

# Research on Hedging and Risk Management of Stock Index Futures

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**Abstract:** Futures are a relatively new financial instrument in modern times and play a pivotal role in the economy. Stock index futures, as a hedging tool for the stock market, have become even more popular among investors in this particular period of multinational trade friction. However, everything has its pros and cons, and to gain extra income you must first bear the corresponding risk, so the purpose of this paper is to introduce stock index futures hedging and its risk management, to analyze and explain the operation and risk of hedging, and to empirically test the analysis and application of the hedging strategy, thus providing a theoretical reference for investors' practical operation.

**Keywords:** Stock Index Futures, Hedging, Risk Management

## 1. Introduction

Investors need to deal with both systematic and non-systematic risks when investing with stocks. When dealing with unsystematic risk, investors usually adopt a single approach, based on the idea of not putting eggs in the same basket, and diversify their investments by expanding their investment methods and investment channels to avoid unsystematic risk. In order to adequately deal with systemic risk, hedging transactions are the most common technique. By using the gains and losses of futures trading to offset the gains and losses of the stock portfolio, the stock portfolio is always maintained at a relative range of values, thus exposing the investor to relatively less systematic risk. In addition, stock index futures are also a relatively high-risk investment tool and there is a possibility of loss, so investors need to avoid harm and improve their returns through stock index futures.

## 2. Theoretical overview of stock index futures hedging and risk management

### 2.1. The concept and characteristics of stock index futures

#### 2.1.1. The concept of stock index futures

Stock Index Futures, specifically called stock price index futures, are futures contracts in which the stock price index is used as the underlying and the corresponding futures contract is formed. Both parties can choose a specific trading date in the post-trade and trade according to the stock index agreed in advance, and the final settlement is done by using cash to make up the difference.

#### 2.1.2. Characteristics of Stock Index Futures

Stock index futures are leveraged in the sense that it is not mandatory for traders to pay the full amount of the contract equivalent in the stock index futures trading process, but rather a little margin to complete the operation of the contract, thus creating a huge leverage. The leverage index is relatively large, and the trader only needs to provide a certain amount of margin as investment capital, and the contract price drawn up during the trading process can be even five times higher than his or her own investment capital[1].

Stock index futures also feature two-way trading, and stock index futures trading is different from stock trading. Stocks are traded in a one-way fashion, often falling after they are bought, and rising during the wait-and-see process, so investors are not informed of the expected rise and fall of stocks. But stock index futures trading is different in that this two-way trading model allows investors to go long, buying low and selling high to earn the difference, and short, selling at high prices and buying back when the price drops to a low price to gain revenue. The riskiness and diversity of stock index

futures is related to leverage. The greater the leverage, the greater the risk. Stock index futures trading is more leveraged than stock trading and therefore exponentially more risky than stock trading, and such risks tend to be diversified, with both human and market factors.

## ***2.2. The concept and characteristics of hedging***

### ***2.2.1. The concept of Hedging***

Hedging, also known as hedging, is the most common term for hedging trade. Using the futures market as a trading platform and a space for development, traders can use equivalent futures contracts in the futures market to offset the exchange of physical goods, thus ensuring the value of the physical goods themselves and preventing the risk of their depreciation. Futures trading replaces physical trading with certain convenience and also fully hedges the possibility of asset shrinkage to achieve hedging. Dot should be included after the section title number.

### ***2.2.2. The features of hedging***

Hedging is characterized by the sameness of the counterparty, which means that in the process of hedging, it is necessary to ensure that the type, nature and quantity of futures contracts remain highly consistent with the physical goods. Inverse-phase nature of trading means that the trader must perform operations diametrically opposed to the spot market during the hedging transaction. If the price of a commodity goes up or down, the price changes in the futures market and the spot market, although similar, cannot be kept exactly the same, so it is possible that one market will generate a profit while the other actually loses money, and the trader reverses the operations of the two markets so that the profits and losses are mutually offset in order to preserve the value of the asset. Proximity of trading time means that in the hedging process, it is important to ensure that the trading time between the futures market and the spot market is roughly the same and identical, and that the trading time between the two markets should not be too long. This can make the hedging time of the futures contract consistent with the time of the spot market risk, and make the spread between spot and futures as small as possible to give full play to the hedging utility [2].

## ***2.3. The Concepts and methods of risk management***

### ***2.3.1. The concept of risk management***

Risk management of enterprises refers to the management method that enterprises adopt certain means to reduce the risks they will face in the course of business. Risk management methods generally include controlling risks and managing related risks through finance.

### ***2.3.2. The methods of risk management***

Risk control methods include risk avoidance, i.e., abandoning risky business operations. Risk prevention, i.e., taking preventive measures to reduce losses associated with the occurrence of risks. Risk hedging, similar to hedging, by buying physical derivatives in the financial derivative market to hedge the corresponding risk. Risk diversification, which is the diversification of risk through investment. Methods of managing the associated risks through finance include: risk retention, where the company assumes all the corresponding business risks. Risk transfer, which is similar to risk diversification, is the transfer of risk by investing in different industries [3].

## **3. Current status of hedging application**

### ***3.1. Buy Hedging***

Buy hedging in stock index futures, also known as "long hedging", is a way for investors to hedge against the risk of price increases in the spot market by buying futures contracts of the same or similar value as the spot market and hedging by going long in the futures market. In stock index futures trading, if you want to buy the corresponding stock later, you can therefore buy the contract futures corresponding to the type, quantity and time of the stock, and then sell the contract futures later when you buy the stock, hedging the two and using the profit to offset the loss. If the price of the stock rises and the price of the futures rises, the trader can offset the loss from the rise in the price of the stock by the gain from the sale of the futures. Similarly, when stocks fall, the profits made in the stock market can offset the losses in the futures market, and the hedging objective is achieved.

### **3.2. Sell Hedging**

Sell hedging in stock index futures, also called "short hedging", is very similar to "long hedging" in form and operation. It is a way for investors to hedge against the risk of falling prices in the spot market by selling futures contracts of the same or similar value as the spot market in the futures market. In stock index futures trading, if you want to sell the corresponding stock at a later date, you can therefore sell futures contracts corresponding to the type, quantity, and time of the corresponding stock, and later buy the contract futures when you sell the stock, hedging the two and using the profit to offset the loss. If the price of the stock falls and the price of the stock index futures also falls, the trader can offset the loss from the fall in the stock price by buying the stock index futures. Similarly, when stocks rise, the profits made in the stock market offset the losses in the futures market, and the hedging objective is achieved. We hope you find the information in this template useful in the preparation of your submission[4].

## **4. Types of hedging risks in stock index futures**

### **4.1. Intrinsic Risk**

Intrinsic risk includes basis risk, where  $\text{basis} = \text{spot price} - \text{futures price}$ , and is called basis risk because of the relatively large price fluctuations in the stock and futures markets, which expose traders to corresponding risk. This risk is known as basis risk. If the movement of the basis difference is in line with the expectations of the trade, then it gives the trader additional benefits while hedging. If the spread is relatively large, the hedge will not be as effective and the trader may suffer losses.

The daily settlement risk of index futures trading stems from the daily settlement system and the margin system. If a trader discovers a gain or loss in index futures, the exchange will notify the intermediary and require the trader to make up the difference in margin in accordance with the exchange's rules. If the trader is unable to cover the margin due to insufficient funds available, the position will likely be closed out by the exchange. This would prevent the trader's hedging strategy from proceeding smoothly and could result in losses to the trader, which is the risk of day-ahead settlement of stock index futures. Underlying risk is caused by the fact that the underlying stock price index is selected as the underlying, so the stock market cannot be fully aligned with the underlying stock futures market and the hedging of stock index futures cannot be fully realized, and the physical hedging of the underlying and the stock is not complete, which brings about the underlying risk of stock index futures.

Finally credit risk, the buyer and seller in the hedging transaction process or because of the breach of the contract way or cannot perform the situation in the contract before the expiration date to terminate cooperation, thus resulting in the inability to pay the situation, will cause the inability to perform[5].

### **4.2. Extrinsic Risk**

Operational risk is the risk that arises from both the computer and the trader, where the computer system crashes or the trader food. The decision risk, on the other hand, is brought about by the fatal flaws in the hedging program developed by the company and by the managers due to poor decision making. Finally management system risk, China's regulatory system is lax, inadequate and imperfect, leaving certain loopholes in our hedging management and thus the possibility of losses.

## **5. Preventive measures for hedging risks of stock index futures**

### **5.1. Risk prevention measures by the government and financial institutions**

#### **5.1.1. Exchange precautions against risk**

Futures exchanges accommodate a variety of buyers and sellers and are an important territory for futures market transactions. As a platform and link between buyers and sellers of futures, futures exchanges exhibit significant functional and communication effects. The futures exchange is also responsible for the management of the futures market trading process, links and instruments, and needs to fully ensure the order of the futures trading market. At the same time, futures exchanges also bear a

relatively large amount of trading risks, and as a trading platform, futures exchanges demonstrate a significant role, so it is crucial to effectively prevent and optimize risk prevention measures.

First, effective construction and optimization of the market operation mechanism and the introduction of an enforceable risk management system. The management system of futures exchanges is updated in step with the development of the futures market, but the futures market is so dynamic that the update of the system never keeps up with the actual development and changes. Compared to countries such as the United States, where the system has become more mature, the risk management system of China's exchanges is slightly inadequate. For example, a special margin posting account for traders can be set up under the margin system to avoid unnecessary losses to traders due to insufficient margin to close out positions forcibly; it is also possible to learn the market capital replenishment strategy to deal with the chaos brought by credit risk to the whole futures market. The government can also strengthen the trading and settlement with the spot market to ensure the smooth flow of funds between the spot market and the futures market; as well as regularly maintain and update the exchange machinery and equipment and trading software to avoid unnecessary operational risks to traders due to the destruction of machinery and equipment or the obsolete software. The second is to strengthen the monitoring of the dynamics of futures trading.

Second, we should strengthen the tracking of futures trading dynamics. Due to the improvement of the legal system of the securities and stock markets, many unscrupulous elements have extended their black hands to the slightly "young" futures market. Although the exchange has a large account reporting system, after all, it only supervises static account positions, but does not track the entire trading process dynamically. In order to track the flow of funds in the futures market, the exchange should establish a comprehensive dynamic tracking system for futures trading, and conduct a series of dynamic tracking of accounts with abnormal flow of funds, from the accounts traded, the types of products traded, and the number of products traded, in order to resolutely combat the illegal and criminal behavior of lawless elements and maintain the stability of the futures market.

### ***5.1.2. Risk prevention measures by the SEC and the Futures Industry Association***

As the direct supervisor of China's stock, financial, and futures markets, and the country's highly enforced regulatory authority, the SEC plays a great role in the supervision of the futures markets. And as a private self-regulatory organization, the futures association must also fully and actively address the risks of linking the stock and stock index futures markets. Thus, the two statutory regulators as well as the private self-regulatory organizations are linked to fully realize the strict prevention of risks and form a strong risk prevention measure. Therefore, risk management in the system requires not only the active response of the futures market itself, but also the construction and improvement of the relevant legal system, which is effectively protected by law.

Second, in order to fully optimize the systematic regulatory system, the secondary regulatory system should be improved, while industry self-regulatory regulatory bodies should be organized, with the aim of strengthening the joint regulation of spot and futures. Futures associations should fully protect the rights and interests of their members, serve their members from an objective point of view, protect the legitimate rights and interests of each trader, strengthen the legal and risk awareness of each trader, try to avoid suffering risk losses while complying with laws and regulations, and play their role of command and coordination in the futures market to solve all aspects of the doubts encountered by traders.

### ***5.1.3. Financial institutions' precautions against risk***

Financial institutions are oriented to all consumers in the futures market, providing them with warehousing agents to operate. In fact, many financial institutions in the society are the real participants in the futures market. Traders only issue operation instructions, and the execution of the instructions must be done through the financial institutions, which build the bridge of operation between traders and the exchange. Moreover, financial institutions are also responsible for collecting and organizing information on the futures market, providing traders with information services such as the latest quotes and the latest policies. Finally, financial institutions are in control of traders' positions and margin, and have the responsibility to promptly remind traders to close their positions or make up their margin when their accounts are blown out or when their margin is insufficient. It is therefore extremely important for financial institutions to prevent risks.

First, actively understand the trader's assets and operating experience to control the credit risk of the market. Before opening an account for a trader, the financial institution should have a detailed understanding of the trader's creditworthiness, assets and liabilities, etc. The trader should be given a

detailed explanation of the risks of futures trading and sign a risk statement at the time of account opening, and should then actively participate in relevant training and seminars to enhance the trader's risk awareness and reduce subsequent losses due to lack of awareness and blind operation. After opening an account, the financial institution should keep an eye on the trader's position and trading status, and contact the trader in a timely manner to report any abnormal money flows.

Second, standardize industry standards and strictly comply with laws and regulations. Financial institutions should keep traders informed when information is released by the futures exchanges. They should promptly remind traders of accounts with insufficient margin and force them to close their positions if there is a significant risk. Monitor the entire trading process and funds, and never break the law for selfish reasons[6].

Third, strengthen the management training of institutional personnel. Financial institutions should conduct timely training for their salesmen and other personnel to expand their knowledge and enhance their practical skills and improve their competitiveness in the futures market. At the same time, they should pay attention to the ideological and moral education of the institution's personnel to avoid the phenomenon of corruption and abuse of the law.

### **5.2. Traders' precautions against risk**

First, traders should strictly comply with the laws and regulations related to the futures market. When trading, traders need to follow the operating guidelines of futures exchanges and financial institutions to avoid operational risks. They should also strictly comply with the relevant laws and regulations and refrain from committing illegal and criminal acts to maintain the normal operation of the futures market.

Then, traders should be physically active and trade stock index futures according to their financial strength. Traders have different risk-taking abilities, and those with large capital have a greater risk-taking ability than those with small and medium-sized traders, and their capital operates more smoothly. Since futures trading is leveraged and requires only a small amount of capital to operate a large number of futures contracts, many traders are blinded by their interests, resulting in large losses and credit risk to the futures market, which not only puts them behind bars but also interferes with the normal operation of the market. Therefore, traders should be physically active when trading stock index futures and look for investment strategies that suit their needs to reduce risk as much as possible.

Last, traders should choose the right and reasonable investment direction and make investment decisions as soon as possible. When hedging arbitrage, traders should find the right basis difference to speculate for profit. The direction of the decision also determines the trader's plan for the development and extension of the investment strategy afterwards. If the direction is wrong, the trader should adjust it in time and not face the stock index futures with a gaming mentality, otherwise he will only get deeper and deeper into the loss. After making an investment direction should promptly inform the financial institution to operate, do not spend excessive time to speculate and hesitate, futures market and stock market like a second jump, the market is also fleeting, traders should timely grasp the timing, investment transactions, to avoid the risk caused by poor timing.

## **6. Conclusion**

With the change of time and rapid economic development, stock index futures are gradually becoming a new trend in the financial world. As a result, significant changes are bound to occur in the securities and futures markets. Traders should be aware of the risks involved when hedging or arbitrage on stock index futures and should actively address the risks. The government and relevant departments should also fully recognize the pivotal role of stock index futures in the financial sector, continuously improve relevant laws and regulations, implement a strict regulatory system, and maintain the order of the futures market so that China's stock index futures can develop steadily.

## **References**

- [1] Wang Xue. *Risk management of futures* [J]. *Business*, 2016(14):165.
- [2] Li Yanhong. *A study on risk management and strategy of stock index futures market* [J]. *Time Finance*, 2016(03):109-111.
- [3] Zheng Yi. *The impact of stock index futures launch on the stock market* [J]. *Cooperative Economy*

*and Technology, 2018(17): 70-71.*

[4] Wang Yudong. *Analysis of the development history and current situation of stock index futures in China [J]. China market, 2017(18):38.*

[5] Wang Mingguo, Yu Hailin. *Research on the problems and countermeasures of stock index futures in China [J]. Modern business, 2018 (22):74-75.*

[6] Han Ning. *On the function of stock index futures and the impact on China's stock market [J]. Time Finance, 2017(05):170-171.*