

# Enterprise Futures Hedging Risk Management -Take the Qingshan Holdings' Nickel Futures Incident on the LME as an Example

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**Abstract.** When conducting international commodity trade, companies have to face changes in the prices of raw materials and finished products. Particularly in the context of a volatile international situation and increasingly complex geopolitics, enterprises are often inclined to engage in hedging activities to mitigate price risks. Establishing and improving risk management in hedging to promote enterprises' smooth trade business is significant. Good risk management can ensure the long-term and stable development of enterprises. This paper conducts a case study through the March 2022 nickel futures price surge event on the London Metal Exchange. Through the huge loss of Tsingshan Group in the transaction, the cause of the event and the corresponding suggestions are put forward. The causes of the problems are analyzed from the macro-environmental and micro factors of the exchange and the enterprise, and the solutions are put forward. This paper has a certain reference value for similar enterprises to improve their hedging risk management ability.

## 1 Introduction

### 1.1 Research background

As global economic integration progresses, the significance of commodity supply chains in the international arena has grown even more prominent. Due to the complexity of the global situation and the impact of geopolitics, there has been an increase in price fluctuations of commodities, making companies more susceptible to the risks of price volatility in raw materials and finished products. In the current volatile international situation, international commodity trade is more likely than before to be affected by the macro environment and unforeseen events.

In the first quarter of 2022, there was a collective surge in commodity prices. The S&P Goldman Sachs Commodity Index (GSCI), a barometer for global raw material prices, witnessed a remarkable increase of nearly 34%, marking the largest surge since 1990. Meanwhile, the rapid development of electric vehicles and renewable energy equipment has boosted the demand for metals such as aluminum, nickel, and lithium. The International Monetary Fund (IMF) estimated that the global economic growth rate 2022 will be 3.4%, showing a significant decline compared to the 6.2% growth rate in 2021. The World Bank had projected a drop in global economic growth for 2022 to be 2.9%, compared to the 5.9% growth rate recorded in 2021.

Many companies use futures for hedging to avoid price risk, but there are some unavoidable risks. In

particular, the frequent occurrence of black swan events in recent years has led to an increase in price volatility factors in the international futures market, making it necessary for enterprises to consider and face more diversified risks when using futures for hedging. If companies do not implement hedging programs according to the right principles, they are prone to face greater risk exposure. At the same time, problems such as incomplete risk control and inadequate regulatory systems may cause enterprises to incur huge losses in participating in hedging.

Therefore, risk management throughout the entire process of hedging becomes particularly important for optimizing corporate hedging strategies, mitigating price risks, and enhancing the company's overall risk management capabilities. For core companies with large volumes, their losses in hedging often hit the entire supply chain and industrial chain. For these important enterprises, having good risk management and corresponding countermeasures play an important role in enhancing the stability of supply and demand in the whole market and promoting the development of the industry. This paper will study and explore how to strengthen enterprises' risk management on futures hedging and propose corresponding countermeasures.

### 1.2 Literature review

Bartram & Jiang found that firms' hedging behavior reduces their exposure to price risk and increases firm value [1,2]. By estimating the efficiency of futures

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hedging, Xiang & Wang & Ling found that the hedging efficiency of most hedging programs was above 90%, and the ability of the futures market to serve the real economy was gradually enhanced [3]. Zhu & Han proposed that futures played an important role in promoting the quality development of the real economy, but at the same time, they believed that the current futures market was not perfect and there were many problems and put forward a series of measures to improve it [4]. Li & Duo analyzed the risks that may arise when enterprises carry out hedging business and pointed out that there are inherent risks and extrinsic risks in the process of hedging, and at the same time, put forward the corresponding countermeasures according to these risks [5]. Cao & Tang take the crude oil hedging loss of a wholly-owned subsidiary of a Chinese state-owned enterprise as an example to analyze the reasons for the failure of financial derivatives hedging in large enterprises and put forward relevant countermeasures [6].

### 1.3 Research gap

Most scholars analyze the effect of hedging to avoid price risk by studying enterprises' hedging behavior and further exploring the value that hedging can play in enterprises. It was found that companies can better avoid the risk of price fluctuations in raw materials and finished goods by hedging. And the case study proves that hedging has a high efficiency of value preservation. Some articles prove that the correct use of hedging can promote the high-quality development of the real economy. Meanwhile, most scholars take the possible risks in the conventional financial derivatives market as the starting point, point out some risks that enterprises may face when hedging business, and put forward corresponding suggestions. Few scholars focus on enterprise failure cases under the influence of black swan events. They analyzed the macro background that led to the failure of enterprise hedging, the failure of the enterprise's own management, and improper risk management of hedging, and they put forward corresponding countermeasures.

### 1.4 Research framework

This paper focuses on the case study method. The nickel futures price surge in the London Metal Exchange (LME) as a case study. This paper will analyze the reasons for the failure of Tsingshan Group's hedging business using futures and the risk management problems it faced and propose relevant opinions according to the problems. First is a specific description of the incident of the surge of nickel futures price in the LME. Second, the futures hedging issues and risks in this case will be analyzed. Finally, corresponding countermeasures are proposed based on the different issues analyzed.

## 2 Case description

### 2.1 Nickel prices on the London Metal Exchange (LME) experienced a sharp surge

In March 2022, the nickel futures prices on the LME experienced an epic surge, causing a sensation in the international financial markets. During this period, the LME had to halt trading twice and implemented a series of emergency adjustments.

In 2021 and early 2022, the nickel prices on the LME remained relatively stable at around \$20,000 per metric ton. However, by the end of February 2022, the conflict between Russia and Ukraine escalated, leading to a series of sanctions imposed by Western countries on Russia. Market concerns about possible restrictions on trade and delivery of related resource goods have triggered significant volatility in global commodity prices. From March 1 to 4th, nickel prices on the LME saw a continuous upward trend for four consecutive trading days, with the highest price surpassing \$30,000 per metric ton. Then, on March 7th and 8th, the front-month nickel futures contract on the LME broke historical records, reaching a peak increase of 250%. On March 7, nickel futures opened at \$29,770 and briefly surged to a historic high of \$55,000 during intraday trading. During overnight trading on March 8, nickel futures continued to skyrocket, breaking the \$100,000 mark and reaching a peak price of \$101,365, as shown in Figure 1.

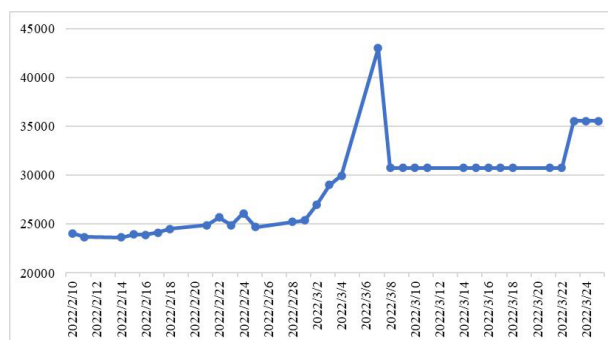


Fig 1. LME Nickel Official Prices (Shown in US\$)  
 (Photo credit: Origin)

### 2.2 Tsingshan group suffers massive losses

Tsingshan Holding Group Co, as a producer of metal nickel, held a global market share of 18% in 2020. Tsingshan Group adopted a future hedging strategy by taking short positions in nickel futures to hedge against the risk of metal nickel price fluctuations.

Taking the market speculation of 150,000-200,000 tons of short positions, Tsingshan Group's selling price for the position opened before March 6, 2022, is about \$25,000 per ton, and based on the highest price of \$101,000 per ton that appeared on March 8, its floating loss will reach \$11.4 billion - \$15.2 billion. According to hedging, if Tsingshan Group has sufficient underlying goods, the profit of spot delivery on the expiration date has been locked in advance, and the company only needs to make physical delivery. However, Tsingshan Group faced a problem: they did not have enough delivery

commodities and failed to move their positions in time. On March 15, 2022, Tsingshan Group announced it had reached a silent agreement with a consortium of futures banking creditors. During the silent period, participating futures banks agreed not to close out Tsingshan's positions or require additional margin on existing positions. As an integral part of the agreement, Tsingshan Group is expected to gradually reduce its existing positions reasonably and orderly as abnormal market conditions subside. However, it is already certain that Tsingshan Group has incurred losses that cannot be reversed.

### 3 Analysis on the problems

#### 3.1 Macro reasons

##### 3.1.1 *Russia-Ukraine conflict leads to panic in nickel futures market*

In February 2022, the conflict between Russia and Ukraine escalated, leading to a series of sanctions imposed by Western countries against Russia. As a major global producer and exporter of nickel, Russia accounts for 8% of the world's nickel supply, and its production of electrolytic nickel exceeds 20% of the global total. Russia plays a significant role in the nickel supply chain. Although the West's policy of sanctions against Russia did not directly restrict Russia's non-ferrous metal export trade, the main supply side of nickel brought the potential risk of non-negligible impact and public opinion.

The policy of sanctions against Russia implemented by Western countries increases the liquidity risk of the nickel spot. The liquidity risk of nickel spots triggered panic in the nickel trading market, exacerbate the possibility of a shortage of LME nickel stocks and the risk of a run on the LME, creating the conditions for nickel prices to rise. Market participants are concerned about the instability of the nickel supply. As a result, they are taking measures to address the potential nickel shortages. The interaction of this panic and investor behavior has driven volatility in the nickel futures market, resulting in high prices.

Although, in recent years, Russia's nickel production in the global market has seen a gradual decline from the LME standard delivery goods - electrolytic nickel-Russia's Norilsk nickel industry accounted for about 15% of the global electrolytic nickel production. The sanctions imposed by the West on Russia have worsened the conditions for Russian electrolytic nickel to enter the LME delivery market. This situation poses a potential risk for the sharp surge in nickel futures on the LME.

##### 3.1.2 *Nickel supply and demand support nickel prices rose steadily*

Nickel is widely used in various sectors, such as stainless steel production, electroplating, and batteries. With the continuous reform and upgrading of the manufacturing

industry, the demand for nickel has steadily increased [7]. As a crucial non-ferrous metal supporting the new energy sector, the demand for nickel has been steadily rising in line with the rapid development and expansion of the new energy industry. According to data compiled by the Nickel Institute in 2022, nickel accounts for a significant proportion of global usage across various sectors. Specifically, nickel's usage in stainless steel production constitutes 70% of global consumption. Other alloys account for 16%, electroplating layers represent 8%, and nickel consumption in the battery sector amounts to 5%. Despite the relatively low proportion of nickel demand in the battery sector, the continuous increase in demand for electric vehicles and the promotion of high-nickel batteries have accelerated the growth of nickel demand in the new energy sector. New energy batteries are poised to be a driving force for long-term and stable future nickel demand growth.

Despite Indonesia's abundant reserves of nickel resources and increased production of nickel pig iron and ferronickel, its output remains limited. This has resulted in a global nickel supply that can only meet the growing demand for nickel. The supply and demand dynamics in the global nickel market have led to a sustained increase in nickel prices. Investors and market participants anticipate that the supply gap will continue to persist. This supply and demand scenario supports a steady rise in nickel prices from 2016 to 2022. Against the backdrop of tight supply and surging demand, global nickel stocks continue to fall. And since 2021, nickel stocks on the LME have declined month by month to low levels. The above factors provide inherent conditions for the surge in nickel futures.

#### 3.2 Micro reasons

##### 3.2.1 *Strict limitations on LME nickel futures standard delivery brands*

In the LME nickel futures contract, only Class I electrolytic nickel with a minimum purity of 99.8% can be used for future delivery. Galaxy Futures Commodity Research Institute of non-ferrous R & D report shows that in 2012, Class I nickel accounted for 51%, Class II nickel accounted for 38%, while in 2021, Class I nickel, Class II nickel accounted for 31.4% and 63.6%, respectively. The proportion of Class I nickel products available for future delivery continues to decline, while the production of high-ice nickel, nickel pig iron, etc., is rising yearly. However, many forms of nickel, such as Class II nickel, nickel salts, high-ice nickel, and ferronickel, are not deliverable on the LME. The demand for risk management of nickel industry chain chain-related production enterprises, especially ferronickel and other non-standard goods, continues to increase. The hedging demand has increased substantially. This has led to a continuous increase in trading volume in the nickel futures market while the supply of electrolytic nickel remains relatively stable. The growth rate of hedging volume for nickel futures is significantly higher than that of electrolytic nickel supply, and Tsingshan Group falls

into this category. The existing design of LME futures contracts has struggled to keep up with the significant changes in the global nickel industry. The growing demand for hedging non-standard nickel products and the insufficient supply of pure nickel has created a contradiction, resulting in the potential for speculative trading in LME nickel.

Indeed, while Tsingshan Group possesses a significant nickel production capacity in Indonesia, a considerable portion of its products may not qualify as standard delivery brands in LME nickel futures. This situation means that shorting nickel futures on the LME does not provide a complete hedge for the nickel products produced by the Tsingshan Group. As a non-standard asset, hedging operations using futures contracts may not perfectly align with Tsingshan Group's main product portfolio. The underlying assets of the futures contracts held by the company do not fully match its primary products. This situation makes the hedging behavior of Tsingshan Group naturally exist in the face of the risk of physical delivery not being completed or even forced position behavior.

### *3.2.2 Tsingshan Group holds an excessive short position in nickel futures*

Indonesia is rich in nickel resources, and Tsingshan Group has invested in many nickel production plants in Indonesia to achieve its goal of producing nickel at low cost. Tsingshan Group, the world's No. 1 nickel producer in 2021, said it will continue to increase its investment in Indonesia's nickel industry. According to their claims, Tsingshan Group expects to produce an estimated 600,000 metric tons of nickel equivalent in 2021, 850,000 metric tons in 2022, and 1.1 million in 2023. The announced production forecast by Tsingshan Group represents a significant portion of the global nickel supply, directly impacting the global nickel supply market. The substantial increase in these production forecasts has significantly boosted the supply in the nickel market. However, global economic conditions have been sluggish at the same time, leading to a decrease in market expectations for the demand side of the nickel market. Therefore, Tsingshan Group predicts that nickel metal prices will continue to decline in the future market. To ensure stability in the spot market and hedge against the risk of falling nickel prices, Tsingshan Group has actively taken on a significant short position in nickel futures. However, the number of futures short positions the group holds exceeds its holdings in the spot market. If trading in the futures market fails, Tsingshan Group's production capacity may not be able to withstand the consequences, and the risk exposure may exceed the company's capacity to bear it.

## **4 Suggestions**

### **4.1 Improvement of enterprise risk awareness**

As a financial derivative, a hedging business has its own market rules. Enterprises carrying out hedging business to hedge price risks should follow the market rules of futures to carry out business. Enterprises should consider their situation in the spot market, but more importantly, they should not blindly rely on their spot market advantages and reduce the emphasis on the risk management of hedging business. When the Russia-Ukraine conflict broke out, it buried the hidden danger of blocked spot delivery of electrolyzed nickel. The risk sensitivity of futures market participants catalyzes increased volatility in the nickel futures market. When hedging, enterprises should not ignore macrogeopolitical factors but also consider the role of market participants in promoting the market.

### **4.2 Strengthen strategic risk management at the decision-making level**

Strategic risk management is the highest promoter in enterprise risk management. Strengthening risk management and control at the strategic level often makes risk management more effective with less effort [8]. The upward price trend of nickel had already appeared before this incident. The continuous innovation and commercialization of the global new energy field has put higher supply demand on the supply side of nickel. Enterprises should face future development and serve the enterprise strategy when managing risk. Risk management programs related to industry trends need to be continually enhanced. Enterprises need to strengthen cross-management, improve market monitoring and early warning capabilities, and establish a multi-level risk early warning system.

### **4.3 Flexibly use a variety of financial derivatives to diversify hedging risks**

Futures trading adopts the mark-to-market system on a daily basis, also known as the daily debt-free system and daily settlement system [9]. Although Tsingshan Holdings mainly conducts transactions with LME member banks in the over-the-counter market, there is still great pressure on member banks to call margin in case of market emergencies. The strict margin system and mark-to-market system of futures markets require high liquidity for futures trading. In contrast, non-standardized financial derivatives such as forward contracts and swaps do not have this requirement. In addition to futures, companies can also use derivative instruments such as forward contracts, swaps, and options to hedge their risks. By combining various financial derivatives, it can better avoid the strict restrictions of the exchange on standard delivery products.

Tsingshan's hedging positions are on the LME, exposing it to the London market. China's futures market implements penetrating supervision, with a specially set up margin supervision center, and the risk system is the world's leading [10]. If Tsingshan can carry out part of the position hedging in the Chinese

market, it can reduce the hedging risk accordingly. Enterprises should also be careful not to concentrate risks in one market when hedging. In extreme cases, there will often be no buffer.

#### 4.4 Match positions as required and build an early warning system for closing positions and delivery

Enterprises should reasonably control the scale of hedging when conducting hedging business, especially when there is no perfect match between the underlying futures asset and the spot. Enterprises should make full use of futures and options tools to protect positions in hedging. At the same time, they should strengthen the observation and adjustment of risk exposure and make the futures positions follow the spot positions for liquidity management.

Enterprises should formulate risk early warning measures, and when extreme situations occur in the futures market, they should be able to close positions or deliver in time to alleviate position risks. Position risk is assessed by taking into account risk events that may occur and analyzing the potential impact of the events. Risk assessment for the delivery and closing of positions is carried out dynamically in accordance with the enterprise's business conditions and risk tolerance. In order to avoid bad consequences such as forced positions and unbearable risk to enterprises, enterprises should do a good job formulating risk response measures and constantly improving their risk response-ability.

## 5 Conclusion

Enterprises can effectively avoid the price risk of raw materials and finished products by hedging, but they will encounter many unexpected situations when carrying out hedging business. The impact of geopolitical and world turmoil has led to very volatile prices for nickel futures on the LME. Strict restrictions on the delivery of products on futures exchanges can make it quite limiting for enterprises to use the underlying product for hedging. Enterprises actively hold unreasonable amounts of futures positions, laying the groundwork for failure to complete delivery. In order to better manage hedging risk, enterprises should first establish risk awareness and formulate hedging strategies based on their own conditions. Moreover, it is necessary to clarify the enterprise's strategic objectives and improve the risk control ability of the strategic decision-making layer. When the underlying futures are severely restricted, look for a combination of multiple financial derivative instruments to diversify the hedging risk. Enterprises should establish reasonable hedging positions according to demand and improve the early warning mechanism for closing and delivery.

This paper analyzes the risks encountered by enterprises in the process of hedging to avoid the risk of price fluctuations of raw materials and finished products under the background of international turmoil and geopolitical influence, puts forward corresponding

countermeasures and suggestions, and bridges the gap in the analysis of the complexity of the world situation in conventional hedging operations; and helps real enterprises to establish risk management principles when conducting hedging operations and enables companies to consider diversification risks in a multifaceted manner and to avoid situations where they are exposed to large risk exposures. It also promotes establishing comprehensive risk control and sound regulatory systems by real enterprises and improves the reaction speed and response-ability to deal with hedging risks.

This paper focuses on qualitative research through the case of the Tsingshan Nickel incident, missing the use and analysis of data. Future research can conduct more in-depth research through data investigation and game model derivation of enterprise hedging business.

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