

The Risks Facing China's Mining Companies – An Analysis from Global Perspective¹

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Abstract

Mining operations represent an economic activity with plenty of decision problems involving risk and uncertainty. While underlying risks do not vary significantly from year to year, their level of acuteness and priority can change depending on the economic environment. With the development of economic globalization, China's mining companies are exposed to a higher than average level of risks, especially risks from political and economic policies of the host country, as well as financials. This paper works through various risk scenarios and performs impact analysis, and then gives suggestions about risk management and control from both macro and micro perspectives.

Key words: Risks, China's Mining Companies

1. Introduction

According to the enterprise risk management framework of COSO (the Committee of Sponsoring Organizations of the Treadway Commission), events with a negative impact represent risks, which can prevent value creation or erode existing value [1]. Mining projects are famous of its long investment period with great uncertainty. It normally takes at least 3-4 years from the start of mineral exploration to construction till finally production, involving many buyers and sellers and implying a variety of risks. With economic globalization, the domestic and international minerals markets are more closely linked, not to mention the large number of international M & A activities of mining companies. Chinese mining are now exposed to a higher than average level of risk and their risk appetites reflect this. In working through various risk scenarios and performing impact analysis, we would find opportunities for mining companies to adequately prepare themselves for existing and potential risks. In doing so they will not only be able to tighten processes and controls, but also make themselves more agile and able to seize strategic opportunities, as well as operate more effectively, no matter what the market conditions.

2. Literature Review

Li Kuixing (2009) concludes the risk characteristics of mining companies as follows: ① large investment and long implementation cycle of production with more uncertainties than other industries due to the incomplete understanding of mineral resources. ②The mineral resources tend to be non-renewable, and mineral activities have tremendous destructive

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impact on the environment as well. ③The process of mining production is full of variability. Different locations of mining production usually mean different technical and economic parameters. Even in the same deposit, the nature of the ore also changes in different burial depth. ④As a basic industry, mining is directly affected by economic situation. Demand and market prices for minerals has a clear periodicity [2].

Chhitiz Kumar (2010) [3] studies the mining companies in India and summarizes the mining investment risks as geology, marketing, finance, administration, government policies, regional / host country issues, environment and national / political stability. The pity is that it doesn't follow the newly coming risks facing mining from a global perspective. Since the reform and opening-up, China's sustained economic growth effectively promoted its domestic mining market, while many Chinese mining companies at the same time also turn to overseas investment. Wang Zhiqiang, XIAO Rongge (2009) [4] noticed the change and pay attention to the possibility of loss caused by international economic recession and advise to conduct a comprehensive risk management system in China's mining companies. This paper emphasizes a rough qualitative research and doesn't propose economic data to argue its opinion. In Last year Ernst & Young released its report of Business Risks Facing Mining and Metals 2011-2012 [5], in which it ranks the risks as: ① resource nationalism; ②skills shortages; ③Infrastructure access; ④maintaining a social license to operate; ⑤capital project execution; ⑥price and currency volatility; ⑦capital allocation; ⑧cost management; ⑨ interruptions to supply; ⑩ fraud and corruption.

The paper contributes to the literature above in several ways. First it sheds new light on the categories of risks facing mining companies on the basis of the existing level of economic development in China and its unique socialist market economy. Then we focus on the influence on mining risks of economic globalization in detail. Finally it gives some advice of dealing with such risks from both macro and micro perspective.

3. Regular Risks facing Mining Companies

There are many forms of regular risks facing mining companies, which include the following:

- **Geology**

The geological risk of mining refers to the risk brought about by the uncertainty of exploration work, lack/low reliability of the geology and mineral resources information. In the early phase, most of the mining projects need to do a lot of exploration work with a high cost and low probability of finding economic mineable deposit. Even for the successfully explored deposits, its distribution and reserves can be of variability. The geological parameters, deposit boundary survey and determination of ore grade...etc. is also a dynamic concept with great uncertainty. At the same time, the initial cash flow is negative and uncertain for a long period (maybe 5-10 yr) as mineral grade and quantity is being established.

Figure 1 shows changes of the value and cash flow of a mining project from the beginning of early exploration, assessment, to construction and finally production.

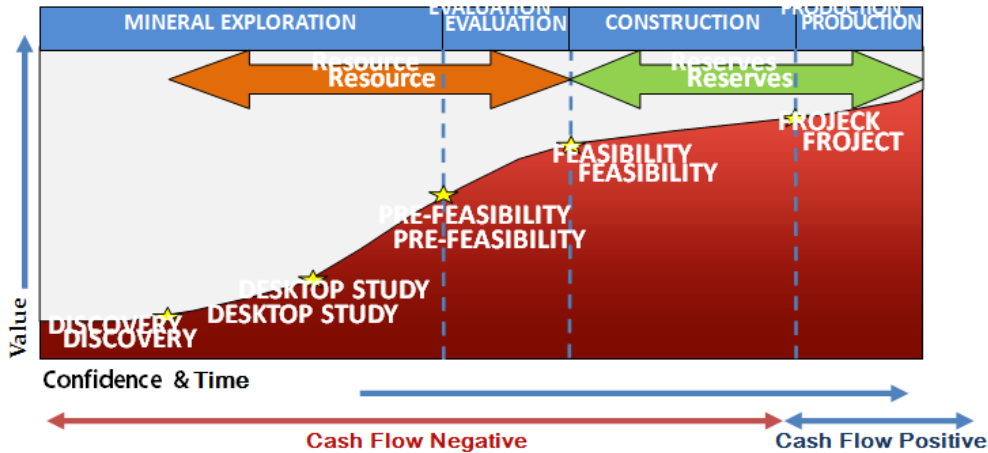


Figure 1. Geology Risk of Mining

- **Market & Currency Fluctuation**

As a basic industry of the national economy, mining commodity prices are directly affected by the country's economic situation. The impact of the economic cycle determines that the demand and market prices for minerals has a clear periodicity. At the same time, since the minerals is mainly used for smelting, power generation and chemical industry, the volatility of final products will also have a direct impact on sales of mineral commodity. Table 1 shows the severe price fluctuations of major metals since 2001.

Table 1. Price Fluctuation of Primary Metals Since 2001

	Prices 2009.02.09	Price Fluctuation since 2001			
		Highest Prices	Lowest Prices	Down from Top (%)	Largest Increase (%)
LME 3-month nickel futures (US\$/t)	10825	51800	4320	-79.1	1199.1
LME 3-month zinc futures (US\$ /t)	1150	4580	742	-79.4	617.3
LME 3-month lead futures (US\$ /t)	1305	3890	413	-66.5	941.9
LME3-month copper futures (US\$/t)	3630	8940	1336	-59.4	669.2
LME 3-month tin futures (US\$ /t)	13700	25500	3630	-46.3	702.5
LME3-month aluminium futures(US\$/t)	1925	3380	1255	-43.0	269.3
International gold price (U.S. \$ / oz)	900.85	1033	254	-12.8	407.2

Resource: Bloomberg

- **Safety Incidents**

With the increased intensity of mineral development, mine safety accident warning and control techniques is relatively in a backward state compared with mining technology. Mine safety incidents occur frequently in recent years, which often result in heavy casualties and property losses. In September-October 2008, 247 production safety accidents happened in China, in which mine incidents ranked top 2, accounting for 19.43% of the total [6].

In fact, not only in China, mine safety incidents are annoying and troublesome in worldwide. A Geneva-based trade unions federation estimates that worldwide mining disasters account for around 12,000 deaths every year. Mine deaths in the US increased by 115% in 2010 to 77 mine related deaths after only 33 in 2009, the safest year in US mine history.

- **Financials**

The financial risks facing mining include:

- ◇ High uncertainty of cash flows—geological reasons and uniqueness of each project.
- ◇ Because of its long period of project cycle and large amount of investment, the total investment of mine projects is not easy to control. In present China, Most of the mines produce a total investment exceed the original budget.
- ◇ Difficult to finance

- **Environment Impact**

Protecting the surrounding environment both during the development and operation of mines, and after closures, is becoming increasingly challenging with increased attention in recent years. Mining activities damage the natural resources and environment directly. The greatest analogies challenge to this is the failure of tailings dams. Seventy-five percent of the major environmental incidents at mines since 1975 have related to tailings dam failures. The impact of such an accident can have severe and ongoing ramifications. There are important lessons to be learned, including planning, response, risk identification and the inability to contract out of risk.

4. New Risk Pattern of China's Mining Companies during Economic Globalization

4.1. The Extension of Regular Risks in Global Perspective

Under the trend of economic globalization, the risks facing China's mining companies changed. Firstly it reflects an extension of existing normal risks as follows:

- Accompanied by the internationalization of commodity trade, the linkage between international and domestic minerals market tightened. The domestic ore prices are significantly influenced by the volatility of futures and spot prices on international markets.

Figure 2 shows the 2007-2009 New York and China's Daqing oil price movements. January to March 2010, the oil price in both China and U.S. rose at a certain level. The monthly average crude oil spot prices of the Daqing Oilfield were 76.9, 72.7 and 76.6 per barrel. In the same period in the United States, New York spot prices of crude oil were compared with of 79.2,76.5,81.0 U.S. \$ / barrel. The rise in oil prices was mainly due to a weaker dollar which stimulated the investors' risk appetite for crude oil futures, as well as to optimism for economic recovery. Further back, we can see that the spot prices of crude oil in both Daqing and the New York are moving on the nearly same trend. Figure 3 also reflects a similar trajectory of fluctuation of the copper ore prices on both international and domestic markets.

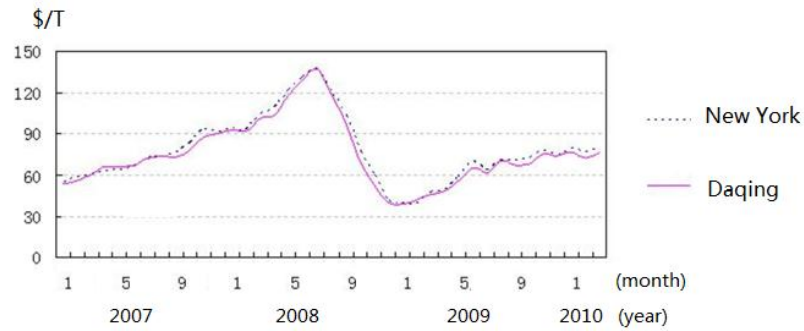


Figure 2. Price Movement of Crude Oil in New York and Daqing

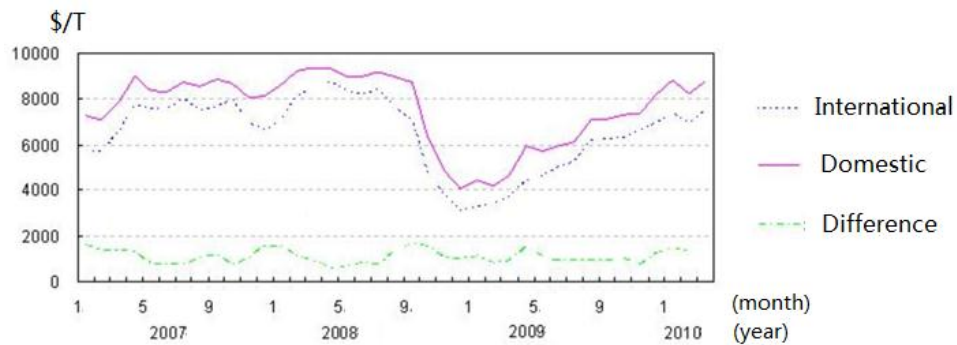


Figure 3. International and Domestic Prices Fluctuation of Copper

Resource: website of the Ministry of Land and Resource of China

- On the basis of the original financial risk, foreign exchange rate risk turns more obvious and severe due to a great increase in import and export of mineral products.

Commodity price volatility is influenced by a number of factors, including economic landscape, geopolitical events and their effect on underlying supply and demand, as well as investment in commodity funds. Mining producer currencies can soften the impacts as their currencies have a strong correlation to movements in metal prices. However, as many global mining and metals companies have the US dollar as their functional currency, the volatility is even more pronounced.

Companies with input costs in stronger currencies, e.g., Australian dollar, South African rand or Chinese Yuan, but with revenues in the weakening US dollar, will face potential margin pressure. Australia's Fortescue Metals Group, for example, is moving funds earmarked for its Pilbara expansion project from US dollar accounts to Australian dollar accounts to prevent a project cost blow-out due to currency differences.

- The resources and resource-oriented enterprises often invest in financial derivative instruments for speculative and hedging. Because of the leverage of the derivatives, the international financial risk will be brought in with a much enlarged impact.

The industry characteristics of mining decide its high possibility of financial derivative products investment. The minerals market is naturally linked with the financial markets: gold, silver and other precious metals, metals like aluminum, copper, molybdenum and nickel, as well as oil, coal and other energy products, in an international context, all have mature markets of futures, options and other derivative products. Currently China's domestic derivatives market is still less developed, with few kinds of derivative products available and strict limitation for overseas derivatives transactions. So China's resources and resource-oriented companies have to do their investment through Goldman Sachs, JP Morgan and other foreign investment banks with a higher cost. Part of the mining companies and companies using minerals as their main raw materials invest in the 'structural options' to circumvent controls. Air China, for example, didn't signed its hedging contracts in formal futures exchanges, but privately made the over the counter structural options trade with the counterparty, which, when meeting the oil price plunge in 2008, led to a great loss of up to 3.1 billion yuan(in its income statement of October 2008).

4.2. Newly Emerging Risks

- With the internationalization of mineral market, the development of the domestic mining companies is tremendously affected by the international economic situation. Meanwhile, China's domestic economic situation in turn influences the movement of the international minerals price.

With the 'emerging markets' 'drive towards industrialization, demand in China, India and even across Africa has been rising at break-neck speed and long-term forecasts seem to point to rising demand for decades to come. China alone already accounts for 37% of world demand for copper and 44% of global demand for aluminium—figures that exceed the combined total consumption of the United States, Western Europe and Japan [7]. On the other hand, declining U.S. domestic spending, a shaky European debt market, political instability and rising interest rates in Asia continue to take a toll on the domestic commodity prices, leading to an unprecedented level of volatility. As shown in Figure 2 and Figure 3 above, the international financial crisis beginning in 2008 made a great drop of minerals price even in the domestic market of China. In that 'cold winter', many mining companies had to cut their production or even close some mines.

- As commodity prices rose, more and more countries and regions express their concern about the minerals trading, mining investment projects, as well as mergers and acquisitions within mining companies. The resource nationalism makes overseas investment or M& A face a greater political and policy risk of the host country.

There are many forms of recent resource nationalism, which include the following in Table 2:

Table 2. The Common Policies and Measures took by the Host Countries to Protect their Domestic Resources and Increase Mining Income

Resource Rent	Tax and Royalty	Controls on Foreign Participation
the Australian Government's plan to implement the Minerals Resource Rent Tax on iron ore and coal mining in 2012 is on track with draft legislation being published.	A 5% royalty charge in Obama's budget concerned with hard rock miners in the United States.	Venezuela has revoked multiple mining licenses. In February 2011, Crystallex's mine operating contract for the Las Cristinas mine was terminated by the Venezuelan Government.
In-country Beneficiation		Mandatory Government/Local Participation
Indonesia's Ministries of finance, trade and energy and mineral resources are considering a proposed ministerial decree which would require all miners to process raw commodities including gold, copper, tin, iron ore, and coal, before being shipped overseas. There is also an intention on the part of the Indonesian Government to issue a decree to ban the export of low grade thermal coal from 2014 onwards.		Over the past three years, the Government of Zimbabwe, has been implementing the Indigenisation Law. Under this law mining companies have to hand over as much as a 51% stake to indigenous Zimbabweans.

Resource: Ernst & Young report of Business Risks Facing Mining and Metals 2011-2012

5. Conclusion

With a long period of construction and significant uncertainty, a mining project normally implies a variety of risks. At the same time, under the background of economic globalization, mining companies are exposed to a higher than average level of risks, especially risks from political and government policies of the host country, as well as financials.

The various risks facing mining companies can be summarized as a "risk pyramid" showed in figure 4, which has three levels. The top of the risk pyramid is the risks coming from the policies of host government and change of the international economic situation. This level of risk is often difficult to be completely circumvented by the companies, or even difficult to predict. To deal with such risks, the government needs to play an important role. The intermediate level of the pyramid consists of the extended financial and market risks during globalization. These risks can be handled by hedging, as well as compliance with and effectively using of international rules. At the bottom of the pyramid are the regular risks facing mining companies, in response to which could the companies improve their strategic and operating management with focus on a comprehensive risk management.

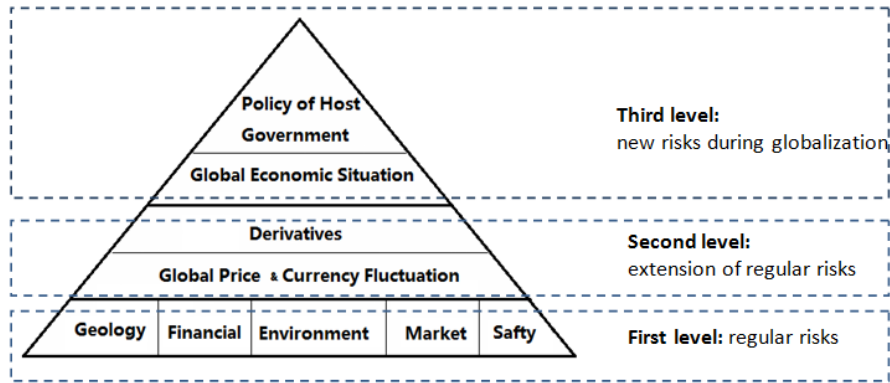


Figure 4. The Risk Pyramid of Mining

6. Suggestions

6.1 Strengthening the Support and Macro-management of Government to Ming

To reduce the risks of mining companies, the government can do:

- ✧ Establishing a regular data analysis and reporting system, and building a platform of sharing the geology and mineral resources information.
- ✧ Promoting the international resources cooperation.
- ✧ To actively participate in rules making of international minerals trade and improve its influence on minerals pricing.
- ✧ The Ministry of Land and Resources organizes to do some research on the mining risks environment, risk assessment and risk management and publishes risk management guidelines.

Figure 5 summarizes the function of government in risk management.

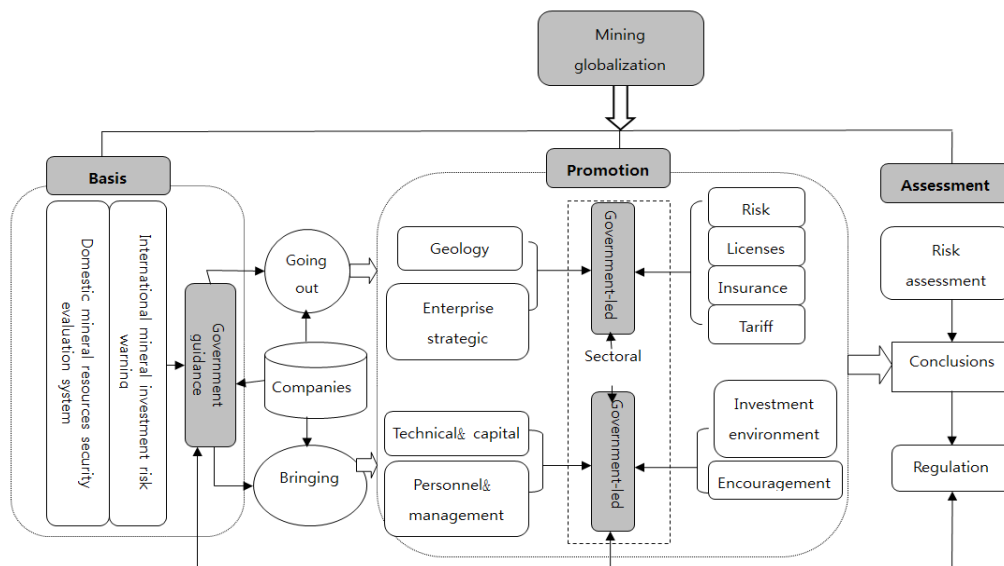


Figure 5. The Function of Government in Risk Management

6.2 Measures for Specific Risks Facing Mining

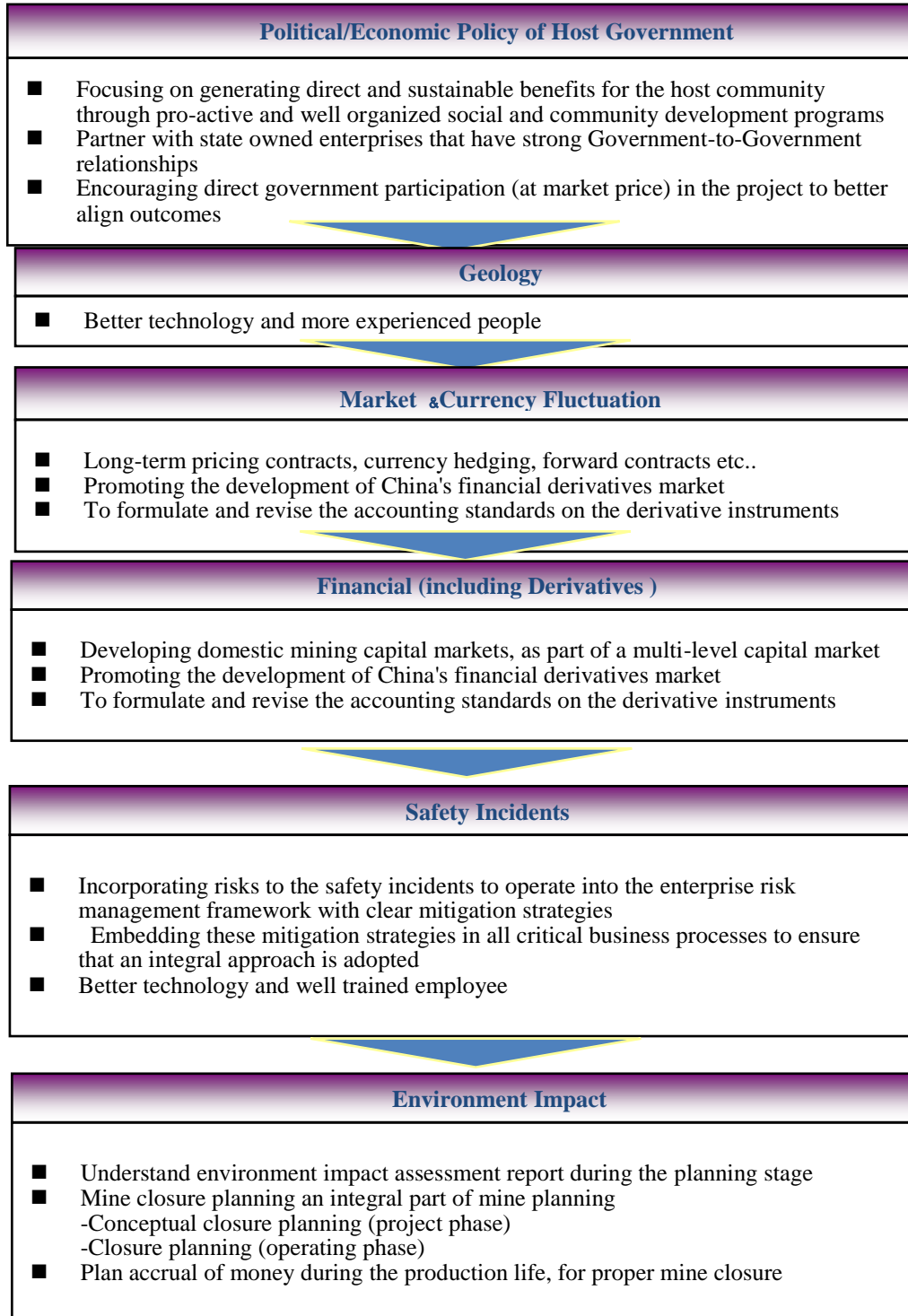


Figure 6. Measures for Specific Risks Facing Mining

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