Postprint: Security Level and Risk Prevention and Control Recommendations for China from Central Asian Petroleum Resources Development in the "Silk Road Economic Belt"

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Abstract

Central Asia possesses enormous predicted reserves of oil resources, holding significant strategic importance in the global energy geopolitical landscape and playing a crucial role in China' s promotion of an oil import diversification strategy and the expansion of overland pipeline oil imports. This article analyzes the security level of Central Asian oil resources for China, finding that although China' s investment intensity in Central Asian oil is continuously increasing, the security rate provided by Central Asian oil for China' s oil imports remains extremely low. By constructing a risk evaluation index system for transnational oil investment and employing a fuzzy comprehensive evaluation model, a quantitative assessment of oil investment risks in Central Asia was conducted. The results indicate that policy and regulatory risk constitutes high risk, while economic risk, socio-cultural risk, and political risk constitute moderate risk, and infrastructure risk constitutes low risk. Among these, seven indicators—including mining rights allocation, the degree of host country intervention in operations, and differences in ethnic culture and religion—exhibit a significantly high probability of high-risk occurrence. For future oil investment cooperation in Central Asia, it is necessary both to scientifically and rationally avoid risks based on risk assessment results and to seek solutions by selecting mutually beneficial and win-win cooperation models, thereby ensuring an advantageous position in the development of Central Asian oil resources.

Full Text

Preamble

Special Topic: "Silk Road Economic Belt" Central Asia Energy Geoconfiguration and National Security

Title: Protection Level and Risk Prevention of Oil Resources Development in Central Asia for China

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Abstract: Central Asia possesses enormous predicted oil reserves and holds a strategically important position in the global energy geopolitical landscape, playing a vital role in China' s efforts to diversify its oil import strategy and expand pipeline imports via land routes. This paper analyzes the degree to which Central Asian oil resources can guarantee China' s supply security and finds that, despite China' s increasing investment in the region, the actual guarantee rate provided by Central Asian oil remains extremely low. By constructing a risk evaluation index system for transnational oil investment and applying a fuzzy comprehensive evaluation model, this study quantitatively assesses the risks associated with oil investment in Central Asia. The results indicate that policy and regulatory risks are high-level risks, while economic, socio-cultural, and political risks are medium-level risks, and infrastructure risks are relatively low-level risks. Among the 18 risk indicators, seven—including mining rights allocation, degree of host government intervention in operations, and ethnic-cultural-religious differences—show a high probability of high-risk occurrence. Future oil investment cooperation in Central Asia should not only scientifically avoid risks based on these assessment results but also seek solutions through mutually beneficial cooperation models to ensure China' s advantageous position in the region' s oil resource development.

Keywords: oil resources, Central Asia, degree of guarantee, investment risk, prevention and control measures

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Main Text

Central Asia is considered a region rich in world oil resources with tremendous potential reserves, attracting intense competition among global powers eager to gain a foothold [1]. As China' s neighbor with friendly relations, and against the backdrop of the "Silk Road Economic Belt" initiative, China has placed high expectations on the region' s oil resources and continuously increased its investment efforts [2]. However, from the perspective of oil resource geopolitics, we must not overlook the strategic importance of Central Asia in the energy landscape, nor should we overestimate the degree of protection its oil resources can provide for China [3]. Strengthened research is needed to adopt multiple models and approaches for scientifically and rationally mitigating risks, thereby enhancing China' s advantageous position in Central Asian oil resource development.

Central Asia' s Oil Reserves and Geopolitical Significance

Central Asia is endowed with abundant organic sediments and stable sedimentary basins—scientifically termed "oil-bearing structures" —providing favorable conditions for oil generation, storage, migration, and preservation, and thus potentially harboring vast petroleum resources. According to literature reports, even excluding the Caspian Sea region, Central Asia ranks as the world' s third-largest oil accumulation area after the Middle East and Siberia, representing one of the largest energy reservoirs for 21st-century global economic development. The Caspian region alone holds enormous reserves, generally estimated at 150-200 billion barrels (approximately 18-25% of world reserves), with some estimates reaching around 600 billion barrels, potentially making it a "second Persian Gulf" [4-7].

The region hosts dozens of oil-bearing basins, including the Volga-Ural Basin, Afghan-Tajik Basin, Fergana Basin, Chu-Sarysu Basin, Turgay Basin, and the West Siberian Basin, some of which contain world-class petroleum resources [8,9]. However, as of the end of 2016, Central Asia' s total proven oil reserves amounted to approximately 4.263 billion tons, representing only 1.8% of global proven reserves [10]. Compared with overly optimistic expectations, the actual proven reserves in Central Asia are relatively modest.

Major Powers Competing in Central Asian Oil

Following the dissolution of the Soviet Union, the five Central Asian countries emerged as independent political and economic entities. Due to their oil and gas resource advantages, the region' s status in global energy geopolitics has continuously risen, with major powers competing for involvement. This has led to a basic pattern of repeated gaming and multi-party wrestling in Central Asian energy geopolitics, with multi-polar competition characterizing the new energy geopolitical landscape.

Russia, the United States, and China form the dominant triangular relationship shaping the region' s energy geopolitics. U.S. international oil majors have secured exploration and development rights for multiple oil fields in Central Asia through capital and technological advantages, while the U.S. has also intervened in regional affairs politically, militarily, and socially [11]. Russia primarily enhances its political and economic influence in Central Asia through energy cooperation and maintains its monopoly position in EU energy supply by utilizing existing oil and gas transportation infrastructure. China, leveraging its geographical proximity and friendly relations with the five Central Asian countries, has actively developed oil and gas cooperation that has gradually expanded from resource trade to upstream and downstream integration, including exploration and development, pipeline transportation, refining, and sales, forming a complete industrial chain that further extends to related construction fields [12]. Additionally, the EU, India, Japan, South Korea, Turkey, and other nations or regions have also actively invested in Central Asian countries, further increasing

the complexity and uncertainty of the regional energy geopolitical landscape.

China' s Oil Import Dependency and Central Asia' s Low Guarantee Level

Since its reform and opening up, China's rapid economic and social development has driven soaring demand for oil resources. Having become a net oil importer in 1993, China' s oil imports and external dependency have continued to rise. According to the General Administration of Customs, in 2016 China' s crude oil imports reached 381 million tons, surpassing the United States' net imports of approximately 372 million tons and making China the world' s largest net crude oil importer for the first time. China' s oil dependency also hit a record high of 65.4% in 2016, approaching the U.S. historical peak of 66%. The International Energy Agency predicts that by 2020 and 2030, China's oil imports will reach 450 million and 570 million tons respectively, with dependency rates reaching 72% and 81% [13]. Oil import sources and channels have become bottleneck factors constraining China' s economic development and opening-up, a situation that will become increasingly apparent.

However, China has long faced issues of concentrated import sources and single transportation modes. While Central Asian oil can be transported via land pipelines, avoiding risks associated with wartime blockade of sea lanes, and the region' s status in China' s "diversified import strategy" has gradually risen, the actual contribution from Central Asia remains very low. The historical peak was 4.2% in 2010, but this has declined in recent years, averaging only 1.43% for 2014-2016 and dropping to just 0.85% in 2016. Moreover, China' s oil imports from Central Asia account for a small proportion of the region' s total oil production—only about 5% in 2015-2016 [10]. This demonstrates that, amid great power competition, China' s current access to Central Asian oil resources is extremely limited.

Risk Assessment of Oil Investment in Central Asia

Transnational oil investment involves geopolitical relations and is influenced by international economic conditions. When investing in Central Asia, China must thoroughly analyze numerous uncertainties and reasonably avoid various types of risks. This study constructs a risk evaluation index system for transnational oil investment and applies a fuzzy comprehensive evaluation model to quantitatively assess five risk categories: political, policy and regulatory, economic, socio-cultural, and infrastructure risks, providing a basis for risk control.

The risk evaluation index system comprises 5 risk factors and 18 risk indicators . Political risk factors include domestic regime change, domestic governance corruption, war or turmoil, major power diplomatic policies, and international oil monopolies. Policy and regulatory factors include mining rights allocation, tax systems, degree of host government intervention in operations, legal stability, and environmental policy requirements. Economic factors include economic

growth rates, exchange rates, and inflation. Socio-cultural factors include labor costs, ethnic-cultural-religious differences, and terrorist activities. Infrastructure factors include infrastructure construction and oil transportation routes.

Since these disturbance factors have unclear boundaries and involve complex phenomena with multiple interacting elements, a fuzzy comprehensive evaluation model combined with the Delphi method was employed. Senior experts in the field were invited to score the indicators, conducting a comprehensive evaluation of China' s oil investment risks in Central Asia to obtain risk levels and probability distributions for each factor.

The evaluation results show that among the five risk categories, policy and regulatory risks are high-level risks, economic, socio-cultural, and political risks are medium-level risks, and infrastructure risks are relatively low-level risks [Figure 1: see original paper]. Land pipeline transportation significantly reduces investment risks, but inadequate, unstable policies and regulations, along with law enforcement issues, substantially increase investment risks and require focused attention.

Among the 18 risk indicators, seven show a high-risk occurrence probability exceeding 30% [Figure 2: see original paper]. These high-probability indicators are: mining rights allocation, degree of host government intervention in operations, ethnic-cultural-religious differences, tax systems, legal stability, war or turmoil, and labor costs. These require heightened attention and research to reduce their occurrence probability and mitigate potential losses. During the pre-investment phase, human and financial resources should be allocated according to these probability results to conduct targeted risk management research.

Risk Prevention and Control Measures

Central Asia remains a potential advantage region for enhancing China' s oil import security. China' s oil investment and cooperation in Central Asia should target the high-risk factors and indicators identified in the assessment, seeking effective risk avoidance and transformation methods through reasonable cooperation models and pathways to minimize investment risks and ensure a stable oil supply.

De-emphasize State Characteristics and Emphasize Joint Ventures to Reduce Host Government Intervention Risks

As oil resources involve national interests and economic security, the rise of "resource nationalism" has made host governments highly sensitive to foreign investment, increasing approval procedures and legal restrictions [10]. Chinese state-owned enterprises' overseas investments carry strong state characteristics that have raised concerns among host countries. Private enterprises such as Guanghui Energy, Zhenghe Shares, and Zhongneng International have participated actively in Central Asian oil development with smoother progress. Therefore, encouraging private enterprise participation and promoting cooperation

between state-owned and private enterprises to establish "going global" industrial alliances is recommended.

Additionally, acquiring or holding controlling stakes in important host country oil projects triggers vigilance and countermeasures. It is advisable to shift approaches by cooperating with host countries to avoid policies unfavorable to joint ventures, or to partner with non-host-country oil investment enterprises for co-investment, profit-sharing, and risk-sharing to avoid bearing risks alone and reduce potential losses.

Identify Legal Pitfalls and Strictly Comply with Policy Terms to Avoid Policy and Regulatory Risks

Contract terms must be carefully reviewed to identify potential legal traps, especially transition plans and contract texts from exploration to extraction phases. Comprehensive negotiations should address product sharing ratios, labor proportions and employment, local content requirements and quality standards, and pipeline usage agreements. After signing contracts, Chinese investors should strictly comply with Central Asian laws and contract terms to avoid substantial penalties from violations. Chinese oil companies should monitor host country legal and policy changes in real-time, maintain communication with Chinese embassies, consulates, commercial agencies, and domestic institutions to obtain accurate and authoritative policy information, and prepare response measures in advance to avoid losses.

Conduct Public Welfare Programs and Build a Benevolent Image to Reduce Cultural Conflict Risks

Chinese enterprises should actively engage in social interactions, enhance public diplomacy capabilities, and shape positive corporate images. They should pay attention to local livelihood issues, actively participate in charitable activities supporting community development, invite opinion elites to visit company or project sites, and build benevolent corporate images through good dialogue and interaction. Creating corporate public welfare images emphasizing environmental protection and ecological care ensures that media and the public understand Chinese enterprises' sense of responsibility, effectively avoiding hostility from local populations and extremist forces. In daily interactions, respect for local religious beliefs and cultural customs is essential, avoiding contact with extremist religious figures, strengthening communication with tribal communities, elders, and religious leaders, expanding social networks, and cultivating human resources to obtain early warning information through multiple channels before crises and mobilize rescue efforts afterward to ensure the safety of Chinese personnel.

Seize Key Areas and Adopt Multiple Approaches to Increase Oil Resource Control

Given the unclear reserve status and current trade characteristics of Central Asian oil resources, China' s investment should focus on key areas and core links

to secure future discourse rights in oil extraction or purchase. It is necessary to control both ends of the oil industry chain: the upstream exploration and R&D phase to ascertain the actual reserves and distribution, and the downstream application phase, even extending to related economic fields to develop close cooperation in knowledge sharing and technology development, making it an important engine for mutually beneficial socio-economic development.

Furthermore, China should enhance control over existing pipelines and actively promote pipeline projects proposed by Iran, Kazakhstan, and Turkmenistan to build a route from the Caspian Sea through northern Iran to the Persian Gulf. If completed, this would connect Central Asian oil with the Middle East, enabling China to obtain both Central Asian and Middle Eastern oil resources via land routes.

Optimize Cooperation Models and Emphasize Mutual Benefits to Enhance Geopolitical Advantages

Oil development cooperation is an important component of consolidating and strengthening geopolitical and geo-economic relations between China and the five Central Asian countries, and a requirement for deepening "comprehensive strategic partnerships" under new circumstances. Following the principle of mutual benefit and drawing on international oil and gas cooperation models, China can adopt various cooperation models including loans-for-oil, production sharing, joint operations, technical services, mergers and acquisitions, and vertical integration [18-20]. In practice, these models often intersect to form "hybrid cooperation models" to meet China's enormous demand for oil resources.

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Note: Figure translations are in progress. See original paper for figures.