

Construction of China's Venture Exploration Capital Market

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Abstract: This paper first studies the development status of domestic and overseas venture exploration capital markets (VECMs). Combining the current situation of the venture exploration market in China, this paper concludes that lack of participants in the VECM, lack of credibility of mining investment, backward mining policies, and the defective supporting system for the VECM are the main challenges in building a strong VECM. To establish the VECM in China, the paper proposes a three-step development path, which to first cultivating the VECM participants in China using the overseas market, then improving the domestic mining investment environment and establishing a credit system, and finally, establishing China's VECM.

Keywords: mineral resources; venture exploration capital market; investment environment

1 Introduction

In recent years, due to slow economic growth and falling mineral product prices in the global mining market, the vitality of the global mineral exploration market has weakened, and mineral exploration investment in typical countries such as China, Australia, and Canada has declined yearly. With the deepening of industrialization and urbanization, although China's demand for bulk minerals has decreased, its demand for mineral resources will continue to be at a high level [1]. China's geological survey investment activities include public and commercial geological survey. The former relies on state financial support. However, in the current geological prospecting market, there are two obvious contradictions: (1) insufficient financial funds are invested and social capital is gradually shrinking, and (2) while the number of geological exploration units has gradually increased, the amount of financing for exploration projects has decreased rapidly. Mineral resources are the guarantee of economic and social development, and geological exploration is the foundation of mining development. Mobilizing social funds to invest in commercial mineral exploration is an important measure to ensure the national mineral resource demand.

The highest level of competition is at the capital level [2], and geological exploration is one of the industries combining intensive labor and capital [3,4]. With the continuous deepening of globalization, the number and speed of international capital flows have increased significantly. However, due to the lack of a capital market for venture exploration, China's geological exploration agencies are trying to resolve narrow financing channels and social capital usage issues. This has also prevented China's mining industry from being effectively competitive. Therefore, accelerating the construction of the venture exploration capital market (VECM) and encouraging more social capital to participate in China's venture exploration are necessary for promoting the vitality of the Chinese mining market. Additionally, this is the only way for China to effectively combine technology, resources, and capital to improve

Received date: January 8, 2019; **Revised date:** January 20, 2019

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Funding program: CAE Advisory Project "Research on Construction of a Great Power of Mineral Resources" (2015-XZ-35); Survey project of the China Geological Survey "Construction of Safety Dynamic Assessment and Decision Support System for Energy and Mineral Resources in China" (DD20160084)

Chinese version: Strategic Study of CAE 2019, 21 (1): 074-080

Cited item: Li Ying et al. Construction of China's Venture Exploration Capital Market. *Strategic Study of CAE*, <https://doi.org/10.15302/J-SSCAE-2019.01.011>

resource allocation efficiency and promote the sustainable development of China's mining industry.

2 Status of domestic and foreign venture exploration capital markets (VECMs)

2.1 China's VECM

2.1.1 Although China has a multilevel capital market system, it lacks VECMs.

The financing structure of China's mining capital market includes stock markets, bond markets, and mining rights trading markets. Among them, the stock market is divided into the main board market, small- and medium-sized enterprise (SME) board market, growth enterprise market (GEM), and "new third board" (NTB) market. The main board market mainly provides financing for large and mature enterprises to go public, the SME board market and GEM are mainly the places where SMEs are listed, and the "new third board" market mainly serves innovative, entrepreneurial, and growing SMEs. The Shanghai Stock Exchange and Shenzhen Stock Exchange are the only two stock markets in China. The former only has a main board, while the latter has three boards: the main board, the SME board, and the GEM. The NTB market is independent from the Shanghai Stock Exchange and Shenzhen Stock Exchange.

The current China mining rights trading market includes the Beijing International Mining Rights Exchange, Shanghai United Mining Rights Exchange, Tianjin International Mining Rights Exchange, and Chongqing Stock Exchange Mining Rights Trading Center. Concurrently, it has thousands of geological survey units and tens of thousands of mining enterprises. Judging from the mining right trading market, geological exploration units, and mining enterprises, China has a certain foundation, but it is still far from being a mature VECM.

2.1.2 Mining has the smallest proportion in the industry sector; the majority are production companies.

According to the Wind database, the total number of companies listed in Shanghai and Shenzhen was 3573, with a total market value of 44.7 trillion yuan as of October 2018. Among them, there are about 77 mining companies with a market value of 3.85 trillion, accounting for 2.2% of the total number of listed companies, and a market value of 1.9%. In 2017, the Shanghai and Shenzhen Stock Exchanges raised 1102 fund companies, raising a total of 1.7 trillion yuan, 438 initial public offerings, and 232.3 billion yuan of IPO funds. Among them, 22 mining companies raised a total of 85.459 billion yuan, two of which were IPOs that raised 1.13 billion yuan. As of the end of 2017, there were 42 mining companies listed on the NTB market, which accounted for 0.36% of the total number of listed companies, only higher than the lodging and catering industry and ranking second to the bottom of all industries. The mining industry issued a total of 3 shares valued at 126 million yuan, and both the number of shares issued, and the issue values are at the bottom ranks.

2.2 Foreign VECMs

In addition to Asia, major global mining capital markets are distributed in North America, Oceania, Europe, and Africa, including the Toronto Stock Exchange (TSX); the London Stock Exchange (LSE); the New York-Euronext Exchange Group (Euronext N.V.), which includes New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and Nasdaq; Australian Stock Exchange (ASX); Johannesburg Stock Exchange (JSE); and Hong Kong Stock Exchange (HKEx), etc. Each capital market has distinct characteristics (Tables 1). Among the above six capital markets, the TSX is the most important mining capital market in the world. In 2017, mining financing (including the energy industry) accounted for 26% of total financing; meanwhile, mining stock trading was active and (including the energy industry) accounted for 55% of the total transaction volume. Although the JSE is an SME stock exchange in terms of market value, the mining sector has an important position on the JSE.

The foreign VECM refers to the TSX Venture Exchange (TSXV), the Alternative Investment Market (AIM) of the LSE, the AMEX (NYSE MKT), the ASX, and the Alternative Exchange (AltX) of JSE. As of September 30, 2018, there were 979 mining companies listed on the TSXV, accounting for 82% of all listed mining companies, which is 4.5 times the number of mining companies on the TSX main board market. Since most of them are junior exploration companies, the market value of these listed mining companies accounts for 7.3% of the total market value of all mining companies. There are 937 companies listed on the AIM of the LSE, accounting for 44.6% of the total number of listed companies. Of these, 85% are from the United Kingdom, while the international companies were smaller in number. Most primary exploration companies are listed on the AIM market. Although there are three mining capital markets in the United States, large mining companies are listed on the NYSE. Primary exploration companies are listed on the AMEX (NYSE MKT). However, whether it is the NYSE or the AMEX, the number of mining companies and the market value of the entire US capital market is relatively small. The AltX of JSE provides

financing platforms for small junior exploration companies. Due to the difficulty in obtaining information, detailed data is currently unavailable. The ASX does not distinguish between the main board or the GEM, but it has specifically set up the listing conditions suitable for primary exploration companies (Table 2). Compared with the previous large-scale VECMs, the HKEx has been involved in the field of mining investment late, and there is a large gap in its management of the mining sector. For example, although the HKEx can grant certain exemption conditions for the primary exploration company, the primary exploration company generally cannot meet its listing conditions, resulting in the large mining companies that can be listed on the HKEx.

Table 1. Key descriptions of major mining capital markets.

	Market status	Key features
TSX	The most mature mining capital market	Low listing thresholds, multiple listing channels, complete capital market mechanism, strong financing capabilities, good market liquidity, large growth potential, and high degree of internationalization
LSE	The oldest mining capital market	Possesses the longest and most complete statistical data to facilitate analysis of mining cycles and performance of listed companies
Euronext N.V.	The largest trading agency	A company listed on it can trade on any of its exchanges
ASX	The most perfect credit system construction	The service and management system is perfect, the credit system construction is a perfect model, and has a strong ability to sustain financing
JSE	Africa's most important mining capital market	Although the market scale is smaller, there are more world-class mining companies listed here

3 Problems and challenges in constructing a VECM in China

For the international mining capital market, the primary financing location for primary exploration companies has always been the stock exchange. However, in China's capital market, the proportion of mining companies is extremely small, regardless of the number of listed companies, the number of financings, the amount of financing and other indicators, and there is no primary exploration company listed on the stock exchange. This is because China does not have a VECM yet.

3.1 Lack of participants in VECMs

The fundraiser in the VECM is the geological survey unit (Fig. 1). At present, the main force engaged in venture exploration of mineral resources in China are the state-owned geological exploration units [5]. However, in recent years, the problems faced by geological exploration units have become more prominent. For example, due to the impact of fluctuations in the mining market and the reform of the classification of public institutions, the financing of domestic geological exploration projects has gradually decreased in the past five years; due to the constraints of the traditional system and the government-led monopoly allocation of mining rights, geological exploration units are neither willing nor able to conduct prospective venture exploration. After the institutional reform, about 80% of geological prospecting units are positioned as public welfare class I institutions or public welfare class II institutions and cannot become investment targets. Even if a large mining company succeeds in the exploration project, it is difficult to see the growth of capital, and it is not favored by risk exploration capital. Finally, domestic small-scale mineral exploration companies are still unable to play the role of the main force in an exploration project. The abovementioned circumstances are all reasons for the lack of funds for risk exploration in China.

Intermediary agencies are one of the main bodies in the capital market for risk exploration. Canada, Australia, and other mining-developed countries have many technical consulting agencies, law firms, and accounting firms familiar with the operation and management of mining projects. Securities management agencies and stock exchanges are responsible for the review and supervision of geological exploration projects. Investors' understanding of geological exploration projects relies heavily on the judgment of these intermediaries. However, compared with foreign mature VECMs, only few agencies in China can provide professional geological and mineral technical consulting for mining projects.

Table 2. Overview of major mining capital markets in 2018 and IPO financing in 2017.

	TSX	ASX	JSE	NYSE	AMEX	Nasdaq	LSE	HKEx
Total number of listed companies	3201	2252	371	2028	227	2644	2158	1885
Total market capitalization	3044.2 billion C\$	1979.7 billion \$	14 247.5 billion R	27 399.5 billion \$	103.9 billion \$	12 710.2 billion \$	4195.0 billion £	31 956.8 billion HK\$
Number of mining companies	Energy 119, Mining 1198	Energy 189, Material 691 (Global Industry Classification Standard, GICS)	–	Energy 462, Material 427 (Wind industry classification, Total US stocks)	–	–	Energy 160, Material 197 (Contains chemical 28) (Industry Classification Benchmark, ICB)	Energy 72, Material 133
Market value of mining companies	Energy 310.6 billion C\$, Mining 269.0 billion C\$	–	–	Energy 3661.9 billion \$, Material 1331.6 billion \$ (Wind industry classification, Total US stocks)	–	–	Energy 600.2 billion £, Material 307.7 billion £ (Contains chemical 85.4 billion £)	Energy 1420.4 billion HK\$, Material 533.3 billion HK\$
Share of mining companies (%)	41.1 (Energy + Mining)	39.1 (Energy + Mining)	–	18.1 (Energy + Mining, Total US stocks)	–	–	16.5 (Energy + Material)	10.9 (Energy + Material)
Share of market value of mining companies (%)	19 (Energy + Mining)	–	–	12.4 (Energy + Mining, Total US stocks)	–	–	21.6 (Energy + Material)	6 (Energy + Material)
2017 IPO financing	6.14 billion C\$	14.55 billion \$	–	45.0 billion \$ (Total US stocks)	–	–	9.65 billion £ (Main board 8.05 billion £, AIM board 1.6 billion £)	122.3 billion HK\$
Total funds raised in 2017	54.5 billion C\$	37.39 billion \$	100.5 billion R	–	–	–	27.2 billion £ (Main board 20.8 billion £, AIM board 6.4 billion £)	443.7 billion HK\$
Trading volume in 2017	1465.1 billion C\$	–	–	30 516.8 billion \$	94.8 billion \$	18 586.1 billion \$	1338.97 billion £	21560.1 billion HK\$
Mining IPO financing in 2017	Mining 0.97 billion C\$	–	–	Energy 6.377 billion \$, Material 2.39 billion \$ (Wind industry classification, Total US stocks)	–	–	1.33 billion £ (Main board 12.1 billion £, AIM board 0.12 billion £)	–
Share of mining IPO financing in 2017 (%)	15.8 (Energy + Mining)	–	–	20 (Energy + Mining, Total US stocks)	–	–	13.8 (Energy + Material)	–

Source: Official website of each stock exchange. Deadline for data statistics: Toronto Stock Exchange, 2018.8; London Stock Exchange, 2018.9; New York Stock Exchange, American Stock Exchange, and Nasdaq, 2018.10.26; Australian Stock Exchange, 2018.10.29; Johannesburg Stock Exchange, 2018.9; Hong Kong Stock Exchange, 2018.9.

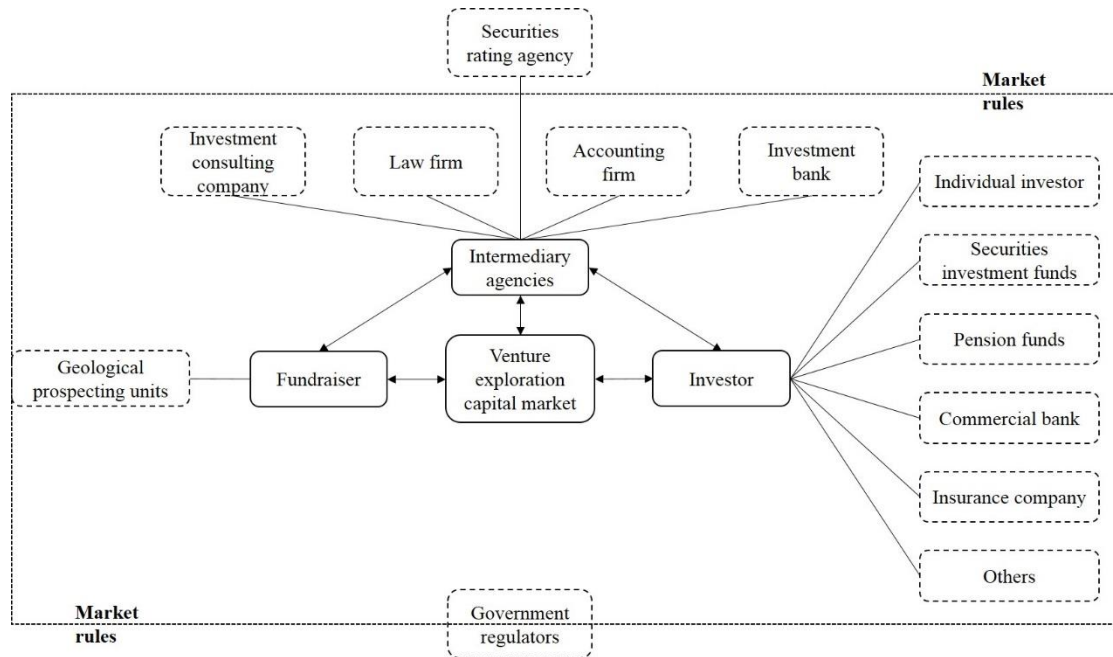


Fig. 1. Relationship between elements of risk exploration capital market.

3.2 Lack of integrity affects investor confidence

Geological exploration has technology-intensive characteristics, and the success of prospecting activities itself is a small-probability event with a high-risk industry. Affected by the geological exploration unit's own management and the principle of profit-seeking, fraud frequently occurs in geological exploration data in China, which makes investors face greater risks of investment failure.

The emergence of the above problems is also due to the imperfect market competition mechanism and the huge pressure on the survival of enterprises. In addition, the small punishment on the fraudulent party of the investigation report is one of the reasons for widespread fraud. As Mr. Liu Yikang said, "Compared with other economic frauds, the punishment for exploration fraud is only ordered to be corrected within a time limit, and a fine of 100 000 yuan is imposed. From beginning to end, no mention was made of measures such as revocation of mining rights or cancellation of survey qualifications." To ensure the accuracy of the exploration report, a professional geologist system has gradually formed in the international market, but China lacks third-party evaluators in mineral exploration projects. Finally, the reference standards for exploration reports by foreign geologists refer to the JORC Rules of the ASX, the NI 43-101 Rules of Canada, and the SAMREC Rules of South Africa. In China, there is currently no mineral resources exploration rules for comparison.

3.3 Backward mining policy system

First, the free circulation of mining rights projects is one of the prerequisites for the establishment of a mining VECM. The foreign exploration right projects are free and easy to transfer; however, the transfer of mining rights in China is still led by the government. Second, compared with developed countries, China's mining tax policy is relatively lagging behind, and the cost of exploration phase is higher than that of developed countries. During the development phase of the mine, especially the period of mining, the lack of policy subsidies has caused a large burden on enterprises, which has greatly reduced their production enthusiasm. Third, compared with Japan, the United States, Germany, Canada, Australia, and other countries, China's fiscal subsidy is mainly based on the promotion of both fiscal and social funds, and the subsidy form is too simple.

3.4 Mining capital market supporting system and information disclosure mechanism are not yet complete

The construction of foreign VECM system is relatively complete. For example, an independent geologist system, a bank loan feasibility report system for mining companies, a listed company's exploration and mining investment and a quarterly disclosure system for geological information, an independent manager system, and so on.

Due to the particularities of the mineral exploration industry, foreign stock exchanges generally list primary

exploration companies separately and clearly specify different listing standards and financial requirements than other types of listed companies. According to the requirements of different stock exchanges in various countries, when disclosing public information and submitting prospectuses, mineral exploration companies must provide technical reports when they go public. Technical reports must be prepared by professional consulting companies and competent personnel. More importantly, the technical report should accurately reflect the risks in terms of geology and mineral resources.

The improvement of the institutional system plays a decisive role in the construction of China's VECM. Although China has conducted VECM construction pilots in Beijing, Tianjin, and other cities, a series of problems still exist. For example, the institutional system is not yet complete; capital, information, and technology are difficult to flow freely; the industry's integrity system must be improved.

4 Construction path of the VECM in China

In summary, the participants in the mining capital market are the foundation for constructing the VECM. The credit system of the mining capital market and sustainable and stable mining policies are the links between the participants (Fig. 2). A mining capital market with Chinese characteristics can only be established when the foundation is sufficiently "firm" and the links are sufficiently "sturdy." Therefore, for the establishment of China's securities and capital market supporting the exploration and development of mineral resources, we proposed implementing three stages:

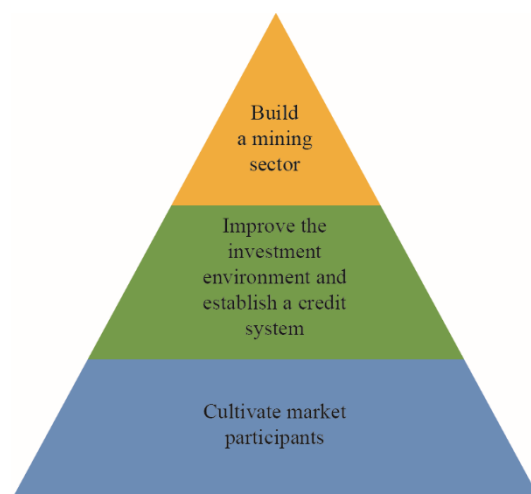


Fig. 2. Structure of the VECM construction path.

4.1 The first phase: To use of overseas markets to develop China's market participants

At present, China's securities market cannot provide effective support for risk investigation. This is due to (1) the underdeveloped investment entities in China's capital market, inadequate credit constraint mechanisms, and inadequate reserves of mining investment expertise resulting in poor service capabilities of intermediary agencies; (2) the incomplete reform of geological exploration units has not yet been completed, and insufficient financing motivation due to a lack of financing entities caused by such factors. Therefore, to establish China's mining capital market, we must first cultivate effective market players.

For geological exploration enterprises, the reform of geological exploration units should be completed first. Encourage exploration companies to participate in overseas mature mining capital markets, use both foreign securities market and credit systems to monitor Chinese exploration companies/mining companies, and use international funds to serve the Chinese mining industry. Lastly, optimizing its internal management system, changing the geological exploration enterprise from within, strengthening the staff's innovation ability, and renewing the vitality and work motivation of the geological exploration unit will be useful.

For intermediaries, they should (1) improve their mining investment knowledge system, (2) standardize their credit rating systems, (3) conform with the mining standards of countries such as Australia and Canada, and (4) encourage intermediaries to participate in the services of the global mining capital market and accumulate industry experience. Geological exploration technicians cannot meet the current demand for "geology + finance + law + accounting" composite talents. This is because (1) geological survey technicians rarely have the opportunity to work

in intermediaries such as securities firms; (2) ordinary geological college education mostly focuses on geological prospecting techniques and does not focus on teaching finance, accounting, finance, law, and other aspects. Therefore, colleges and universities should strengthen the expansion of interdisciplinary disciplines in geology and other professional fields, and intermediary institutions should also provide corresponding job opportunities for geology graduates.

4.2 The second phase: To improve domestic mining investment environment and establish a credit system

A continuous and stable policy environment and investment environment are the foundation of the mineral resource exploration and development industry. Due to the long period of mineral resource exploration and development, establishing a stable expectation of a financial investment institution for the exploration/mining company under an unstable policy environment is not possible. The construction of a credit system requires not only punishing fraud by law but also rewarding honesty in the market so that Chinese intermediary service agencies (especially technical consulting agencies) can be truly competitive and build trust in investment institutions. Therefore, the domestic mining investment environment should be improved and a credit system established.

For financing entities, if there is no code of conduct, then fraudulent investigation reports will frequently occur. Fraud of geological prospecting reports will cause investors to suffer losses, which will inevitably affect investor confidence in the prospecting field. From the perspective of investors and financiers, the relationship between the two must be coordinated to regulate the financiers. Therefore, investors should clearly investigate the consequences of fraudulent reports, that is, clear legal constraints. For investors, a third-party evaluation agency—professional geologist system/qualified person system should be introduced to transform geological information into capital language, and to ensure the authenticity and understandability of geological information disclosure.

Similarly, professional geologists/qualified persons should have standards. On the one hand, the requirements for responsibility standards, such as the regulations of the American Association of Professional Geologists, require at least 8 years of professional experience in geological practice after obtaining a bachelor's degree and a long-term record of compliance with ethical standards. On the other hand, the professional geologist/qualified person's own code of conduct must be verified. Foreign countries usually disclose in accordance with the ASX's JORC Rules, Canadian NI43-101 Rules, and South Africa's SAMREC Rules. However, at present, China does not have a standard that complies with international standards. We should establish disclosure rules that complies with international standards as soon as possible.

From the perspective of the capital market access system, the Shanghai Stock Exchange and Shenzhen Stock Exchange failed to consider the particularities of the geological exploration industry and did not set a special entry threshold for geological exploration units to list. Therefore, we should set corresponding listing thresholds according to the characteristics of Chinese geological exploration units, for example, implement a registration system and set requirements on indicators such as cash flow, capital amount, and mining rights and interests.

4.3 The third phase: To establish China's owned securities market to support mineral exploration

At present, there are still issues in the development of the VECM participants in China, and the institutional construction cannot meet the requirements of the prospecting capital market. For example, the various technical reports issued by intermediary service agencies are intended for the government and not for investment institutions in the capital market; sometimes technical reports are falsified or untrue, and cannot be trusted by financial investment institutions.

There are two ways to use the international market to cultivate participants in the VECM. First, the venture exploration capital of the international market should be used to solve the current development problems of China's mining industry. Second, the international market should be used to regulate the management of geological exploration units and intermediary agencies, strengthen their international competitiveness, and lay the foundation for future international competition.

We should strengthen China's connection with the world's mining capital markets, domestic investors, and geological exploration units by improving the domestic mining investment environment and developing a credit system that complies with international standards. Once China has a competitive exploration/mining company, a certain credible intermediary service agency, and a mature financial investment institution, China's own VECM can be built.

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