor, operator, government, National Oil Company (NOC), Concessionaire, Subcontractors, and other beneficiaries- to undertake the obligations in respect thereof. For example, in the case of the responsibility for operator's equipment, "The operator is responsible for any owned equipment, including equipment owned by joint ventures or co-lessees. This equipment will include "casing, tubing, wellhead equipment, and platform, if applicable, and the responsibility applies irrespective of when or how such damage occurs. A release is provided by the operator to the contractor." (Sharpe, D., 2009. P68). The second category focuses on the discussion of insurance parameters specifically, as the most fundamental and practical tool of risk allocation. The indemnity parameters are also classified in the third category as the final stage required to meet.

In the following table, the set of necessary parameters of insurance and indemnity clauses for

[7] The other titles are "Insurance and Indemnification", Liability and Indemnification", Liability and Insurance", "Liability for losses and damages"

[8] Risk Services Agreement, Angola, June 1976 Clause 33.

[9] Production Sharing Agreement, The Azerbaijan Republic, June, 1996, Clause 20.

upstream petroleum contracts, involving the basic and complementary ones within the three main

Table 1: The Set of Parameters of insurance and indemnity Clauses in the Upstream Petroleum Contracts, Source: The Findings of Study.

Type	Category	Parameters		IPC[10]	Others[11]	No. of Clause (As an instance)*
Basic	Liability towards Risks	Determination of liable contracting party for dealing with Risks, Losses or Damages		✓	✓	Azerbaijan Republic, PSC[12], Clause 22.2 Iranian Petroleum Contract (IPC), Clause 11.6
		Determining a definite territory or location for losses incur liabilities i.e. Contract Area		×	✓	Angola, Risk service contract, Clause 33
		Defining the extent of liability according to the provided law, to avoid a high degree of generality		×	✓	Angola, Risk service contract, Clause 33 Brazil, Technical services agreement 8.5
		The duty of "Loss Prevention" as the contractor's liability based on Best Industry Practice		×	✓	Angola Risk service contract, Clause 22
		The requirement of Operator or NOC to comply with the related National Legislations[13]		×	✓	Iraq PSC, Clause 2.6
		Exercise of Reasonable Care and Diligence in petroleum operations as a precondition for indemnification		×	✓	Brazil, PSC, Clause 19.1 Iraq, GSDPC[14], Clause 2.6
		Joint and Several Liability for the cases of more than 1 contractor		×	✓	Iceland. License, Clause 19
		Exclusions/ limitation of Liability	Consequential Damages or Indirect Losses[15]	✓	✓	Russian, PSC, Clause 21.3 IPC, Clause 11.13
			Losses not arising out of a failure to conduct Petroleum Operations as provided	✓	✓	Georgia, PSC, Clause 24.3.1 IPC, Clause 11.5
			Damages arising from any environmental condition or damages existing in the Contract Area prior to the contract effective date	×	✓	Georgia, PSC, Clause 24.3.2
			Force Majeure events[16]	×	✓	Georgia, PSC, Clause 24.3.2

[10] Upstream Iranian Petroleum Contract, Exploration, Development and Production Service Contract.
[11] Other Countries' Upstream Petroleum Contracts including Model and Actual contracts of 15 different countries.
[12] Production Sharing Contract
[13] Such as applicable workmen's compensation and employers' liability laws or insurance laws of the State
[14] Gas Service Development and Production Contract
[15] Such as loss of profit or revenue, costs and expenses resulting from business interruptions, loss of delay in production; loss of or damage to the leasehold; etc. (Sharpe,2009,p69)
[16] The exception: The contractor shall be liable for environmental conditions, damages resulting from a Force Majeure event to the extent that such conditions, or damages resulting from contractor's failure to exercise Good Oil Field Practices that would have prevented or ameliorated such environmental conditions or damages.

			Any damages caused by contamination entering the contract area as a result of State, NOC, or Third Party activities beyond or within the boundaries of the contract area	×	✓	Georgia, PSC, Clause 24.7
			Damages not under the direct possession and control of the Contractor or its Affiliate, its Subcontractors, and the Operating Company	×	✓	Georgia, PSC, Clause 24.8
			If the contractor has no possibility of exercising direct control in accordance with the Standard Practices of the international petroleum and natural gas industry	×	✓	Russian, PSC, Clause 21.4
			Any damages whatsoever in respect of the State share of petroleum, storage, or transportation thereof once NOC has taken custody of the State share of Petroleum	×	✓	Georgia, PSC, Clause 24.8
		Risk Management of Petroleum Operations according to the relevant National Legislation or the instructions, rules, and procedures approved by NOC or complying with the underlying insurance law[17]		×	✓	Angola, PSC, Clause 35
		Definition of third parties and excluding the governmental authorities not considered as the third parties		×	✓	Azerbaijan Republic, PSC, Clause 20.2
	Insurance	Determination of responsible contracting party for procurement of Insurance Policy[18]		✓	✓	Ecuadorian, Risk service contract, Clause 10.2 IPC, Clause 11.1 IPC, Clause 11.4
		The Duty of sub-contractors adequately to insure their risks under their relevant sub-contracts besides the duty of the contractor and operator		✓	✓	The republic of the Gambia, Petroleum License, Clause 14.3 Iraq PSC, Clause 24.5 IPC, Clause 11.1
		The determination of the market for obtaining the insurance policy, Domestically or		×	✓	Iraq PSC, Clause 24.6 Ecuadorian, Risk service contract, Clause 10.2

[17] e.g. The Contractor shall comply with what is established in Decree Nr. 39/01, of June 22, "Petroleum Activities Insurance Decree"

[18] Mostly the contractor is liable, even sometimes, referred to; "Contractor will be "*solely liable*" to maintain all the necessary national and international insurance policies.

		Internationally esp. in the case of unavailability, domestically			
		Reasonable Insurance Rates-Premium rates and Prevailing conditions not greater than Market Rates- as well as the need to update the commercial value annually	✓	✓	Azerbaijan Republic, PSC, Clause 20.1 IPC, Clauses 11.2 and 11.4
		Preparing third-party liability coverages according to the relevant laws in the field of liability such as applicable workmen's compensation and employers' liability laws[19]	✓	✓	Pakistan, Concession, Clause 24.2 IPC, 11.1
		Procurement of insurance in compliance with insurance laws and regulations of the relevant authorities; such as the Management Committee and in accordance with the BIP	✓	✓	Pakistan, Concession, Clause 24.1 India, PSC, Clause 24.1.1 IPC, Clause 11.3
		Duration of Insurance Policy, ordinary from the Effective Date of the contract	✓	✓	Ecuadorian, Risk service contract, Clause 10.2 IPC, Clauses 11.1
		Arranging appropriate Reinsurance plans for supporting direct insurance coverages	×	✓	Iraq PSC, Clause 24.5 Ecuadorian, Risk service contract, Clause 10.2.6
		Waiving all rights of subrogation against NOC and the government, any Designated Authority and the members of the Joint Commission	×	✓	Tanzania, PSC, Clause 18.3 (d)
		Considering NOC and the government (and their directors, officers, and employees) as Additional insureds and name the Designated Authority and the members of the Joint Commission as Co-insureds	×	✓	Australia, PSC, Clause 17.2 (b)
		The requirement of reviewing and approving the insurance plan by the JMC/BOD or Coordination committee and the prior written Approval of NOC[20]	✓	✓	Iraq, Service Contract, Clause 24.5, 24.8 Georgia, PSC, Clause 6.4.4 IPC, Clauses 11.1, 11.2, 11.3
		Determining the Types of Insurance Coverages of such type and amount as is customary in the International Petroleum Industry[21]	✓	✓	Libyan Arab Jamahiriya, PSC, Clause 6.2.10 Ecuadorian, Service contract, Clause 10.2.9 IPC, Clause 11.3, 11.1
		The need for the approval of the Steering Committee for additional insurance coverage or any further insurance, the contractor may at its discretion deem necessary	×	✓	Azerbaijan Republic, PSC, Clause 20.1 Ecuadorian, Service contract, Clause 10.2.12

[19] However, IPC includes this parameter but it has mentioned that the 3rd party liability coverage should be procured according to the good industry practice that needs amendment.
[20] Notwithstanding any such approval, the contractor shall be fully liable for the adequacy, sufficiency and suitability, as well as any shortcomings, of any such insurance program.
[21] Some prevalent types of Insurance Coverages customary in the International Petroleum Industry are Full Oil Industry Risk Coverage for Contract Activities, Public and Civil Liability Insurance, Fire Insurance, Electronic Equipment Insurance, Personal Injury and Life Insurance, Blow out Insurance, Cratering, Well Cost Control, Drilling Expenses, Environmental Pollution and Damage Insurance and Petroleum seepage and pollution.

	Indemnity	Determination of Liable Contracting Party for indemnity obligation	✓	✓	Lisbon, Concession, Clause 10 IPC, Clause 11.8, 11.9
		The duty of Indemnify, Defend and Hold harmless as three main functions in the indemnity process	✓	✓	India, PSC, Clause 24.2 Australia, PSC, Clause 17.1 IPC, Clause 11.10
		The conditions related to Gross negligence, Willful misconduct, or Serious Fault	✓	✓	Iceland. License, Clause 18 Angola, PSC, Clause 34.2, 34.3 IPC, Clause 11.11
		The Joint, Concurrent Negligent, or Intentional acts or omissions and assigning to each parties' liability relative to the degree of fault	×	✓	Tanzania, PSC, Clause 26.2 (d)
		The limitation of liability for Indemnification	✓	✓	Tanzania, PSC, Clause 26.1 Brazil, Service Contract, Clause 8 IPC, Clause 11.11, 11.6
		The indemnity inclusions; Repairing, Replacement, Restoration and Covering the Underinsured property	×	✓	Iraq, Service Contract, Clause 2.9 (a) Ecuadorian, Service contract, Clause 10.2.8
		The duty of the government to release and exempt contractors from the claims of third parties caused by the actions of the government or its representatives	✓	✓	Russian, PSC, Clause 21.5 IPC, Clauses 11.6, 11.8
		Indemnification for fines and penalties as the sole responsibility of the non-complying party[22]	✓	✓	Tanzania, PSC, Clause 24.6 IPC, Clause 11.5
		Indemnification Exemptions for the party claiming indemnification if reimbursed pursuant to any insurance policy	×	✓	Tanzania, PSC, Clause 26.2 (a)
		Indemnify and hold harmless concerning ESHIA requirements	✓	×	IPC, Clause 11.7
		The duty of indemnitee for giving timely notice of the claims and the opportunity to defend	×	✓	Angola, PSC, Clause 34.1
		Indemnity Exclusions / Limitation of Liability; Reduction or Cancelation of compensation if the party who suffered loss or died was himself partly responsible for the loss either intentionally or through gross negligence; failure during petroleum operation	×	✓	Iceland, Petroleum License, Clause 18
		Cancelation of Compensation for environmental damages caused by a natural catastrophe or by other uncontrollable events	×	✓	Iceland, Petroleum License, Clause 18

[22] However, IPC has different condition, the contractor shall indemnify and hold harmless NIOC in respect of fine and penalty arising out of or resulting from violation by contractor or its employees and personnel of any laws, rules, regulations and measures.

		The preconditions for indemnification; those not controllable by contractor and operator through the exercise of reasonable care and diligence in operations; not resulting from contractor and operator's failure to timely file and diligently pursue claims against insurance companies	×	✓	Iraq, Service Contract, Clause 2.6
Complementary	Liability towards Risks	Sole Risk; When the operation is conducted at the sole cost, risk, and expense of one party, usually the contractor	×	✓	Angola Risk service contract, Clause 29
		The duty of the government to protect and ensure the safety and security of the contractor's property and personnel in the territory of the contractor for the perils such as war and political issues, especially in the presence of foreign contractors[23]	×	✓	Georgia, PSC, Clause 24.9
		The liabilities of Co-ventures in terms of risks as the possible contracting parties	×	✓	Brazil, PSC, Clause 19.1 & 19.2
	Insurance	Engaging, renewing, and keeping in force all insurances as a duty of the contractor	×	✓	Ecuadorian, Service contract, Clause 5.1.17
		Failure to procure insurance triggering the liability of operator or government to undertake	×	✓	Tanzania, PSC, Clause 18.4
		The possibility of Self-Insurance according to the rules and written approval of NOC	×	✓	Federative Republic of Brazil, Concession, Clause 22.2 Australia, PSC, Clause 17.2 (i)
		Setting forth the insurance terms and conditions in more detail in the contract Annex	×	✓	Tanzania, PSC, Clause 18.1
		The Duty of Notifications to NOC in respect of any issues related to the insurance policies especially Insurance Reports and the duty of NOC to not disclosing	×	✓	Tanzania, PSC, Clause 18.5
		Cancelation and Renewing or any material changes of the insurance policy after giving 30 days prior written notice to the Government or NOC	×	✓	Tanzania, PSC, Clause 18.3 (e)
		Insurance Proceeds to be considered as Petroleum Costs and Cost Recoverable[24] or, Direct Capital Costs (DCC)	✓	✓	Azerbaijan Republic, PSC, Clause 20.1 Iraq, Service Contract, 24.7 IPC, Clause 11.12

[23] The other perils in addition to war (declared or undeclared), include civil conflict, sabotage, blockade, riot, terrorism, unlawful commercial extortion, or organized crime. Notwithstanding anything to the contrary contained herein, Contractor acknowledges and agrees that the obligations undertaken by the State are no greater than the general obligations of the State towards citizens of the country in respect to the perils named above. Furthermore, the contractor agrees that it shall have no claim for legal or equitable relief for the failure of the State to comply with the provisions of the Article, except as may be permitted by law.

[24] Provided that it is not attributable to the Gross Negligence or Willful Misconduct of contractor and operator or sub-contractors.

	Indemnity	Emergency Situations and events for which government provide the necessary assistance to the contractor in addition to any indemnity obligations	×	✓	Georgia, PSC, Clause 24.6
		Warranty or Representation that there is not any kind of licensing or exclusive commercial relationship with any other enterprise (NOC competitor) which can become or create an obstacle for NOC	×	✓	Brazil, Service Contract, Clause 7.4
		Infringe the intellectual property rights of third parties, no responsibility for the Contractor in terms of any information, materials, or equipment arising from the project either by NOC or by any third party, except those arising out of its own negligence	×	✓	Brazil, Service Contract, Clause 7.1
		Cancelation or Recession; such as failure to comply with the obligations constitutes a serious violation and excluding the Emergency Situations	×	✓	Georgia, PSC, Clause 24.10

6.Comparative analysis

As the results and discussion of the foregoing discourses, the comparative analysis of the necessary parameters of insurance and indemnity clauses, which were derived by examining the aforementioned risk allocation provisions of the upstream petroleum contracts from different countries in the previous part with the related clauses in IPC, is presented in this section. As a result, similarities and differences as well as strengths and weaknesses –including contractual shortcomings- have been detected. Therefore, enabling to resolve the existing weaknesses and clarify the ambiguities, by proposing the needed parameters for drafting and improving the previously mentioned clauses in upcoming upstream petroleum contracts of Iran.

The comparative analysis indicated that the insurance and indemnity clauses set out in the upstream Iranian Petroleum Contract are similar to the other related contracts in regards to the obtained parameters with a checkmark in the preceding table. Moreover, it has different points and deficiencies due to the lack of parameters illustrated by a cross sign, which represented the weaknesses, and contractual shortcomings that need to be meted to prevent any ambiguities leading to judicial interpretation of the contract as a time-consuming and costly process. However, among the different points, some of them can be considered as the strengths of IPC compared to the other countries' contracts while the others lack them.

This analysis also had shown that however almost all of the contracts besides the Iranian one, include the three main categories in the way they allocate risk between contract parties using the insurance and indemnity contractual tools as described, there still exist so many deficiencies involving the basic and complementary parameters which should be taken into consideration for having a thorough and effective petroleum contract in the context of insurance and indemnity clauses.

The common parameters stated in IPC have comprised of;

- Coordination with the National Iranian Oil Company (N.I.O.C) and its prior written Approval but with a higher emphasis in comparison to the other contracts, as it is repeated several times in the clauses
- Compliance with laws and regulations as well as considering the Best Industry Practice,
- Appointment of the responsible contracting party for the procurement of insurance coverage along with mentioning the inception time to be within six months from the effective date,
- Types of insurance coverages but with more concentration on third-party liability insurance, (The different point here as a deficiency is about the preparation of the third-party liability coverages according to the Best Industry Practice, since BIP is mostly used in the case of operational risks and its relevant insurance policies as they addressed the practical and technical issues. Therefore, it's better to procure the third party liability insurance according to the relevant laws in the field of liability such as applicable workmen's compensation and employers' liability laws instead).
- Exclusions including the popular one as indirect losses,
- Limitation of liability and at last;
- Indemnity and its related duties such as defending and hold harmless

Apart from the similarities, the focus of this study is more on the differences especially those leading to the shortcomings of the petroleum contract as well as the differences that can be regarded as the strengths.

The differences constituting the contractual shortcomings mostly were derived from detected parameters-both basic and complementary ones in the preceding section that were not being drafted in IPC. Thus they can be resolved by the inclusion of them and codification according to the legal wordings. In the case of the differences regarded as the strengths of IPC, in the insurance clauses category, it is stated that N.I.O.C besides the contractor is also liable for the procurement of insurance coverage. While it is customarily considered as the duty of contractor even solely and it was observed that just the failure to procure necessary insurance plans triggers the liability of the operator or government to undertake in the other contracts. Also, it has mentioned that 'N.I.O.C shall have and may exercise the option to provide at the contractor's cost such insurance coverage at a premium not greater than market rates for obtaining equivalent insurance coverage and security. A prerequisite is also determined here; provided that there is a requirement to notify the contractor of the said coverage for enabling him to arrange for substitute or additional policies to remedy any omissions.[25] A high level of emphasis also exists about the market rate for the premium and the prevailing conditions in comparison to the other contracts merely mentioning the reasonable premium rates.

In the case of indemnity clauses, it had very similarity with the other contracts except for the violation of the contractor or its employees and personnel and also the inclusion of fine and penalty, whereas indemnification for fines and penalties in the other contracts is addressed as the sole responsibility of the non-complying party. The other constructive difference as the strength was the contractor's liability to indemnify and hold N.I.O.C harmless from and against any and all loss or damage to the Environmental, Social, Safety, Security, and Health (as per the ESHIA plan requirements) resulted from or connected with the petroleum operations carried out by contractor under the contract. Therefore, it is recommended for inclusion in the other contract as a complementary parameter. Moreover, addressing the Direct Capital Costs (DCC) as the costs of insurance coverage obtained and maintained under the contract for insurance premiums, which paid by the contractor for obtaining such insurance coverage to be recoverable under the contract is an efficient clause in IPC, which in most of the reviewed contracts had not been drafted. Nevertheless, assuming it as the petroleum costs needs to be added as a complementary parameter.

In addition, the comparative analysis highlighted that nearly all the contracts as well as IPC, allocate the responsibility for indemnification of the particular adverse events including the death of, and personal injury to the members of both operator and contractor, firstly on a knock-for-knock basis.

[25] Iranian Petroleum Contract, (IPC), Exploration, Development and Production Service Contract, Clause 11.4

Thereafter, the parameters of indemnity are determined by assigning the best party suited to bear the risk and the duty of indemnity based on different rationales, such as the ownership of, or access to, resources with which to prevent a certain risk from occurring, besides the capability to bear the economic consequences. For instance, the contractors have mostly been considered as the principal party responsible for the economic consequences of almost any damages related to the petroleum operation in all of the aforementioned contracts. The rationale for this is based on the assumption that contractors can reduce risk volatility, according to the width of their properties or investment relative to the risk of damage to the petroleum facilities and due to the role as the main party in charge of the most portion of petroleum operations. It also found out that even some contracts considering the contractor's liability so broadly to include all and any damages, even due to the Acts of Gods and Force Majeure, climate changes, or weather-related natural disasters as the catastrophe events, although such events customarily shall be considered as exclusions. On the other hand, the economic benefit principle justifies the stance of contractors who presume that the majority of risks arising from the petroleum operation besides the responsibility for indemnification should be allocated to the operators as they benefit economically from production in the oilfield.

In the case of the insurance clause, IPC as well as the other contracts obliged the contractor to obtain insurance in respect of the liabilities it has assumed under the contract. Therefore, it can be analyzed that the contractor's responsibility for bearing the economic costs of the adverse events may be too much for it to carry without the utilization of insurance. Hence, indemnification would be idle if the responsible party were unable to handle the economic consequences, so these contracts not only binding the contractor to maintain insurance but also specify the types of insurance as well as the applicable thresholds and limits. Furthermore, the contractor is mandated to show evidence of compliance with the contractual requirement in this regard.

Given the type of the contract, however, it was not the objective of this study to compare them and just the general outcome of examining them was intended, it should be noted that PSCs and Service contracts are mostly the same as each other in terms of the insurance and indemnity clauses while the liability of the concessionaire, due to the nature of the license, is ordinarily considered such widely even expressed by the term of "full responsibility" for any loss and damage incurred out of hydrocarbon activities,[26] which subsequently constitute a broad exemption for the government implicitly.

Finally, according to the findings, the possibility of setting the aforesaid contractual clauses in the future petroleum contracts of Iran by applying the derived points would be provided in a more efficient manner, which eventually enhances the effectiveness of petroleum contracts in respect of insurance and indemnity and prevents potential future disputes which demonstrate the significance of the results of the study. Especially in comparison with the previous researches, none of them have addressed the parameters of this issue. Moreover, the achieved set of necessary parameters can be applied at the negotiation stage of petroleum contracts as one of the most challenging topics, ensuring the interests of the contracting parties and the balance of bargaining power.

7. Conclusions and suggestions

The discourses in the previous parts lead to certain two principal conclusions. The first main one, as the answer to the main question, is the extracted and achieved set of necessary parameters of insurance and indemnity clauses in the upstream petroleum contracts as mentioned in the related (Table 1). As a result, it is indicated that there are several parameters such as liability towards risks, determination of liable contracting party for procurement of insurance and indemnification of losses, limitation of liability, exclusions/exemptions, consequential damages, waiving all rights of subrogation, etc. playing roles for drafting the insurance and indemnity clauses contractually in the main types of upstream petroleum contracts". All of these obtained parameters should be considered in the wordings to have thorough and efficient

[26] The Concessionaire shall assume full and objective responsibility for all damage to the environment that may result, directly or indirectly, from the execution of the operations. (Federative republic of Brazil, Concession Contract, Clause 21.7).

insurance and indemnification clauses in the petroleum contract.

The second main conclusion is the identification of the existing contractual gaps and the common points, which were derived from examining and comparative analysis of the parameters, related to the foreign countries' contracts around the world with the IPC as stated in the comparative analysis section in detail.

In addition to the main desirable outcomes, some subsequent results have been inferred. It is concluded from the foregoing clauses that, it is actually the economic consequences arising out of the adverse events, which are being allocated, not the risk itself, thus the term "risk allocation" seems to be misleading. Since by allocation of any risk event and the liability to indemnify subsequently, despite several consequences-physical, bodily injury, legal, reputational- in fact, the economic costs of the occurrence are being allocated.

The study has also shown a transition in regards to the assignment of the best parties suited for bearing the risks and indemnification of petroleum contracts by development and utilization of risk allocation mechanisms such as indemnities, insurance, exclusions and limitation of liability on a knock-for-knock basis, rather than the bedrock fault-based regime. Therefore, the contracting parties are able to codify these mechanisms into their contracts and regulate the contractual provisions to express their intent unequivocally, which is more consistent with their contract objectives and expectations. This is contrary to the fault-based regime as a default indemnity bedrock based on certain principles and theories of liability, in which the contract parties must bear and indemnify the full brunt of economic costs arising out of the adverse events if they have occurred which can lead to more dissatisfaction.

Furthermore, the study found that a knock-for-knock basis is mostly used in respect of death; personal injury, loss of, or damage to operators and contractor's items and property in the petroleum contracts. In contrast to the consequential losses which are indemnified on a fault basis especially in respect of third-party death, personal injury, property loss or damage, intellectual property, and patent infringement; and insurance to cover assumed liabilities. The other losses are allocated based on optimality, where they are assigned to the party that seems best able to handle and compensates them.

Ultimately, it is suggested to apply the findings of this study in the petroleum business especially the Ministry of Petroleum of the Islamic Republic of Iran, enabling to take more effective measures for the promotion of this industry contracts in terms of the issues of insurance and indemnity in the process of risk allocation. As a specific suggestion for this ministry, focusing more on the insurance aspect especially for the upstream industry is recommended since most of the insurance schemes are designed for the downstream industry. In addition, the optimization of the wordings of these contracts for more conformity with the legal system of Iran and due to the lack of so many parameters is suggested.

As a specific suggestion for future researches in this area, it is proposed to codify the insurance and indemnity contractual clauses based on the legal wording of the contract, utilizing the set of insurance and indemnity clauses parameters extracted in this study for having a more precise and thorough petroleum contract. The examination of the insurance model for the contracts of the *National Iranian* South Oil Company (NISOC) is also offered for future research papers. Moreover, as a general suggestion, making future researches in this area is inevitable to keep up with its continuous development.

The most important limitation of the present study was the lack of access to the petroleum contracts due to confidentiality and the reluctance to provide information in this regard, according to the significance of the upstream petroleum industry.

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