



Developing a Framework for Accounting and Financial Management Procedures of Joint Operating Agreements (JOAs) in Iran's oil and gas industry

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ABSTRACT

Regarding the contingency theory, the purpose of this research is to identify factors affecting the development of accounting and financial management procedures for joint operating agreements in Iran's oil and gas industry. To this end, at first, some partial factors were identified through deep study of theoretical foundations. Subsequently, in order to identify environmental factors, a semi-structured interview was conducted with accounting and finance experts in oil and gas exploration and production companies whose competences were approved by the ministry of petroleum. Using the theoretical framework and interview results, a questionnaire was set up and distributed in a wider range in order to add potentials, eliminate, modify and finally rank the raised factors. The results showed that changes in laws and regulations, use of services in Iran's oil and gas industry, changes in business practices, information technologies, the structure of the principal contract and conflicts among operational parties are the most important factors that should be taken into account in the formulation and development of AFPs for these contracts in Iran's oil and gas industry, and in this regard some suggestions are provided.

Keywords:

Iranian Petroleum Contract, Joint Operating Agreement, Accounting & Financial Procedures, contingency theory.



1. Introduction

Sharing of costs and distribution of risk by establishing partnerships will allow International Oil and Gas Companies to take on a major responsibility for the exploration, development, and production of oil and gas, even in extremely costly and high-risk situations, such as offshore. Even in a low-cost and low-risk mode of operation, IOGCs will be willing to contribute to the advantages and economic scales. In some cases, the legal requirements and existing regulations require IOGCs to engage in a JOA (Brady, J. et.al.2011). Appropriate procedures for operating oil and gas reservoirs require monitoring and control by oil and gas resource owners and often lead them to engage in operations with IOGCs (Roberts, P.,2010). When it is to be shared the costs and benefits of a project or operation between two or more legal entities, there are questions about modality, howness and the mechanisms of cost and benefit sharing.

In such circumstances, an agreement is established for the joint operation in the form of a consortium or joint operation document. Issues such as operation ship, responsibilities, and authority of the operator and non-operators, how to allocate revenues and costs, etc. are those that can be clearly seen in a JOA or even a consortium contract; but that there are no specific guidelines or standards for accounting and reporting of financial events in JOAs. In such agreements, the only reference to determine the correct accounting behavior in dealing with financial events is Accounting & Financial Procedure (José Bucheb, 2007). AFPs are an integral part of the JOA and deal with issues such as how to allocate costs between partners, how to fund the required operations, the timing, and settlement of bills and statements, how to translate currencies, independent auditing, material management, equipment and inventory, etc. and includes accounting methods and financial management techniques to be used by the operator or non-operators (Wright, C.J. and Gallun, R.A, 2005).

Regardless of the inclusion of consortia as JOAs, due to developments in the oil and gas industry in Iran, we will observe JOAs; Because of emerging a new generation of contracts called Iranian Petroleum Contracts (IPCs). One of the main goals of Ministry of Petroleum (MOP) for introducing this new model is to use the country's maximum internal capacity. In this regard, the IOGC is required to establish a partnership with participation of Iranian qualified Exploration and

Production (E&P) Companies in form of JOA that under the supervision, management and responsibility of the contracting party, with all its technical and financial support, will carry out exploration, development, and operation of the oil and gas fields¹. The unitization of capital and interests in the form of such JOAs requires clarification of operational, legal and financial relationships between partners. financial management in such JOAs needs a tool to explain how the transactions and financial events between the partners must be recorded. The first step in the formulation of such an AFP is to identify factors that contribute to its development.

Financial and accounting issues of oil and gas have particular complexities, some of which are in the area of dispute and lawsuits. One of the effective ways to deal with any ambiguity, especially in financial affairs (which is primarily significant amounts), is to identify the factors influencing the development of the AFPs, to design and formulate guidelines in accordance with the contingencies and environmental conditions of Iran. Identification of these factors and elements makes the AFPs in a way designed and codified that, while clarifying the responsibilities and authorities of each stakeholder in financial transactions, minimizes the possibility of any self-interpretation of the agreement, plays an important role in the effective implementation of JOAs and assures financial managers that resources will be provided quickly when needed.

2. Literature Review

Joint operating agreements in Iran's oil and gas sector

Almost all companies operating in the upstream field of oil and gas are engaging in JVCs (Patrícia, C, 2008). These contracts are aimed at exploration, development, and operation of oil and gas reserves. Joint venture contracts may be made to facilitate the construction of a refinery, the construction of pipelines or other equipment that requires large financial resources or to manage and operate a joint operation of an oil and gas project (Roberts, P.,2010). accounting and financial reporting for such activities depends on the type of JVC. The International Accounting Standard No. 31, entitled "Interest in Joint Ventures," as well as Financial Reporting Standard No. 9, entitled "associates and joint ventures", generally outline the

way in which accounting and financial reporting are used in JVCs. Based on these standards, JVC takes place in three forms: Operation, asset(s) and/or economic entity under joint control (Wright, C.J., and Gallun, R.A., 2005)². according to the latest reviews and amendments (2016) in Iran's IPC, the establishment of any jointly controlled economic entity is prohibited.

The concessions, PSCs, service, and buy-backs are part of the oil and gas contracts, which are referred to as main upstream or primary contracts. However, in the current era, oil and gas contracts are not limited to this, but there are other types of contracts, called upstream co-operation contracts or also referred to as secondary contracts (Rodgers, R., Hallock, et.al,2004). Upstream co-operation contracts refer to contracts between oil companies to jointly participate in a tender or jointly explore/develop an oil and gas project, or unitize a common property. Among the most important of these contracts are "joint bidding contracts", "joint venture contracts", "unitization agreements" and "JOAs" (shiravi,2016).

Iran with huge reserves of oil and gas has experienced diverse contracts in its history of more than 100 years, from concessions to buy-backs. The problems and inadequacies in Iran's interdependent contracts have led the MOP to introduce new contract models called IPC. Increasing the revenues of foreign companies using the "fee" mechanism along with the long-term contract period and the assignment of the operating period to these companies are three important features of this new contract model (Mohammadi, et.al,2015). In these contracts, with the aim of transferring technical knowledge and using the country's maximum internal capacity, the IOGC is required to conclude a JOA with Iranian E&P companies whose competence is approved by the MOP. This JOA governs all oil and gas field development and operation under the supervision and management of the main contractor, with its full technical and financial support. Therefore, according to the government bodies' approval of the new model of IPCs, we will observe quick emergence and expansion of JOAs in the Iranian oil and gas law system in predictable futures.

Accounting & Financial Procedures development

Oil and gas companies must conclude contracts with mineral resource owners to access potential reserves and perform exploration and production activities. In the United States, these contracts are typically leased contracts, while outside of the United States, these contracts may take various forms (Walker Jr, A.W.,1928). Oil and gas companies are negotiating with the host governments for exploration, development, and extraction of hydrocarbon reserves. These contracts may be concessional, PSC or service or take other forms. Contrary to financial accounting, there is no standard for contract accounting in the oil and gas industry (Wright, C.J. and Gallun, R.A, 2005), because we cannot consider the same articles, clauses, provisions, and structure for the contracts. The sole source and reference of accountants for contract accounting are AFPs. When the number of operational partners is more than one, both AFPs and contract accounting become the most complex. For this reason, in most cases, the term "contract accounting" is by default the same as the accounting for JOAs in accordance with annexed AFPs (Wright, C.J., and Gallun, R.A, 2005). In an operation involving several partners, only one of the partners will manage the day-to-day operation as the operator (consortium leader). The JOA specifies the roles and responsibilities of each of the partners and determines the instructions for allocating costs and revenues. JOAs have an exhibit named AFPs.

This exhibit is an integral part of a contract and deals with accounting and financial management issues. In contract accounting, the emphasis and focus are on AFPs and it is needed to be evaluated and analyzed. The existence of AFPs ensures non-operating partners that the operator acts in accordance with the clauses of the contract and the procedures set forth therein. In addition, other non-operating partners should be familiar with accounting procedures not only to determine their share of spending and income but also to oversee spending by the operator and its financial activities.

Although there is no standard for contract accounting in the oil and gas industry, the Council of Petroleum Accountant Society (COPAS) at U.S. level and Association of International Petroleum Negotiators (AIPN) at international level, play an

important role in the designation and development of AFPs attached to contracts. These entities do not have legal authority; however, if the contract affirms the use of the AFPs issued by these associations, the parties to the contract are required (contractually) to comply with that AFPs during the contract period (McArthur, J.B., 1995; Miles, C.M., 2003). These forms and templates have already been prepared and can be changed in different circumstances, depending on the priorities of the parties to the primary and secondary contracts. Given that there is no significant difference between the two instructions, we can perceive them as following structures:

- **Section1:** general provisions: definitions, billing & statements, payments, adjustments, financial audits, approval of non-operators.
- **Section 2:** determining direct charges: The direct costs are costs that the operator can recover directly through the billing. Among these costs are rents, royalties, operator's staff salaries and benefits (which are directly related to operation), governmental expenses, purchased material and equipment, cost of services used, damages and losses incurred on joint property (except in cases of misconduct and negligence of the operator), legal expenses, taxes, insurance coverage costs, etc.
- **Section 3:** indirect charges (overheads)
- **Section4:** pricing of joint material and equipment, purchasing, and dispositions
- **Section5:** managing of inventories

Conceptual framework development

Etemadi & Tavakkoli Mohammadi (2005) followed by Ebrahimi Kour-Lar and Moghaddaspour (2012) used contingency theory and identified the effective factors on the development of financial and managerial accounting, respectively. Studies have also been carried out abroad, which are indirectly related to the subject of this research. Belkaoui (1985), Choi, Frederick DS, and Gerhard G. Mueller (1992), Saudagaran (2009) and Černe, Ksenija (2009) also explored the factors that contribute to the development of accounting systems around the world. However, in this researches, factors such as laws and regulations, organizational structures, capital markets, political and economic sovereignty, etc. are mentioned as the main factors, but there are criticisms or compelling reasons

that show these results cannot be applied by the researcher:

- 1) Accounting and financial information in the oil and gas industry can be used in the context of financial, management, taxation, and contracts. Internal and external research has only focused on the financial or managerial accounting system, while the main focus of this research is the contract accounting.
- 2) the upstream sector in the oil and gas industry has inherent characteristics, unique accounting standards and financial management procedures that the prevailing accounting, financial and reporting systems do not have much applications in this sector (14).
- 3) the number of these studies may be large, but they focus on a few, general and limited factors. This is while we are also looking for specialized factors (industry-based factors).
- 4) Sometimes the results of this research contradict each other and, therefore, their results cannot be relied upon to formulate the conceptual framework³.

It was stated that AIPN and COPAS have issued some AFPs models and templates for JOAs in the U.S and international level, respectively. AIPN has released five versions for AFPs of JOAs at 1992, 2000, 2002, 2004 and 2012, respectively (AIPN's accounting procedures version, 2012). COPAS also has issued eight versions for AFPs attached to JOAs at 1962, 1968, 1975, 1976, 1984, 1986, 1995 and 2005, respectively (COPAS's accounting procedures, MFI,2005). these institutions use interpretative declarations before or along with each of their versions, in which present the positive development of each version over the previous version and its causes and factors. These declarations are called "preannouncements", "Model Form Interpretations" or "Accounting Guidelines" by COPAS and AIPN's members (Jennings, D.R., et.al, 2000). The study of these interpretative statements, along with a line-by-line comparison with each of these versions, although it was a very time-consuming task, was the best and most effective way to formulate a conceptual framework.

Some of the factors directly affect the AFPs, while there are some economic, social, political and legal factors that affect the AFPs attached to the contracts

with the intermediary. In other words, these factors primarily affect the **structure of principal contracts (the original contract or JOA)**, and then, through this mechanism, affect the AFPs⁴. **Changes in business practices and industry needs** are the second main factor that affects designation and development of AFPs and are common between COPAS and AIPN (Jonathan, D., Derrick, J., 2005). In this regards, the needs for effective and constructive interaction with supervisory and regulatory bodies, more transparency and disclosure of information in financial reporting, Use of trained and experienced law and accounting personnel and The need to monitor operator activities by non-operator partners are factors that are specified at COPAS MFI no 5,17,19,30 and AIPN AG 1992, 2000, 2004.

IT advancement and broadening use of IT in oil and gas industry is the third main factors according to COPAS MFIs and AIPN's AGs (Jonathan, D., Derrick, J., 2005; Jennings, D. R, et.al,2000). Development of infrastructure for receiving, sending, documenting, recording and communicating financial and non-financial information, increasing controls (input-output) and monitoring over the quality of information systems, Advances in issuing and submitting bills and electronic payment methods and Use of financial and accounting information systems to report and share revenues and expenditures are among technology-related factors that have affected the development of

AFP for both primary and secondary contracts (Jennings, D. R, et.al,2000)⁵.

According to members of these associations, the oil and gas industry cannot operate independently of the environment. This connection with the environment imposes limitations on oil and gas activities, which are often reflected in forms of **laws and regulations** (Jennings, D.R,200; COPAS's accounting procedures, MFI,2005; AIPN's accounting procedures version, 2012; Jonathan, D., Derrick, J., 2005). **Increasing use of other services in the oil and gas industry** as a powerful factor affects development of upstream and downstream petroleum contracts (Aghion, P. and Quesada, L., 2010). Jonathan, D. and Derrick, J. (2005) believed that broader use of audit and insurance services in the oil and gas industry along with development of transport and communications infrastructures have an Undeniable role in development of petroleum contracts, their articles, and provisions. **Conflicts among or between partners** on direct and indirect (recoverable, non-recoverable) expenditures, pricing of materials and equipment, allocation of revenues and expenditures and timing and amount of settlement are the most important factors that may affect AFP developments (Jonathan, D., Derrick, J., 2005).

Now, we can formulate the conceptual framework as figure1 below:

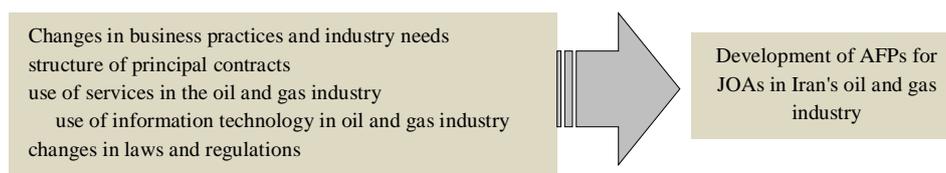


Figure1: Conceptual framework of research

3. Methodology

Based on the theory that assumes research as a layer-by-layer onion, the methodological attributes of research are presented in table1 below.

the universe is a blend of objective and subjective realities that are governed by certain rules and disciplines, so the philosophy of this study is functionalism. Since the researcher does not seek to test the hypothesis in this research and does not start

his work with an aforementioned theory, the approach of this research is inductive.

The general discussion of contingency theory is that there is no universal form for the accounting and financial systems, so Specific situations, and environments dictate the best system choices. In this research, due to the contingency theory, we seek to identify the factors influencing the development of AFPs in JOAs of Iran's petroleum environment. for

this reason, the strategy is Surveying study with multi-method choice⁶ in descriptive-analytical forms. The use of mono methods is not enough to choose mixed-method. Although this research has not been carried out with the support or order of a specific organization, it is applicable in term of purpose, because its results can be used in the formulation of JOAs and annexed AFPs, especially in Iranian E&P companies. The Theoretical scope of this study is contract accounting and financial management in oil and gas industry, The

Spatial scope of this research is all E&P companies operating in Iran's oil and gas industry and finally, we must limit the time scope of research to the use of JOAs in Iran's oil and gas industry. Primary data were collected through semi-structured interview and valid/reliable questionnaire. Also, data needed for developing conceptual framework were collected through books, journals, dissertations and Internet databases. To do this, the archival methods were used.

Table1: Methodological characteristics of research

characteristics	descriptions
philosophy	functionalism
Approach	Inductive
Strategy	Surveying study
Choice	Mostly qualitative (multi-method) with minimum use of mono methods.
purpose	applicational
Data collection	Interview and questionnaire
Population	All experienced experts in accounting, finance, contract and even project management departments in E&P firms operating in Iran's oil and gas industry
Sample	Some of the population working in only those E&P companies that have been qualified by MOP to be a partner in JOAs (32 and 80 cases were selected for interview and questionnaire, respectively)
Sampling method	Snowball
Analysis method-tools	Descriptive (interpretive) analysis with minimum use of statistics for significance tests and final ranking- SPSS software
Ranking methods	Lee Ho & Friedman test
Level of analysis	individuals

4. Results

The purpose of this interview was to identify the environmental and contingent factors affecting the development of AFPs annexed to JOAs in the Iranian oil and gas industry (which was not mentioned in the conceptual framework) and the elimination of unrelated identified factors in the conceptual framework. Although the subject of the JOA and its AFPs in Iran is new, there has been significant progress in developing accounting and financial accounting guidelines of buy-backs and in this section, it has been sought more than individual specialist in this field. therefore, the number of interviewees is less than the statistical sample of questionnaire⁷.

Most interviewees believed that ambiguity in the structure of contracts is effective on annexes to contracts and number of amendments. In their view, the greater transparency of articles and provisions in the contract and more detailed budget and work plan

communicated by the employer, make the contract accounting and financial management, easier. More than half of the respondents claimed that the complexity of contractual relationships affects the accounting and financial management of oil and gas contracts due to the entry of a diverse range of investors with different goals and objectives. In their view, a proper accounting and financial system in the contract must be formulated and completed in order to meet the interests and needs of this diverse range of individuals. According to interviewees, all components identified for principal contract's structure will influence development of AFPs annexed to JOAs in Iranian oil and gas industry, and requirements for the maximum use of domestic capabilities and agreements on the allocation of contract risks should be added to account.

Regarding the changes in business practices and industry needs, all interviewees stated that the changes

in business environment also have been occurred in Iran's oil and gas industry that leads to meeting of some needs and the emergence of new ones. In their view, need for interaction, high transparency, in-house monitoring, timely information for decision-making, the development of access to various financial markets, need for training and skills in business management, ... all constitute the characteristics of today's trade, and respondent also admitted them. From the respondents' point of view, this changes in practices and requirements along with the need to reduce the volume and number of amendments all have a direct impact on the costs and benefits of the parties to the contract.

The interviewees, like the researcher, acknowledged that in the formulation of clauses, provisions, and appendices of the contracts, the information, and communication technology should be used as much as possible. According to their viewpoint, decisions in the oil and gas industry will be made at a speed and ease with the use of information technology. All interviewees agreed that developing the infrastructure for receiving, sending, documenting, recording and sharing financial and non-financial information, advancements in the fields of issuing and sending invoices and methods of payments, and using financial accounting systems for reporting purposes and sharing revenues and expenditures, reduce the need for using overload calculations and enhances the quality, efficiency, and effectiveness of information processing.

Significant results were achieved in the use of services in other areas and sciences in the oil and gas industry. Conversations about transportation and communication infrastructures showed that in almost all contracts, there is a mechanism that requires agreement on the use of these services. The use of this infrastructure also bears and brings expenditure and revenue for the parties to the contract, which taking to account these expenditures as direct or overhead costs is specified in AFPs. According to the interviewees, the issue of insurance in the oil and gas industry and in joint operations is so important that it forms one of the contract's exhibits. Considering that today the insurance industry is used in a wide range in oil and gas industry and is increasing day by day, it is one of

the most important factors contributing to the development of accounting and financial instructions.

Conflicts between or among parties was another factor that we assumed. In this regard, the disagreement between the partners about being direct or indirect (recoverable or non-recoverable) expenditures, pricing of material and equipment, allocation of expenditure and revenues and timing and amounts of settlements were approved by all respondents as components that could affect design and development of AFPs. The majority of interviewees also claimed that the costs of dispute resolution between partners in the country and the efficiency of judicial institutions and prosecution processes should be considered in the formulation and development of JOAs since they impact direct and overhead costs and encounter joint operations with abnormal interruptions.

All respondents agreed that the country has several laws and regulations that should be reflected well in the AFPs, in order to refrain the ambiguity of external partners and to decide on compliance/non-compliance costs. Some of this laws and regulations are related to acquiring licenses, registering companies and managing branches and representing by foreign partners. There was a controversy among the interviewees about this component and some believed that since the establishment of a joint operating company or Special Purpose Vehicle (SPV) by foreign partners is prohibited in IPCs, this could not be relevant. The view of the researcher was also close to this group, which is why this component has been omitted from the final list of factors that were presented at the end of this section.

We can summarize the interview results in table 2 below:

Table 2- results of interview analysis

factors	components
structure of principal contracts (primary contract and JOA)	<ol style="list-style-type: none"> 1. The existence of ambiguities and gray areas in the principal contract 2. The budget and work plan provided in the principal contract 3. The financial regime governing the principal contract 4. The complexity of contractual relations and the existence of different investors 5. requirements related to the use of maximum internal capacity (local contents) 6. Agreements in the principal contract regarding the allocation of contractual risks
Changes in business practices and industry needs	<ol style="list-style-type: none"> 7. need to manage operator and nonoperator's relationships with each other, affiliated companies and third-party subcontractors. 8. need for effective interaction of contracting parties with regulatory and bodies 9. need for more transparency and disclosure of information in financial reporting 10. Use of trained and experienced law enforcement and accounting personnel 11. need to monitor operating activities by non-operating partners 12. benchmarking and the need to transfer experience from international cases 13. The need to reduce the volume and multiplicity of the amendments 14. Developing partner access to financial markets 15. need for timely financial information for decision making
Broader use of IT in oil and gas industry	<ol style="list-style-type: none"> 16. Development of infrastructure for receiving, sending, documenting, recording and communicating financial and non-financial information 17. Controlling and monitoring the quality of information systems 18. Advances in issuing and submitting bills and electronic payment methods 19. Use of financial and accounting information systems to report and share revenues and expenditures 20. Recording information on the receipt and delivery of oil and gas using information systems 21. Verification and approval of documents related to joint operations with electronic methods
Broader use of services in oil and gas industry	<ol style="list-style-type: none"> 22. Developments in use of financial reporting and accounting services 23. Developments in use of audit services 24. Developments in use of insurance services 25. Developments in use of transportation and communication infrastructures 26. Developments in banking relationships (nationally and internationally) 27. Developments in use of consulting services 28. Developments in the level of education and training of the accounting profession and laws in universities
Conflicts among parties	<ol style="list-style-type: none"> 29. Conflicts on direct/indirect expenditures 30. Conflicts on the pricing of materials and equipment 31. Dispute settlement costs 32. The efficiency of judicial institutions and investigating processes 33. Disagreement between/among partners on how to share revenue-expenditure 34. Conflicts on timing and amounts of settlements
Changes in laws and regulations	<ol style="list-style-type: none"> 35. Changes in tax laws (VAT, direct taxes, etc.) 36. Changes in labor laws and human resource employment-related regulations. 37. Emergence and development of HSE provisions and regulations 38. Changes in insurance laws and regulations 39. The requirement for financial transparency in the Tehran stock exchange and other TSE laws and instructions 40. Regulations and provisions related to tariffs and customs duties and foreign investment in Iran

After analyzing the interview, the identified factors and components were presented to a wider range of contract accounting and financial experts engaged in selected E&P companies in the form of a questionnaire. The purpose of this questionnaire was to add potential factors, eliminate unrelated ones, and ultimately rank the factors. For this reason, the

questionnaire was designed in the Likert scale (from one to five) so that respondents, while scoring each component, could comment the modification and customization of the components, then add and score some factors which the researcher was unaware of them.

In an analysis of the questionnaire, no evidence was found about the addition of new factors and components. In order to remove irrelevant factors and components, after testing the normality (Kolmogorov-Smirnov), the one sample t-test was used. According to the obtained p-values, all of factors and components were significant. The results of the factor ranking were

also similar in both methods due to the low oscillation and fluctuation in responses⁸. This ranking is presented in table 3 below; According to that, the most important factor that affects the development of AFPs for JOAs in Iran's oil and gas industry is Changes in laws and regulations.

Table3: ranking of identified factors

factor	Friedman index	Mean	priority
Changes in laws and regulations	5.78	4.7580	1
Broader use of services in oil and gas industry	4.08	3.9530	2
Changes in business practices and industry needs	3.74	3.8995	3
Broader use of IT in oil and gas industry	3.51	3.8288	4
structure of principal contracts (primary contract and JOA)	2.00	3.1872	5
Conflicts among parties	1.89	3.0411	6

5. Discussion and Conclusions

there are many laws, regulations, codes and instructions in Iran that govern the calculation and payment of taxes, the recruitment and employment of labor, insurance policies (social security, retirement (pension), etc.), health, security and environment (HSE), foreign investment, customs duties and tariffs, financial reporting in capital market, use of the maximum internal capacity, guidelines for the resistance economy, and so on. However, the existence of laws and regulations in the oil and gas industry is indispensable for coordination, but Massive volume along with continuous changes (instability) are two hallmarks of these laws and regulations, which may cause uncertainty and bewilderment for foreign investors and parties⁹. Laws and regulations affect more sections in the structure of AFPs (general provisions, direct charges, overheads, material/equipment pricing and inventory management) than the other factors. Considering these laws and regulations and observing continuous changes is the most important factor that has prompted the development of AFPs for all types of petroleum contracts from the past and should, therefore, be considered in the formulation of AFPs for JOAs in Iran's oil and gas industry. This is in line with COPAS MFI No.2,4,5,17,19 and AIPN AG 1992, 2000 and 2002. Therefore, contract accounting and financial departments of E&P companies must consider these factors and related components to assess the risks and develop AFPs for JOA. To do this, they should constantly monitor changes in the laws and

regulations, business practices and information technologies to develop flexible AFPs

Association of Certified Public Accountants and the audit firms have been working on the development of accounting and auditing standards for Iran's oil and gas industry. At the time of the auditor's selection, E&P companies should pay attention to the level of expertise, reputation, background, etc. and preferably, select a certificated public accountant. Any achievement of these professions along with the use of banking, insurance, transportation and communications services as well as financial, technical and legal advice are important components that should be taken into account in the formulation of AFPs for JOAs in Iran's oil and gas industry. These components along with the development of the level of education and training of the accounting profession at universities and academic circles could affect the AFP's structures (general provisions, direct charges, overheads, etc.) and also must be considered. These results confirm the Jonathan, D. and Derrick, J. (2005) findings and are consistent with AIPN AG 2004 and 2012.

management of relations requires constructive interactions between the operator and responsible authorities, use of experienced and high skilled personnel and transparency in financial reporting. These issues, in line with the parties' efforts to exploit competitive advantages, benchmarking, developing access to financial markets, reducing the contractual modifications (uncertainty), and the need for timely access to accurate financial information for decision

making, are all of today's demands in JOAs in the oil and gas industry that must be considered in AFPs' structuring (Jonathan, D., Derrick, J., 2005). E&P companies must develop clear and transparent procedures and instructions for interactions between operational partners, affiliates, subcontractors, governmental authorities and other legislative bodies and use effective communication tools in this regard.

The successfulness of a joint operation involves the exchange of a large amount of operational and financial information between partners. Earlier, this information was collected, categorized and published using traditional and manual methods; but later, computer technology provided companies with the ability to develop software programs for storing data and preparing financial reports. It is also supposed to E&P companies to develop using of Electronic Data Interchange instead of conventional methods. Crude oil data exchange, check stub data exchange¹⁰, Gas revenue accounting data exchange, Joint audit data exchange and Joint interest billing exchange are the most applicable EDI methods in this regard. Beyond these, the budget and work plan provided in the IPCs and JOAs, governing financial regime, requirements for the maximum use of domestic capacities of the Iran (as specified in the IPCs) and efficiency or inefficiency in litigation processes must be considered in formulation of the direct charges and overhead sections in AFP's structure. These results confirm COPAS MFI No. 1,2,5,17,19,30, AIPN AG 1992,2000,2002,2004 and 2014 and are also consistent with Jonathan, D. and Derrick, J. (2005) findings.

The lack of internal and external studies, difficult access to the statistical population due to geographical dispersion and working conditions of respondents, not assigning adequate time and Precision, lack of interest in managers and experts to answer interview questions, etc. are among the barriers and limitations that were observed. So, it is suggested for further research to examine the validity, sustainability, and durability of presented factors and components.

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Nomenclatures

AFP: Accounting and Financial Procedure
 AIPN: Association of International Petroleum Negotiators
 COPAS: Council of Petroleum Accountant Society
 E&P: Exploration and Production
 HSE: Health, Security, and Environment
 IOGC: International Oil and Gas Company
 IPC: Iranian Petroleum Contract
 JOA: Joint Operating Agreement
 JVC: Joint Venture Contract
 MFI: Model Form Interpretation
 MOP: Ministry of Petroleum
 NIOC: National Iranian Oil Company
 PSC: Production Sharing Contracts
 VAT: Value Added Tax

Appendix: summary of statistical tests

Kolmogorov-Smirnov Test

		structur e	practices	IT	services	Conflicts	Regulations
N		73	73	73	73	73	73
Normal Parameters ^{a,b}	Mean	3.1872	3.8995	3.8288	3.9530	4.7580	4.7580
	Std. Deviation	.32507	.38319	.74482	.64552	.45052	.45052
Most Extreme Differences	Absolute	.119	.112	.167	.140	.296	.296
	Positive	.107	.112	.167	.067	.296	.296
	Negative	-.119	-.110	-.119	-.140	-.255	-.255
Test Statistic		.119	.112	.167	.140	.109	.296
Asymp. Sig. (2-tailed)		.013 ^c	.024 ^c	.0001 ^c	.001 ^c	.031 ^c	.002 ^c

- a. Test distribution is Normal.
 b. Calculated from data.
 c. Lilliefors Significance Correction.

One-Sample Test
Test Value = 3

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
c1	2.807	72	.006	.16438	.0476	.2811
c2	.134	72	.004	.01370	-.1902	.2176
c3	3.377	72	.001	.31507	.1291	.5011
c4	3.259	72	.002	.28767	.1117	.4636
c5	.648	72	.019	.06849	-.1421	.2791
c6	3.200	72	.002	.27397	.1033	.4446
c7	5.400	72	.000	.60274	.3802	.8252
c8	8.153	72	.000	.79452	.6002	.9888
c9	8.863	72	.000	.94521	.7326	1.1578
c10	8.302	72	.000	.78082	.5933	.9683
c11	8.058	72	.000	.82192	.6186	1.0253
c12	8.431	72	.000	.84932	.6485	1.0501
c13	10.291	72	.000	1.06849	.8615	1.2755
c14	10.779	72	.000	1.09589	.8932	1.2986
c15	10.765	72	.000	1.13699	.9264	1.3475
c16	2.839	72	.006	1.16438	.3468	1.9819
c17	6.408	72	.000	.71233	.4907	.9339
c18	9.816	72	.000	.86301	.6877	1.0383

One-Sample Test

Test Value = 3

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
c19	7.038	72	.000	.80822	.5793	1.0371
c20	6.181	72	.000	.72603	.4919	.9602
c21	6.171	72	.000	.69863	.4729	.9243
c22	7.502	72	.000	.90411	.6639	1.1443
c23	7.672	72	.000	.94521	.6996	1.1908
c24	7.972	72	.000	1.01370	.7602	1.2672
c25	6.665	72	.000	.84932	.5953	1.1033
c26	7.789	72	.000	.97260	.7237	1.2215
c27	9.755	72	.000	1.09589	.8720	1.3198
c28	7.448	72	.000	.89041	.6521	1.1287
c29	.399	72	.0091	.06849	-.2735	.4104
c30	-.098	72	.022	-.01370	-.2927	.2653
c31	.081	72	.035	.01370	-.3219	.3493
c32	-.243	72	.009	-.04110	-.3788	.2967
c33	.609	72	.044	.09589	-.2180	.4098
c34	.797	72	.028	.12329	-.1852	.4318
c35	83.732	72	.000	1.95890	1.9123	2.0055
c36	19.449	72	.000	1.73973	1.5614	1.9180
c37	23.539	72	.000	1.69863	1.5548	1.8425
c38	19.929	72	.000	1.73973	1.5657	1.9137
c39	18.243	72	.000	1.67123	1.4886	1.8539
c40	20.446	72	.000	1.73973	1.5701	1.9093

one-Sample Test

structure	4.921	72	.000	.18721	.1114	.2631
practices	20.057	72	.000	.89954	.8101	.9889
IT	9.507	72	.000	.82877	.6550	1.0025
services	12.614	72	.000	.95303	.8024	1.1036
Conflicts	.531	72	.047	.04110	-.1132	.1954
Regulations	33.340	72	.000	1.75799	1.6529	1.8631

Friedman Ranks

factors	Mean Rank
structure	2.00
practices	3.74
IT	3.51
services	4.08
Conflicts	1.89
Regulations	5.78

Test Statistics

N	73
Chi-Square	220.946
df	5
Asymp. Sig.	.000

Notes

¹ . For example, the development of phase 11 of South Pars by the Pars oil and gas company, Total and CNPC.

² . Iranian GAAP no. 23 also approve this classification.

³ . for example, Adhikari A. (1992) Did not provide evidence of the impact of economic development on accounting development. while Frank W.G. (1979) concluded that economic development is effective on accounting development.

⁴ . COPAS MFI-1, 2,4,5,17,19,30,51 & AIPN AG-1992, 2000, 2002, 2004 and 2012.

⁵ . COPAS MFI-5,17,19,30,51 & AIPN AG-1992, 2000, 2004 and 2012.

⁶ . Mostly qualitative with minimum use of mono methods.

⁷ . The interviewee's personal information remains confidential with the researcher.

⁸ . Lee Ho ranking factors focuses only on the empirical mean of responses and does not consider the variance and standard deviations. To overcome this drawback, Friedman's complementary ranking method was used, whose results are more reliable.

⁹ . Mortaza Ezzati and Mohammad Ali Dehghan, Economic Security in Iran, Islamic Consultative Research Center.

¹⁰ . Automatically reviews and exchanges information about properties that are owned, jointly.