

The Research about Shale Gas Industry Financing Problems based on the Theory of Financing Structure

Hongyong LIU, Yiqi CHEN

School of Civil Engineering and Architecture, Southwest Petroleum University, Chengdu, 610500, CHINA

Abstract: Nowadays, shale gas has set off a global "green revolution". In terms of our country, the development and utilization of shale gas resource has been mentioned as a possible solution for the government's energy strategy planning. Along with the shale gas geological evaluation, development theoretical innovation, related key technology breakthrough and national policy support, broad prospects for the development of shale gas resources in China is expected to change China's natural gas development and the whole energy development pattern. But for the investment of shale gas project, the required amount and investment risk is bigger, seeking international cooperation, exploring the cooperation mode, attracting the capital will be the important choice for development of shale gas project. In this article, through the expounds and analysis of shale gas investment and financing needs, and the shale gas project financing theory and structure, I am trying to seek suitable financing way for shale gas project, find the key to the success of the financing factors. Eventually come to the conclusion that shale gas enterprises should not limit in a single financing mode, but combine a variety of financing channels and means to raise money.

Keywords: Shale gas; Financing structure; Raise money

1. Introduction

Energy is a stable development of a country and an important guarantee to improve people's living standard, and decide whether it achieve sustainable economic and social development of rigid conditions. With the rapid development of world economy, the energy consumption and the rising demand, unconventional shale gas as a clean and efficient energy has received the widespread attention at and abroad in recent years. While China's shale gas resource is very rich, broad prospects for development, according to the EIA (the United States energy department) predicts that China's shale gas recoverable reserves in the world first, reached 36.1 trillion cubic meters[1], more than 10 times a proven reserves of 3 trillion cubic meters of natural gas[2], is one of the important energy that anyone could ignored.

But shale gas development started relatively late in our country, the development of technology is not mature, development costs are still high, not have a large-scale commercial development conditions yet. In all kinds of problem of the shale gas, financing difficulties has become our country shale gas, accelerate development and enhance competitiveness of the important factors. From the point of investment always need, in order to realize the development strategy of energy action plan (2014-2020) for the identified by 2020, shale gas production more than 30 billion cubic meters of planning objec-

tives[3], 2020 years ago the domestic need drilling 16000-27000, a total investment of 480 billion - 810 billion yuan, an annual investment of 53.3 billion-90 billion yuan[4]. But our country is still in the socialist market economic system transition process, the financial market is still not enough mature and perfect. Shale gas development enterprise existing financing scale and scale of financing channels and one hundred billion yuan investment does not match.

Based on the above background, the funding problems research and exploring the solve strategies for shale gas has become a very urgent and important task.

2. The Financing Structure Theory and Current Development Situation

Enterprise financing structure, also known as capital structure, is refers to the enterprise funding sources including equity financing, bond financing, bank loans, such as different combination of the financing way of a kind of, is a combination of all equity financing and debt financing, also can saying is the shareholder rights and interests of enterprise and the creditor rights and how to distribute the total equity in the enterprise. Now in the operation of modern enterprise, the goal of enterprise financing structure choice is under the condition of a given investment opportunities, compare costs and benefits of various financing way to determine a combination of the lowest cost of financing, so as to achieve the cor-

porate market value, enterprise value maximization, the process is the enterprise financing structure optimization. Modigliani and Miller proposed the initial of the MM theory; And then to modify the original MM theory, by perfecting the capital under the condition of the MM theory gradually formed a corporate tax in the MM theory, including personal taxes of the MM theory; ScottL Hoffman studied western seven (G - 7) data, the results show that the company characteristic factors between different countries to the company's financing structure has a role in the decision, they think the company's profitability and debt ratio is negatively related to the relationship, but also will continue to strengthen with the expansion of the company.[5] Finnerty project financing is considered for a financially independent business accounting of capital investment projects to raise, stakeholders in the main stems from a project's cash flows in the future as to repay the loan funds and projects for equity investment returns. [6]Titman and Wessels use linear regression model, and studies the factors affecting the financing structure that the profitability of listed companies and the debt ratio is significantly negative correlation. Fu explore the path of optimizing enterprise capital structure, various theories of capital structure theory with economics method for analysis and evaluation.[7]Xiao and Wu compared the United States, Japan, Germany and so on the characteristics of enterprise financing. The essence of the financing process of the enterprise, the enterprise capital structure and financing decision problems such as carried on the thorough research[8].Huang studied the enterprise financing, the enterprise financing structure optimization, system innovation financing structure adjustment[9]. Liu andWu through the description of the financing structure of listed companies, believe there is a strong equity financing preference. They point out that equity financing preference is the direct cause of the company equity financing cost is much lower than the cost of debt financing, and the deep reason is that the current system and policies[10].

The financing structure is the core content in the shale gas project financing of financing problem, it is the goal of realization of shale gas, investors in the financing requirements, is how to arrange the shale gas project financing all the elements of the relationship between the key, is the carrier of shale gas project value realization. In this paper, considering the particularity of shale gas, financing and the restrictive factors of conditions, the impact of shale gas project financing structure of the external and internal environment, discussed the goal of shale gas project financing structure arrangement and the need to solve the key problems, explore the factors according to the maximum benefit to arrange shale gas the reasonable way of financing structure.

3. Shale Gas Project Financing Structure Feature and Correlation Analysis

3.1. The characteristics of the shale gas project financing structure

(1) In the loan form. In the loan form is a kind of limited recourse loans without recourse, or to use shale gas project cash flow to repay debt, in order to project assets as collateral.

(2) On the credit guarantee requirements for shale gas project has first mortgage assets, this is a basic characteristic of project financing guarantee of effectively circumvent the risk of project construction. The cash flow has effective control of the project; Required to control all contractual agreements related to the project; Request project into a single business entity, thereby limiting the entity to raise other debt financing; Required to provide the project completion.

(3) On the structure of time is usually divided into the construction of the project development period and operation period. Construction development period of high-risk usually require arrangements with full recourse the nature of the loan and the corresponding engineering contract and security control. Period is complete recourse loans to Banks to investors would turn, into a limited recourse or without recourse, sales revenue increase project control, cash flow control of credit guarantee.

3.2. The impact of market environment and internal environment to shale gas project finance structure

In project financing, capital source, and financing channels will be affected by the project internal or external factors and constraints, these factors restrict each other and influence each other, closely linked to form an organic system, and the organic system is project financing environment. Project financing of the external environment is exist in the project of external conditions and influence factors of project financing activities; Internal environment exists within the project and the project sponsor is a direct link between the conditions and factors influencing the financing activities. External financing environment and the internal financing environment between the two is not completely independent, but intertwined together, work together in the financing behavior of the project. Research project financing environment helps to develop project financing structure correctly.

(1) External financing environment

(1) Natural environment. Include shale gas project location, geological information, such as trap area, average net thickness of shale, shale gas recovery, shale gas reserves, such as shale gas project prophase investment situation, as well as the country's transportation communication situation, local customs, etc.

(2) Political environment. Mainly include domestic political resources, social order, national religion, foreign political environment, etc.

(3) Economic environment. Macro economic development, particularly shale gas project in regional economic development level, the ministry of foreign trade conditions, government's policy to protect the environment, the shale gas prices and inflation, etc.; Micro economic development, such as shale gas resource extraction technology, shale gas resource, shale gas development infrastructure and shale gas pipeline, shale gas resource and shale gas exploration and development status, difficulty and risk of subsequent exploration.

(4) Legal environment. Mainly is to attract and use foreign related laws and regulations; System of foreign exchange control and tax laws, including the foreign exchange regulation law, the profits tax law and the value-added tax, etc.; Law is closely related to shale gas activity, including the stone shale act, the shale gas resource law, "property law", "general management method" and "land law" and so on, these laws for shale gas project development has provided a legal basis

(5) Financial market environment. A well-functioning financial market environment, on the one hand can make small scattered social idle funds quickly into social capital. Financial markets, on the other hand, can reduce the risk of investors, so that the more money into financial markets, increase the market supply, reducing the issuer of the cost of financing and financing.

(2) The internal financing environment

The internal financing environment is mainly from the perspective of shale gas project characteristics analysis.

(1) The shale gas project size. Shale gas project operation scale is closely related to the project financing structure, because shale gas project scale to a certain extent, reflects the ability of mortgage. Many studies have shown that project asset-liability ratio positively related to the project size, project size has become an important internal factor of financing structure.

(2) The continuous mining of shale gas project deadline. Shale gas project construction and operation of a certain period, should pay special attention to when shale gas project exploitation period in the future. Project growth is dependent on the potential exploitation of shale gas project, the project financing decision must consider in advance to the project's future growth potential.

(3) The equity of shale gas project finance structure. Had a greater influence on the equity structure of financing structure, under different ownership structure tend to produce different financing structure. Project company will consider when to finance all of its benefits and risks, and it has a different proportion of equity means differently to different shale gas project investment proportion and support.

(4) The shale gas project late stage construction conditions and management skills. Shale gas project revenue mainly comes from the shale gas project construction after the completion of the shale airflow generated by the business value, management ability of shale gas project, the total assets turnover time is shorter, current assets utilization efficiency is high also, accounts receivable recovery speed is faster, which can reduce the credit risk, reduce capital takes up, shorten the construction period.

(5) The shale gas project construction in bear risk ability of solution. Shale gas project financing participants focus mainly on its overall risk, such as shale gas project technology risk, business risk, political risk and so on overall risk distribution. If the shale gas project risk resolving capability is strong, the shale gas project can attract all favorable factors to spread risk, to ensure that its earnings.

3.3. Determination of shale gas project financing environment analysis of the factors

Forming the reasonable structure of shale gas project finance is the goal of the project financing decision to consider, the formation of the shale gas project will be restricted by many factors, its financing structure is limited by many factors, only determine the various factors affecting, can benefit maximization to arrange financing structure according to the factors.

(1) The shale gas industry factors. Including the strength of the shale gas company contrast is shale gas companies participating in the game industry both or all parties based on the comprehensive strength of the capital, talent and technology comparison; Shale gas company competition strategy with competitors, strategic principles and specific ways of cooperation skills, etc.

(2) The shale gas project company itself. This aspect mainly includes the shale gas company's capital strength, talent reserves the technical level and other factors. The shale gas has the greatest effect in the company's capital strength, he reflects the company's financial advantage, is formed by the company in the long-term development; Shale gas talents, the competition of the market competition in the final analysis is quality, a perfect shale gas project personnel knowledge structure, if the local culture, have strong ability to adapt the international rules, is conducive to project finance; Technology means that shale gas company work experience and have advanced technology development, such as high and advanced technology can enhance the financing ability of shale gas project.

(3) The shale gas project factors. In terms of shale gas project financing, the influence factors of project characteristics include project size, project growth, equity structure, project mortgage value, not debt tax shield, project profitability, project management ability, debt paying ability, project management risk, etc. These factors reflect the degree of enrichment of shale gas, shale gas

resources, where the project is located, as well as the exploration and development and the ease of transportation, if for shale gas exploration project, its natural conditions, including geological structure, location and infrastructure, health, etc. will increase the difficulty of financing.

4. Shale Gas Project Financing Structure Arrangement Analysis

4.1. Shale gas project financing structure arrangement of target

Shale gas projects financing structure arrangement should consider its own specific characteristics, combining with the relevant national financial market, shale gas, shale gas in terms of the specific situation of the system of laws and regulations, reasonable choice of capital structure, investment structure and the credit structure, and make the three organically, so as to realize the goal of project financing.

For shale gas project sponsor, the project financing structure arrangement of target is mainly determined by the nature of the shale gas projects, should include the following aspects

(1) Raise foot shale gas, the funds required for the project is the most basic resources necessary to implement the project, insufficient funds project is unsustainable. Therefore, the project financing structure arrangement of the most basic purpose is to meet the funding needs of shale gas project. Therefore, recourse responsibility scope becomes one of the goals of the financing structure arrangement.

(2) Without recourse or limited recourse financing. The ideal financing structure should be in for capital providers for stronger earnings at the same time, the restrictions to the project sponsor's recourse responsibility as much as possible.

(3) Achieve off-balance-sheet financing. Each person's credit is limited (performance) for the credit line, project sponsors do not want to because the debts of the shale gas project and affect the company's financing ability. Therefore, the realization of off-balance-sheet financing become one of the goals of the financing structure arrangement.

(4) To achieve optimum shale gas project risk - benefit balance.

Source of funds, its different requirements; money different, its risk is different, the cost is also different. Due to the cost of financing that is associated with risk, the lowest cost is not equal to the optimal. Therefore, one of the goals of the financing structure arrangement is to realize the optimal risk benefit balance.

4.2. Shale gas project financing structure arrangement problem based on the different credit

For specific shale gas project, the project finance credit foundation is different. The different credit characteristics can be reflected in the arrangement of the financing structure, so as to arrange the different characteristics of financing structure.

(1) Shale gas project financing on the basis of "shale gas product payment"

"Product payment" financing is the ownership of the production of shale gas shale gas project as collateral arrangements by financing. In shale gas resources exploitation project, the lender agrees to a borrower with all or part of the project products as loan guarantees, directly with the shale gas products to repay the loan principal and interest. In the concrete financing arrangements, is generally established by shale gas project sponsor shale gas project company, by lenders or investors to set up a "financing intermediary institutions", signed by the agency with shale gas project company pay agreement "" shale gas products, purchase a certain percentage from shale gas project company shale gas project resources reserves or future production of shale gas product yield; Payment protocol based on shale gas products, financing intermediaries "purchase and payment" to pay for shale gas products in the form of funding for shale gas project company, used in project construction and operation. While shale gas project company promised calculation formula according to certain prices for shale gas products pay (and determine the amount of loans for shale gas) the number of key product. After the shale gas project operation, financing intermediaries for shale gas product payment agreement stipulated number of shale gas products. Then, financing intermediaries direct sales of shale gas products in the market, with sales revenue to repay the loan.

(2) Shale gas project financing on the basis of the sales agreement

To sales agreement (especially with "all needs to pick up the goods or not pay" the nature of the purchase agreement) on the basis of shale gas project financing, shale gas project investors can take advantage of the associated with shale gas project benefit of third party products buyers (shale) credit to arrange financing. Shale gas products buyers here can provide a powerful have "all needs to pick up the goods or not pay" nature of commitment, and the reliable degree of the promise (the credit of the buyer) becomes the key to success or failure. Shale gas items requested by the financing products whether pick up the goods, buyer have to unconditionally to the shale gas project company regularly pay a pre-determined amount of shale gas product cost commitment. The unconditional commitment contract rights will be transferred to provide the loan bank, with the guarantee the completion of shale gas project investors constitutes a major component of project structure of credit guarantee

(3) Shale gas project financing on the basis of the shale gas market sales

There is no purchase contract or use only the franchise agreement of shale gas project, its financing is based on shale gas products of market sales, finance lenders to shale gas product market demand and the risk of a shale gas prices. In most cases, the shale gas in shale gas project sponsor engineering contractors, thus may adopt the way of negotiation, built by shale gas project sponsor their shale gas project facilities. Adopted on the basis of the "shale gas product marketing" arrangement of shale gas project financing, the key is to ensure that has certain market demand. In franchising power, therefore, often asked the government to guarantee the project in a certain period of time have some degree of monopoly or monopoly.

5. Conclusion

Shale gas resources exploration, development and product production of shale is present and the future for a long time plays an important role in promoting the national energy security, and the implementation of the strategy of shale gas resource and relies on shale gas project investment, along with the increase of shale gas project investment, how to ensure the financing source is a critical problem. The shale gas project financing structure is the core content in shale gas project finance, is the goal of realization of shale gas, investors in the financing requirements, is how to arrange the shale gas project financing all the elements of the relationship between nodes. Shale gas project financing structure arrangement is the key to determine the good shale gas project financing on the basis of the principle of structure arrangement, handle the shale gas project finance target and conflicts between stakeholders. Whether from the perspective of financing tool or from the perspective of financing sub-

ject, it needs to be starting from the actual situation of the shale gas project, flexible structure of project funding. Both from the perspective of the sponsors, and from the perspective of different credit foundation arrangement of shale gas project financing needs to be in the shale gas project sponsors, shale gas project management companies, lenders, investors, shale gas project construction, shale gas products buyers and resources to establish a good communication relationship between governments, shale gas development in our country really take off.

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