



Identification of Factors Affecting the Development of Accounting and Financial Management Procedures for Joint Operating Agreements (JOA) in Iran's Oil and Gas Industry

Mohammad Tavakoli Mohammadi^a, Mansour Ahmadnejad^b and Ali Es'haghzade^c

^a Assistant Professor, Accounting Department, Petroleum Faculty of Tehran, Petroleum University of Technology, Tehran, Iran, Email: mtavakolm@put.ac.ir

^b Assistant Professor, Law Department, Petroleum Faculty of Tehran, Petroleum University of Technology, Tehran, Iran, Email: ahmadnejad@put.ac.ir

^c MA Student in Finance- Financing and Investing in Oil and Gas Industry, Petroleum Faculty of Tehran, Petroleum University of Technology, Tehran, Iran, Email: ali_eshaghzade@put.ac.ir

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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 (AFP) for joint operating agreements in Iran's oil and gas industry. To this end, at first, some partial factors were identified through a 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 the interview results, a questionnaire was set up and distributed in a wider range in order to add potentials and 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 AFP's for these contracts in Iran's oil and gas industry, and, in this regard, some suggestions are provided.

1. Introduction

Sharing of costs and distribution of risk by establishing partnerships will allow international oil and gas companies (IOGC) 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, IOGC's will be willing to contribute to the advantages and economic scales. In some cases, the legal requirements and existing regulations require IOGC's to engage in a joint operating agreement (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 IOGC's (Roberts P., 2010). When the costs and benefits of a project or operation are to be shared between two or more legal entities, there are questions about modality, how, 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; however, there are no specific guidelines or standards for accounting and reporting of financial events in JOA's. In such agreements, the only reference to determine the correct accounting behavior in dealing with financial events is accounting and financial procedures (José Bucheb, 2007). AFP's 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, how to time and settle bills and statements, how to translate currencies, how to independently carry out the audit, how to manage material, equipment, and inventory

* Corresponding Author

etc. AFP's also include 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 JOA's, due to developments in the oil and gas industry in Iran and because of emerging a new generation of contracts called Iranian Petroleum Contracts (IPC's), we will observe JOA's. 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 the participation of Iranian qualified exploration and production (E&P) companies in the form of JOA; this partnership will carry out exploration, development, and operation of the oil and gas fields under the supervision, management, and responsibility of the contracting party and with all its technical and financial support. The unitization of capital and interests in the form of such JOA's requires the clarification of operational, legal, and financial relationships between partners. Financial management in such JOA's 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 AFP's so as to design and formulate guidelines in accordance with the contingencies and environmental conditions of Iran. The identification of these factors and elements designs and codifies the AFP's in a way that, while clarifying the responsibilities and authorities of each stakeholder in financial transactions minimizes the possibility of any self-interpretation of the agreement. Therefore, AFP's play an important role in the effective implementation of JOA's and assure financial managers that resources will be provided quickly when needed.

2. 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 joint venture contracts (JVC's) (Patrícia C., 2008). These contracts are aimed at the exploration, development, and operation of oil and

gas reserves. Joint venture contracts may be employed to facilitate the construction of a refinery, pipelines, or other equipment which requires large financial resources or used to manage and operate a joint operation of an oil and gas project (Roberts P., 2010). Accounting and financial reporting for such activities depend on the type of JVC. The International Accounting Standard No. 31, entitled "Interest in Joint Ventures," and Financial Reporting Standard No. 9, entitled "Associates and Joint Ventures," generally outline the way in which accounting and financial reporting are used in JVC's. 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). According to the latest reviews and amendments (2016) to Iran's IPC's, the establishment of any jointly controlled economic entity is prohibited.

The concessions, production sharing contracts (PSC's), services, 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

Table 1- Conceptual framework of the research

| Characteristics | Descriptions |
|-----------------------|---|
| Philosophy | Functionalism |
| Approach | Inductive |
| Strategy | Surveying study |
| Choice | Mostly qualitative (multi-method) with minimum use of mono methods |
| Purpose | Applied |
| Data collection | Interview and questionnaire |
| Population | All experienced experts of accounting, finance, contract, and even project management departments in E&P firms operating in Iran's oil and gas industry |
| Sample | Some of population working in only those E&P companies qualified by MOP to be a partner in JOA's (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 by SPSS software |
| Ranking methods | Lee Ho and Friedman test |
| Level of analysis | Individuals |

¹For 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 approves this classification.

Table 2- Results of interview analysis

| Factors | Components |
|---|--|
| Structure of principal contracts (primary contract and JOA) | <ol style="list-style-type: none"> 1. 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. The need to manage operator and non-operator's relationships with each other, affiliated companies, and third party subcontractors. 8. The need for the effective interaction of contracting parties with regulatory bodies 9. The need for more transparency and disclosure of information in financial reporting 10. Use of trained and experienced law enforcement and accounting personnel 11. The 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. The 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. Advancing on issuing and submitting bills and electronic payment methods 19. Using 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. Verifying and approving documents related to joint operations using electronic methods |
| Broader use of services in oil and gas industry | <ol style="list-style-type: none"> 22. Developing use of financial reporting and accounting services 23. Developing use of audit services 24. Developing use of insurance services 25. Developing use of transportation and communication infrastructures 26. Developing banking relationships (nationally and internationally) 27. Developing use of consulting services 28. Developing the level of education and training of the accounting profession and laws at universities |
| Conflicts among parties | <ol style="list-style-type: none"> 29. Conflicts over direct/indirect expenditures 30. Conflicts over 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 over the 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 health safety environment (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, customs duties, and foreign investment in Iran |

not limited to this, and there are other types of contracts called upstream co-operation contracts, 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, 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 JOA's (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's. Increasing the revenues of foreign companies using the "fee" mechanism, long-term contract periods, 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 IPC's, we will observe quick emergence and expansion of JOA's in the Iranian oil and gas law system in predictable futures.

3. 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 lease contracts, while outside of the United States these contracts may take various forms (Walker Jr. A.W., 1928). Oil and gas companies negotiate with the host governments for exploration, development, and extraction of hydrocarbon reserves. These contracts may be concessional, production sharing contracts (PSC), or service or may 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

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 and AIPN AG-1992, 2000, 2002, 2004, and 2012.

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

contracts. The sole source and reference of accountants for contract accounting are AFP's. When the numbers of operational partners are more than one, both AFP's 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 JOA's in accordance with annexed AFP's (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. JOA's have an exhibit named AFP's.

This exhibit is an integral part of a contract and deals with accounting and financial management issues. In contract accounting, the emphasis and focus is on AFP's, and it is needed to be evaluated and analyzed. The existence of AFP's ensures 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 the U.S. level and the Association of International Petroleum Negotiators (AIPN) at the international level play an important role in the designation and development of AFP's attached to contracts. These entities do not have legal authority; however, if the contract affirms the use of the AFP's issued by these associations, the parties to the contract are required (contractually) to comply with that AFP's 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 into the following structures:

- Section 1, general provisions: definitions, billing and statements, payments, adjustments, financial audits, and approval of non-operators.
- Section 2, determining direct charges: The direct costs are those 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.

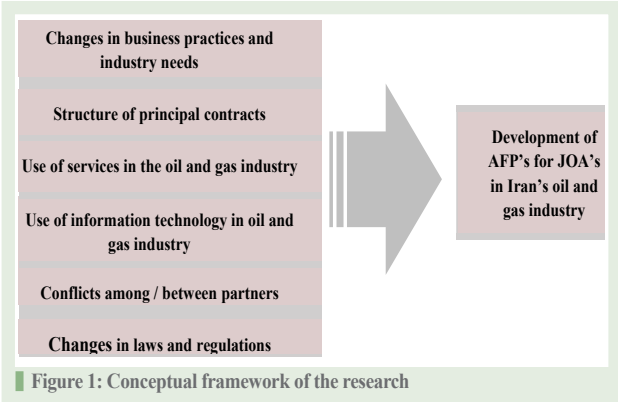
- Section 3, indirect charges (overheads)
- Section 4, pricing of joint material and equipment, purchasing, and dispositions
- Section 5, managing of inventories

4. Conceptual Framework Development

Etemadi and 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 contributing to the development of accounting systems around the world.

Table 3- Ranking of the 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 |



⁶ Mostly qualitative with minimum use of mono methods.



However, in these 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 confirming that these results cannot be applied by 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 researches have 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, to which the prevailing accounting, financial, and reporting systems do not have much applications (14).
3. The number of these studies may be large, but they focus on a few, general, and limited factors; however, we are also looking for specialized factors (industry-based factors).
4. Sometimes the results of these researches contradict each other, so one cannot rely upon their results to formulate the conceptual framework.

It was stated that AIPN and COPAS have issued some AFP's models and templates for JOA's in the U.S. and international levels respectively. AIPN has released five versions for AFP's of JOA's in 1992, 2000, 2002, 2004, and 2012 respectively (AIPN's accounting procedures version, 2012). COPAS also has issued eight versions for

AFP's attached to JOA's in 1962, 1968, 1975, 1976, 1984, 1986, 1995, and 2005 respectively (COPAS's accounting procedures, model form interpretation (MFI), 2005). These institutions use interpretative declarations before or along with each of their versions, in which they 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 line-by-line comparison with each of these versions, albeit a very time consuming task, was the best and most effective way to formulate a conceptual framework.

Some of the factors directly affect the AFP's, while there are some economic, social, political, and legal factors that influence the AFP's attached to the contracts with an intermediary. In other words, these factors primarily impact on the structure of principal contracts (the original contract or JOA), and they then, through this mechanism, affect the AFP's. Changes in business practices and industry needs are the second main factor that affects the designation and development of AFP's, and it is common between COPAS and AIPN (Jonathan D., Derrick J., 2005). In this regard, the needs for an 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

Table 4- Kolmogorov-Smilov Test

| | | structur | 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.

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

partners are factors specified at COPAS Model Form Interpretation (MFI) No. 5,17,19,30 and AIPN AG 1992, 2000, and 2004.

IT advancement and broadening use of IT in oil and gas industry are the third main factors according to COPAS MFI's and AIPN's AG's (Jonathan D., Derrick J., 2005; Jennings D. R. et al., 2000). Developing an infrastructure for receiving, sending, documenting, recording, and communicating financial and non-financial information; increasing controls (input-output); monitoring the quality of information systems; advancing on issuing and submitting bills and electronic payment methods; and using financial and accounting information systems to report and share revenues and expenditures are among technology-related factors that have affected the development of AFP's for both primary and secondary contracts (Jennings D. R. et al.,

2000).

According to the members of these associations, the oil and gas industry cannot operate independent of the environment. This connection with the environment imposes limitations on oil and gas activities, which are often reflected in the 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 the 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 the development of transport and communication infrastructures has an undeniable role in the development of petroleum

Table 5- 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 |

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



contracts, their articles, and provisions. Conflicts among or between partners over direct and indirect (recoverable and non-recoverable) expenditures, pricing of materials and equipment, the allocation of revenues and expenditures, and the timing and amount of settlement are the most important factors that may affect AFP developments (Jonathan D. and Derrick J., 2005).

Now, we can formulate the conceptual framework as illustrated in Figure1:

5. Methodology and Design

Based on the theory that assumes research as a layer-by-layer onion, the methodological attributes of research are presented in Table 1. 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 AFP's in JOA's of Iran's petroleum environment. For this reason, the strategy is a surveying study with a multi-method choice in descriptive-analytical forms. The use of mono methods is not satisfactory, so we used mixed-method. Although this research has not been carried out with the support or order of a specific organization, it is applicable in terms of purpose because

Table 6- One- Sample Test

| | t | df | Sig. (2-tailed) | Test Value = 3 | | |
|-----|--------|----|-----------------|-----------------|---|--------|
| | | | | 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 |

its results can be used in the formulation of JOA's and annexed AFP's, 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. Finally, we must limit the time scope of research to the use of JOA's in Iran's oil and gas industry.

Primary data were collected through a semi-structured interview and a valid/reliable questionnaire. The purpose of the interview was to identify the environmental and contingent factors affecting the development of AFP's annexed to JOA's 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 AFP's in Iran is new, significant progress has been made in developing accounting and financial accounting guidelines of buy-backs, and we chose to seek for individual specialists in this field. Therefore, the number of interviewees (32) is less than the statistical sample of the questionnaire (80), and all respondents were selected through snowball sampling. After analyzing the interview using a descriptive (interpretive) analysis, 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 researcher-made questionnaire was to add potential factors, eliminate unrelated ones, and ultimately rank the factors. To this end, the questionnaire was designed in the Likert scale (from one to five) so that respondents, while scoring each component revealed from the interview analysis, could comment the modification and customization of the components, and they then add and score some factors of which the researcher was unaware. To approve the interview and questionnaire's validity, identified factors were used in the formulation of questions, and necessary corrections and modifications in accordance with the points of the supervisor, other academics, and experts were made after the pre-test. To assess reliability, a small scale questionnaire was distributed among sample members. Given that Cronbach's alpha for the questionnaire was above 0.7 (0.865), the reliability of the questionnaire was confirmed. Of the 80 questionnaires distributed, 73 were completed and returned, indicating that the research has a relatively good response rate (92%). We used one sample t-test and Friedman technique to assess the significance and rank the raised factors. The data needed for developing conceptual framework were collected through

books, journals, dissertations, and the databases on the Internet. To this end, the archival methods were used.

6. Empirical Findings

Most interviewees believed that ambiguity in the structure of contracts is effective on annexes to contracts and the number of amendments. In their view, the greater transparency of articles and provisions in the contract and a 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 the interviewees, all the components identified for principal contract structure will influence the development of AFP's annexed to JOA's in Iranian oil and gas industry, and the requirements for the maximum use of domestic capabilities and agreements on the allocation of contract risks should be taken into account.

Regarding the changes in business practices and industry needs, all the interviewees stated that the changes in business environment have also occurred in Iran's oil and gas industry, which leads to the emergence of some new needs. Moreover, they admitted that the need for interaction, high transparency, in-house monitoring, timely information for decision-making, the development of access to various financial markets, and the need for training and skills in business management all constitute the characteristics of today's trade from the respondents' point of view, these 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 information and communication technology should be used as much as possible in the formulation of clauses, provisions, and appendices of the contracts. According to their viewpoints, decisions in the oil and gas industry will also be made quickly and easily with the use of information technology. Furthermore, all the interviewees agreed that developing the infrastructure for receiving, sending,



documenting, recording, and sharing financial and non-financial information; advancing on 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 enhance the quality, efficiency, and effectiveness of information processing.

Significant results were also 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; taking these expenditures as direct or overhead costs into account is specified in AFP's. In addition, according to the interviewees, issuing insurance in the oil and gas industry and in joint operations is so important that it forms one of contract's exhibits. Considering the fact that the insurance industry is today 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 considered. In this regard, the disagreement between the partners about being direct or indirect (recoverable or non-recoverable) expenditures, on the pricing of material and equipment, about the allocation of expenditure and revenues, and over the timing and amounts of settlements was approved by all the respondents as the components that could affect the design and development of AFP's. The majority of the 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 JOA's since they impact on direct and overhead costs, and they cause joint operations to encounter abnormal interruptions.

All the respondents agreed that the country has several laws and regulations that should be reflected well in the AFP's in order to prevent the ambiguity of external partners and to decide on compliance/non-compliance costs. Some of these laws and regulations are related to acquiring licenses, registering companies and managing branches, and representing 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 IPC's, this could not be relevant. The view of the researcher is also closer to the latter's point of view, which is why this component is omitted from the final list of factors presented at the end of this section.

We can summarize the interview results as tabulated I

7. Conclusions, Discussions, and Suggestions

There are many laws, regulations, codes, and instructions in Iran which 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 a massive volume of laws and regulations along with continuous changes in them (instability) are two hallmarks of these laws and regulations, which may cause uncertainty and confusion for foreign investors and parties. Laws and regulations affect more sections in the structure of AFP's (general provisions, direct charges, overheads, material/equipment pricing, and inventory management) than the other factors. Considering these laws and regulations and observing continuous changes in them are the most important factors that have complicated the development of AFP's for all types of petroleum contracts from the past, and they should therefore be considered in the formulation of AFP's for JOA's 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, the contract accounting and financial departments of E&P companies must consider these factors and related components to assess the risks and to develop AFP's for JOA. To this end, they should constantly monitor changes in the laws and regulations, business practices, and information technologies to develop flexible AFP's.

The 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 contributions to these professions along with the use of banking, insurance, transportation, and communication services as well as

financial, technical, and legal advice are the important components that should be taken into account in the formulation of AFP's for JOA's 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 centers could affect the AFP's structures (general provisions, direct charges, overheads etc.) and must be considered. These results confirm the findings of Jonathan D. and Derrick J. (2005) and are consistent with AIPN AG 2004 and 2012.

Managing relations requires constructive interactions between operator and responsible authorities, use of experienced and high skill 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 JOA's in the oil and gas industry and must be considered in AFP's 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 exchanging a large amount of operational and financial information between partners. Earlier, this information was collected, categorized, and published using traditional and manual methods; nevertheless, later, computer technology provided companies with the ability to develop software programs for storing data and preparing financial reports. It is also supposed that E&P companies develop and use electronic data interchange (EDI) procedures instead of conventional methods. Crude oil data exchange, check stub data exchange, 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 IPC's and JOA's, governing financial regime, requirements for the maximum use of domestic capacities of Iran (as specified in the IPC's), and efficiency or inefficiency in litigation processes must be considered in the 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 consistent with the findings of Jonathan D. and Derrick J.

(2005).

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

Table 7- 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 |

Table 8- Friedman Ranks

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

Table 9- Test Statistics

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